Report of the Comptroller and Auditor General of India

for the year ended March 2000

Review of Inventory Management in Ordnance Services

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CONTENTS

Preface

Materials constitute a critical component of military capability. The need for their ready availability at the time and place where required is a matter of prime concern for the Army. Almost the entire material inventory is presently procured, stored and distributed through a multi echelon supply chain which is, essentially, of World War II design.

There have been major developments in the nature, capabilities and capacities of the national industrial base and infrastructure since the time the existing system was put in place. The advent of Information Technology revolution has almost entirely transformed the way procurement and distribution functions are handled by the defence forces through out the World yet the highly routinised systems prevalent in the Army have changed little. The system, despite major investments in inventories, appears unable to deliver the desired user satisfaction level. Its speed of response and cost effectiveness have remained unscrutinised.

With a view to identifying the causes underlying the present situation and suggesting remedial measures, a special system wide review of the inventory management policies, practices and procedures was undertaken by my department with the complete involvement and full cooperation of the Army, making a significant departure in approach from the established audit practice of identifying and reporting failures. It covers several areas of inventory management though we have not at present touched capital equipment like tanks, guns and radars or ammunition because of their specialised nature. We have also not touched the location aspect of depots, which have deep-rooted history and social and human problems attendant upon their relocation. Both these areas, however, do require separate studies to bring the total system in line with the present day needs.

Based on the study conducted, we have made certain recommendations. Of these, the main ones relate to the need for:-

(a) speeding up the ongoing computerisation project;
(b) revising the scales which govern spares procurement;
(c) restructuring the supply chain;
(d) reducing procurement related lead-time, both internal and external;
(e) improving the intake standards of manpower and training;
(f) standardisation of equipment.

While the Ministry of Defence and the Army Headquarters have both agreed with most of the recommendations made in the study report, the purpose of the exercise would be fulfilled only if these are implemented in a time bound manner. We feel that if these are addressed in real earnest, there would be payoffs in the following areas:-

(a) segmentation of inventory for selective treatment leading to economies;
(b) reduction in procurement lead-times resulting in lower investments in inventories besides reduction in inventory carrying costs;
(c) realistic scales for provisioning resulting in avoidance of over stocking;
(d) de-layering of supply chain making it more responsive and contributing to higher levels of user satisfaction;
(e) enhanced stock visibility resulting in system cost effectiveness;
(f) standardisation and rationalisation making for more effective inventory control;
(g) speedy disposal of surplus stores releasing locked up funds.

I commend implementation of recommendations of the study report both by Ministry and the Army in the interest of system improvement and ensuring "Value for Money" for the Nation.

The Report has been prepared for submission to President under Article 151 of the Constitution.

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EXECUTIVE SUMMARY

Introduction

Inventory Management policies, practices and procedures currently in vogue in the Army are rooted essentially in the experiences of Second World War. Although these have been modified and adapted from time to time to cater for the changed conditions, the same have not been subjected to any comprehensive review to bring in line with modern practices in the field of materials management.

India now has a well-developed industrial base with majority of defence requirements being met indigenously. Equally, the logistics infrastructure has undergone major changes impacting on the channels and speed of replenishment. Added to these changes are the overarching developments in the field of Information Technology, which have made the processes of procurement and distribution comparatively simpler and speedier.

In the light of these fundamental changes, justification for holding large stocks in a multi-tiered distribution system, involving investments of substantial sums of public money warranted re-examination and promised worthwhile payoffs, both in terms of user satisfaction and resource utilisation, contributing ultimately to system effectiveness, ensuring "Value for Money".

A special audit review was, therefore, undertaken to examine whether the current inventory management policies, practices and procedures were contemporary and cost effective, bearing in mind the imperative need for the Army to remain in a high state of operational readiness at all times.

The findings, recommendations and conclusions of the study are summarised below.

Audit Findings

1. Essential provision related documentation was either incomplete or not updated or both in most Central Ordnance Depots. Issue of directives providing vital inputs on force levels and equipment policies were invariably delayed for prolonged periods. There were also incidences of provision action either not having been taken at all or not followed to its logical conclusion. The system lacked selectivity, resulting in the whole range of inventory items being treated equally irrespective of cost, criticality or ease of availability. Audit analysis of a few transactions revealed excess liability of Rs.11.31 crore on provisioning due to inaccurate inputs, avoidable lock up of inventory estimated at Rs.40.15 crore due to provision of spares for overhaul for five years just in one depot and procurement of spares worth Rs.180.72 crore by circumventing the established procedures. Despite over two decades of trials, Ordnance Services had not been able to fully automate this largely computational function.

2. The supply chain, which was essentially of pre-independence design, was sluggish in responding to the needs of the troops. It also locked up large inventories, which became

invisible at the system level resulting in excessive provision. The chain was highly inflexible and non-selective with almost all items being procured centrally and then following the same channels of distribution. It ignored the ready availability of large number of inventory items of common civil end use in most parts of the country.

3. There were significant delays, up to 11 years, in the issue of Initial Stocking Guides (ISGs). Validation of spares provided in the scales vis-à-vis actual consumption revealed that the scales were always on higher side with the degree of variation ranging between 25 to over 1000 percent. Certain stocks of ICV and Radar 'B' spares were likely to last for indefinite period of time. Although the scales had financial implications, the existing system did not provide for their financial approval i.e. scrutiny by the Ministry and concurrence of the Ministry of Defence (Finance).

4. The existing arrangements for budget and inventory control were inadequate and were fraught with risks of over or under provisioning. There was no system of vendor registration at Army Headquarters level to accommodate wider participation of civil industry. The Depots availed administrative lead-time of upto three years in certain cases as against the permitted time of two months. The allowed Interim Period (IP) of upto 42 months was archaic and not justified in the light of encouraging trend in supplies from trade as experienced by all depots. The Defence captive industrial base of DGOF and PSUs were slow in response, despite enjoying favourable payment terms. A PSU, as pointed out by the DGOS in November 1999, was yet to supply stores worth Rs. 102.35 crore though an advance of Rs.412.39 crore had already been paid.

5. Store Keeping and Clerical staff were recruited locally with a minimum qualification of SSC. In the absence of any structured arrangements for induction training, rudiments of the work were learnt on the job. Analysis of training imparted at College of Material Management Jabalpur revealed that nearly 2/3 of the civilian staff would retire without any training during their service period. Recommendations of the Fifth Central Pay Commission laying down qualifications for recruitment that would have improved the technical capability of staff over a period could not be implemented due to resistance from staff.

6. The inventory valuation procedure in vogue was unscientific and unreliable for decision-making. Audit analysis of value of a selected sample of Mechanical Transport stores at COD Delhi Cantt and CAFVD Kirkee revealed that the actual value was much higher at Rs.9.74 lakh at COD Delhi Cantt and Rs.48.88 lakh at CAFVD Kirkee as against Rs.49,040 per ton fixed in September 1990. The existing valuation did not help in application of Selective Inventory Control Techniques like ABC/VED analysis, which were necessary for proper decision-making.

7. The initial efforts made by the Army towards computerisation of its inventory date back to late sixties. However, the implementation had been discontinuous and fragmented. The PCs possessed by the Depots were being used as stand alones for generating a few internal reports. With the exception of COD Delhi Cantt, the major activity of all the Depots i.e. provision function was being performed manually. Even after decades of embarking on the process of computerisation by the ADP Branch of COD Delhi Cantt, the computerised output were put to manual check ostensibly to avoid over provisioning

indicating unreliability of the system. Computerisation could have acted as a boon in addressing the shortcomings like poor stock visibility, lack of Selective Inventory Control, large-scale extraction of demands and poor user satisfaction. The Ordnance Services hoped to address these problems through their Computerised Inventory Control Project (CICP) sanctioned in 1994, implementation of which was at present lagging behind schedule.

8. There was no agreement in inventory reported as verified by the depots and reflected in the Annual Audit Certificates rendered by the concerned Controllers of Defence Accounts (CsDA). Consequently, the actual stock levels held by a Depot could not be vouchsafed and the reported stocktaking could not be relied upon. Completion of stock verification had been achieved by enhancing the prescribed speed of verification of items per day and over loading the task of verification of the existing stock-verification groups affecting its accuracy. Further, discrepancies i.e. surpluses/deficiencies remained unreconciled for a long time. At COD Delhi Cantt. unreconciled discrepancies amounted to Rs.14 crore in which some were unreconciled for nearly two decades. Huge inventory of spares in respect of Weapon Systems 'C' and 'D' held by COD Agra and CAFVD Kirkee was lying unidentified, even after four years of its receipt. Yet, the Depots continued to report 100 percent stock-verification of their inventory every year. Shortage of manpower for stocktaking was a common excuse.

9. Ordnance was not able to enhance user satisfaction level and the inability percentage ranged from 12 to 40 per cent. The overhaul/repair programmes were affected due to non-availability of critical and vital spares. Cases of rejection of stores not meeting the specifications were a common occurrence. Precious man-hours were lost in segregating wrong demands and 30 to 40 per cent of demands remained unregistered at any point of time. Users did not acknowledge receipt of stores in some cases even after three years of supply. Mandatory "Dues Out Audit" intended to weed out fictitious dues out headings were in arrears in most cases. Absence of a real time data links amongst the CODs, Army HQ and the dependant units were the constraining factors.

10. Low technology nature repairable stores weighing 7896 tonne were held by the CODs as on 31 March 1999, although the provisions stipulate for their repairs through civil contracts in cases where they were unlikely to be repaired in RSSDs/MSSD. In one Depot, timely repair of the inventory could have saved Rs.17.59 crore involved in fresh purchases. RSSDs/MSSD were not cost-effective. At MSSD of COD Kanpur, Rs.1.55 crore per annum were spent towards pay and allowances on 307 idle tradesmen.

11. There was large-scale proliferation in variety of items of civil end use, found in the Ordnance inventory to meet the same purpose giving standardisation a back seat. There were 189 types of 'B' vehicles and in passenger carriers alone there were vehicles of five different types. The futuristic policy for standardising 'B' vehicles, proposed some time in 1971 remained a matter of history. There were eight to ten types of generating sets with a spare support in the range of 53 to 448 nos. Similarly, five to eleven types of charging sets with a spare support in the range of 72 to 588 nos. were carried in Army inventory. The clothing items consisted of 24 sizes of Boot Ankle, 15 sizes of Hats-Gorkha and 15 sizes of shirts plain Olive Green/Khaki.

12. Whereas 10 percent of the item held by the depots were demand bearing, yet, the reported inability percentage in meeting the demands varied between 4.70 percent at COD Jabalpur to 35.54 percent at COD Kanpur. The stocks held were 2.79 times at one depot to 29.28 times at another depot, of the average annual issues made. Based on the prevailing consumption trend, the stores in hand were likely to last up to 100 years and beyond in some cases and for an indefinite period in certain other cases. These included items with limited shelflife. Faulty scales, incorrect forecasting, avoidable delays in provision review, indents processing and disposal action were some of the problem areas.

13. The existing system of identification of surplus stores and their disposal were constrained by time consuming procedures involving several agencies for the clearance at various levels. Considerable time was taken in CTT check, recommending a meagre quantity of items for re-utilisation. There were delays in disposal action even after publication of Assignment Lists. While inventory valuing Rs.55.09 crore was pending for disposal, serviceable stores valuing Rs.156.4 crore were lying in open, facing the vagaries of weather, as unwanted stores had occupied precious covered accommodation.

14. In view of the above-mentioned Audit findings, the following recommendations were made.

Audit Recommendations

1. Automation of the provision processes, introduction of selective inventory control techniques and upgradation of human resource standards coupled with timely inputs both from policy formulating authorities and associated agencies were the identified needs for an effective provision function. These needed immediate attention.

2. De-layer the multi-echelon structure and increase the scope of regional and local procurement, making the chain flexible and responsive besides imparting the system a measure of dynamism to ensure that it meets the requirements of the modern day Indian Army.

3. Publish the scales timely, preferably with the involvement of DGQA, Ordnance and Finance. Limit provisioning of overhaul spares to three years requirement instead of the present five years. Curtail Interim Period in respect of DGOF and PSUs supplies.

4. Review the existing arrangements of budget and inventory control.

5. Outsource maintenance/overhaul of civil end use vehicles/equipment to trade. Encourage trade participation in indigenous manufacture and supply of defence stores.

6. Revise manpower norms; select feeder cadres through recruitment boards as followed in other Departments like Railways and Post. Introduce compulsory induction training.

7. Introduce a system of checking the efficacy and accuracy of stocktaking carried out by the stocktaking teams by the concerned supervisory officers. Explore the feasibility of resorting to segmentation of inventory for stocktaking purposes on selective basis.

8. Enhance stock visibility through an appropriately designed Management Information System to avoid extraction of large number of wrong demands and for timely issue of stores to the users. DGQA inspection should be stringent to prevent rejection of stores by the users.

9. Initiate/gear up standardisation of vehicles, general stores and clothing items to reduce the cost of inventory and ensure better control thereof.

10. Review all the repairable holdings to reassess their utility and arrange for repair/disposal. Reassess the cost-effectiveness of the RSSDs/MSSD vis-à-vis laid down performance indicators and explore the feasibility of repairs through civil contracts.

11. The depots should come out of "Just in Case" attitude and declare surpluses timely. Curtail the time taken in CTT check. Re-examine the system of back loading surplus inventory by lower echelons to the concerned CODs. Study the feasibility of forming a permanent body analogous to the disbanded Special Surplus Stores Disposal Committee (SSSDC) for disposal function. The declaration of equipment status and the issue of Assignment Lists should be carried out speedily.

Conclusion

The areas of concern as emerged during audit were:-

(a) Abnormal delays and repeated slippages in computerisation of the provision functions/processes
(b) Rather lavish nature of scales, contributing to excessive inventories
(c) Unjustified practice of procurement of overhaul spares for a period of 5 years
(d) Sluggish supply chain with large stocks locked up within it
(e) Excessive lead times both internal and external
(f) Poor quality of human resource. Inadequate training of civilian workforce
(g) Lack of standardisation of equipment
(h) Mounting repairables, insufficient rate of repair and non-involvement of civil industry in liquidating the same
(i) Large accumulation of surplus stores.

The Ordnance Services and the Ministry fully agreed with 51 out of 68 of the recommendations of Audit, spelt out in different chapters of this Report. If these and the remaining recommendations are implemented, the same will go a long way in improving the ailing system. Audit feels that there could be pay-offs in the following areas:

1. Segmentation of inventory for selective inventory control
2. Reduction in procurement lead time resulting in lesser investment on inventory, besides saving of storage space and inventory carrying costs
3. Realistic scales for procurement resulting in avoidance of over-provisioning
4. De-layering of supply chain which would respond effectively and enhance user satisfaction
5. Enhanced stock-visibility
6. Variety reduction through standardisation
7. Speedy disposal of surplus stores.

INDEX OF FIGURES

INDEX OF ANNEXURES

INDEX OF TABLES

LIST OF ABBREVIATIONS

ABC	Always Better Control
AD	Ammunition Depot
ABW	Army Base Workshop
ABOD	Advance Base Ordnance Depot
ADGOS	Additional Director General Ordnance Services
AL	Assignment List
AMF	Annual Maintenance Figure
AOC	Army Ordnance Corps
AMU	Average Monthly Usage
ASC	Army Service Corps
ADP	Automated Data Processing
AsHSP	Authorities Holding Sealed Particulars
APCs	Armoured Personnel Carriers
CCPA	Cabinet Committee on Political Affairs
CGDA	Controller General of Defence Accounts
CAD	Central Ammunition Depot
CAFVD	Central Armoured Fighting Vehicle Depot
CTT	Convenor Technical Team
CRV	Certificate Receipt Voucher

CDA	Controller of Defence Accounts
CFA	Competent Financial Authority
CVIL	Consolidated Vital Inability List
CAG	Comptroller and Auditor General of India
CMM	College of Materials Management
COD	Central Ordnance Depot
COS	Catalogue of Ordnance Stores
CP	Central Procurement
CPO	Contract Purchase Officer
CVD	Central Vehicle Depot
CICP	Computerised Inventory Control Project
CHT	Civil Hired Transport
CQA	Controllerate of Quality Assurance
DAFA (O)	Deputy Assistant Financial Advisor (Ordnance)
DAO	Depot Accounts Officer
DDGOS	Deputy Director General Ordnance Services
DDL	Draft Depot List
DGOF	Director General Ordnance Factories
DGOS	Director General Ordnance Services
DP	Direct Purchase
DLM	Depot Local Manufacture
DLP	Depot Local Purchase
DGQA	Directorate General of Quality Assurance

DDPS	Department of Defence Production and Supplies
DGS&D	Director General of Supply and Disposal
DOU	Divisional Ordnance Unit
EME	Electrical and Mechanical Engineers
EDI	Electronic Data Interchange
EMERs	Electrical and Mechanical Engineering Regulations
EEC	East European Countries
ECC & E	Extreme Cold Clothing and Equipment
EOA	Equipment Out of Action
FDL	Final Depot List
FF	Field Force
FSN	Fast, Slow and Non-moving
FWP	Fixed Working Proportion
FOD	Field Ordnance Depot
FAD	Field Ammunition Depot
FCI	Fire Control Instrument
GOC	General Officer Commanding
GOC-in-C	General Officer Commanding-in-Chief
GS&C	General Stores and Clothing
GSEPC	General Staff Equipment Policy Committee
GS	General Stores/General Staff
HQ	Headquarters
HVF	Heavy Vehicles Factory

I&BC	Inventory and Budgetary Control
IP	Interim Period
ICV	Infantry Combat Vehicle
IF	Initial Fill
IFA	Integrated Financial Advisor
ISG	Initial Stocking Guide
LTB	Life Time Buy
LRW	Light Repair Workshop
MAG	Maintenance Advisory Group
MGO	Master General of the Ordnance
MOD	Ministry of Defence
MMF	Monthly Maintenance Figure
MPI	Master Part Index
MIS	Management Information System
MP	Maintenance Period
MS	Maintenance Scale
MSP	Maximum Stock Potential
MT	Mechanical Transport/Metric Tonnes
MUL	Maruti Udyog Limited
MRLS	Manufacturers' Recommended List of Spares
MSSD	Material Stores Sub-Depot
MSTC	Metal Scrap Trading Corporation
NA	Not Available

NFF	Non Field Force
NIC	Not in Catalogue
NIV	Not in Vocabulary
OBT	Obsolescent
OBE	Obsolete
OC	Officer Commanding
OD	Ordnance Depot
OEM	Original Equipment Manufacturer
OSS	Ordnance Store Section
OMC	Ordnance Maintenance Company
OH	Overhaul
'P'	Provided
PC	Personal Computer
PC&P	Parts Change and Publications
PET	Peace Equipment Table
PAF	Provision Action Figure
PRF	Provision Review Form
PPO	Procurement Progressing Organisation
PRS	Permissible Repair Schedule
PSU	Public Sector Undertaking
RC	Rate Contract
ROD	Regional Ordnance Depot
RAF	Review Action Figure

RAOS	Regulation for the Army Ordnance Services
RSSD	Returned Store Sub Depot
SDE	Scarce, Difficult, Easy
SPRD	Supplementary Provision Review Directive
SSG	Special Stocking Guide
SM	Store Margin
SSSDC	Special Surplus Stores Disposal Committee
SSC	Secondary School Certificate
TGEME	Technical Group Electrical and Mechanical Engineers
TLP	Total Liability Period
TSS	Technical Store Section
UE	Unit Entitlement
VCOAS	Vice Chief of Army Staff
VED	Vital, Essential, Desirable
VFJ	Vehicle Factory Jabalpur
VOR	Vehicle Off- Road
WAN	Wide Area Network
WWR	War Wastage Reserve
WET	War Equipment Table

GLOSSARY OF TERMS

1. Authorities Holding Sealed Particulars (AsHSP)

The establishment responsible for maintaining technical information, including drawings and specifications in respect of stores of their responsibility. The AHSP is also responsible for scrutiny of tenders against defence demands; laying down inspection criteria; drafting technical documents for introduction of stores; and guidance for procurement and production of stores by the industry.

2. Assignment Lists

Information about the introduction into service, change in status, Cat/Part Nos. nomenclature of a spare part and disposal is intimated to all concerned by the issue of Assignment List by the AHSP.

3. Benchmarking

A process by which an organisation seeks to determine and introduce best practice, and assess programme performance. Benchmarks can operate as standards or targets for performance levels by using comparisons of products, services, practices and processes with similar programmes either within the organisation or in the other organisations or countries. Benchmarks usually operate as best practice standards.

4. Class 'A' stores

These are usually main equipment, the liability for which consists of UEs plus maintenance requirements, assessed on the basis of fixed percentage wastage for unit entitlements, plus policy reserves ordered by higher authorities.

5. Class 'B' Stores

These are assemblies/sub-assemblies of an equipment that are replaced in field/light repair workshops by virtue of a repair policy (PRS), the replaced item being back loaded to the appropriate rear repair echelon through Ordnance channels. After repair these are returned to Ordnance and counted as serviceable assets, e.g. dynamo or carburetor of a vehicle.

6. Current items

All items which are currently in service

7. Dispersal Stores

These are stores belonging to a central Depot, which are centrally accounted for but held at different CODs/ODs/FODs etc., for ease of transportation to the consuming units.

8. Dues- out -Audit

A system of cyclic review of all the recorded Dues Out (Record of items and quantities demanded by the dependant units from the depots but not issued due to non- availability ex- stock at the time of demand). The review is undertaken every month with a view to eliminating fictitious Dues Out and weeding out those Dues Out which have lapsed. The system is analogous to the review of "Back Orders" as practiced in industry and trade. It involves physical check of the stores locations on ground and release of the items where available. The exercise includes all efforts at locating alternative means of meeting the demands by issuing substitutes (in- lieu items) or arranging repair of repairables, where held to make the demanded items available. It also involves checking of the provision action and expediting dues- in against Depot orders placed on sources of supply.

9. Earmark

Stores held in Ordnance Depots under specific authority, which may only be issued in accordance with the instructions of that authority

10. Equipment Not Introduced (ENI)

Expression used to indicate equipment, store and components thereof, which have not been formally introduced into service, irrespective of whether stocks are held or not.

11. Exponential Smoothing

This is a method of manipulating past consumption data to assess future requirements. It is a form of weighted moving average, which can cater for trend and the calculations are much simpler to make. In this method, sensitivity to recent calls are adjusted in a desired manner. Only minimal past data is required for its computation.

12. Fixed Working Proportions (FWP)

A minimum quantity fixed to be provided to meet any probable calls on stocks during the provision period in cases where the issues are so fluctuating from month to month or year to year that a true maintenance figure cannot be established.

13. Free Flow

Items of developmental nature are declared "free flow" when two sources supply stores successfully against two orders each. However, if the second source is not established within five years of first supply order these are also treated as free flow.

14. Inability percentage

Refers to the percentage of demands from the dependant units, which the supplying depots are unable to meet due to stocks of the demanded items not being available. Inability percentage is inversely related to the level of user satisfaction.

15. Initial Fill (IF)

Initial Fill is the total requirement of spares for initial issue to Workshops in accordance with the maintenance scales applicable to them. It serves as an 'Imprest' of spares for the above repair units from which spares are issued for repair, replenishment being made from the next ordnance echelon.

16. Initial Stocking Guide (ISG)

A guide prepared by HQ Technical Group EME for the guidance of CODs to take procurement action for all newly introduced equipment, till sufficient usage data is built up in the depots.

17. Interim Period (IP)/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.

18. Lead-Time

Same as Interim-Period (IP)

19. Maintenance Figure (MF)/Monthly Maintenance Figure (MMF)

A figure expressed as an actual quantity of stores, which represents the estimated/calculated requirements of an item for a fixed period, either a month (monthly maintenance figure (MMF) or a year (annual maintenance figure (AMF). It is usually based on past average issues and modified by any known

factor/factors governing future requirements e.g. Increases/decreases in the number of equipments or troops.

20. Maintenance Scale (MS)

A document that lays down the range and quantities of repair parts that should be initially stocked by the different repair and ordnance echelons till sufficient spares requirement data is generated, whereafter the stocking level is adjusted based on recorded consumption. MS is an authority for the unit or workshop to place demands for these spares initially.

21. Maintenance Requirement ('M' Column)

The requirement of spares for stocking at various Ordnance echelons such as ABODs, FODs and CODs for replenishment of spares consumed from the Initial Fill. Sometimes, certain items are not authorized for IF. These requirements of various repair echelons on 'as required basis' are also included in this column. 'M' column thus represents field maintenance i.e. replenishment capability.

22. Master Part Index (MPI)

A document on which all information about an item, its status, supersession, Part/Cat No, correct ordnance nomenclature, items issuable in lieu, is recorded in the COD. Each items is allotted a separate sheet.

23. Maximum Stock Potential (MSP)

This represents the estimated maximum requirements. It is equal to

a) in an Ordnance Depot;
maintenance period + interim period + store margin.

b) in a Central Ordnance Depot;
maintenance period+ interim period (if authorised)+store margin+reserves

24. Non-Provided Items (NPIs)

Components of current major equipment not normally provisioned but for which special procurement may become essential.

25. Normal Issues

All issues of a recurring nature against the authorised scales made by a COD are classed "Normal Issues" and reckoned so during assessment of wastage pattern.

26. 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.

27. Obsolete

An equipment/store for which approval has been given for its withdrawal from service.

28. Overhaul Requirement ('O' Column)

This is an assessment of spares required for the first overhaul of equipment in a base workshop. It is shown under the 'O' column of the Initial Stocking Guide.

29. Overhaul Scales (OS)

A document that lays down the scales of repair parts requirement during base overhaul of equipment.

30. Provided (P)

All items introduced in the service for which normal provision action is taken. When MPI's held in CODs are marked 'P' this is called P enfacement.

31. Provision Action Figure (PAF)

A pre-determined figure for making replenishment of stock. It is equal to: -

(a) In an Ordnance Depot: -
Store Margin + Interim Period + Earmarks.

(b) In a Central Ordnance Depot: -
Store Margin + Interim period + Earmarks + Reserve.

32. Provision Period

The time that elapses between two successive reviews.

33. Provision Review Form (PRF)

A form on which data and calculations pertaining to provision review of an item are recorded while carrying out review of a class 'B' item at a command depot, a COD or Army HQ Central Provision Cell. The reverse of the form used in a COD/Army HQ Central Provision Cell presents a working sheet for recording provision data by establishment and for carrying out detailed provision calculations. The obverse of the form gives all the detailed particulars with regard to the status of the item and other information relevant to provisioning. In addition, the consolidated figures are transcribed from the reverse on to the obverse. This form is a permanent record of provision work and is subject to financial check.

34. Repair Part/Spare

A repair part is an item/component of equipment or an assembly/sub-assembly thereof, which is capable of being replaced at an appropriate repair echelon.

35. Repair Pool

The amount of stock (serviceable and repairable) which is temporarily non-effective for being in the pipe line for repair by EME Workshops, but which should always be maintained, both to enable advance replacement issues to be made and to ensure even flow of out-turn from Workshop.

36. Reserve (Res)/War Wastage Reserve (WWR)

Stocks held for specific war purposes. Reserves can be of different types. They are generally named after the purpose they are intended for, e.g., War Wastage Reserves (WWR).

WWR is a reserve kept to cover the increased wastage of military equipment, vehicles, ammunition, maintenance spares and other items of military inventory in the initial phases of war till such time as industrial production gears up to meet increased demands.

37. Review Action Figure (RAF)

Pre-determined stock level (s) at which the provision position of an item is to be reviewed. This level is endorsed on account cards so that posting clerks may initiate a Review Action Slip, when the stock has reached the Review Action Figure.

38. Store Margin (SM)

The period in months, which represents a quantity of buffer stock to ensure against contingencies e.g. delay in obtaining stores from sources of supply or increased rate of issues.

39. Special Issues

Issues not recurring with any degree of regularity e.g. initial issues, increases in scales, special workshop programmes and issues, for which special provision action is normally taken.

40. Special Stocking Guide(SSG)

On occasions it is essential to procure the quantity of spares for maintenance during the entire service life of the equipment. This will be so for some imported equipment and often for indigenous equipment whenever the manufacturer is about to stop production of the equipment. If spares are not procured at that time, these will not be available latter. Assessment of the requirement of such spares is made on an 'All Time Buy'

41. Transportation Model

Transportation Model is an effective management tool for speeding up deliveries by reducing multiple handling of spares (stores) from manufacturers to the ultimate users and in cutting down the requirement of maintaining stocks and minimising transit losses thereby decreasing the cost of inventory holding and management.

42. Unit Entitlement (UE)

Quantity of an item authorised to be held on unit charge under the authority of unit WET/PET, an Army Order or a Govt. of India letter.

43. Unit Holding (UH)

The actual holding of equipment in the unit/formation against its authorization (UE).

44. Weighted Moving Average

This is a method of assessing the wastage data giving focus to the fact that latest consumption data is better indicator for future consumption. So, in this process, past data is progressively discarded and mean of the consumption during the latest selected period of say three or four monthly usage is taken as the requirement for the next period. In the weighted moving average, latest periods are given greater weightage on the assumption that the same are better indicators of future requirement pattern.

CHAPTER 1: INTRODUCTION

1.1 General

Materials have always been central to the creation and maintenance of military capability. Their importance has, however, increased manifold in the modern day technology intensive warfare. "***SHASTRA SE SHAKTI***"- motto of the Ordnance Services, materials managers of the Indian Army, aptly underscores this reality.

Implicit in the importance of this function to the readiness of the Army to perform its role, is the imperative need for the materials managers to ensure that the requisite materials are available in the right quantity at the right place and at the right time; the need for right quality being self-evident.

High assurance of such availability, especially for operations, implies pre-acquired and pre-positioned inventories both in the range of items and depth of holding at the likely points of use and demand or within easy reach of such points, linked for replenishment, to a dependable and responsive supply chain connecting the sources of supply to the end users.

Policies, practices and procedures relating to acquisition and deployment of inventory as also the structure of supply chain serving widely dispersed troops both in peace and war, have a major influence on the levels of investment of national resources and system operating costs. Since the magnitude of such investments[1] and operating costs are staggering and the resources for the same are found out of public funds, a cost- effective approach to the management of this critical inventory becomes a matter of national concern.

1. 2 Army Inventory

i) Composition

Army inventory consist of a complex range of items, including:

a) Weapon systems and complete equipment such as tanks, guns, radars, vehicles and helicopters; termed variously as "Capital Equipment", "Primary Items" or *Class 'A'* stores. These constitute the main tools of trade for the Army. Bulk of these are normally in the hands of troops.

[1] Ordnance Services hold approximately half-a-million items valuing Rs. 50,000 crore- AOC Annual Report 1996-97.

b) Items required for support of weapon systems and equipment such as repair spares, consumable and expendable stores classified as "Secondary Items" or *Class 'B'* stores.

c) General Stores and Clothing items needed for equipping and operationalisation of units and the upkeep of troops; also classified as *Class 'B'* stores.

ii) Categorisation

Army inventory, for the purposes of generic description and control, is categorised as under: -

a) **Warlike Stores;** Those items of the inventory that constitute the primary implements of Army's activities which are not normally in use in the civil. These are invariably sophisticated, complex, multi-disciplinary, high technology and expensive pieces of equipment, which are conserved and maintained in peace, for full exploitation during war. Only limited use of these being made in peace for training purposes. Fighting vehicles, guns, radars, missiles and ammunition fall in this category.

b) **Non-Warlike Stores;** All other items of general nature which usually, though not always, have a civil end use and which experience more extensive peace time usage in the Army. The specifications of some of these items may, however, differ from those in use in civil and their wartime consumption may be several times higher than in peace. Clothing, General Stores, tyres, tubes and batteries fall under this category.

iii) Purpose

Stocks are held or provided for to meet the following requirements: -

a) Maintenance, to meet normal wastages during the "Provision Period" and the procurement "Lead Time".

b) Reserves, to meet contingencies including increased consumption during war.

c) Insurance items, held as safeguard to meet demands of items not ordinarily needed for normal maintenance.

d) Lifetime requirement of maintenance and overhaul spares, for equipment which have gone/or going out of production and where such spares are not likely to be available from the known sources of supply in future. These relate usually to imported equipment.

e) Repairables, including complete equipment and major as well as minor assemblies.

f) Overhaul spares and modification kits.

g) Held over stocks, which though surplus to known requirements are not intended to be disposed off due to operational or financial consideration or both.

1.3 Inventory Management Philosophy

The main purpose of inventories carried by the Army is to avoid stock-out situations, which may impact its readiness during peace and operations during war. At the same time, it is well nigh impossible to ensure availability of every single item at each location at all times. The system is, therefore, designed to work on the basis of given levels of assurance of availability; with such levels being prescribed empirically by the Commanders.

It remains for the materials managers to ensure the desired levels of assurance of availability of the required range of diverse items of inventory throughout the system while keeping the total investments and system operating costs within acceptable limits.

This is a challenging task indeed.

1.4 The System and its Operators

i) Operating system

The system operates through a set of Central Ordnance Depots acting as mother depots, with all India responsibility for a specified range of items on commodity basis, feeding regional and field depots which in turn are linked to the units supported through smaller dedicated store holding units forming a supply chain linking the sources of supply with the users in all parts of the country. Details of links in the chain of supply, referred to as "echelons" and flow of material are given in Annexure 'A'.

ii) Role of Ordnance Services

Composed of a combatant element; the Army Ordnance Corps (AOC), which forms bulk of managerial and supervisory cadres and a civilian component which provides the store keeping as well as clerical manpower besides industrial work force, Ordnance Services meet the material needs of the Army through a network of depots and store holding units, both in peace and field areas throughout the country.

The range of stores that the Ordnance Services cater is both large and diverse and is best described by identifying the exclusions rather than cataloguing the inclusions. In this context, Ordnance Services provide all material requirement of the Army except food, fuel, fodder and medical supplies. The other exception is a range of specialist engineering plant and machinery, provided by the Corps of Engineers. The division is historical in origin and has its roots in the practices of the Royal Army Ordnance Corps, after which the Indian Ordnance Services are patterned.

Essentially, the Ordnance Services are responsible for provision, receipt, storage, issue and disposal of all Ordnance stores including ammunition and explosives. They do have other secondary responsibilities which not being relevant to the present review are not catalogued here.

iii) Organisational Set- up

Director General Ordnance Services (DGOS) as the head of the Army Ordnance Sevices is responsible to the Master General of the Ordnance (MGO) for administration and direction of Ordnance Services. Organisational Chart of Ordnance at Army HQ is given at Annexure 'B'.

DGOS is responsible in peace and war for: -

a) Provision, receipt, storage, preservation, accounting, stocktaking and issue of Ordnance Stores i.e. armament, engineering, signal and wireless stores, Mechanical Transport (MT) spares, vehicles, ammunition, clothing and necessaries to the Army.

b) Repair and modifications to Ordnance Stores, which are not the responsibility of the EME. These are usually low technology items.

c) Inspection, repair, proof-test, conversion and disposal of ammunition and explosives.

d) Disposal action in respect of unwanted and unserviceable stores.

e) Training and development of its manpower, both combatant and civilians

Additional DGsOS and DDGsOS at Army HQ assist DGOS. Major Generals AOC at Command level and Cols (Ordnance) at Area level advise the GOsC-in-C and GOsC respectively, on all Ordnance matters and are responsible for such other Ordnance functions which may be assigned to them under the Regulations for the Army Ordnance Services Part 1. Similarly, DDsOS at Corps HQ and OsC Divisional Ordnance Units at Division level are responsible for efficient functioning of the Ordnance Services in the

Corps/Division concerned. At Sub Area level, a Sub Area Ordnance Officer functions for this purpose. Ordnance Stores Sections attached to Army Base Workshops, though forming integral part of EME, are staffed by Ordnance personnel.

iv) AOC Establishments and Units

a) The more important executive establishments and units of the Ordnance Services are: -

(i) Central Ordnance/Ammunition/Vehicle Depots
(ii) Ordnance/Ammunition/Vehicle Depots
(iii) Advance Base Ordnance Depots
(iv) Field Ordnance/Ammunition Depots
(v) Divisional Ordnance Units
(vi) Ordnance Stores Sections attached to ABWs
(vii) Technical Stores Sections attached to EME workshops
(viii) Central Aviation Stores Depot
(ix) Regional Aviation Depot

b) The main training and administrative establishments of Ordnance Services are: -

(i) College of Materials Management Jabalpur
(ii) AOC Centre and Records Secunderabad

v) Central Ordnance Depots (CODs)

Ordnance system is based on a tiered-multi-echelon structure with Central Depots located at stations as indicated below to deal with specified items of stores to cater for the all India requirement with stocks being distributed to Ordnance Depots, Advance Base Ordnance Depots, Field Ordnance Depots and Ordnance Stores Sections of Army Base Workshops to cater for issues to units/formations in their area of supply or dependant on them. The nature and range of items carried by these Depots as also their tonnages and value as on 31 March 1999 are shown in the table below: -

Table: 1.1: Nature, number, tonnage and value of the inventory maintained by the Central Ordnance Depots as on 31 March 1999

Sr No	Name of Depot	Nature/Range of items	No. of items	Tonne	Value (Rs in crore)
1.	COD Agra	Radio sets,Line Equipment, Radars, Charging sets, generating sets,instruments, Fire Control Instruments (FCIs) and related spares and sighting devices	121945	10262	5993
2.	COD Jabalpur	Armament/small arms with related spares, water transportation equipment and its spares.	58820	58408	1624
3.	COD Delhi Cantt.	Vijayanta spares, 'B' vehicle spares, Machinery and its spares.	103894	122902	603
4.	COD Dehu Road	East European Countries (EEC) 'B' Vehicle spares, and fire fighting equipment and its spares.	40362	26151	447
5.	COD Bombay	Tyres, Tubes, laboratory and chemical equipment, cinematographic equipment with its spares and scania spares.	7563	1594	116
6.	COD Kanpur	Clothing, Barrack Stores and air-borne equipment.	5893	80162	807
7.	COD Chheoki	General Stores and 'B' Vehicles.	10439	39599	135
8.	CAFVD Kirkee	EEC 'A' vehicles and spares, EEC specialist vehicles.	53789	59768	306
		Total	**402705**	**398846**	**10031**

The main functions of Central Ordnance Depots are:

(a) to act as central inventory points for stores/ equipment dealt with by them and related spares from sources both in India and abroad;
(b) to carry out the provision of Class 'B' stores to meet the requirements of the Army;
(c) to supply stores in bulk to various depots like Command Ordnance Depots, Advance Base Ordnance Depots, Field Ordnance Depots, Ordnance Stores Sections of Army Base Workshops as well as para military and police forces;
(d) to carry out the additional functions of Command Ordnance Depot in exceptional circumstances;

(e) to hold reserve stocks as authorised;
(f) to manage the repair/overhaul of equipment through Army Base Workshops;
(g) to receive stores returned by units;
(h) to repair/fabricate items in the depot to the extent possible; and
(i) to initiate action for disposal of unserviceable and redundant inventory.

An organisational chart of a Central Ordnance Depot is given in the enclosed Annexure 'C'.

vi) Other Operators

Major decisions relating to equipment policies of the Army, which *inter alia* cover induction into service, distribution, deployment, in service use, exploitation, maintenance, upgradation, life extension, discard and disposals lie outside the purview of the Ordnance Services. Similarly, force levels and fleet strengths to be maintained, reserves to be carried and repair echelons to be supported including scope of repairs to be undertaken at each of those echelons and spares backup to be provided for overhaul are decided upon by agencies and authorities outside the Ordnance Services.

The production and supply agencies including Directorate General Ordnance Factories (DGOF) and Defence Public Sector Undertakings (PSUs) which supply bulk of the materials are controlled directly by the Ministry of Defence. The Directorate General Quality Assurance (DGQA) handles the indigenisation function. Budgetary control with the exception of delegated powers rests with the Ministry of Defence (Finance). Defence Accounts Department headed by Controller General of Defence Accounts handles payments against procurements.

All these considerably limit the scope of material management as practiced in the Ordnance Services[2]. Any review of the performance of Inventory Management functions of the Ordnance Services has to contend with these ground realities.

1.5 Genesis of Audit Review

Inventory Management policies, practices and procedures currently in vogue in the Army are rooted essentially in the experiences of Second World War. Although these have been modified and adapted from time to time through in-house efforts to cater for the changed conditions, these have not

[2] "India's Defence Budget and Expenditure Management in a Wider Context" by Mr. A.K. Ghosh, 1996, Page 253

been subjected to any comprehensive review to bring the same in line with modern practices in the field of materials and supply chain management.

India now has a well-developed industrial base with a significant proportion of defence requirements being met indigenously. Equally, the logistic infrastructure has undergone major changes impacting on the channels and speed of replenishment. Added to these changes are the overarching developments in the field of Information Technology, which have made the processes of procurement, storage and distribution comparatively simpler and speedier.

In the light of these fundamental changes, justification for holding large stocks in a multi-tiered distribution system, involving investments of substantial public funds warrants re-examination and promises worthwhile payoffs both in terms of user satisfaction and resource utilisation, contributing ultimately to system effectiveness, ensuring "Value for Money".

1.6 Scope and Audit Objectives

The principal objective of review was to ascertain whether the current inventory management policies, practices and procedures were contemporary and cost effective bearing in mind always the imperative need for the Army remaining in the highest state of operational readiness.

The Review covered the essential functions of Inventory Management relating to Provision, Supply Chain Management, Inventory and Budgetary Controls, Procurement, Stock Visibility, Disposal and Warehousing. The main focus of the Review was the range of *Class 'B'* stores managed at the COD level, which include secondary items such as Spares, General Stores and Clothing. It did not cover Ammunition and Explosives.

Inventory Management of Class 'A' equipment, which include Armoured Fighting and General Service vehicles, weapons and technical equipment differs greatly from that of *Class 'B'* Stores. It is not an in-house function of the Ordnance Services as it involves decision making at the levels of the Ministry of Defence, the General Staff, production agencies, users as well as the maintaining agencies, leaving only the custodial and storekeeping functions to the Ordnance Services. As a review of this system without full involvement of all these major agencies could not have been comprehensive, it was not attempted as a part of the present exercise.

Even within the functions germane to the Ordnance Services, several areas were not covered. These include:-

1) Material Handling
2) Storage and Retrieval Systems
3) Covered space utilisation

4) Modes of Transport
5) Technical aspects of care and preservation
6) Management of Packing Material
7) Utilisation of depot held machinery

All these areas merit examination and need to be studied separately.

1.7 Methodology

a) Selection of Depots and determination of Focus Areas

Audit, during preliminary survey of various activities decided to select the under mentioned five depots to focus on the areas mentioned therein. These areas were decided based on the criticality and value of inventory held by the Depots. The range (86 *per cent*), tonnage (83 *per cent*) and the value (93 *per cent*) of the inventory, which these selected depots hold, represent the near total activities of the Ordnance Services.

Table: 1.2. Depot-wise focus areas of the review

Sr. No.	Name of Depot	Range of Items	Focus Areas
1.	COD Agra	Radio sets, line equipment, radars, Charging sets, generating sets, instruments, Fire Control Instruments and related spares and sighting devices	* Provision * Obsolescence and disposal * User satisfaction (EME) * Stock visibility
2.	COD Delhi Cantt.	Vijayanta spares, 'B' vehicle spares, Machinery and its spares.	* Stock visibility * Lead Time * Provision * Repair programme (RSSD)
3.	COD Jabalpur	Armament/small arms with related spares, water transportation equipment and its spares.	* User satisfaction * Disposal * Stock Taking
4.	COD Kanpur	Clothing, Barrack stores and airborne equipment.	* User satisfaction * Manpower * Procurement through Trade
5.	CAFVD Kirkee	EEC "A" vehicles and spares, EEC specialist vehicles.	* EME satisfaction * Lead Time * Inability percentage * Repair programme (RSSD)

Considering that the primary motto of the Ordnance was to ensure better "User Satisfaction", a conscious decision was taken to examine this aspect in detail at all the selected depots.

b) Sampling

Criteria were developed to select randomly as representative samples as possible, bearing in mind always the cost and criticality factors. In the absence of uniformly developed or maintained automated database throughout the system, Audit had to rely on different sets of data both automated and manually maintained in different depots without compromising on the need for representativeness of the samples.

c) Bench Marking

Audit, on examination of contemporary practices followed by the Ordnance Services of other countries and certain well established techniques used in the commercial world for better Inventory Management, attempted to assess the current practices/procedures against the best practices followed world wide.

1.8 Constraints

a) The special review taken up by Audit involved considerable amount of time for data collection/extraction, analysis and reporting. The data collection in the absence of an automated database either at the level of Army HQ or the depots, entailing the scrutiny of nearly 4.02 lakh items held by the depots and collection of inputs relevant to Audit was a mammoth task. The data held and maintained in the depots was still based on the manual system i.e. posting of entries by hand in various control registers. Retrieval of data involving the physical perusal of the records held for each item was found to be a formidable exercise, therefore, representative samples depending on the size of the population were collected for further analysis.

b) In the existing set up of Management Information System (MIS), the depots send a quarterly report to the DGOS on the entire range of their functions. The annual compilation of these reports is commonly known as DGOS Annual Statistical Summary. On examination of the inputs taken for its compilation and the methodology followed in their preparation, Audit felt that these reports are exaggerated to project a position somewhat better than that existed on the ground. Their accuracy could not be vouchsafed. However, to supplement the inputs collected by the team, in some cases, in absence of any other authentic source of reports, the statistics mentioned in the above report were relied upon by Audit.

1.9 Layout of the Report

The succeeding report is laid out in 13 chapters, each of which deals with a specific focus area.

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CHAPTER 2: PROVISION

2.1 Summary:

Provision, the most important function of Ordnance Services as material managers of the Army, requires authentic past consumption data and timely information on future force levels besides equipment maintenance policies to enable accurate forecast of requirements followed by prompt procurement action.

While the provision system in vogue in Ordnance Services is inherently sound, serious implementation level deficiencies were noticed. Essential provision related documentation was either incomplete or not updated or both in most depots. Directives providing vital inputs on force levels, and equipment policies were invariably delayed for prolonged periods derailing the entire process. There were also incidences of provision action either not being taken at all or not being followed to its logical conclusion. The system lacks selectivity resulting in the whole range of inventory items being treated equally irrespective of cost, criticality or ease of availability. Audit analysis of a few transactions revealed excess liability of Rs.11.31 crore on provisioning due to inaccurate inputs, avoidable lock up of inventory estimated to cost Rs.40.15 crore in just one depot due to provision of spares for overhaul for five years and procurement of spares worth Rs.180.72 crore by circumventing the established procedure. Despite over two decades of trials, Ordnance Services had not been able to fully automate this largely computational function.

Automation of the process, introduction of selective inventory control techniques and upgradation of human resource standards coupled with timely inputs both from policy formulating authorities and associated agencies are the identified critical areas requiring strengthening and modernisation.

2.2 General

Provision, the process of calculating and obtaining the quantities of stores required by the Army, is perhaps the single most important function of the Ordnance Services. The accuracy and fidelity of this function determine not only the magnitude of public funds that are annually, progressively and cumulatively committed to Army inventories but also the levels of user satisfaction that are achieved through the commitment of these funds.

The function of provisioning involves forecasting the anticipated future requirements of the Army and initiation of timely procurement action. It calls

for intelligent extrapolation of past experience into the future environment and refining the same in the light of known or likely changes that might impact the rate of demand and consumption of items of inventory over the period being covered by the ongoing provision exercise. The uncertainties attached to this exercise involving a vast range of diverse items and the large number of variables that have a bearing on the requirement determination, make it necessary for the function to be handled with the greatest of diligence. The need for employing professionally qualified, well-trained, highly numerate and experienced staff for this function is self-evident.

2.3 Classification of Inventory and Provision Responsibilities

Stores in Ordnance inventory are classified into Class 'A'[1] and 'B'[1]. Class 'A' includes all main equipment, the liability for which consists of Unit Entitlements (UE)[2] plus maintenance requirements assessed on the basis of fixed percentage wastage of UE and policy reserves as ordered by Army HQ[3]. Class 'B' refers to items related to main equipment such as spares and General Stores[4], the provision of which is based on scales or issue experience and items of Clothing[5] in respect of which Life Cycle Concept[6] of replacement applies.

Provision function in respect of Class 'A' stores is performed by the concerned Stores Sections of the Directorate General Ordnance Services[7] at Army HQ. Provision responsibility in respect of Class 'B' Stores rests with the respective Central Ordnance Depots with the exception of CODs Kanpur and Chheoki in whose case, provision functions are handled by Deputy Director General Ordnance Services (General Stores and Clothing), located at Army HQ.

2.4 Existing System

The Ordnance Services presently follow a system of "Periodic Review"[8] for determining and catering for their stock replenishment

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[1] See Glossary of Terms

[1] See Glossary of Terms.

[2] See Glossary of Terms.

[3] These include War Wastage Reserves, Engineer and Signal Stores, Theater Reserves, Extreme Cold Clothing and Equipment Reserve and the like spelt out in various Appendices and Annexures to the Standing Directive for Provison Review both for class"A" and "B" stores. (DGOS Technical Instruction No 307 and 040).

[4] General Stores include items like tentage, digging and entrenching tools, cooking utensils besides expendable items like paints, oil and preservatives.

[5] Uniforms including footwear and other items of personal clothing.

[6] A concept under which the life of different items is fixed and replacement is provided at the end of the prescribed life.

[7] These sections are earmarked responsible as per charter of duties published by DGOS.

[8] This system, also known as "Fixed Interval System" is based on cyclic review of stocks on periodic basis. The interval between the reviews is called the "Review Period" and in

requirements. The system corresponds to requirement determination methods in vogue in a number of areas in which the stocks on hand together with those already on order are compared periodically with the desired levels and the difference covered through fresh procurement action. The procurement action thus taken covers not only the requirements for the period separating the two reviews but also the Lead-time[9] involved in fulfilling the demands by the supplying agency. This system, in comparison with the alternative of "Perpetual Review"[10] is relatively easy to operate but involves comparatively higher levels of safety stocks.

In the case of Ordnance Services, the reviews are annual at the Army HQ and COD levels. Provision Review in case of Class 'A' stores commences at Army HQ on 01 November every year and is required to be completed, including placement of demands, by 31 March of the following year. It covers a period of 4-5 years[11]. At the COD level, the Annual Provison Review Cycle commences on receipt of Supplementary Provision Review Directive[12] (SPRD) from Army HQ. It is spread over a period of 10 months commencing 01 April every year with the last two months of the financial year being reserved for completion of all outstanding demand action. The review covers the Total Liability Period (TLP)[13], which varies from 21 to 54 months depending upon the source of supply. It is, however, noteworthy that all items were reviewed annually and there was no practice in vogue as of now to differentiate the inventory range on the basis of usage rates, criticality or ease of availability[14].

Detailed instructions on the system are laid down in Standing Directive for Provision Review of Class 'A' and 'B' stores issued by DGOS in 1986 with concurrence of the Ministry of Defence[15]. A flow chart depicting various events involved in provision function is given at Annexure D.

Ordnance parlance, the "Maintenance Period" or "Provision Period". This period is usually set for administrative convenience but can also be chosen to minimize costs.

[9] See Glossary of Terms. In Ordnance parlance, Lead-time is referred to as " Interim Period" (IP).

[10] A system in which the stock levels are continuously watched and replenishment ordered when the predetermined Re-order Level is reached.

[11] It has now been limited to 3 years under the Financial Management Strategy of MGO's Branch – 1997 Policy. However, the basic Directive (DGOS Tech Inst 307) is yet to be amended.

[12] Supplementary Provision Review Directive (SPRD) is issued by Army HQ to provide data inputs regarding maintenance and repair liabilities besides dependencies

[13] Total Liability Period is the sum of Maintenance Period and the prescribed Interim Period (Lead-time).

[14] A beginning in this regard has been made through introduction of biannual reviews in respect of certain high value item of automotive discipline like tyres and batteries

[15] These directives are referred to in the Ordnance Services as DGOS Tech Instruction No 307 and 040, respectively.

2.5 Special System Feature

Whereas the classic Periodic Review System does not cater for a re-look at the stock levels during the Provision Cycle, the system of review in vogue in the Ordnance Services allows a refinement of ordering practices by super-imposing a type of Re-order Level replenishment where needed. Intermediate review is permissible before the next periodic review to meet demands prompted by Review Action Figure (RAF)[16] slips floated when the stock level touches the pre-determined stock level or by Dues Out Audit[17]. Similarly, when additional liabilities are revealed after normal review, special review is carried out. Predetermined stock levels are prescribed for this purpose at all echelons and supplementary replenishment demands are permissible. There is thus an in-built system of keeping a watch on the asset levels and alarm signals being raised where intermediate reviews and supplementary demands are indicated. Together, therefore, the two systems provide both a routine replenishment practice and a reactive response to abnormal situations, keeping the stock levels in line with anticipated requirements

2.6 System Contemporaneousness

Benchmarking the existing system against prevailing practices world wide, it is opined that the system is practicable for the large and diverse inventory carried by the Army. It is inherently sound as an inventory management technique and continues to be a preferred practice even in the business world[18]. When one takes into account the admissibility of "Intermediate Reviews", the system design reflects a degree of refinement and a measure of responsiveness to enhance assurance levels making it well suited for inventory control, particularly, so long as full automation of all these processes was not implemented throughout the Ordnance Services.

2.7 System Implementation Requirements

However, for the system to perform optimally and cost effectively, it is essential that: -

(a) Policy and population figures in respect of equipment and strength of personnel, referred to in Ordnance as "Dependency", to be provided for are made available to the provisioning authorities well in time for accurate provision action.

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[16] See Glossary of Terms.

[17] A periodic verification to determine the correctness of "Dues Out Records", where all the accepted but unmet demands are filed awaiting fresh receipts for issue action.

[18] Periodic Inventory Reviews always have been popular and often used tools to manage and control inventory: Reason: They can easily and cost effectively be used to achieve a myriad of objectives. (Institute of Management and Administration, New York: Inventory Reduction Report-Oct 1999).

(b) Provision action is comprehensive and all items of Ordnance responsibility are reviewed at the prescribed intervals at all echelons followed by prompt action to generate demands where indicated and initiate disposal action where warranted.

(c) Provision Review Forms (PRFs)[19] are maintained for every item of Ordnance provision responsibility and all available data is accurately and completely entered on these forms.

(d) The status[20] of items to be provided for is regularly and systematically updated in all provision related documents.

(e) The recorded wastage data, which forms the basis for forecasts is authentic and represents true wastage through authorised use. For this purpose, the classification of issues into "Normal" and "Special"[21] has to be strictly followed. No wastage, unless specifically authorised in the policy directives must either be included in or excluded from the data that may impact the calculation of the Monthly Maintenance Figure (MMF)[22] resulting in over or under provisioning.

(f) The fundamental unit of all provision related computation, i.e. the MMF, adopted for all calculations is not only arithmetically correct but also takes into account the trend, seasonality and expected future usage pattern of the equipment besides other refinements possible with the advanced forecasting techniques.

(g) The assets by way of stocks held including such stocks at lower echelons as are permitted by policy directives to be counted towards all India assets are correctly noted. These, under the existing practice include stocks over and above the Maximum Stock Potential[23] of the echelons concerned, the Dispersal Stocks as well as decentralised elements of authorised reserves like War Wastage Reserve (WWR)[24] held at those echelons.

(h) All Dues In i.e. inward pipeline stocks ordered or contracted as a result of earlier provision reviews are duly accounted for as assets[25].

(i) The Internal lead-time i.e. the time elapsed between requirement determination and demand placement is kept within prescribed limit of two months[26]; there being no provision in the system for absorbing longer delays on this account.

(j) All revealed demands are covered through Supply Orders or Indents on the sources of supply promptly, allowing the prescribed procurement lead- times.

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[19] The basic document on which all necessary statistics are consolidated for the purposes of carrying out Provision Reviews and on which the demands on the sources of supply are formulated.

[20] Status refers to an item being "Current", Obsolescent or Obsolete. See Glossary of Terms.

[21] See Glossary of Terms.

[22] "Monthly Maintenance Figure"- See Glossary of Terms.

[23] See Glossary of Terms

[24] See Glossary of Terms

[25] For a detailed discussion on management of Dues In, see Chapter on "Budget and Procurement"

[26] DGOS Tech Instruction 040

(k) Reasons for not covering any revealed demands and holding over of revealed surpluses are based on sound commercial as well operational judgment and clearly recorded in files to guide future actions.
(l) All surpluses revealed are effectively progressed till disposal.

2.8 Deficiencies in System Implementation

Audit found the following deficiencies in the implementation of the prescribed system.

2.8.1 Delays in Issue of Supplementary Provision Review Directives (SPRDs) by Army HQ

SPRDs are required to be issued to the provisioning authorities before commencement of the Annual Provision Review by 31 March for Class 'B' Stores to provide basic inputs such as equipment profile and equipment population both for maintenance and overhaul purposes as well as the troop strength to be maintained during the Provision Period. Certain provisioning factors that affect the determination of requirements during review which *inter-alia* include increase/decrease in troop and equipment strength, modernisation plans, equipment policy, repair and upgradation programmes, form part of the SPRD. Any delay in the issue of this directive has adverse impact on the accuracy and timeliness of the review carried out by the depots.

Audit observed that these SPRDs were invariably issued late, as shown in the table below, resulting in delayed commencement and completion of reviews at the COD level.

Table: 2.1. Delays in issue of SPRDs.

(Delay in months)

Year	COD Delhi Cantt.	COD Agra	COD Jabalpur	CAFVD Kirkee
1994-95	Not issued	1	No delay	No delay
1995-96	1	7	1	6
1996-97	1	10	6	4
1997-98	1	11	11	10
1998-99	1	5	7	4

Note: In the case of COD Kanpur, no SPRD is being issued as provision function is handled by DDG OS (GS&C) who receives the necessary inputs from the concerned authorities at Army HQ/Ministry of Defence.

Among other things, delay in issue of SPRDs affected the provision reviews in CAFVD Kirkee and COD Delhi Cantt. adversely. The reviews could not be completed in time in any of the following years: -

Table: 2.2. Impact of delay in issue of SPRDs on provision reviews of COD Delhi Cantt. and CAFVD Kirkee.

Review Cycle	PRFs to be reviewed		PRFs actually reviewed		*Per cent* of shortfall in review	
	COD Delhi Cantt.	CAFVD Kirkee	COD Delhi Cantt.	CAFVD Kirkee	COD Delhi Cantt.	CAFVD Kirkee
1994-95	56338	43765	NA	13606	NA	69
1995-96	60782	43749	43216	5584	28.90	87
1996-97	61272	36636	52326	11832	14.60	68
1997-98	61348	28060	46086	7717	24.88	73
1998-99	61337	34745	41098	18390	33.00	47

Note 1: Provison Review 1999-2000 has been completed in CAFVD Kirkee.

Note 2: In the case of COD Delhi Cantt,, the figures for the Year 1998-99 show the position till February 1999.

Note 3: COD Agra did not report any shortfall in review despite late receipt of SPRDs by as many as 11 months in some cases. Audit is of the view that such rushed reviews can lead to inaccuracies.

Note 4: COD Jabalpur and DDGOS (GS&C) have not reported any shortfall in reviews.

Note 5: The accuracy of the total number of PRFs to be reviewed at CAFVD Kirkee as declared by the depot could not be vouched for by Audit in the absence of updated index.

Figure-I

Shortfall in review of PRFs at COD Delhi Cantt.

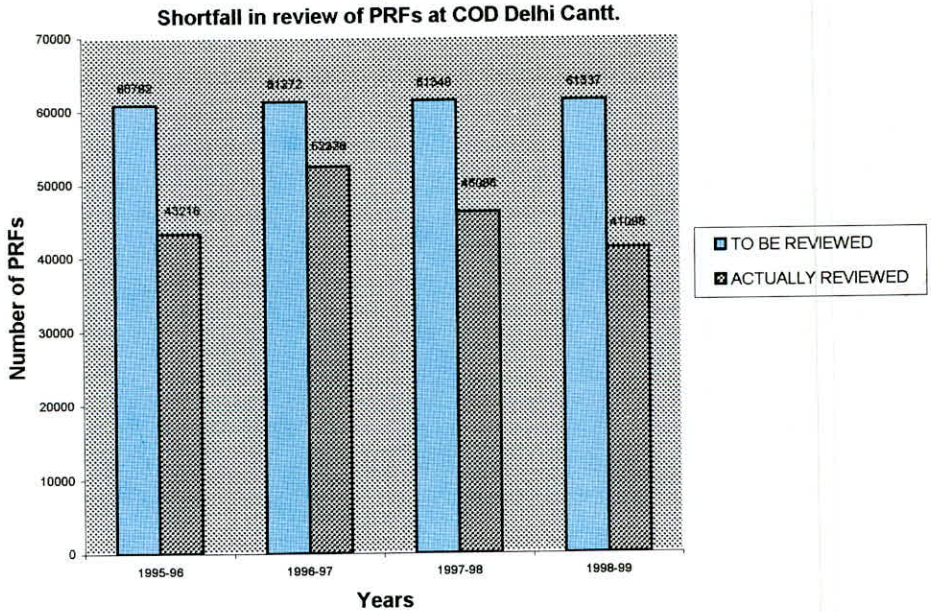
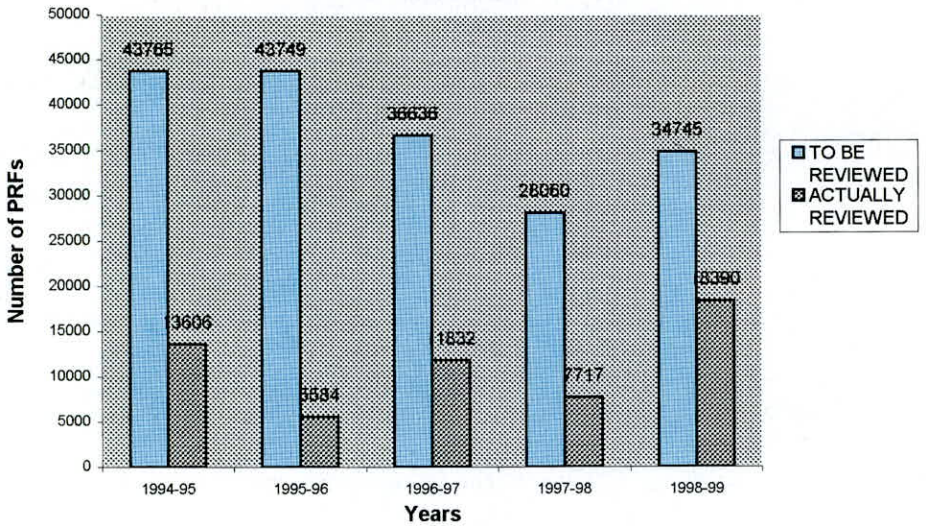


Figure-2
Shortfall in review of PRFs at CAFVD Kirkee



The ramifications of not carrying out the mandatory review are wide ranging as it results in decline in demand satisfaction, increase in dues-out headings and delay in identification of surplus inventories.

As a rule, SPRDs are issued with the concurrence of Ministry of Defence (Finance) and an Un-Official (UO) Number signifying their concurrence is invariably quoted in the SPRD. However, the SPRDs issued by Army HQ to COD Agra for 1999-2000 did not have financial concurrence thereby rendering the covering of demands worth approximately Rs 194 crore, lacking proper authority. Audit is of the view that since SPRDs provide essential inputs, which result in financial commitments, it is only appropriate that these inputs are vetted and concurred in by the Ministry of Defence (Finance) in the first place. Audit does not accept the view that this is purely an administrative function as maintained by the Ministry of Defence.

2.8.2 Non-Maintenance and Non Accounting of Provision Review Forms (PRFs)

Provision Review Form (PRF) is a form on which data and calculations pertaining to provision review of an item are recorded for carrying out review of Class 'B' stores at COD or by DDGOS (GS&C) at Army HQ. It serves as reference document for all basic data and a working sheet for periodic reviews. PRF is a permanent record of Provision work.

Audit observed that the depots did not have any systematic, up-to-date and accurate record of the range of items constituting their provision responsibility. The completeness of the exercise of Annual Provision Review to cater for all the spares requirements can, therefore, not be vouched for. In

COD Agra, the number of live[27] PRFs was 167463 as in August 1999 against the number of items of their provision responsibility (P Items) gleaned from the Master Parts Indices (MPIs)[28], which stood at 240187. There being no system of maintaining a record of the total number of items included in various scales pertaining to equipment of their responsibility and comparing the same with the list of "P" items on the one hand and PRFs on the other, it was not possible to confirm whether all items that were required to be provided were in fact being covered by Annual Provision Reviews.

There was no proper practice of indexing PRFs, which were vital documents for provision function, making it difficult to trace and account for the same. The Directive on provision review requires indexing of all PRFs and recording of their removal and insertion duly authenticated by Provision Officer / Assistant Provision Officer. In CAFVD Kirkee, there were no proper indices of PRFs and the total number of PRFs held could not be ascertained with any degree of accuracy. In the absence of proper indexing, there were no means to ensure that all the PRFs held were accounted for and the PRFs accounted for were subjected to mandatory review.

2.8.3 Delay in Allotting Part Numbers and Nomenclature to Items

All items in Ordnance inventories are required to be properly identified by the allocation of distinctive Part Numbers and standard Nomenclature to be used by all those connected with the procurement, demand and issue of such stores. It aims at preventing ambiguity, vagueness or variation in the nomenclature of stores and makes for effective management of inventory involving the functions of provisioning, procurement, and stock-holding, demand preparation, issue and status updation. Non-allocation of Part Numbers and Nomenclature to items of inventory leads to delays in procurement affecting user satisfaction. At COD Agra, out of 40,443 items covered in weapon system 'C' and 'D' scales published in 1976 and 1984, respectively, 73.2 *per cent* of the items were not allotted COS Section / Part Numbers till August 1999. Consequently, no provisioning records were created and no provision action initiated. Additionally, Codification of Ordnance inventory under Defence Equipment Cataloguing System was also in arrears. Progress in respect of the selected Depots as gleaned from the minutes of meeting held in September 1999 of the Directorate of Standardisation of the Ministry of Defence is given below;

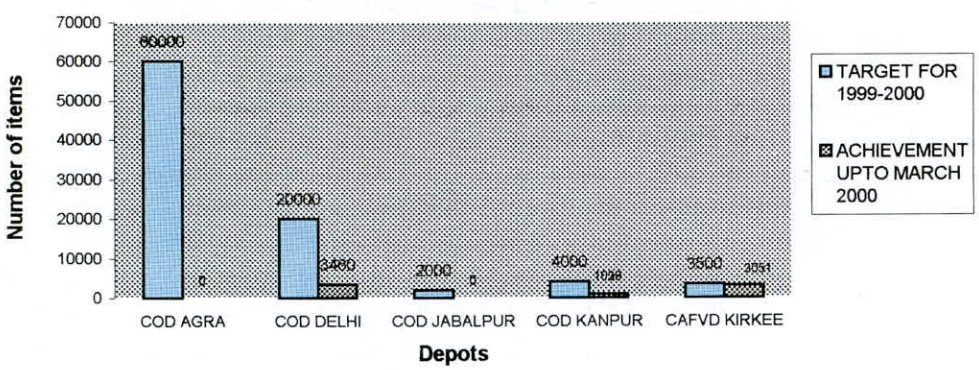
[27] PRFs in respect of all current items.
[28] For definition see Glossary of Terms.

Table: 2.3.Progress of Codification as of September 1999.

Sr. No	Name of the Depot	Target for 1999-2000 (Number of items)	Achievement till September 1999	Balance	Percentage Shortfall
1.	COD Agra	60,000	Nil	60,000	100
2.	COD Delhi Cantt.	20,000	3460	16540	83
3.	COD Jabalpur	2000	Nil	2000	100
4.	COD Kanpur	4000	1039	2961	74
5.	CAFVD Kirkee	3500	3051	449	13

Note: While data on the total number of inventory items of Ordnance responsibility, which remained outstanding for codification under the Defence Equipment Cataloguing System, as of 31 March 2000 was not available, statistics in respect of five Depots,[29] showed that the backlog as on 01 October 1999 was in the region of 46 *per cent*.

Figure-3
Progress of codification



2.8.4 Delays in Updation of Status

Continual updation of equipment status as well as the status of related spares is *sine-qua-non* for ensuring that provision is made only of the current items with specifications as approved by the Authorities Holding Sealed Particulars (AsHSP)[30]. This *inter-alia* implies that the Depot records in this respect i.e. Master Part Indices (MPIs) of all equipment are kept continually updated through issue of Assignment Lists (ALs)[31]/Parts Change Indices (PCIs). Audit examination, however, revealed that status updation remained in arrears in several cases making it necessary for the Depots to refer their indents to AsHSP for vetting before the same could be released for procurement action. This contributed to delay in procurement.

[29] CAFVD Kirkee, COD Jabalpur, 223 ABOD, COD Chheoki and CAD Pulgaon.
[30] These are Directorate General Quality Assurance (DGQA) Establishments responsible for maintaining technical information, including drawings and specifications in respect of stores of their responsibility.
[31] These are the lists through which information about the introduction into service, change in status, catalogue/part numbers and nomenclature of spare parts is intimated to all concerned by the concerned AsHSP.

In the case of COD Agra, which holds electronic equipment and spares where the rate of obsolescence is relatively fast, the problem has assumed serious proportions. Detachments of only two out of 10 AsHSP with which the Depot deals are located within the Depot and these also are not adequately staffed and equipped to answer even minor queries making it necessary for the Depot to refer procurement cases to the parent AsHSP located at far off places.

2.8.5 Time gap between the declaration of the status of the equipment and publication of Assignment Lists (ALs).

Audit observed that there had been wide time gaps between the declaration of the status of equipment as obsolescent or obsolete by the DGQA/AHSP and the publication of Assignment Lists for disposal of the connected Class 'B' spares of such equipment. These time gaps which ranged from one to eight years were fraught with the risk of avoidable financial losses due to over provisioning of unwanted spares, particularly in respect of obsolescent equipment on the one side and delay in disposal of equipment and connected spares on the other. A few instances of such cases as observed in COD Agra are cited below;

Table: 2.4. Time taken between declaration of the status of equipment as obsolescent or obsolete and publication of Assignment Lists (ALs)

Sr. No.	Item Pt No./ Nomenclature	Status	DGQA approval of Status/Assignment List	Time gap (Years)
1	Z5-6665-000144 Detecting Set Mine 9A	OBT	L/TEL/CQA (L)-1884 dt.19/5/95 & AL CQA (L)/Z/33 dt. 22.4.98	3
2	Z1/ZA-5650 Radio Set R105D	OBE	L/TEL/CQA (L)/AGD-1915 dt. 3.6.96 & AL CQA (L)/Z1/1438 dt. 29.4.98	2
3	Z-5/6665-000001 Detector Mine 7 A	OBT	L/TEL/CQA (L) AGD-1808 dt. 14.5.90 & AL CQA (L)/Z5/31 dt. 19.1.98	8
4	Xe-IXB-2911 Gen Set diesel engine AC and Gen set 130 V AC	OBE	L/TEL/CIP/AGD 25 dt. 27.2.87 and AL DGQA Bangalore no. 77956/Gen dt. 28.5.95	8

In CAFVD Kirkee, T-54 and PT-76 tanks were declared obsolete in November 1994 and April 1996, respectively. The ALs for T-54 were published during March 1995 to November 1999 and were yet to be completed.

In the case of PT-76, the publication of AL commenced in November 1996 was completed in March 2000.

2.8.6 Unrealistic Wastage Data

The wastage data adopted by the CODs, for provision purposes included inter-echelon stock transfers, which was in fact not consumption. The procedures did not cater for capture of consumption data at the user level, which in reality is the only true consumption. The policy relating to this practice bears re-examination in the context of inventory availability and visibility.

When demands for items could not be met from existing stock, these were to be recorded in "Dues Out". According to the rules, dues out are reckoned as liability for provisioning purposes. Dues Out outstanding for more than three years are, however, required to be cancelled automatically unless requests for renewal of such demands are received well before the expiry of this period. Test check of 133 PRFs at CAFVD Kirkee revealed that in 12 cases, 50 *per cent* of the cancelled dues out were taken into account while working out liability during provision review, entailing an avoidable liability of Rs 2.01 crore. This practice prevailed in COD Agra as well and the extra liability in respect of 10 cases noticed during test check by Audit stood at Rs 5.46 crore during 1997-2000. The advisability of treating 50 *per cent* of the cancelled dues out as liability during Annual Provision Review needs re-examination. This was particularly necessary as the requirement would either have been met alternatively or ceased to exist altogether, making retrospective provison action unnecessary.

Audit further observed that local purchases made by lower echelons, against Non-Availability Certificates issued by the CODs were not being reported by the purchasing echelons for cancellation of dues out maintained in their favour by the CODs and for recording wastage data. This failure results in excessive provisioning. In this context, the purchases of MT Stores amounting to Rs 12 lakh made by 6 FOD and not reported to COD Delhi Cantt. were reflective of such failures.

2.8.7 Accuracy of MMF

Monthly Maintenance Figure (MMF) is the estimated / calculated requirement of an item for a month based on past average issues as modified by any known factor (s) governing future requirements. Since this is the basic figure for all provision related calculations, inaccuracies, if any, in the calculation of the same have a cascading effect resulting in substantial under/ over provisioning. The computation of MMF, which is largely being done through simple average method, leaves room for refinement through use of advanced forecasting techniques such as Weighted Moving Averages and Exponential Smoothing[32].

[32] See Glossary of Terms.

Audit observed that during provision review, MMF was being rounded off to the nearest whole number at CAFVD Kirkee. At COD Agra, MMF was being rounded off to the lower whole number. This practice was not in accordance with any of the provisions in regulations / instructions. Audit analysis of a sample of 52 cases at CAFVD Kirkee revealed that in 13 cases, rounding off of MMF on the higher side had the effect of inflating the liability by Rs 41.12 lakh. The depot stated that inflation of liability in certain cases would balance out by reduced liabilities in other cases where rounding off was to the lower side. This argument is not tenable since the inflated stock in some items can in no way compensate the demand for other items where stock had reduced due to downward rounding off. Thus, there was a need for following a nearly accurate projection of requirement correct to two decimals in the MMF. The Depot agreed in May 2000 to note it for compliance with effect from the Review Cycle 2000-2001.

2.8.8 Inflated maintenance liability and modification factor resulted in over-provisioning:

The SPRD issued by Army HQ to COD Delhi Cantt. for 1999-2000 did not take into account the reduced liability for maintenance of Nissan category of vehicles due to their engine overhaul and consequentially off road condition. Test check in Audit revealed that liability of Rs 33.64 lakh could have been reduced, if actual maintenance liability had been considered with reference to actual number of vehicles on road. Similarly, newly introduced vehicles with warranty of two years, were also reckoned for maintenance. Test check of such provisioning revealed that there was scope for reducing provisioning of Rs 67.92 lakh worth items[33].

At CAFVD Kirkee, Audit noted an instance of arithmetical error leading to inflation of modification factor and resultant over-provisioning of stores worth Rs 5.15 lakh during 1999-2000.

Modification factor forms one of the cardinal provision factors. Any error in its calculation has serious repercussions leading to under/ over provisioning. This, therefore, calls for 100 *per cent* supervisory check before adoption. Use of computers for computational work, even in stand-alone mode by the Provision clerks appeared necessary both to apply the sophisticated formulae and ensure computational accuracy. This implies that the provision staff should be computer literate

2.8.9 Dispersal stock[34]

According to DGOS Technical Instructions on the subject, these records are to be kept immediately opposite the relevant account card and the

[33] For details of this case see Annexure 'E'.
[34] See Glossary of Terms.

account cards are to be enfaced "DISP". CAFVD Kirkee is maintaining dispersal stock in respect of 400 items held at different FODs / ODs / DOUs / CVD. The dispersal records were kept separated from account cards and resultantly there were instances of stock balance held as dispersal stock getting ignored during provision review. Scrutiny of a sample of 40 dispersal records by Audit revealed that in 22 cases, assets valued at Rs 2.36 crore were ignored during provision review due on 1 April 1999. Of these, in nine cases there were plus balances and as such did not lead to fresh procurement. However, in 13 cases procurement action was taken which amounted to an element of over provisioning leading to an avoidable outgo of Rs 2.26 crore. Audit do not agree with the Depot's view that since these Dispersed Stocks were utilised for issues where required, there was no adverse impact because of these "paper assets" being ignored for provision purposes. Since these stocks are also the assets of the CODs, though stored at dispersed locations, ignoring of such assets during provision review tantamount to under-statement of existing assets and thereby inflating requirement for procurement.

At COD Kanpur, Dispersal Records in respect of dispersal stores were not even maintained and the depot was simply guided by the periodical reports received from such ODs where dispersal stocks were held. This practice results in loss of control over these stocks and their non-inclusion in the assets for provision purposes.

2.8.10 Decentralised War Wastage Reserve (WWR)

In accordance with the Policy Directives, elements of WWR, which are decentralised to lower formations, are required to be taken into account as assets against the all India liability. It is, therefore, imperative that all holdings on this account at the lower echelons are reported to the COD concerned at the time of Provison Review. Audit observed that such holdings at the lower echelons were being ignored. This is likely to result in over-provisioning.

2.8.11 Delay in Placement of Indents

The internal lead-times in most CODs were excessive. According to Para 136 of DGOS Technical Instruction 040, demands for procurement of spares should be placed within two months from the date of review. However, considerable time elapses in the Depots before demands are actually placed. The delays ranged up to 2 years in CAFVD Kirkee, to 18 months in COD Jabalpur and 12 months in COD Delhi Cantt. In the case of COD Agra, where the demands had to be vetted by a large number of AsHSP located in different stations, the delay ran up to several months derailing the procurement process. This issue is covered in detail in a separate chapter on 'Budget & Procurement' of this Report.

In COD Delhi Cantt., on an average, 38.8 *per cent* of the cases relating to demand bearing items remained under process at the close of the Financial Year during the past four years as indicated in the table below: -.

Table: 2.5. Status of demand bearing items to be processed during 1995-99 at COD Delhi Cantt.

Year	Number of demand bearing items	Number in process at the end of the financial year	Percentage in process at the end of the financial year
1995-96	6869	2823	41.09
1996-97	4117	575	13.97
1997-98	3734	1119	29.96
1998-99	3537	2583	73.02
Total	18297	7100	38.80

Promptness in placing orders is essential for timely replenishment of stocks and effective inventory management as there were no room in the present system for absorbing such abnormal delays, which distort the entire provision system and budgetary control. Delayed placement of demands also affects availability and lowers users satisfaction.

2.8.12 Non Placement of Demands

In several cases, the revealed demands were not covered by Supply Orders. Of the demand bearing items revealed during the annual review, certain percentage of items were not processed for procurement action. In COD Delhi Cantt., the position was as under;

Table: 2.6. Percentage *of demand bearing items held over at COD Delhi Cantt. during 1995-99.*

Year	Number of demand bearing items	Number of items held over (Demands not placed)	Percentage of hold over
1995-96	6869	582	8.47
1996-97	4117	204	5.00
1997-98	3734	528	14.14
1998-99	3537	678	19.17

Audit is of the view that holding back procurement action on revealed demands, except in the cases of very meagre requirements, should have a valid justification either in financial or operational terms. In any case, there is a need for prescribing criteria for such holdover to avoid imbalances in the inventory and to improve user satisfaction levels. Revealed demands not covered by procurement action at the COD level, create shortages at the lower echelons necessitating local purchase.

Audit also observed that with the issue of the Financial Management Strategy of MGO's Branch 1997, demands in respect of certain Class 'B' stores such as engines, tyres, batteries and a range of high value GS & C items revealed at the CODs / DDGOS (GS&C) levels, were being projected to the Army HQ for consideration of procurement as a part of the "Priority Procurement Plan" prepared at that level to consider procurement in respect of both *Class 'A'* and "B" stores. Audit felt that this practice runs counter to the concept of Annual Provision Review for Class 'B' stores, where the demands revealed should follow the normal processing and procurement action. Removal of some of the items from the normal stream and clubbing the same with procurement of Class 'A' equipment, while leaving the rest of the connected spares to be procured as a matter of course was likely to create imbalances in the inventory holdings. Procurement action in respect of such items has to wait till the Priority Procurement Plan is finalised, resulting in delay in procurement. Further, since the budgetary provisions for these items are independent of the budgetary provisions for Class 'A' stores, there can be no *inter-se* prioritisation between the two classes. In any case, clubbing of the maintenance requirements of the existing dependency with the acquisition of fresh capital equipment did not appear to be sound practice and needs re-examination.

2.8.13 Failure to Declare Revealed Surpluses for Disposal

Audit observed a tendency on the part of the Depots to hold on to revealed surpluses reflecting a "Just in case" attitude. This issue is discussed in detail elsewhere in the Report[35].

2.8.14 Provision for five years liability contributes to huge accumulation of inventory

CAFVD Kirkee and COD Agra follow the practice of assessing liability for meeting overhaul requirements for next five years in respect of vehicles / equipment for which the responsibility for overhaul is that of the Corps of Electrical and Mechanical Engineering (EME) as per their repair programme. Apart from overhaul liabilities, even for maintenance, the period of liability was reckoned as five years, if the items were not in the category of 'free flow'[36]. The implementation of the Financial Management Strategy of MGO's Branch 1997 aims, *inter alia*, at reducing processing time of cases and thereby ensuring speedier procurement of spares. Further, this strategy worked on the principles of provisioning / planning on a three year roll on basis, both in Ordnance and EME. In the light of this shift in focus from five years to three years, there was a necessity to make corresponding changes in the present practice. The matter was addressed by DGOS to Ministry in December 1999 but the Ministry directed the status quo to continue. The Ministry's

[35] See Chapter on Surplus Management (Disposal)
[36] See Glossary of Terms

ruling went counter to the spirit of Financial Management Strategy approved by the same Ministry.

Audit analysis of a sample of 83 cases of provisioning during 1998 and 1999 at CAFVD Kirkee revealed that the spares provisioned to meet last two years of five years constituted 43 per cent of the liability for which provisioning was made. Since the average demand for provisioning for spares as revealed during the period 1994-99 was Rs 93.37 crore, the outflow of funds to the tune of Rs 40.15 crore could have been checked if the liability period was limited to three from the present five years. It will also help in reducing the workload of the Depots and to bring the inventory to manageable levels besides substantially lowering the inventory carrying costs. In COD Agra, the average annual expenditure on procurement was Rs 85 crore during 1994-99; pruning down the requirement to three years can reduce about 40 per cent of this expenditure.

2.8.15 Cases of provisioning by circumventing of procedures:

In the normal provisioning practice, the requirement determination by Ordnance precedes actual procurement, however, the Ministry concluded three contracts during July 1999 to February 2000 for import of certain spares for an equipment at a total cost of Rs 153.63 crore. Audit observed that these contracts were concluded based on the requirement determined by the Director General Electrical and Mechanical Engineering (DGEME). Although, before concluding one of the contracts in August 1999 for Rs.97.65 crore, the depot had vetted the list prepared by EME, yet in October 1999, it pointed out that the practice of procuring spares based on EME recommendation had sidelined the annual provision review of the depot and opined that this could lead to over-provisioning.

In yet another case relating to spares in respect of ICVs, procurement action initiated by Project 'White Lily' resulted in sanction for procurement of spares amounting to Rs 27.09 crore, without the involvement of the Ordnance Services. The procurement action in respect of these stores was at various stages of contracting and receipt at the time of review (May 2000).

These instances reveal the existence of multiple provisioning and procurement authorities with inadequate interaction, which dilutes the responsibility and accountability of the Commandants of CODs who alone are made responsible for these functions under the system. In addition, the possibility of excessive and unwanted provisioning could not be ruled out.

2.8.16 Delays in Computerisation of Provision Related Work

Audit observed that Provision Review, which involves a great deal of computational work, was being performed manually in most Depots. The need for accuracy in this computation is paramount as errors get multiplied and can

result in unwarranted commitment of funds. Further, manual computation does not permit application of sophisticated forecasting techniques that are now available for better results. Excessive tabulation and laborious calculations tend to reduce the work to drudgery and routine leaving little time for the judgmental inputs so vital in forecasting.

At the same time, Audit observed that in COD Delhi Cantt. where the automation of Ordnance inventory started in 1968, Provision Review that was automated was not debugged enough to remove errors as evident from the fact that almost all items were being subjected to manual review after the automated review. This anomaly continued even after it was pointed out by the Director (Inspection) of Ordnance in 1997. It was recommended to remove the duplication of the effort.

The subject is discussed further in a separate chapter on "Computerisation"

2.8.17 Selective Inventory Control

Pareto Principle of "vital few and trivial many"[37] holds equally true in case of Army Inventories. Only a small percentage of the items account for a very large proportion of the funds invested. This feature, which has made possible all the practices of Selective Inventory Control, allows for inventory segmentation in several ways for differential treatment depending upon cost, criticality, movement pattern and ease of availability. Application of these techniques is now near universal both in the business and defence forces worldwide. Need for their adoption by the Ordnance Services is well established and long overdue.

Army Ordnance Services embarked upon these practices as early as April 1984 through a Pilot Project in COD Chheoki with the approval of the Ministry of Defence (Finance). The same was, however, aborted in 1988 due to implementation problems especially because the provisioning authority, DDGOS (GS&C) was located away from the depot and delays experienced in submission of stock details. The attempt was revived in June 1996 when all the CODs and CAFVD Kirkee were called upon to subject all items of three major equipment to ABC Analysis. DDGOS (GS&C) was also required to do like-wise in respect of all items of their responsibility. The orders issued in June 1996 were, however, cancelled in August 1997 due to various problems, which could not be tackled within the infrastructure existed in the depots. Formal introduction of these techniques thus remains suspended although 16 years have elapsed since need for the same was first felt. There was no evidence to show that problems encountered in introducing these highly desirable practices were addressed.

[37] See Annexure 'F' for an explanation of the principle

2.8.18 Impact on Provision

The percentage of demand bearing items as detailed in Annexure G revealed during annual provision reviews over the last five years in different CODs is given in table below: -

Table: 2.7 Percentage *of demand bearing items revealed at the CODs under review during 1994-99*

Year	COD Agra	COD Delhi Cantt.	COD Jabalpur	COD Kanpur	CAFVD Kirkee
1994-95	6.85	NA	6.59	9.14	9.88
1995-96	6.46	11.30	11.85	8.58	17.47
1996-97	9.62	6.72	11.35	8.61	18.00
1997-98	10.16	6.09	10.81	9.03	12.70
1998-99	7.40	5.77	14.14	9.14	11.22

This pattern clearly indicated the need for and feasibility of application of the well-known technique of segregating the inventory into Fast, Slow and Non-moving (FSN) nature to guide provision and procurement actions.

Audit, during test check at CAFVD Kirkee, detected 178 slow and non-moving items pertaining to certain equipments. Of these, 58 items had recorded no issues at all since initial procurement. In the remaining 120 cases, the movement was minimal. Yet, the Depot in all these cases had taken further procurement action resulting in over-provisioning. Such wasteful expenditure could have been avoided if the movement pattern had been analysed at the time of Provision Review.

In partial implementation of Selective Inventory Control Techniques, Ordnance Services have introduced a practice of taking up the review of demand bearing items early in the review cycle as well as subjecting high value demands to scrutiny at appropriate levels of decision making[38]. Audit observed that some or the other form of Selective Inventory Control had been attempted at COD Agra, COD Delhi Cantt. and COD Jabalpur; but these efforts remained isolated, fragmented and discontinuous with limited results.

In order to derive full benefit from the application of these techniques, it is essential that the total inventory is systematically segmented both on operational and financial considerations and differential periodicity is prescribed for each segment. All relevant provisions should be brought in line to enable full benefit being derived from the implementation of these practices, which will not only optimise investments in inventories but also reduce the overall workload.

[38] As indicated by CAFVD Kirkee in their reply to Audit observation.

2.9 Recommendations

In view of the observations made and the constraints noted, Audit recommends that: -

(a) Army Ordnance Services should continue with the "Periodic Review System" of Inventory Control, as presently in vogue, with a fuller use of the provisos of "Intermediate Reviews" triggered by the Review Action Figures (RAFs) and "Special Reviews" as provided for in the existing rules till the inventory is fully automated. In order, however, both to effect economy and to reduce the total clerical workload, it should undertake to lay down different review periods for different items based on their annual consumption value, criticality and ease of availability.

(b) Supplementary Review Directives should be issued well in time for the provision action to proceed on schedule and should carry the approval of the Ministry of Defence (Finance).

(c) The system of creating, accounting for and closing of PRFs should be faithfully implemented. The practice of simultaneous check, which ensures that all depot records are periodically brought in line, should be strictly enforced. PRFs should be made accountable documents with proper indexing.

(d) Review of all PRFs during the Review Period should be made mandatory with competent authority sanction being made necessary to condone any failures on this account.

(e) Ordnance Services should devise procedures to capture actual wastage data from the actual users and use the same as the basis for future provisioning.

(f) Dispersal Stocks and decentralised elements of WWR held at the lower Ordnance echelons should be taken as assets during Annual Provision Review without exception.

(g) The practice of holding back procurement action in cases where demands have been revealed, as observed in COD Delhi Cantt., needs to be covered by suitable policy guidelines.

(h) All decisions relating to holding over revealed surpluses must be justified on the basis of either operational or commercial considerations or both and recorded on files.

(i) The conflict between the Annual Provision Review of Class 'B', which implies generation of demands soon after the review of an item is completed and the Priority Procurement Plan, which implies initiation of procurement action only after the relative importance of all revealed demands has been assessed, needs to be resolved. Priority Procurement Plan should cover only Class 'A' items.

(j) The system of codification and status updating should be streamlined and speeded up.

(k) The possibility of locating self contained cells of the various AsHSP at the CODs to provide technical support including indent vetting should be examined keeping in view the over all cost effectiveness of the system.

(l) The system of working out the crucial figure of MMF should be refined through application of modern techniques including Weighted Moving Averages and Exponential Smoothing. Provision Staff may use computers for this purpose for enhancing accuracy and speeding up the process.

(m) Provison staff should have basic qualification in the fields of Materials Management and be trained in the stores discipline they are required to provide for. They should also be computer literate[39].

(n) Conflicts between the Standing Provison Review Directive and Financial Management Strategy of MGO's Branch 1997 in so far as it relates to period of procurement of overhaul/maintenance spares needs to be resolved.

(o) Multiplicity in provision and procurement agencies in respect of Ordnance stores needs to be effectively checked. No Ordnance stores should be procured unless the demand has first been confirmed by the Ordnance Services.

(p) Computerisation of provision function should be taken up as high priority area. The experiences of COD Delhi Cantt. where manual provision reviews have co-existed with computerised provision reviews for several years and where manual reviews that follow the computerised reviews detect errors in most cases should be used to refine and finalise the Provision Review Package. This should bring to an end the manual system at that depot and lead to extending application of computerised package to all CODs. In the interim, Ordnance may consider introducing a hybrid system in which only the computational aspects of provisioning are computerised leaving the judgmental areas to the provision staff. A judicious division of work with human intervention at the appropriate stages may help provide a solution.

2.10 Defence Response

Of the 16 recommendations made by Audit, the MGO agreed with 11, partially agreed with two and disagreed with the remaining three, Ministry also agreed with the views of MGO.

Response of the MGO to the above recommendations is mentioned below *ad seriatim*.

[39] See also Chapter 6 on Human Resources Management

(a) Agreed. MGO further proposed to introduce varying periods for review, viz. six monthly in respect of 'A', 'V' and 'F' items, annual for 'B', 'E' and 'N' items and biennial for 'C', 'D' and 'S' items, which would take care of annual usage value, criticality and ease of availability. On completion of the ongoing Computerised Inventory Control Project, CICP, this would be implemented.

(Para. 2.9 (a))

(b) Agreeing partially, they stated that vetting of SPRD by the Ministry of Defence (Finance) was one of the main reasons for delay in issue of SPRD and it needed to be done away with for ensuring timely issue of SPRD.

(Para. 2.9 (b))

(c) Agreeing partially, they maintained that PRFs were permanent records, which were subjected to financial check by CFA and I&BC cells. Instructions existed for maintenance of index and documentation of insertion or removal of new/old PRFs. There was, therefore, no need for classifying them as accountable documents.

(Para. 2.9 (c))

(d) Agreed and opined that the commandants of CODs could take formal approval of ADGs OS concerned for not carrying out provision review, explaining reasons thereof.

(Para. 2.9 (d))

(e) Agreed and explained that the existing system of considering the demands from RODs/units as wastage data followed the assumption that such demands were for replenishing actual consumptions. Actual wastage data from the lowest echelons would be captured and adopted for future provisioning, on implementation of CICP.

(Para. 2.9 (e))

(f) Agreed and stated that although appropriate directives existed yet suitable instructions would be issued to eliminate aberration which might have crept into the system.

(Para. 2.9 (f))

(g) Agreed and added that this was normally covered in the internal provision review directives issued by the commandants of the depots.

(Para. 2.9 (g))

(h) Not agreed, maintaining that the task of recording decision on each case would be enormous.

(Para. 2.9 (h))

(i) Agreed and suggested that the 'Financial Management Strategy of MGO's Branch, 1997' needed amendment.

(Para. 2.9 (i))

(j) Agreed and qualified that CICP would accelerate the status updating, though efforts were being made to computerise this activity through stand-alone mode of computers.

(Para. 2.9 (j))

(k) Not agreed, as it would not be cost effective and stated that the viable alternative would be to link AsHSP with CICP through WAN which was under their consideration.

(Para. 2.9 (k))

(l) Agreed that application of modern techniques like Weighted Moving Average and Exponential Smoothing would help in accurate forecasting and that they would be adopted on completion of CICP.

(Para. 2.9 (l))

(m) Agreed and proposed certain measures to improve the professional skills of existing staff through training.

(Para. 2.9 (m))

(n) Not agreed and argued that the existing system of procurement of spares for five years overhaul and maintenance should continue in view of the long lead time taken by DGOF/PSUs.

(Para. 2.9 (n))

(o) Agreed and stated that Ordnance Stores should not be procured unless demands are confirmed by Ordnance Services and that the multiplicity of provisioning and procurement agencies should be avoided since that might contribute to excessive/unwanted procurement.

(Para. 2.9 (o))

(p) Agreed and clarified that the practice of manual checking of computer output generated at COD Delhi Cantt., where computerisation had been achieved to a limited extent, continued because of the error prone system of creating data on computer. Ordnance expected to overcome this difficulty on implementation of CICP. Till that time a judicious division of work with human intervention at appropriate stages might provide a solution.

(Para. 2.9 (p))

2.11 Conclusion

Audit noted that most of its recommendations were acceptable to the Ordnance Services/Ministry. It, therefore, suggests that a monitoring system

be instituted to go into the details of each recommendation to pave way for their speedy implementation. As far as the non-acceptance of the recommendation to make PRFs as accountable document is concerned, Audit maintains that making PRFs as accountable documents became all the more important when Ordnance itself admitted that PRFs are permanent records of provision work and subjected to financial check. The decision to hold on to revealed surpluses need to be recorded as those decisions have financial and operational bearing and in such cases, fixing responsiblity assumes utmost importance. This does not mean that separate records are to be opened on each item as these can be grouped.

Audit strongly recommends immediate pruning down of stocking period of spares for overhaul/maintenance from the existing five to three years, if not lesser. In the five year repair programme of EME, the first year's programme is 'firm', second year's is 'planned' and the rest are only 'forecasts'. Even the firmed up targets were seldom achieved, as commented upon in Para 6.3 of Report No.14 of 1992[40] of the Comptroller and Auditor General of India, leave alone the 'planned' and 'forecasts'. The procurement of stores to meet five years tentative programme is one of the main contributing factors for accumulation of stores in CODs and warranted immediate cut. Under the Financial Management Strategy of MGO's Branch, 1997, Army Base Workshops/Advance Base Workshops would work on the basis of approved three year 'roll on' programme for overhaul and not on five years forecast programme. Long lead time does not mean that five year spares are justified. It only means that the demand, what ever it is, is to be placed well in time so that the stores arrive at the end of the allowed lead- time.

In matters like absence of guiding principles for holding back of procurement action and condonation of non-completion of mandatory provision review, necessary express provisions need to be incorporated in the Regulations/Technical Instructions, to ensure their implementation. Audit feels that the suggestion to do away with the vetting of SPRD by Integrated Finance be examined in the light of conflicting requirement of speeding up the provisioning process and the imperative need for adequate financial control.

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[40] See Annexure - M

CHAPTER 3: MULTI-ECHELON SYSTEM (SUPPLY CHAIN MANAGEMENT)

3.1 Summary:

Army's Supply Chain for Ordnance stores comprises a multi tiered distribution system in which "mother depots" in the heartland are connected to troops deployed throughout the length and breadth of the country through a network of regional and field depots besides other store holding units. The basic philosophy underlying the system is to ensure ready availability of needed stores and spares to maintain the Army in the highest state of readiness at all times. Speed of response and high levels of assurance of availability are the essence of this system.

Audit observed that the existing supply chain, which is largely of pre-independence design, was sluggish in response to the needs of the troops. It also locked up large inventories, which become invisible at the system level resulting in excessive provision. The chain was highly inflexible and non-selective with almost all items being procured centrally and then following the same channels of distribution. It ignored the ready availability of large number of inventory items of common civil end use in most parts of the country.

There was a need for delayering the system, increasing the scope of regional and local procurement, making the chain flexible and imparting the system a measure of dynamism to ensure that it meets the requirements of the modern day Indian Army.

3.2 General

Ordnance Logistic Support is currently provided to the Army through a network of Central Ordnance Depots (CODs), Ordnance Depots (ODs), Advanced Base Ordnance Depots (ABODs), Field Ordnance Depots (FODs) and Divisional Ordnance Units (DOUs) that collectively connect the sources of supply with the troops throughout the length and breadth of the country. This Multi-Echelon System of stocking and distribution, which represents the Army's Supply Chain, is diagrammatically illustrated in Annexure 'A'. The system is basically of pre-war design with the CODs and ODs functioning from the locations that were chosen to meet the conditions then obtaining. ABODs and FODs were, however, added in the chain, post independence.

3.3 Role and Responsibilities

CODs, which operate as mother depots, are the main sources in this chain of supply and are organised on commodity basis[1]. These depots are responsible for all India provisioning and supply of full range and depth of stores of specified commodities as discussed in introductory chapter.

Regional ODs, ABODs and FODs on the other hand are composite depots[2], which receive supplies from the CODs for the maintenance of the units/formations dependent on them. Their holdings are accordingly customised in range and limited in depth to meet their specified charters.

3.4 Stock Levels in Ordnance Echelons

Stocks held at various Ordnance echelons are detailed below: -

a) Central Ordnance Depots

(a) "Maintenance Stocks", referred to in the business parlance as "Cycle Stocks". These are the stocks that are needed to meet normal maintenance requirements of the Army during the Provision Period. The level of these stocks is prescribed in "Number of Months Requirement".
(b) Reserves including War Wastage Reserves
(c) Repairable Class 'A' Stores including "Serviceable Incomplete" Equipment
(d) Earmarked or Appropriated Stocks
(e) Insurance Items[3]
(f) Held Over Surplus Stocks
(g) Surplus Stocks Awaiting Disposal
(h) Repairable *Class 'B'* Stores
(i) Salvage Stores

b) Regional Ordnance Depots and FODs

Regional Ordnance Depots carry three months "Maintenance Stocks" in respect of items of their responsibility for their own dependencies. The

[1] The entire range of Ordnance supply items are grouped into different commodities and responsibility of different commodity groups are allocated to different CODs. For instance electronic spares are identified as a commodity group and is the responsibility of COD Agra.

[2] These depots draw stores from the CODs and hold stocks of all commodities but both the number of items (range) held and the volume of stocks (depth) are limited.

[3] Items which may not be needed in the ordinary course of maintenance and repair but which are stocked as a matter of abundant precaution to avoid vital equipment being rendered inoperative, in those rare cases where the item may become necessary to restore it to battle worthy condition.

point to observe is that the levels are fixed for a given echelon and apply to all items of their responsibility and are in no way linked with the cost, criticality or availability of the items.

Regional Ordnance Depots, ABODs and FODs also carry a Store Margin[4] (SM) of one month each and an element of War Wastage Reserves (out of the total All India War Wastage Reserve). These Depots also hold stocks of repairable *Class 'B'* Stores as well as Salvage Stores.

3.5 Replenishment System

The whole system operates with the lower echelons recouping their stocks from the higher echelons through placement of demands revealed as a result of their own Periodic, Intermediate or Special Reviews. The Lead-time allowed in the case of ODs, ABODs and FODs is two months with certain exceptions where three months are allowed on this account. Almost the entire range of stores, with the exception of a few selected items since placed on Transportation Model, follows the chain of supply from the mother depot right down to the ultimate users.

3.6 System Responsiveness

The basic purpose of operating the Multi-Echelon Stocking and Distribution System, which *inter alia* implies pre-positioned stocks within easy reach of dependant lower echelons and units besides pipeline stocks for continual replenishment, is to ensure ready availability of the right material at the right place and at the right time.

Audit, however, observed that the existing chain was not as responsive as intended. This is illustrated by an analysis carried out by Audit at COD Kanpur and COD Delhi Cantt.

All Regional Ordnance Depots (RODs), Newly Raised Units (NRUs), Regimental Centers and local units of Kanpur are dependent on COD Kanpur for their requirement of Clothing and General Stores items. Out of 13 RODs/ABODs/FODs dependent on COD Kanpur; three, viz., OD Fort Allahabad, ABOD 'X' and ABOD 'Y' were selected by Audit to analyse the satisfaction level of demands met by COD Kanpur.

The results in respect of 273 (four *per cent*) demands selected randomly are tabulated below: -

[4] See Glossary of Terms

Table: 3.1 Response of COD Kanpur in meeting the demands of OD Fort Allahabad, ABOD 'X' and ABOD 'Y'.

Demand Satisfaction	**Number**	**Percentage**
a) Demands met within 22 days (Ideal)	11	4.03
b) Demands met with delay (Months)		
Up to 1	7	2.56
Above 1 and up to 3	29	10.62
Above 3 and up to 6	42	15.38
Above 6 and up to 12	52	19.05
Above12 and up to 24	77	28.21
Above 24 and up to 36	45	16.48
Above 36 and up to 48	10	3.67
Total	273	100

It would transpire from the above that only four *per cent* of the demands were met within authorised time limit of 22 days prescribed for meeting the demands out of the stock readily available with the Depot.

In order to see impact of the low percentage of demand satisfaction on the RODs and user units, Audit visited OD Allahabad and a DOU to collect and analyse data on user satisfaction up to cutting edge level. Two dependent units viz,. Military Hospital Allahabad and the Infantry Division Ordnance Unit were selected. Scrutiny of total 176 items demanded by these units revealed the following:-

Table: 3.2 Response of OD Allahabad in meeting the demands of Military Hospital and a DOU.

Demand Satisfaction	**Number**	**Percentage**
a) Demands met within 22 days (Ideal)	15	8.52
b) Demands met with delay (Months)		
Up to 1	12	6.82
Above 1 and up to 3	18	10.23
Above 3 and up to 6	42	23.86
Above 6 and up to 12	28	15.91
Above12 and up to 24	35	19.89
Above 24 and up to 36	21	11.93
Above 36 and up to 48	05	2.84
Total	176	100

Similarly, two dependent units of the Infantry Divisional Ordnance Unit were also taken for scrutiny. Results of this scrutiny were as under;

Table: 3.3 Response of a DOU in meeting the demands of two dependent units

Demand Satisfaction	Number	Percentage
a) Demands met within 22 days (Ideal)	19	12.34
b) Demands met with delay (Months)		
Up to 1	28	18.18
Above 1 and up to 3	25	16.23
Above 3 and up to 6	35	22.73
Above 6 and up to 12	33	21.43
Above12 and up to 24	08	5.19
Above 24 and up to 36	04	2.60
Above 36 and up to 48	02	1.30
Total	154	100

It is apparent from the above that OD Allahabad was able to meet only 8.52 *per cent* of items demanded within time and the Infantry Division Ordnance Unit could supply not more than 12.34 *per cent* of items demanded within authorised time.

3.7 Issue Time Check

Abnormally high Issue Time Checks[5] seem to be a feature in each of the CODs where review was carried out. The following table indicates the position: -

Table: 3.4 Delay in meeting normal demands of the users by the Depots under review

(Delay in months)

Name of the Depot	Demands seen	Demands met within ideal time	Demands met with delay					
			< 1	>1<3	>3<6	>6<12	>12<24	>24<36
COD Agra	145	3	61	73	8	0	0	0
COD Delhi Cantt.	235	0	10	131	61	30	3	0
COD Jabalpur	399	0	6	214	146	33	0	0
COD Kanpur	263	11	7	29	42	52	77	45
CAFVD Kirkee	429	37	89	148	38	68	40	9
Total	1471	51	173	595	295	183	120	54
Percentage		***3.46***	***11.76***	***40.45***	***20.05***	***12.45***	***8.15***	***3.68***

3.8 Responsiveness to Operational Demands

CODs are permitted a response time (Issue Time Check) of 14 days for meeting the operational demands as against 22 days for normal demands. To gauge the responsiveness of the current system vis-à-vis operational demands, a test check of such demands received by COD Delhi Cantt. during June 1999 and demands pertaining to an Operation were undertaken. Results were as under;

[5] Time taken to issue the stores against the demands placed on a depot

Table: 3.5 Delay in meeting operational demands by COD Delhi Cantt.

Indentor	**Sample Size (Demands)**	**Demands met within ideal time**	**Delay in days**				
			up to 5	**6-10**	**11-15**	**16-20**	**21-45**
FOD 'X'	44	Nil	Nil	2	-	35	7
Percentage		-	-	4.5	-	79.6	15.9

From the above it could be seen that none of the selected operational demands raised in June 1999 by FOD 'X' (coinciding an Operation) was met within the time frame of 14 days. Approximately 80 and 16 *per cent* of the selected demands were met with a delay of 16 to 20 and 21 to 45 days, respectively.

Table: 3.6 Delay in meeting demands of Operation by COD Delhi Cantt.

Sr. No.	**Indentor**	**Sample Size**	**Demands met within ideal time**	**Delay in days - percentage in bracket**					**Delay in months - percentage in bracket**				
				upto 5	**6-10**	**11-15**	**16-20**	**21-30**	**1**	**1-3**	**3-6**	**6-12**	**Indefinite[6]**
1.	FOD 'Y'	16	3 (19)	-	-	-	-	4 (25)	-	9 (56)	-	-	-
2.	Armoured Workshop 'A'	8	-	-	6 (75)	1 (12.5)	-	-	-	1 (12.5)	-	-	-
3.	Armoured Workshop 'B'	1	-	-	1 (100)	-	-	-	-	-	-	-	-
4.	Armoured Workshop 'C'	12	-	-	-	-	-	-	-	9 (75)	-	-	3 (25)
5.	FOD 'Z'	7	-	-	Nil	-	-	-	-	2 (28)	3 (43)	-	2 (29)
Total		44	3	-	7	1	-	4	-	21	3		5
Percentage			*7*	-	*16*	*2*	-	*9*	-	*48*	*7*	-	*11*

In case of demands pertaining to an Operation, only seven *per cent* of the demands were met within the permitted period of 14 days. The analysis further revealed that 48 *per cent* of the selected demands were met with a delay ranging between one and three months. Incidentally, as mentioned above, the issue time check delays worked out by Audit for meeting routine demands was also in the range of one to three months, in the case of 40 *per cent* of the sample selected. Obviously, the depot did not differentiate between the operational and routine categories of demands

Further, 25 *per cent* of the samples selected in case of Armoured Workshop 'C' and 29 *per cent* in respect of FOD 'Z' were still lying in the depot for despatch as of February 2000.

[6] Lying in packed condition as of February 2000

The depot in their reply attributed the delay to non-availability of packing material necessitating their local purchase, non-availability of Civil Hired Transport (CHT), booking restriction placed by Railways and in a few cases, non-collection of stores by the indentors.

The results of a similar exercise to assess the reaction time for operational demands, at COD Kanpur were as under;

Table: 3.7 Delay in meeting demands of an Operation by COD Kanpur

Sr. No.	Indentor	Sample Size	Issued within ideal time	Delays in days				
				Up to 15	16-30	31-60	61-90	> 90
1.	FOD 'X'	6	1	Nil	Nil	1	1	3
2.	FOD 'Y'	3	1	Nil	1	Nil	1	Nil
		9	2		1	1	2	3
Percentage			22		11	11	22	34

Audit is of the view that most of the reasons stated were well within the control of the Depots and this situation highlights the fact that mere availability of stock does not guarantee their issue even to meet an operational demand.

From the above, it is clear that the Multi Echelon Distribution System is sluggish and the purpose of its creation and operation was not being met in full measure. There was thus a need to re-examine the system with a view to speeding up flow of material from the sources of supply to points of consumption. Reduction in the number of echelons is indicated.

3.9 Assets Visibility

Under the existing policy, stores issued by a higher Ordnance echelon to a lower echelon within the Ordnance Supply Chain are deemed to have been consumed[7]. The issues made by the CODs to the Regional Depots, ABODs and FODs, no longer remain "Assets" in COD Annual Provision Review. There is also no system for these holdings to be reported by the lower echelons to the CODs and to that extent, these stocks, though within the Ordnance Supply Chain and still not consumed, become "invisible" to the system[8]. Ordnance Services are unable, for instance, to indicate the total quantity and value of a given set of items at a given point of time on All India basis highlighting poor state of stock visibility in the pipeline.

[7] See also discussion on this subject in the Chapter on Provision.

[8] Only the stocks at the lower echelons that are over and above their respective MSPs, dispersed Stocks and the distributed elements of WWR are required to be reported to the CODs at the time of Annual Provision Reviews and taken into account for provisioning purposes.

3.10 Locked up Inventories

Since all issues made to the lower echelons by the CODs are treated as consumption and since the entire pipeline connecting the CODs with the ultimate user has to be kept filled up to provide high degree of assurance of availability, financial outlays on inventory, especially in respect of high value spares of sophisticated warlike equipment become excessive. Need for utmost care in arriving at the range and quantum of spares to be deployed at these echelons is, therefore, self-evident.

Ordnance Services, acting on the advice of the General Staff who concur into the "Permissive Repair Schedules" (PRS)[9] and EME who formulate the scales, place spares at every echelon to provide the desired levels of support. Such a stocking policy, however, implies the ability to forecast wartime consumption rates with a fair degree of accuracy.

"Unfortunately, accurate forecasts of such consumption are impossible for the following reasons: -

(a) Resources demands fluctuate erratically thwarting forecasting even in peace time.
(b) Wartime demand levels depend on wartime activity levels (or tempos), which can be forecast only by employing planning contingency scenarios. However, a real contingency is unlikely to ever match a planned scenario, specially in the unpredictable battlefield environments created by today's mobile forces.
(c) Growing enemy capabilities create greater and increasingly unpredictable threats to repair, supply and transportation resources"[10].

The natural tendency on the part of the users and maintaining agencies to seek and cater for higher levels of stocks of Engineering Support Material, under these circumstances, though quite understandable, results in excessive locked up inventories in the total supply chain.

3.11 Changed Conditions

The present day conditions are, however, vastly different from those obtaining when the concept of CODs and Multi-echelon Distribution System was conceived. The main among these being:

(a) The present day Army holdings of *Class 'A'* equipment include a wide range of multi-disciplinary, sophisticated weapons and equipment from different sources which, due to very high costs are now available

[9] See Chapter on Scales for details.
[10] RAND Publication R-3768-A, Developing Robust Support Structure for High Technology Sub Systems" Page 3.

in much smaller numbers and require a very high degree of responsiveness from the materials support services. The Army cannot, for instance, afford as many new generation tanks or guns Off Road/ Out of Action as it could in the case of the old vintage Tanks or guns.

(b) The coming into being of a well-developed industrial production base, which can meet most of the requirements indigenously.

(c) The development of a commercial distribution network connecting fairly far flung and border areas.

(d) Development of several scientific materials management techniques supported by highly evolved information technology systems.

Under the circumstances, the present set up with several links in the chain of supply, which contribute to sluggishness in response besides locking up inventories need re-examination.[11]

3.12 Recommendations

(a) Taking into consideration the present state of our industrial development and the indigenous availability of a large proportion of items in the Ordnance inventories[12], from sources spread throughout the length and breadth of the country, it no longer seems relevant for procurement of all items to remain centralised. Nor does it seem justified any longer for their distribution to follow fixed chains of supply. This model, which came into being when most of the inventory items came from the "Home Country" for support of forces both within India and those deployed overseas under the British flag is unsuited to our present day conditions.

(b) The Ordnance Services have already applied "Transportation Model" to some items of their supply with very worthwhile results both in economic and user satisfaction terms. The possibility of extending this model to other items, particularly those in the GS&C category and spares of indigenous 'B' vehicles needs to be explored.

(c) However, for a more radical change matching the scale of change in the overall situation, Ordnance Services may consider dividing their inventory between echelons for procurement and stocking/distribution purposes on the basis of ease of availability.

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[11] In this connection reference is drawn to the recommendations made by the Study carried out by Professor A H Karlo and P R Shukla of IIM Ahmedabad in 1990 as reproduced in "India's Defence Budget and Expenditure in a Wider Context" by Mr. A.K. Ghosh, 1996, page 253.

[12] As per the number of PRFs held with DDGOS GS&C, there were only 17 imported items in COD Kanpur, out of its total inventory of 5893 items. In the case of COD Delhi Cantt., the entire range of 65,000 current items less around 4000 items pertaining to Heavy Duty Recovery Vehicle was of indigenous origin

(d) One possible model designed to grant greater authority to the lower echelons to buy from commercial sources rather than depend upon central supplies, when such purchases provide better Value for Money and result in reduced response time besides lowering administrative costs is to divide the inventory into "Centrally Provided", "Regionally Provided" and Locally Provided" as under: -

i) Grouping of inventory

a) Centrally Provided Items.

These would include items, which should continue to be procured and distributed centrally. The category would cover: -

- ***All complete equipment***
- ***All imported items procured on Government to Government basis or from Trade abroad***
- ***All items of DGOF Supply***
- ***All items of Defence PSUs Supply***
- ***All items those are exclusive to defence and have no civil end use***
- ***Items classified by the Ordnance Services as "Centrally Stocked" due to limited availability.***

b) Regionally Procured Items

These would cover all items of trade supply other than those classified as Centrally and Locally Procured Items. Majority of General Stores items, spares in respect of commercial 'B' vehicles and a limited range of common user electronic and electrical items like relays, resistors and spares of charging and generating sets will fall in this category.

c) Locally Procured Items

Daily use expendables for personal use those are readily available off the shelf in most parts of the Country.

ii) Methodology for Procurement and Supply.

The systems of provision, procurement and supply of all Centrally Provided Items should continue as per the present practice, with as much use being made of Transportation Model as is possible.

In so far as regionally procured items are concerned, their provision, procurement and distribution should be made the responsibility of the respective commandants of regional/field depots who should enter into rate

contracts if not covered by DGS&D rate contracts wherever possible with the Original Equipment (OE) suppliers. This would,* however, *require suitable I&BC as well as DGQA cover. The cost effectiveness of regional procurement will more than off set the cost of such additional cover.

A system of granting cash allowances in respect of certain items of personal use by troops is already in vogue. The range of such items can be enlarged and a system of local procurement under powers of formation commanders analogous to the procurement of some ASC supply items can be introduced for locally procured items.

3.13 Defence Response

Of the five recommendations made by Audit, MGO agreed with two, partially agreed with one and disagreed with two as brought out below. Ministry also agreed with the views of MGO.

(a) Not agreed with the recommendations for decentralised purchase and argued that centralised purchases had their own advantages like getting highly competitive prices and quality, besides check against supply of spurious items.

(Para. 3.12 (a))

(b) Agreed to extend transportation model progressively to all such cases where volume of stores is large and lends itself to direct transportation.

(Para. 3.12 (b))

(c) Agreed that items of common user nature could be procured by the RODs and issued to the users, duly qualifying that Ordnance would introduce on-line procurement and step into e-commerce on the completion of CICP.

(Para. 3.12 (c))

(d) Not agreed to the recommendation to allow commandants of RODs/FODs to enter into rate contracts for items not covered by DGS&D rate contracts.

(Para. 3.12 (d))

(e) Agreed partially and stated that cash allowance was being granted for six items and five more items were proposed to be added to this list. MGO, however, argued against this scheme as it might work against the interests of the troops.

(Para. 3.12 (d) (ii))

MGO also differed with Audit on the observation that the present supply chain was sluggish in response and locks up large inventory and explained that better part of the Army was deployed for counter insurgency

operations in areas, where no industry exists, large number of spurious items are marketed in civil and industrial development did not matter much to the Army whose main sources of supply were DGOF, PSUs, small scale industries and handloom sector.

MGO added that Ordnance should be allowed to enter into Rate Contracts (RCs), rather than depending on rate contracts concluded by DGS&D.

Ministry/MGO did not comment on long issue time checks and delayed response by the depots even in respect of operational demands.

3.14 Conclusion

Audit maintains that the responsiveness of the existing supply chain were generally sluggish as brought out clearly in this Chapter and also in Chapter 10 on **User Satisfaction**. Since this impacts on the user satisfaction, a system overhaul is warranted. De-layering of the system is considered highly desirable. Regarding the proposal for conclusion of rate contract by DGOS, Audit is of the opinion that while the present system of operating RCs of DGS&D should continue, Ordnance may conclude RCs for Ordnance items exclusive to Defence Services use, either at Army HQ or at CODs, but items that could be regionally/locally procured should be decentralised.

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CHAPTER 4: SCALES

4.1 Summary:

Corps of Electrical and Mechanical Engineering (EME) prepares and issues Scales to the Ordnance for initial stocking, maintenance, overhaul and all time buys of spares. Since they indicate forecast requirements, the same need to be prepared with utmost care and accuracy.

Audit observed significant delays (up to 11 years) in the issue of Initial Stocking Guides. Validation of spares provided in the scales vis-à-vis actual consumption revealed that they were always on higher side (92-100 per cent) with the degree of variation ranging between 25 and over 1000 per cent and there were cases of 'nil' consumption too. Certain spares of* ICV *and Radar 'B' were likely to last for an indefinite period of time. Overhaul scales too were found defective in respect of certain electronic equipment. Although the scales have financial implications, the existing system does not provide for their financial approval i.e. scrutiny by the Ministry and concurrence of the Ministry of Defence (Finance).

Timely publication of scales, preferably through the involvement, besides EME, of Ordnance and Finance and outsourcing of maintenance/overhaul of civil end use vehicles/equipment were some of the issues worthy of consideration.

4.2 General

Ready availability of spares with or near the repair echelons reduces equipment down time and increases assurance levels of their operational readiness. At the same time, deployment of spares at multiple locations has inbuilt costs. Effective management of spare parts inventories in a multiechelon storage and repair system, such as the one operated by the Army, calls for policies, practices and procedures aimed at achieving a judicious balance between costs of down time of equipment, both operational and financial on the one hand and cost of locked up funds in inventories on the other.

Army's equipment maintenance philosophy is based on the concept of "Permissive Repair Schedules" which lay down the level and nature of repairs that can be undertaken at different repair echelons, bearing in mind the equipment down times that are operationally acceptable at those levels and the repair/ spare support effort involved. Spares support is then customised to meet the maintenance requirements of each of these repair echelons. Scales are the instruments through which such customised spares support deployment is achieved.

Additionally, scales are needed to guide provision and procurement action by the Ordnance Services to meet overhaul requirements and undertake Life Time Buys.

4.3 Scales- in nut shell

Corps of Electrical and Mechanical Engineering (EME) guide Ordnance by issuing scales for initial stocking, maintenance, overhaul and all time buy of spares. The types of scales prepared by Headquarters Technical Group Electrical and Mechanical Engineering (HQ TG EME) and their objective in brief are as under;

(a) Initial Stocking Guide (ISG)

This is intended to guide CODs in provisioning of spares to meet about four years requirement from the date of induction of new equipment. Initial procurement of spares for 24 months maintenance is made on the basis of ISG, if available, otherwise Manufacturer's Recommended List of Spares (MRLS), vetted by HQ TG EME, guides it. ISG contains scales for Initial Fill (IF) i.e. scales for initial issue to various units, Maintenance (M) and Overhaul (O) columns for first overhaul of 25 *per cent* of the equipment.

(b) Maintenance Scale (MS)

Indicates the range and depth of spares for stocking by lower Ordnance and repair echelons till such time as sufficient wastage experience is available to guide further provision action at those levels. This serves as an authority for these echelons to demand spares from CODs.

(c) Overhaul Scale (OS)

This lays down the scales of repair spare parts requirement during base overhaul of equipment. It is used by Base Workshops for advance provisioning of their requirement.

(d) Special Stocking Guide (SSG)

This is prepared in the case of that equipment which is proposed for procurement in a limited quantity on one time basis. SSGs are also prepared for those equipment, the spares availability in respect of which from the import source is likely to dry up on account of the equipment going out of production in the parent country. These scales guide "Life Time Procurement" decisions.

4.4 System Implementation Requirement

The scales indicate forecast requirements. Scaling requires utmost care and caution since any variation in assessment would tantamount to either stocking of unwanted spares, both in range and depth or lowering the desired assurance levels of availability of spares for repair of equipment in certain other cases.

Formulation of cost effective spare parts package requires sound analysis of significant parts and an accurate quantifiable method to determine the range and depth. Categorisation into High, Medium, Low cost based on unit price, Vital, Essential and Desirable (V, E, D) on equipment construction and movement pattern such as Fast, Slow and Non moving (F, S, N) on anticipated consumption rate are essential inputs for this evolution.

Need for timeliness in publication of the scales is self-evident.

4.5 System Implementation

Audit, during test check observed the following weaknesses in the system implementation.

4.5.1 Initial Stocking Guides (ISGs)

(a) Delay in Publication

Ideally, ISGs should be available at the time of ordering of main equipment to enable the desired range and depth of spares to be procured as a part of the package. However, publication of ISGs was invariably delayed as shown in the table given below;

Table: 4.1 Delay in publication of Initial Stocking Guides (ISGs)

Sr. No.	Name of the Depot	Name of the equipment	Year of introduction of the equipment	Year of publication of ISG	Delay
1.	COD Agra	Telephone 'A'	April1990	April 1992	2 years
2.	COD Agra	Radio set 'A'	February1990	July1996	5 years 3 months
3.	COD Delhi Cantt.	Maruti Gypsy 413	March1998	October1999	1 year 6 months
4.	CAFVD Kirkee	Weapon system 'A'	1996	May 1999	3 years
5.	CAFVD Kirkee	Weapon system 'B'	1989	Yet to be published	11 years

b) Non-publication of ISGs even after induction of equipment

A few cases of non-publication of ISGs even after induction of the equipment as reported in June 2000 by COD Agra are given below;

Table: 4.2 Non-publication of ISGs even after induction of certain electronic equipment of COD Agra responsibility

Sr. No	Name of the Equipment
1.	Field Cipher Equipment
2.	Radio Receiver
3.	Hand held Direction Finder
4.	Pilot less Target Aircraft System
5.	Integrated Observation Equipment
6.	Hand held thermal Imager
7.	Telescope sighting

Considering that when any new equipment is introduced into service, the spare parts required for its maintenance and repair during its initial service life must be based on the ISGs, procurement of spares in their absence will obviously be without any scientific forecast and could lead to either over or under provisioning.

MGO, however, stated in September 2000, that ISG in respect of item at Sl. No. 1 had been published in March 1996 and in respect of Sl. Nos. 3,4 and 5, no ISG was required to be published. In the remaining cases, ISGs were under preparation. The fact that the depot was unaware of the ISG which was published way back in March 1996, even after four years of its publication and it had no knowledge about the issue that no ISGs were required in a few cases, raised doubt about the adequacy of the process of dissemination of such vital information to the agency responsible for provisioning.

(c) Unduly delayed amendments

ISG is normally valid for a period of four years but in some cases it may go upto six years. In other words the maximum expected usage of ISG is six years. Issue of amendments to ISG after this period of six years, therefore, does not stand to reason. However, in the case of Bridging Set PMP, Bridging Set PMS and Gun 'A', which were inducted into service during 1974, 1975 and 1986, respectively, the ISGs were amended during 1993, 1991 and 1994 as under: -

Table: 4.3 Unduly delayed amendments to Initial Stocking Guides (ISGs) of the equipment of COD Jabalpur responsibility

Sr. No	Name of the Depot	Name of the equipment	Year of introduction of the equipment	Year of publication of ISG	Year of modification of ISG	Delay (Years)
1	COD Jabalpur	Bridging Set PMP	1974	1975	1993	18
2	COD Jabalpur	Bridging Set PMS	1975	1975	1991	16
3	COD Jabalpur	Gun 'A'	1986	1988	1994	6

MGO stated in September 2000 that the necessity of issuing amendments arose due to contingencies like up-gradation, obsolescence of components and product improvements. This was, however, not in tune with the provisions relating to validity of such scales.

(d) Unrealistic Scales

Audit analysed the actual consumption of maintenance spares for three years and compared it with the scales provided in ISG with the objective of assessing as to how far the spares provided in the 'M' column of ISG compared with actual consumption. This revealed substantial variation as tabulated below;

Table: 4.4 Unrealistic Initial Stocking Guides (ISGs) of the equipment of CODs Agra, Delhi Cantt. and CAFVD Kirkee

Name of the Depot	Vehicle/ Equipment	Sample size	Comparison of consumption pattern with ISG					
			More than ISG		Equal to ISG		Less than ISG	
			Number	*Per cent*	Number	*Per cent*	Number	*Per cent*
COD Agra	Radar 'A'	47	3	6	0	-	44	94
COD Agra	Radio set 'B'	30	1	3	0	-	29	97
COD Agra	Radar 'B'	16	0		0	-	16	100
COD Delhi Cantt.	Maruti Gypsy 410	25	1	4	0	-	24	96
CAFVD Kirkee	Tank 'A'	50	5	10	0	-	45	90
CAFVD Kirkee	Weapon system 'C'	25	1	4	1	4	23	92

Further analysis by Audit of the variation between actual wastage and the scales revealed that the variation was of considerable magnitude as mentioned in the table below;

Table: 4.5 Degree of variation in consumption of spares vis-à-vis scaled quantity in Initial Stocking Guides (ISGs)

Name of the Depot	Vehicle/ Equip ment	Total items	Total items with variation	Percentage of variation in consumption vis-à-vis scaled quantity (Items)						
				Upto 25	>25-50	>50-100	>100-500	>500-1000	>1000	Nil Consu - mption
COD Agra	Radar 'A'	47	47	Nil	Nil	Nil	2	Nil	2	43
	Radar 'B'	16	16	Nil	Nil	Nil	Nil	Nil	Nil	16
	Radio set 'B'	30	30	3	1	Nil	5	5	13	3
COD Delhi Cantt.	Maruti Gypsy 410	25	25	Nil	2	1	6	4	12	Nil
CAFVD Kirkee	Tank 'A'	50	50	5	2	7	11	8	12	5
	Weapon system 'C'	25	24	Nil	Nil	Nil	11	2	11	Nil

Audit took note of the fact that some of these spares relate to warlike equipment and there was a possibility of absence of any true co-relation between peacetime wastages with the wartime requirements. However, the fact that such variation exists even in the case of Maruti Gypsy, which is a commercial vehicle with full peacetime exploitation, indicates that the overstocking was more a function of attitude rather than scientific determination.

In the case of ICV vehicles, rather lavish scales of low shelf life and low-technology items like rubber hoses and seat cushions in ISG led to over provisioning during July/August 1990. The issue experience fell much short of the stock levels and as a consequence, rubber hoses costing Rs.1.69 crore and seat cushions costing Rs.1.07 crore were lying un-utilised even after a decade from the date of procurement, occupying valuable air-conditioned storage accommodation in CAFVD Kirkee involving in the process, recurring substantial expenses.

The blanket sanction to procure spares for overhaul of 25 *per cent* of equipment inducted into service in the beginning by including an Overhaul ('O') column of ISG, lacks rationale. Viewed in the light of the fact that first overhaul of vehicles/equipment is normally taken in hand 8 to 10 years after induction, this early procurement seems unjustified. As reported in Para 19 of Report No.7 of 2000[1], of the CAG of India, overhaul facilities for ICV, which were inducted in 1977, were not ready even after 22 years. At times even the overhaul responsibility of vehicles does not devolve on the Army as in the case of Tank 'A' where the Ministry decided in 1993 i.e. 13 years after its

[1] See Annexure N

induction into service to entrust the overhaul task to Director General Ordnance Factories (DGOF). The fact that major policy and implementation level changes could take place during the intervening period since equipment was first inducted and the time it became due for overhaul seemed to have been missed, while formulating procurement policy for overhaul spares as part of initial procurement. These factors also contribute to accumulation of unwanted stores in Ordnance inventory.

e) Timely cut in scales saved Rs.37.02 crore

HQ TG, EME published ISG for a rifle in July 1995 and guided by this scale, COD Jabalpur placed indent on DGOF in April 1997 to procure 109 items of spares at a cost of Rs.37.20 crore. Certain observations raised on the indent by Controller of Quality Assurance, Small Arms (CQA, SA) Ishapur alerted the depot and it realised that wastage pattern did not warrant provisioning of some items, as those were not required for maintenance. The depot also realised that some other items might not be required immediately. This prompted EME to revise the ISG in July 1998 thereby scaling down the requirement to one tenth. This in effect helped the depot to reduce the cost of indented items from Rs.37.20 crore to Rs.0.18 crore, a net reduction of Rs.37.02 crore. This case highlights the need for extreme care in the preparation of these scales as also the desirability of including AsHSP as well as Ordnance representatives in the scales formulation exercises.

f) Overstocking due to defective scales

A test check of stock holding of certain stores in the depots revealed that their stocks based on the established wastage pattern would last for centuries;

Table: 4.6 Stratification of surplus store that arose due to defective scales
(Value: Rupees in crore)

Sr. No	Name of the Depot	Name of the equipment	Sample size	Value of stock	Range of stock sufficiency (years)
1.	COD Agra	Radio set 'C'	12	8.10	9 to 303
2.	COD Agra	Radar 'B'	16	0.63	Infinity
3.	COD Agra	Radio set 'B'	30	0.05	0 to 194
4.	COD Jabalpur	Artillary items	21	0.36	290 to 1354
5.	COD Jabalpur	Small arms	13	0.46	25 to 134
6.	CAFVD Kirkee	Tank 'A'	54	3.24	18 to 8683
7.	CAFVD Kirkee	ICV	50	0.59	Infinity

Of the 54 items of Tank 'A' mentioned above, three items costing Rs.1.15 crore had already crossed their shelf life and resulted in clear loss to the exchequer.

In all the above cases, the over provisioning was basically on account of defective scales.

4.5.2 Overhaul Scales

a) Unrealistic Scales:

COD Agra reported in June 1999 certain cases of unrealistic range and depth of spares included in the overhaul scales of Radio equipment, Line equipment, Power equipment and Instruments as under;

Table: 4.7 Unrealistic Overhaul Scales of certain electronic equipment of COD Agra responsibility

Sr. No	Class	Item	Scale reference	No of items scaled	Items which were not demanded for overhaul programme (1999-2001)	
					Number	Percentage
1.	Radio	Radio set 'D'	TL/F-795/1 issue 1 of. July 83	790	719	91
2.	Radio	Radio set 'C'	TL/F805/4/ISG No.1 of Jun'87	339	276	81
3.	Radio	Radio set 'E'	TL/F 805/2 ISG No 1	398	311	78
4.	Line Equipment	Line Equipment 'A'	TL/T-335/4 ISG No 1 Jan 92	246	174	70
5.	Line Equipment	Line Equipment 'B'	TL/U/775/1 ISG No 1 Jan 83	499	431	86
6.	Line Equipment	Line Equipment 'C'	TL/T 105/9 SG (SL) No 1 ISG 3/93	51	25	49
7.	Power Equipment	Power Equipment 'A'	PWC 185/4 OS No 1 Feb 97	467	353	76
8.	Power Equipment	Power Equipment B'	PWC 185/4 No 1 issue 1 Feb 97	467	307	66
9.	Power Equipment	Power Equipment 'C'	PW/C 185/6 ISG No 1 of Jan 82	419	266	63
10.	Instruments	Instrument 'A'	1S/D 165 OS No 1 issue 1 Sep 84	64	57	89
11	Instruments	Instrument 'B'	1S/B235 OS No 1 issue 2 of Nov 92	127	68	54
12.	Instruments	Instrument 'C'	1S/1 345/1 ISG Nol issue 1 of March 90	158	78	49

MGO stated in September 2000 that the aspect of utilisation of lesser spares during overhaul was being considered during preparation and publication of overhaul scales, subsequently. Audit observed that such corrective steps were too late to undo what was already done. For example, in the case of items at Sl. No.1 of the above table, ISG with 'O' column was published in July 1983, while overhaul scale was published 16 years thereafter, i.e., in October 1999.

Obviously, the overhaul scales were unrealistically on the higher side. This is yet another pointer to the lavishness in scales prepared by the EME. This culminates in procurement of unwanted stores.

b) Defect in overhaul scale of Maruti engines

Having decided not to overhaul Maruti engines at Army Base Workshop, Army HQ in December 1998/August 1999 concluded contract with M/S Maruti Udyog Ltd (MUL) for 1010 Nos. of half-engines[2] with kits at a cost of Rs.1.94 crore for Maruti Gypsy vehicle.

Under the contract, MUL would supply half-engine assembly to field workshops for direct fitment. This was aimed at reducing the vehicle down time and lowering cost of repairs.

Audit observed that though the overhaul scale of Maruti engines provided 98 items as against 40 items in the half engines concept, the cost of spares for overhaul of engines under half-engine concept was higher on account of the 100 *per cent* replacement of certain non-wearing and costly items like crankshaft, cylinder block and piston standard, under half-engine concept as against reduced requirement of spares in the normal overhaul due to replacement on need basis. This case illustrated the impact of change in Permissive Repair Schedules on spares procurement and deployment pattern besides the total system costs. Further, the need for this change in PRS in respect of Maruti vehicles which could easily be repaired in most parts of the country merits re-examination as it would lead to downsizing establishment, both at base workshops and supporting ordnance echelons.

c) Retention of unwanted items in overhaul scale

512 ABW identified a total of 812 items of Tank 'B' in the overhaul scale as not required for overhaul. These were, however, retained in the scales on the recommendations of Maintenance Advisory Group-15 (MAG-15). The retention of items in overhaul scale when the Base Workshop, which executes the overhaul, did not feel their requirement, lacked justification. Audit examination of 42 items representing 5 *per cent* of these items revealed that

[2] Half-engine refers to replacement of certain critical spares only instead of entire set with a view to reducing down time and ensuring economy.

the cost of those items in stock was Rs.58.44 lakh, indicating that substantial amount was locked up in these items.

In contrast to this, MAG 8 immediately acted upon the suggestion of COD Jabalpur when the latter pointed out in September 1997 that an amendment issued in January 1997 to overhaul scales of Gun 'B' had the effect of raising the scales by 10 times of one of the items. The overhaul scale was immediately amended to rectify the error.

CAFVD Kirkee too had identified items costing Rs.4.61 crore procured in excess of requirement for Tank 'B', due to incorrect scales.

4.5.3 Absence of Financial Approval for Scales

Audit observed that the scales promulgated by the EME did not carry financial approvals. Since scales guide Ordnance in provision and procurement of spares and have a multiplier effect resulting in major financial outlays, it is only proper that the scales are thoroughly vetted and concurred in by the Ministry of Defence (Finance) in the first place. Involvement of Finance representatives in the scales formulation exercise merits consideration.

4.6 Recommendations

(a) HQ TG, EME need to address all the probable factors that affect the ranging and scaling with extra care and caution. Involvement of AsHSP, Ordnance and Finance in the preparation of scales merit consideration. More meaningful dialogue with original equipment manufacturers is also called for.

(b) ISG should be prepared at the earliest opportunity, preferably within one year of the introduction of equipment into service, by which time the warranty period of the main equipment generally expires.

(c) Procurement of spares at the equipment induction stage itself for meeting the overhaul requirement of vehicles/equipment, the overhaul of which is likely to be taken up eight to ten years after their induction should be stopped, with the exception of limited quantities for Pilot Overhaul, if warranted.

(d) Overhaul scales once published should be subjected to wholesale review at prescribed periodicities to refine them based on actual experience.

(e) Range of items in Manufacturers Recommended List of Spares (MRLS) needs thorough scrutiny to prevent unnecessary stocking of easily available spares and to check the tendency on the part of manufacturers to dump large quantities of spares on to the Army.

(f) Viability of outsourcing the task of maintenance of vehicles/equipment, with civil end use, in peace stations be explored, particularly where authorised service centers exist.

4.7 Defence Response

Of the six Audit recommendations, MGO agreed with five and partially agreed with one.

The essence of MGO's response to the above recommendations is indicated below, *ad seriatim.*

(a) Agreed partially and stated that due attention was already being paid to all the probable factors that affect ranging and scaling. MRLS was being thoroughly discussed with OEM for inclusion of range of items in the scales and depth was being assessed on scientific analysis. The suggestion for involvement of AsHSP and Ordnance in the preparation of scale was agreed to but not the Finance.

(Para 4.6 (a))

(b) Agreed and assured that all out efforts would be made to meet this deadline.

(Para 4.6 (b))

(c) Agreed, by qualifying that HQ TG, EME had stopped inclusion of 'O' column in the recently published ISGs, except for limited quantities for pilot overhaul and OH scales were prepared after pilot overhaul.

(Para 4.6 (c))

(d) Agreed and added that instructions existed for review of overhaul scales based on experience.

(Para 4.6 (d))

(e) Agreed and maintained that it was already being done.

(Para 4.6 (e))

(f) Agreed but opined that the maintenance through authorised service centers might not prove cost effective in the long run, in view of high annual maintenance cost.

(Para 4.6 (f))

4.8 Conclusion

As brought out by Audit and also experienced by the Ordnance, unrealistic scales had contributed to procurement of unnecessary stores in the past. The necessity for extra caution and care in the preparation of scales is obvious. Scaling cells of the EME are guided by Regulation on EME Scale

published in 1978 for preparation of scales and these regulations were overdue for review to keep pace with the changing needs. The presence of a representative of Finance at the stage of preparation of scales, though not desired by MGO, needs to be deliberated upon by the Ministry in consultation with their Integrated Finance in view of the reasons stated in paragraph 4.5.3.

Deletion of 'O' column from the ISG was a step in the right direction. However, regulations need to be amended to ensure that overhaul spares, even when based on pilot overhaul are not procured too early in the life cycle of equipment and then remain unutilised for several years.

Comprehensive review of overhaul scales at prescribed periodicity needs to be made mandatory, in addition to the intermittent revisions to the scales as a result of experience gained during actual overhaul.

The cost effectiveness of outsourcing repair/maintenance of equipment/vehicle of civil-end use needs to be analysed with proper cost benefit study.

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CHAPTER 5: BUDGET AND PROCUREMENT

5.1 Summary:

The Army spent on an average, Rs. 5130 crore annually during the period 1994-99 on purchase of stores. Of this, Ordnance purchases accounted for Rs.3373 crore or nearly two thirds. Financial powers ranging from Rs.25 crore to the Vice Chief of the Army Staff to Rs. 25 lakh to the Commandants of CODs are delegated to ensure speedy procurement.

Audit observed that the existing internal checks for purchase and budgetary control were inadequate and fraught with risks of over provisioning and unwarranted commitment of funds. The internal processing of procurement demands is extremely slow and tortuous with depots taking as long as three years to place supply orders in certain cases against the prescribed internal lead-time of two months from the date of review, thereby throwing the system in disarray. The existing lead-times, which range from 21 months in case of direct purchase from Trade to 42 months for DGOF supply items are archaic. Supplies from Trade showed encouraging trend of much lower response time and the DGOF is capable of doing likewise, indicating a need for downward revision of these lead-times. Disturbing instances of PSUs defaulting in supplies despite collecting large advances (over Rs. 400 crore in one instance) were noted in Audit, suggesting a need for ensuring greater accountability on the part of PSUs.

A review of existing budgetary controls, timely processing of procurement demands and reducing procurement lead-times, besides ensuring greater accountability of the supply agencies is necessary.

5.2 General

Procurement forms an important function of materials management in the Army as it relates to sourcing and acquisition, among others, of critical items of inventory and entails substantial financial outlays. Procurement of stores, including Ordnance stores is the second largest item of expenditure of Army budget next to manpower budget and it averaged around Rs 5130 crore per annum, during 1994-99, representing 32 *per cent* of the total budget.

In the Army, procurement of spares becomes a complex process since its capital equipment like guns and tanks are of diverse origins and are continually changing in their composition consequent to technological advancements and changing threat perceptions. This is further compounded on account of their exclusive nature, stringent specifications and limited sources of supply. Those involved in procurement are, therefore, required to be highly watchful of the changing requirements and sources of supply to ensure that the procurement is regulated in line with the real needs.

5.3 Budget

5.3.1 Allotment and Expenditure

The allotment and expenditure on procurement of ordnance stores including Class 'A' stores during 1994-99 was as under-

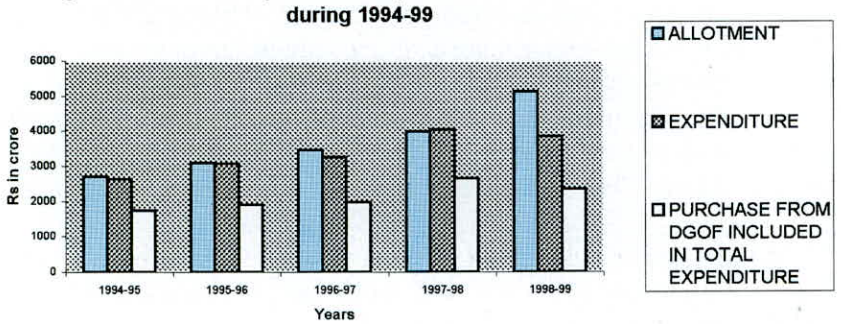
Table 5.1 Budget allotment and expenditure on procurement of ordnance stores during 1994-99

(Rupees in crore)

Year	Allotment	Expenditure	Purchase from DGOF as included in the previous column	Percentage of purchases from DGOF	Excess/ Saving (+)/(-)
1994-95	2713.75	2642.54	1742.81	66.0	(-) 71.21
1995-96	3091.79	3077.50	1907.13	62.0	(-) 14.29
1996-97	3456.99	3256.90	1974.33	61.0	(-) 200.09
1997-98	3979.93	4039.40	2645.71	65.0	(+) 59.47
1998-99	5115.22	3847.90	2337.15	61.0	(-) 1267.32

Barring one year, there was surrender of funds indicating that there was no scarcity of funds available to the Ordnance Services for meeting their demands.

Figure-4
Budget allotment and expenditure on procurement Ordnance stores during 1994-99



5.3.2 Sub-allocation of funds

In the Army, there are several functionaries with financial powers to make purchases, based on the provision reviews. The powers delegated vary between Rs 25 crore to the Vice-Chief of the Army Staff and Rs. 25 lakh to the Commandants of CODs. From the budgetary allocation of the DGOS, sub-allocation is made to each depot. The allocations and expenditure pertaining to the depots reviewed was as under:

Table 5.2 Budget allocation and expenditure pertaining to the CODs under review during 1994-99

(Rupees in crore)

Year	COD Agra		COD Delhi Cantt.		COD Jabalpur		COD Kanpur/ CP Cell		CAFVD Kirkee	
	A	E	A	E	A	E	A	E	A	E
1994-95	64.27	63.19	36.00	35.07	3.30	3.29	NA	NA	29.00	23.75
1995-96	90.85	90.72	47.75	42.70	2.00	0.59	NA	NA	23.00	14.08
1996-97	89.93	87.83	47.11	42.71	4.50	1.43	NA	NA	10.00	10.08
1997-98	89.80	84.07	37.70	34.24	4.38	2.32	NA	NA	10.00	8.86
1998-99	99.33	102.41	50	46.24	4.00	3.60	NA	NA	28.49	27.95

A- Allotment; E - Expenditure

5.4 Delegated financial powers for procurement

Financial powers delegated to the Ordnance functionaries under the Financial Management Strategy published by the Ministry of Defence in 1997 as amended in August 1999 for effecting procurement based on provision reviews were as under: -

Table: 5.3 Delegation of financial powers for procurement of Ordnance stores

(Rupees in crore)

Competent Financial Authority	Without consultation with IFA/CDA	In consultation with MOD (Fin) IFA/CDA
VCOAS	-	25
MGO	-	5
DGOS (Lt. Gen)	2	3
Addl.DGsOS (Maj.Gen)	1.5	-
DDGOS (GS&C)	0. 50	-
Commandants CODs/CAFVD	0. 25	-

The principle underlying enhanced delegation of powers to subordinate functionaries was to introduce efficiency in performance and establishing linkages between utilisation of resources allotted and output achieved.

Procurement in all cases beyond Rs.1 lakh has to be made through Tender Purchase Committee (TPC) whose composition is decided with reference to the financial powers. Notwithstanding the delegation to the Commandants to procure items costing upto Rs.25 lakh, the purchases beyond Rs.10 lakh require prior concurrence of Inventory and Budgetary Control (I&BC) at Army HQ. The local I&BC Cells have powers limited to Rs.10 lakh, as fixed in 1987, for vetting the demands before placing orders.

Prior to 1977, i.e. before the creation of I&BC Cells, scrutiny of provision records was done by Deputy Assistant Financial Advisor (Ordnance) attached to CODs. With effect from 1 April 1977, the duties of DAFA (O) were taken over by Ordnance and I&BC cells were established at various CODs and the Central Provision (CP) cell. In order to achieve objectivity and avoid risks of over provisioning, these cells were made to function as external staff under administrative control of the DGOS through DDGOS (I&BC).

For the purpose of budgetary control, the cells were supposed to keep a close watch on the expenditure vis-à-vis the budget allotments. While bringing out any trends like accelerated or tardy expenditure to the notice of the depots, the cells work out the budgetary effects of cancellation, reductions and supplementary demands against budget allocation. Vicarious control and peripatetic checks by the Ministry of Defence (Finance) over the functioning of I&BC cells are implied in the system.

5.5 Sources of supply:

The main sources of supply of Defence stores are as under: -

(a) **Director General Ordnance Factories :** This is a dedicated agency for production and supply of stores required by the Defence Services. They supply a wide variety of arms, armament, tanks, general stores, clothing, vehicles, and ammunition.

(b) **Public Sector Undertakings :** The Defence PSUs especially provide variety of stores like electronic goods, communication equipment, missiles, heavy and specialized vehicles, helicopters and aviation stores.

(c) **Trade :** The private sector companies in India produce a wide range of stores to meet defence requirements. Further, they participate in indigenisation of imported items.

(d) **Import:** Import of equipment and spares remains necessary till the required items are indigenised.

(e) **EME/Depot:** EME undertake manufacture of items in their workshops, essentially on need basis to meet repair commitments. Some manufacture is also undertaken for Ordnance stock purposes. Central Ordnance Depots manufacture low-tech items in a limited way.

5.6 Procurement Agencies

Major agencies involved in procurement of Ordnance Stores are: -

(a) **DGS&D:** The main Central Procurement agency for all Government departments, including Defence items other than for exclusive use of Defence. DGS&D enters into Rate/Running contracts with manufacturers/suppliers, which are operable by the Defence.

(b) **Department of Defence Production & Supplies (DDPS)**: DDPS undertakes procurement of items of developmental nature, mainly those for indigenisation. This Department is assisted by DGQA for this purpose. Items of developmental nature, till two sources of supply are established to ensure free flow production continue to be procured through DGQA.

(c) **Heads of Department:** Heads of Department like DGOS procure common user, Defence and Civil use items and Defence exclusive items under delegated powers.

(d) **Army HQ (PPO):** Deputy Director General (DDG), Procurement Progressing Organisation (PPO) under MGO branch, handles procurement of stores ex-import.

(e) **Central Ordnance Depots:** Commandants are empowered to make direct, local and cash purchases upto the limits laid down from time to time.

Powers for sanctioning and entering into contracts for procurement of stores for Ordnance, which fall beyond the financial powers of the VCOAS, rest with Ministry of Defence.

5.7 Inspection Agencies

Authorities Holding Sealed Particulars (AsHSP) are the sole agencies for inspection and acceptance of stores under procurement. The only exception is that of low value items i.e., items costing upto Rs.1 lakh in respect of stores under local purchase and those costing upto Rs.50,000 in respect of direct purchase. In these cases, the Ordnance officers of the depot making the purchase can undertake inspection.

5.8 Audit Observations

Audit, during review of the system, procedure and practices observed certain deficiencies and weaknesses as given in the succeeding paragraphs.

(a) Inventory and Budgetary Control Cells

i) Administrative control vis-à-vis the criticality of the role performed:

In the present set up, the functionaries of I&BC cells at Army HQ and depots are under the administrative control of the DGOS through the DDG I&BC. Keeping the spirit with which they were created by disbanding DAFA (O), and the fact of absence of any Internal Audit coverage of the provision records, the existing arrangement of these cells functioning under the administrative control of the Head of the Ordnance needs re-examination. Since failure in effective scrutiny of provision records could lead to either under or over provisioning involving significant financial sums, these cells need some measure of independence, the feasibility of which may be studied separately.

In support of the above argument, the role-played by I&BC Cell in effecting reduction in expenditure is worth mentioning here. In case of provisioning at CAFVD Kirkee, the concerned I&BC Cell had effected savings by reducing the quantities on demands during vetting to a considerable extent as under;

Table: 5.4 Savings effected by I&BC at CAFVD Kirkee by reducing the quantities of demand bearing items projected by the depot

(Rupees in crore)

Year	Total items vetted	Total value of items vetted	Reduction made	
			Number	Value
1994-95	15706	78.11	194	1.82
1995-96	19921	54.46	331	3.92
1996-97	16725	103.86	312	5.31
1997-98	12520	132.29	272	8.60
1998-99	11067	86.13	499	28.17

ii) Mismatch in Financial powers:

Under the Financial Management Strategy of MGO's Branch 1997, Commandants of the CODs have powers to place supply orders in respect of direct purchase/TPC items upto Rs 25 lakh based on provision review. However, the I&BC Cells attached to these depots vet demands upto Rs 10 lakh, beyond which proposals are to be submitted to Army HQ for vetting.

The vetting process at Army HQ in such cases contributed to delay in procurement on an average of three months as observed in COD Delhi Cantt. and CAFVD Kirkee.

Since the objective of Financial Management Strategy of 1997 was to introduce efficiency in performance, financial control and establishing linkages between utilisation of resources allotted and targets / output achieved, there is a need for matching powers for I&BC Cells to vet demands. Without matching powers, the very objective of enhancing the Commandants' powers is not being fulfilled.

(b) Vendors registration

The main sources of supply of stores to Ordnance are the Defence captive industrial base of 39 Ordnance Factories and 8 Defence PSUs. However, the private Sector too makes its own contribution by supplying general stores, clothing, components, spares and certain main equipment. Development of a wide vendor base in the private sector is essential to generate healthy competition and quick response time. DGQA associates Indian industries in development and indigenisation programmes of items for Defence application. On successful production and supply of such items, those firms *ipso-facto* get registered as vendors for such items.

However, there are many production agencies in the private sector, which are capable of supplying common user items, which are not being harnessed under the present system. Ordnance presently does not have its own system of centralised registration of vendors on all India basis for ordnance items even though it is mandatory to accept offers of only registered firms. What is presently done is registration of vendors by the CODs for local purchases, besides referring to the list of registered suppliers of DGS&D and DGQA. The depots do not periodically advertise and update the database of vendors' registration. With the ongoing automation in Ordnance, creation of such a database accessible to all the purchase agencies in Ordnance should not pose any problems.

With enhanced powers delegated to Ordnance functionaries, it is incumbent upon Ordnance to make registration of vendors at Army HQ in respect of fast moving and costly stores besides regional registration. Further, the depots should exchange the lists of vendors registered by them with other depots dealing with similar items like MT spares. The aim should be to encourage maximum participation of prospective suppliers from the Trade. This would help in reducing rejection of the lowest acceptable offers on the ground of non-registration.

(c) Provision for long Interim Period (IP)/ Procurement lead-time:

Interim Period represents the estimated average period, in months, which elapses between the date of placing demands by the provisioning authority and the physical receipt of stores in the consignee establishment. The existing provisioning policies cater for long Interim Periods (Lead Times) in the procurement process. The present system allows Interim Periods as under:

DGOF	-	*42 months*
PSUs	-	*36 months*
Trade (DP)	-	*21 months*
Trade (LP)	-	*09 months*

Audit analysis of a sample of 200 cases of provisioning at CAFVD Kirkee revealed that 34 cases fell in the category of free flow items. The depot in these cases availed IP of 21 months just because these fell under the direct purchase category, though in majority of the orders placed by the Depot, the Trade could supply the items within 12 months as illustrated elsewhere in this Chapter. This had the effect of blocking funds to the tune of Rs. 2.97 crore. By their very nature of free flow there was scope for reducing IP to 9 months. An analysis of pattern of materialisation in 50 selected cases at COD Delhi Cantt. revealed that materialisation of supplies from trade was very fast, though the Interim Period provided in the provisioning of these items had been reckoned as 21 months. Audit assessed an avoidable outflow amounting to Rs 1.24 crore in those cases.

Analysis of the pattern of materialisation of 187 Supply Orders at CAFVD Kirkee and COD Delhi Cantt. showed that in 74 cases, materialisation was within 3 months, in 86 cases it took upto 6 months and in 23 cases it took upto 12 months while in the remaining four it took more than 12 months. Thus, over the years, the supply pattern from trade was showing encouraging trend of quick supply. It was apparent that the Indian industry was sufficiently geared up to meet demands from the Army irrespective of the fact that many items were with stringent specifications with little civil end use. The existing IP needs to be reviewed for downward revision with the objective of reducing inventory holding in Ordnance.

Procurement lead-time is the interval between the identification of a material requirement and the time that ordered material arrives. The length and variance in procurement lead-time directly influence inventory involvement and demand forecast.[1] Ordnance Services take abundant precaution to keep stock for maintenance period of 12 months besides long interim period ranging upto 42 months as mentioned above, to avoid stock out situation.

[1] India's Defence Budget and Expenditure Management in a Wider Context by Mr. A.K. Ghosh, Page 253, 1996.

The internal lead-time relates to the time gap between the date of establishing the requirement till placing of supply order and the external lead-time is the time taken by the supplier to supply the item ordered on them. The existing provisions stipulate a period of two months of internal lead-time for processing the cases since provision review is completed and the indents are placed. Apart from the study of selected 187 supply orders mentioned in the preceding paragraph, Audit analysed the time elapsed between establishment of requirement and the materialisation of supplies, grouping them into internal and external lead-time.

The analysis was further grouped according to the source of supply, viz. Trade, PSU, DGOF and orders on trade through DGQA.

(i) Trade

The results of the analysis in four depots viz., COD Agra, COD Delhi Cantt., COD Jabalpur and CAFVD Kirkee of a sample of supply orders selected at random from the orders placed on Trade by Ordnance during 1994-99 are tabulated below:

a) Internal Lead Time

Table: 5.5 Internal lead-time taken by CODs Agra, Delhi Cantt., *Jabalpur and CAFVD Kirkee in placing supply orders on Trade*

(Time in months)

Name of the Depot	Sample Size	Time taken			
		6	**7-12**	**13-24**	**25-36**
COD Agra	20	10	6	4	--
COD Delhi Cantt.	22	--	3	19	--
COD Jabalpur	8	Nil	Nil	8	--
CAFVD Kirkee	42	Nil	1	25	16
Total	92	10	10	56	16
Percentage		*11*	*11*	*61*	*17*

It is apparent from the above table that the internal lead-time in respect of the sample selected was 13-24 months in all cases of COD Jabalpur, while it was so in 86 *per cent* of the cases in COD Delhi Cantt. and 60 *per cent* in CAFVD Kirkee. On an average, the depots took 13-24 months in processing 61 *per cent* of the sample cases selected.

An analysis of the internal lead-time revealed that maximum delay occurred, above the permitted lead-time of 15 days for the activity between vetting of demands by I&BC cell and raising indents by the depots. The details are as under: -

Table: 5.6 Lead-time taken between vetting of indents by I&BC and their placement by CODs Agra, Delhi Cantt., *Jabalpur and CAFVD Kirkee*

(Time in months)

Sr. No	Name of the Depot	Sample Size	Time taken from I& BC vetting to placing of indents				
			Upto 3	4-6	7-12	13-24	25-36
1.	COD Agra	20	12	7	1	Nil	Nil
2.	COD Delhi Cantt.	22	22[2]	Nil	Nil	Nil	Nil
3.	COD Jabalpur	8	Nil	3	5	Nil	Nil
4.	CAFVD Kirkee	42	15	6	4	10	7
Total		92	49	16	10	10	7
Percentage			*53.2*	*17.4*	*10.9*	*10.9*	*7.6*

The above table shows that the time taken between vetting of demands by I&BC cells and raising indents was in the range of 4-36 months in respect of 47 *per cent* of the cases selected as against the permitted lead-time of 15 days. Although the late receipt of SPRDs, if any, could be responsible for the delay up to the provision review stage, further delay needed justification.

Further analysis of the time taken between raising of the indents and placement of supply orders by the depots is shown below;

Table: 5.7 Time taken between raising of indents and placing supply orders by CODs Agra, Delhi Cantt., *Jabalpur and CAFVD Kirkee*

(Time in months)

Sr. No	Name of the Depot	Sample Size	Time taken from raising of indents to placing of supply orders			
			Upto 3	4-6	7-12	13-24
1.	COD Agra	20	15	1	3	1
2.	COD Delhi Cantt.	22	7	13	2	Nil
3.	COD Jabalpur	8	1	Nil	6	1
4.	CAFVD Kirkee	42	41	Nil	1	Nil
Total		92	64	14	12	2
Percentage			*70.0*	*15.0*	*13.0*	*2.0*

[2] Only two out of the 22 demands selected were processed within the permitted time of 15 days

b) External Lead Time

Table: 5.8 Lead time taken by Trade in supplying the orders placed by CODs Agra, Delhi Cantt., *Jabalpur and CAFVD Kirkee*

(Time in months)

Name of the Depot	Sample Size	Time taken				
		Upto 3	4-6	7-12	13-24	>24
COD Agra	20	3	4	6	6	1
COD Delhi Cantt.	36	1	15	16	4	Nil
COD Jabalpur	8	Nil	2	4	2	Nil
CAFVD Kirkee	74	40	18	13	3	Nil
Total	138	44	39	39	15	1
Percentage		*32*	*28*	*28*	*11*	*1*

The above-mentioned data revealed that 88 *per cent* of the ordered stores were supplied within 12 months. This confirms further that considerable portion of the permitted lead-time was utilised by the depots themselves. In view of the quick response by Trade at all the depots, a serious thought is required to be given for reducing the total interim period by compressing the internal lead-time as well.

Audit had further analysed the performance of Trade in supplying clothing and general stores items of COD Kanpur responsibility, separately, since Trade was one of the major sources of supply of these items. Audit analysis of 179 orders placed by CP cell during 1994-99 revealed that the internal lead-time as indicated below was unusually high.

c) Internal lead time

Table: 5.9 Internal lead-time taken by Central Provision Cell, Army HQ in placing supply orders on Trade

(Time in months: Value- Rupees in lakh)

Particulars	Total	Time taken					
		6-12	13-24	25-36	37-48	49-60	> 60
Number of orders	179	109	46	18	3	2	1
Percentage		60.90	25.70	10.05	1.68	1.12	0.55
Value of orders	2796.53	1903.86	775.83	80.54	30.21	3.95	2.14

While 61 *per cent* of the cases selected had taken 6-12 months time, 36 *per cent* of the cases took 13 to 36 months warranting a justification and suggesting scope for time compression.

The analysis of external lead-time, in respect of 90 cases representing 50 *per cent* of the supply orders from the above sample revealed that orders materialised in 48 *per cent* of the selected cases within two years. The details are as under;

d) External lead time

Table: 5.10 Lead-time taken by Trade in supplying GS&C items of COD Kanpur

(Time in years; Value-Rupees in lakh)

Particulars	Total	Time taken					
		upto 1	>1-2	>2-3	> 3	Yet to be supplied	Cancelled
Number of Supply Orders	90	27	16	8	1	32	6
Percentage	100	30	18	9	1	35	7
Value	1097.6	464.4	229.7	81.5	14.7	285.1	22.2

Considering the progress made by the civil industry in case of GS&C items, the abnormal delays in identifying the prospective suppliers and for placing order needs to be avoided. These are symptoms of poor procurement management in the depot/CP cell, especially when the stores involved were not of intricate technical specifications. Since the possibilities of adoption of business practices by Trade that thwart the efforts of the procurement agencies to speed up procurement cannot be ruled out, Audit recommends an independent study of this anomalous situation which is contrary to the emerging patterns in other disciplines where 88 *per cent* of the stores even though more technical in nature materialised within 12 months.

(ii) DGOF

An analysis of lead-time in so far as items of DGOF supply was undertaken at COD Jabalpur, which is mainly dependent on DGOF for its supplies. Audit analysis of a sample of indents raised during 1994-99 revealed that the depot was not adhering to the laid down time of two months for raising indents from the date of review and the internal lead time ranged as under: -

a) Internal Lead-time

Table: 5.11 Internal lead-time taken by COD Jabalpur in placing the orders on DGOF

(Delay in months)

Sample size	Within two months	Indents raised with delay		
		upto 6	7-12	More than 12
37	7	19	2	9
Percentage	19	51	6	24

Apart from the delay in raising indents by the depot, DGOF also delayed the supply despite the long interim period of 42 months allowed, as revealed during Audit analysis. The details are as under: -

b) External Lead time

Table: 5.12 Time taken by DGOF in supply of the items of COD Jabalpur responsibility.

(Delay in Years)

Sample size	Materialised within the IP of 42 months	Received with delay			
		Upto 1	>1-3	>3-5	Outstanding
37	23	6	2	1	5
Percentage	*62*	*16*	*5*	*3*	*14*

From the above table it could be seen that 14 *per cent* of the indents placed on DGOF were outstanding. While the oldest indent was of September 1991, the items outstanding were like Handle, Bushing, Seal Rubber and Dynamometer etc.

The above details revealed that both the Ordnance services and Ordnance Factories contributed to delays in materialisation of supplies. This needed to be resolved jointly.

(iii) Public Sector Undertakings (PSUs)

The lead-time relating to PSUs as the source of supply was analysed at COD Agra, which receives maximum items from these sources. The results of the lead time analysis at this depot were as under:

a) Internal Lead Time

Table: 5.13 Internal lead-time taken by COD Agra in placing orders on Public Sector Undertakings (PSUs)

(Time in months)

Particulars	Sample	Time taken in placing orders			
		0-3	4-6	7-12	13-24
Number of Supply Orders	18	6	5	5	2
Percentage		*33*	*28*	*28*	*11*

As shown above, in 67 *per cent* of the sample selected, the internal lead-time was in the range of 4 to 24 months. Interestingly, in 11 *per cent* of the cases the time taken was in the range of 13 to 24 months.

b) External lead-time

Table: 5.14 External lead-time taken by Public Sector Undertakings (PSUs) for supplying the items of COD Agra responsibility

(Time in years)

Sample size	Time taken in supply			
	Upto one	**1-2**	**2-3**	**Outstanding**
30	12	14	2	2
Percentage	*40.0*	*47.0*	*6.5*	*6.5*

Both internal and external lead times were high and needed to be brought down if efforts to reduce inventory and to increase user satisfaction are to bear fruit. The fact that PSUs receive substantial advances for supplying stores demanded and yet delay their supplies is discussed in the succeeding paragraph on outstanding dues in.

d) DGQA and Indigenisation

i) Internal and External lead time:

An important role that the DGQA performs is indigenisation of stores for imported equipment/vehicle to attain self-sufficiency for their operation and maintenance. Procurement of stores under indigenisation or already indigenised was undertaken by the Contract Purchase Officers (CPO) of the DDPS till two different suppliers supply stores against two supply orders each. As per modified orders issued in June 1999, an item stands declared as 'free flow' if the second source was not developed within five years from the date of completion of the first supply order. Thereafter, these are termed as 'free flow' items and Ordnance is allowed to purchase stores under Direct Purchase (DP). The procedure followed for identification of stores for indigenisation from the stage of annual provisioning review is briefly narrated in the succeeding paragraph.

On completion of annual provision review relating to a main equipment/vehicle, a Draft Depot List (DDL) is prepared by the COD concerned and forwarded to DGQA, DGOF, HQ Base workshop, MAG and PSUs for their perusal. Then, a technical sub-committee meeting is convened at the COD where all the representatives of these agencies get an opportunity to inspect the samples and to deliberate on the possibility of indigenisation and to identify the source thereof. Thereafter, a Final Depot List (FDL) is prepared listing out all the items identified by the committee for indigenisation through DDPS who proceeds with the process of indigenisation and procurement of the listed items. The validity of such an FDL is two years.

More often, all items in FDL are not made available to the depot or not even covered by supply orders within time frame of two years. The lead-time involved in the procurement in such cases was examined in audit at CAFVD Kirkee. In a sample of 50 cases analysed, Audit observed both internal and external delays as under;

Table: 5.15 Analysis of time elapsed between preparation of Final Depot List and placing of supply orders by DDPS

(Time in years; Value-Rupees in lakh)

Parameter	**Total**	**No. of Supply Orders placed**				
		Upto 1	**1-2**	**2-3**	**>3**	**Outstanding**
Time elapsed between preparation of FDL and placing of supply orders	50	31	12	3	4	Nil
Value	268.24	172.53	54.65	15.39	25.67	

Table: 5.16 Analysis of time elapsed between placing of supply orders by DDPS and their materialisation

(Time in years; Value-Rupees in lakh)

Parameter	**Total**	**No. of Supply Orders placed**				
		Upto 1	**1-2**	**2-3**	**>3**	**Outstanding**
Time elapsed between placing of supply orders and materialisation of supplies	50	9	14	10	7	10
Value	268.24	41.52	84.20	37	33.63	71.89

Audit recognise the fact that indigenisation is a complex process. However, since it is a priority area and only those cases found feasible are listed in the FDL, the time taken to place supply order needed to be compressed.

Further, Audit observed at CAFVD Kirkee that the supply orders placed by DDPS for procurement of non-free flow items were outstanding for considerable period. Supply orders outstanding for more than three years as on 1 June 2000 were as under;

Table: 5.17 Supply orders pending for materialisation placed by DDPS for procurement of non-free flow items

Main equipment	Number of Supply Orders outstanding	Date of the oldest Supply Order
Tank 'B'and variants	156	February1991
Tank 'A'	17	July1987
ICV/Weapon system 'C'	32	September1986

The above delays affect the ability of the depots to meet demands from users. DDPS needs to speed up the process of indigenisation of non-free flow items. Free flow items should be established quickly and transferred to Ordnance so that the delay in procurement could be avoided.

ii) Indigenisation of Spares:

An analysis of progress in indigenisation of spares of COD Jabalpur responsibility revealed that percentage of materialisation of items for indigenisation was extremely low as could be seen from the table given below;

Table: 5.18 Shortfall in indigenisation of spares of COD Jabalpur responsibility by DDPS

Year	No. of items projected for indigenisation	No. of items in respect of which supply orders were		Percentage of materialisation level against projection
		Placed	Completed	
1994-95	2654	119	112	4.2
1995-96	1287	266	122	9.48
1996-97	321	5	1	0.32
1997-98	717	6	4	0.56
1998-99	711	32	4	0.56

The slow progress in indigenisation of spares was ostensibly due to non-availability of drawings, specifications and samples, incapability of AsHSP in making drawings, delays in establishing commonalities, high rates, meagre quantities, non civil end use items, frequent developmental failures, cumbersome inspection procedures and lack of technical know how.

Audit recommends that there should be a time bound programme for indigenisation of spares and frequent interaction among the associated agencies like EME, DGQA, CODs, DGOF and industry. The Technical Committees should meet more often to review and monitor progress.

The above analysis revealed that the administrative lead-time taken by the depots was very high. Although the Trade had been consistently

performing better as compared to the other sources like PSUs and DGOF, it needs to be effectively tapped for various other ranges of items on a continuous basis. The long lead-time taken by the other sources like DGOF and PSUs need to be reviewed since long procurement lead-time has a direct bearing on the levels of stock holdings. A study[2] of inventory management followed in AOC conducted by the Indian Institute of Management, Ahmedabad in 1990 concluded that this kind of lead-time behaviour is the direct consequence of procurement process, diffused responsibilities and a poor information system control. This gives an impression that AOC is more oriented towards performing storage and control function than the more important material management functions.

(e) Outstanding Dues In

As discussed above, while the response from trade to supply of spares ordered on them showed encouraging trend, the performance in meeting demands for supply by DGOF / PSUs was not encouraging. Test check at COD Jabalpur brought out that DGOF did not meet supply schedule in one third of the indents placed on them. At COD Agra, 58 indents placed on Bharat Electronics Limited (BEL), during 1992-98 pertaining to particular Radar, were outstanding in respect of 265 items as of April 2000. This was despite the fact that the PSUs enjoy favorable payment terms by getting 20 *per cent* advance with the orders followed by stage payments. This malaise needs to be addressed and immediate remedial action taken. In this context it is pertinent to mention that DGOS had expressed concern in November 1999 pointing out that Bharat Electronics Limited (BEL) were yet to supply stores worth Rs 102.35 crore against indents of the Army despite the fact that the Army had advanced Rs 412.39 crore for the supplies and stressed the necessity of adhering to delivery schedule.

(f) Uneconomical rates of DGOF:

Apart from the unduly long time taken by DGOF to honour the demands of the Army, the rates too remained at unacceptably high levels compared with rates quoted by private sector. Audit analysis of a sample of 12 cases at COD Jabalpur where rates from Trade and DGOF were available, revealed that DGOF rates were exorbitantly high and by resorting to purchase of items from the Trade, the Depot saved Rs 1.21 crore.

At COD Kanpur, Audit observed similar instances of unreasonable rates quoted by DGOF with reference to market rates, which in a sample of 16 cases, varied between 33.4 and 162 *per cent* on higher side.

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[2] In this connection reference is drawn to the recommendations made by the Study carried out by Professor A H Karlo and P R Shukla of IIM Ahmedabad in 1990 as reproduced in "India's Defence Budget and Expenditure in a Wider Context" by Mr. A.K. Ghosh, 1996, page 254.

DGOF need to be impressed upon to make their rates competitive and comparable with market rates.

(g) Accumulation of rejected stores at COD Kanpur

The terms and conditions of purchase of stores from Trade permit payment upto 95 *per cent* of the value of stores on the basis of proof of despatch of stores, after inspection by the AsHSP concerned. Cases do arise where stores received by the consignee get totally or partially rejected due to defects. Settlement of such cases takes unduly long time due to disputes or inadequate knowledge of procedure or provisions as acknowledged by DGQA in May 1992.

COD Kanpur reported in February 2000, a total of 85 such cases involving inventory costing Rs 55.61 lakh, pending settlement for long which have their origin dating back to the year 1981. Apart from non-recovery of cost of stores so rejected/short received from the payment already made for such defective stores, these defective stores occupy storage space in the depot. Audit observed that the depot was not keeping any record to monitor settlement of such cases expeditiously and thereby allowing them to accumulate into an unmanageable situation. The depot was not able to state with any precision, the number of such cases originated and processed to finality as well as outstanding. This is evident from the fact that when Audit enquired as to how the figure of 85 items was reported in February 2000 while in 1997 the depot had indicated the list of outstanding cases as 171 and there were no records about the cases settled since then, the depot could not offer any convincing reply. The depot merely stated that most of the items would have been disposed off being meager value. The depot also maintained that the CsDA/PAO concerned were being informed for recovery of the value of rejected stores but no confirmation was being received from CsDA/PAO. Till recovery was confirmed, no action for the disposal was possible.

Audit is of the view that the provisions existing in this regard have not been effective. Circumstances, leading to the precipitation of such situations needed to be addressed at higher levels to work out a methodology for avoiding such situations where multiple agencies were involved. The depots should maintain proper records to register and monitor such cases to their finality.

(h) Inspection before the items were manufactured and readied for delivery

Audit observed two instances where an inspection agency, viz. Controller of Quality Assurance (CQA) Avadi issued Inspection Notes even before the items were ready for delivery. The Ordnance Factory, viz. Heavy Vehicles Factory (HVF), Avadi , however, received payments from the Army

based on such Inspection Notes. In the first such incident, CQA Avadi cleared Inspection Notes of HVF Avadi in March 1994 for 60 Class 'A' vehicles on order from the Army. On the basis of these Inspection Notes, HVF obtained Rs 197.56 crore from the Army for these vehicles, which were actually delivered after delays ranging from 386 to 757 days under separate Inspection Notes. In the second case, the CQA issued Inspection Notes for 69 vehicles in March 1995, based on which the Ordnance Factory obtained Rs 220.76 crore from the Army. The vehicles were delivered after delays ranging from 319 to 1030 days under separate Inspection Notes.

When the above irregularity was pointed out by Audit, the Ministry admitted in February 2000 that Inspection Notes should have been issued only after final inspection and delivery and necessary instruction had been issued to CQA Avadi not to clear Inspection Notes before the vehicles were acceptable in all respects and were physically ready for delivery. The Ministry needs to ascertain the circumstances in which deviation from the laid down procedure was allowed.

(j) Procurement of an unapproved item

The existing system of procurement has a provision for associating AsHSP for ensuring that the items procured meet the approved specifications. However, DGOS procured an item not meeting the specification ignoring the caution made by AsHSP. The case is as under;

The Ministry of Defence approved in August 1994, the introduction of Mug Steel in the place of enameled mug used in the Army. The mug steel approved for introduction was developed by Defence Materials and Stores Research and Developmental Establishment (DMSRDE) to meet specific requirements of the Army. The salient aspects of the specifications were that it will have single wall body, with double wall phenolic resin moulded handle, spot-welded to the body and mat finishing of outer surface by sand blasting to avoid shine. During March 1995 to September 1997, DGOS procured 6.10 lakh mugs at Rs.64.95 each. The mugs ordered, however, had specifications different from the one developed by DMSRDE and approved by the Ministry for introduction, in the sense that it did not have the mat finish, a special requirement to avoid shine as a means for camouflage in field areas the mug was double walled as against single walled affecting the unit cost as evident from the fact that the unit cost of mug procured was Rs. 64.95 as against Rs. 50 assessed by DMSRDE. By overlooking the approved specifications despite the caution from the AsHSP viz., CQA (GS) Kanpur, DGOS introduced an unapproved item in the Army, spending Rs.3.96 crore, during 1995-97.

Although it was a stray incident noted by Audit, such deviations are likely to vitiate the established system opening the door for inflow of unapproved items into the Army inventory.

5.9 Recommendations

a) ***Enhancement of financial powers of the local I& BC cells to match the financial powers of the Commandants needs to be considered. As an alternative to the present system of delay prone prior vetting of cases costing above Rs 10 lakh by I& BC at Army HQ, Deputy Director General I& BC at Army HQ can undertake a post scrutiny of such cases during his periodical inspection of I&BC Cells/Depots, to exercise surveillance on the activities of the I&BC cells. Administratively, they should be made independent of the Ordnance for them to achieve the desired objective of Inventory and Budget control in real sense.***

b) ***Ordnance should create a wider vendor base for generating healthy competition and for encouraging active participation of industry for production of defence stores.***

c) ***The existing IP of 21 months for Trade supplies needs to be reviewed and reduced particularly in the light of the quick response experienced by depots. The internal lead-time over which Ordnance/ Ministry/ Finance has control needs to be compressed and time frame for each activity fixed.***

d) ***DGOF need to speed up their response time to supply the items indented by Ordnance and reduce the present long lead-time of 42 months.***

e) ***PSUs need to better their production and delivery schedule, as the present provision of 36 months IP is very much on the higher side. In cases where PSUs do not stick to delivery schedule, there should be a system to levy interest at commercial lending rate for the advance payments made by Ordnance for delayed part of supplies.***

f) ***DGQA need to speed up the process of indigenisation and encourage industry participation in indigenisation.***

g) ***The reasons for the inordinate delay in finalisation of supply orders and materialisation of supplies on orders placed in respect of general stores and clothing items of COD Kanpur responsibility need to be investigated to plug the loopholes, if any, in the practices.***

h) ***DGOF and PSUs should make their rates competitive and comparable with market rates.***

i) Expeditious follow up of cases where stores for which 95 per cent payment is made to suppliers are received short or in defective state is essential to avoid accumulation of such cases.

5.10 Defence Response

Of the nine Audit recommendations, MGO agreed with six and partially agreed with three. Ministry also agreed with the views of MGO.

MGO's response to the above recommendations is indicated below, *ad seriatim.*

(a) Agreed partially and stated that the mismatch in the financial powers of CFAs and the vetting powers of I&BC functionaries defeated the principle of true decentralisation of authority and speedy procurement. The existing system of administrative control of I&BC functionaries need not undergo any change as the I&BC cells enjoy administrative independence from the commandants of depots and at Army HQ, DDGOS (I&BC) is controlled directly by DGOS.

(Para 5.9 (a))

(b) Agreed partially in that industry should be encouraged to participate in production of defence stores by simplifying the cumbersome procedure involved in Ordnance procurement that dampens the enthusiasm of reputed industrial houses. However, Ordnance depots neither have the expertise nor the manpower required to register vendors for central procurement. DGQA should, therefore, be allowed to continue with the registration of vendors, rather than Ordnance creating a wider vendor base.

(Para 5.9 (b))

(c) Agreed partially and elaborated that the two months internal lead time allowed in DGOS Technical Instructions was applicable when after financial concurrence, the indents used to be off loaded to DGS&D for procurement and that this period was insufficient when Ordnance does the procurement. The lead time, at best could be compressed by 3-4 months. Further reduction of lead time would be possible only if Rate Contracts are concluded for maximum items in which case the interim period get slashed to 9 months from 21 months.

(Para 5.9 (c))

(d) Agreed and stated that lead time for developed items could be reduced to 24/30 months from the existing 42 months, provided DGOF felt confident to do so.

(Para 5.9 (d))

(e) Agreed, but indicated that the slow pace of supplies in certain cases might have adverse effect in materialisation of supplies. Besides levy of interest on advances paid, PSUs should be considered at par with suppliers from Trade in so far as levy of liquidated damages are concerned, when they fail to adhere to delivery schedule or to supply at all.

(Para 5.9 (e))

(f) Agreed and stated that it was all the more relevant in case of critical items of armament and 'A' vehicles.

(Para 5.9 (f))

(g) Agreed with the need for avoiding such delays and explained that delays in finalisation of supply orders occur due to time taken for inviting open tenders, holding tender purchase committee meetings and vetting by Finance. Such delays can be reduced if Rate Contracts are concluded and the existing procedures of calling for open tender, Finance vetting etc. are simplified and made time bound. Delay in materialisation of supply was due to placing orders on Khadi and Village Industries Commission/Small Scale Sectors who tend to accept more orders than what they can execute. Placing orders on such firms were being followed as per Government instructions.

(Para 5.9 (g))

(h) Agreed and added that DGOF/PSUs rates were exorbitant and, therefore, the Army get much less value for money for a very large portion of its budget since 70 *per cent* of the AOC stores budget is spent on purchase from DGOF/PSUs.

(Para 5.9 (h))

(i) Agreed and stated that as a remedy to this malady, it had been decided to release complete payment on physical delivery of stores at depots.

(Para 5.9 (i))

5.11 Conclusion

The Ministry must take action for granting matching powers to I&BC. While acknowledging the notable performance of I&BC Cell at CAFVD Kirkee during 1998-99, Audit still maintains the need for a system-wide closer control over the functioning of these cells by the Ministry of Defence (Finance). Ministry should take measures to simplify the so called cumbersome procedure to facilitate participation of more and more industries in production and supply of defence stores. Widening of vendor base by inviting trade participation for manufacture and supply of Ordnance stores, particularly of free flow nature, should receive attention of the Ordnance Services rather than leaving it to DGQA, as the latter is any how involved in

ensuring quality through inspection. Obtaining security deposit/bank guarantee for ensuring assured supplies would guard against fictitious suppliers from bidding. Wider vendor base has more relevance to the Ordnance that deal with over four lakh items of varying nature and origin.

The questions like compression of internal/external lead time, acceleration of indigenisation and making DGOF/PSUs rates competitive with private sector, need to be discussed at appropriate forum represented by all agencies concerned for ensuring lesser investment through reduced interim period and for deriving better value for the money spent from Ordnance budget on purchase from DGOF/PSUs. Audit maintains that improved performance by Trade by way of reduced response time provides enough scope for reducing total interim period. At the same time Ordnance Services must endeavor to minimise internal lead time by streamlining their procedures/processes.

Audit opinion on conclusion of rate contracts is given in paragraph 3.14 of Chapter 3 of this Report.

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CHAPTER 6: HUMAN RESOURCES MANAGEMENT

6.1 Summary:

Ordnance Services employ a workforce of around 1.29 lakh personnel. The civilian to combatant ratio, which is 80:20 in the CODs, is reversed in the field. The civilian cadre which is composed of non-industrial and industrial personnel representing 80 per cent of the COD establishment are responsible for crucial functions like provision, procurement, indent checking and stores management as well as physical handling.

Store Keeping and Clerical staff are recruited locally with a minimum qualification of SSC. In the absence of any structured arrangements for induction training, rudiments of the work are learnt on the job. Analysis of training imparted by the College of Material Management Jabalpur reveals that nearly 2/3 of the civilian staff would retire without any training during their entire service period. The recommendations of the Fifth Pay Commission laying down qualifications for recruitment that would have improved the technical capability of staff over a period could not be implemented due to resistance from staff.

Revision of manpower norms, selection of feeder cadres through an all India recruitment board and induction training could help the AOC in effective human resources management and utilisation.

6.2 General

Materials Management has emerged as a key function in most organisations because of the contribution it makes to their overall profitability.

Inventory Management, a sub set of Materials Management is a complex function even in simple business environments where the inventories held are neither as diverse nor as large as those carried by the Army. Yet, in businesses world over, some of the most highly qualified managers handle this function as it has come to be recognized as 'Profit Centre'.

Need for re-appraising the intake standards of the human resource into Ordnance Services, the Materials Managers of the Army, which employ[1] about 1500 officers, 27750 service personnel and one lakh civilian employees as also for their continual professional development is well established. This is particularly so as these have undergone hardly any significant change over the past fifty years while the nature of their responsibilities and tools of their trade have witnessed a sea change.

[1] AOC Annual Report 1996-97.

6.3 Manpower Profile

Army Ordnance Services have a composite establishment comprising a combatant element viz., the Army Ordnance Corps and a civilian component, essentially of the clerical and store keeping staff. In addition, there is a sizeable labour force of industrial personnel. The Corps is officered mainly by service officers with a small compliment of civilian officers. The deployment pattern of combatants and civilians is so regulated that the proportion of civilians falls as we move down the echelons. Civilian to combatant ratio, which is 80:20 in the CODs, is reversed in the field units. The manpower details are given below;

Table: 6.1 Manpower- Officers[2]

As on 31st March	COD Agra		COD Delhi Cantt.		COD Jabalpur		COD Kanpur		CAFVD Kirkee	
	Ser. A/E	Civ. A/E	Ser. A/E	Civ. A/E	Ser. A/E	Civ. A/E	Ser. A/E	Civ. A/E	Ser. A/E	Civ. A/E
1995	37 31	13 9	32 29	19 11	42 37	17 10	25 19	13 9	23 13	16 6
1996	37 28	13 8	32 31	19 10	42 36	17 10	25 20	14 9	21 19	17 6
1997	37 32	13 10	32 31	19 15	42 30	17 15	25 17	14 12	22 21	17 9
1998	37 25	13 8	32 28	19 13	42 32	17 11	25 20	16 11	22 20	16 9
1999	37 23	13 8	32 31	19 15	42 31	17 12	25 19	14 12	22 22	18 9
Average	37 28	13 9	32 30	19 13	42 33	17 12	25 19	14 11	22 19	17 8
Shortage	9	4	2	6	9	5	6	3	3	11
Percentage of shortage	24	31	6	32	21	29	24	21	14	65

'A' Authorised 'E' Effective 'Ser' Service 'Civ' Civilian

Table 6.2 Manpower - below officers rank[3]

As on 31st March	COD Agra		COD Delhi Cantt.		COD Jabalpur		COD Kanpur		CAFVD Kirkee	
	Ser. A/E	Civ. A/E	Ser. A/E	Civ. A/E	Ser. A/E	Civ. A/E	Ser. A/E	Civ. A/E	Ser. A/E	Civ. A/E
1995	372 337	3725 2960	710 652	3595 2808	825 739	3946 2592	329 319	3685 2764	297 277	2267 1915
1996	372 340	3725 2983	710 614	3594 2750	825 717	3946 2555	329 302	3685 2739	297 243	2292 1891
1997	371 307	3692 2971	710 637	3594 2761	825 657	3565 2511	303 283	3680 2719	297 249	2292 1893

[2] *Total authorised strength in 5 depots as on 31 March 1999 = 239 (Service 158+Civilian 81)*

[3] *Total authorised strength in 5 depots as on 31.3.1999=18064 (Service 2515 + Civilian 15549)*

1998	372 333	3456 2679	710 618	3594 2734	825 683	3545 2540	303 306	3680 2602	297 305	2088 1901
1999	370 333	3143 3063	710 630	3594 2739	825 721	3327 2404	303 296	3245 2208	307 292	2240 1896
Average	371 330	3548 2931	710 630	3594 2758	825 703	3666 2520	313 301	3595 2606	299 273	2236 1899
Shortage	41	617	80	836	122	1146	12	989	26	337
Percentage of shortage	11	17	11	23	15	31	4	28	9	15

Evidently, the main category of personnel in all the depots reviewed constituted civilians and their strength represented 86 *per cent* of the authorized strength of the personnel below officer rank and 85 *per cent* of the total strength. (Staffing pattern of the depots, as per planning norms was based on civilian to combatant ratio of 80:20).

i) Service Cadre

Combatant Personnel of the Army Ordnance Corps are recruited, trained and deployed as per Army recruitment, training and staffing policies. There exist, formalised training courses with well-developed syllabi and structured career progression ladders for this cadre. Officers receive training not only in the functions of materials management but also specialized training in the stores disciplines to which they are assigned at the working and operational levels. The College of Materials Management Jabalpur, which is a premier training establishment in this field with University affiliation and where these officers are trained, keeps the doctrinal instructions in line with the latest developments in the field.

Service personnel other than officers are trained both at the AOC Centre Secunderabad and the College of Material Management Jabalpur with the former concentrating on basic military` and trade training and the latter catering to their need for professional and technical training.

All in all the system, which is kept under constant review both by the Director General of Military Training and the Director General Ordnance Services is contemporary and result oriented.

ii) Civilian Cadre

The civilian cadre, which is composed of non-industrial and industrial personnel, constitutes almost 80 *per cent* of the establishment of the CODs. The non-industrial personnel are mainly in the category of storekeepers, who as custodians of stores are charged with the responsibility of receiving, binning, storing, preserving and issue of stores on demand.

The civilian staff, less civilian officers, is more of a static workforce of any Ordnance establishment. Civilian employees pick up the rudiments of their professional responsibilities by being placed on the job. The minimum

educational qualification for induction of civilian storekeeper and clerical staff is SSC or equivalent with knowledge of typing.

6.4 Audit Observations:

Audit observed that the system in vogue for recruiting, managing and training the vast human resource of the depots by way of civilian staff needs a review.

a) Recruitment Policy

Store keeping and clerical staff are the mainstay of any depot. The Ordnance Service being a material management organisation, store keeping and store accounting staff play a central role in its functioning. In the present system, the depots, based on the vacancies released undertake recruitment locally. The candidates are sponsored by the Regional Employment Exchanges and a Board of Officers carries out the selection for Store Keeping and Clerical staff.

The hierarchy in the store keeping cadre of Ordnance Services and their mode of recruitment is as under:

Table: 6.3 The existing mode of appointment of various store keeping staff of the Ordnance

Cadre	Mode of appointment
Store Keeper[4]	90 percentage by Direct Recruitment-Minimum qualification SSC 10 percentage by promotion from Group 'D'
Senior Store Keeper	Promotion
Store Superintendent	Promotion
Senior Stores Superintendent	Promotion
Ordnance Officer Civilian (Stores)	75 percentage by promotion 25 percentage by Direct Recruitment[5]
Sr. Ordnance Officers Civilian (Stores)	Promotion
Civilian Staff Officer (Stores)	Promotion
Sr. Civilian Staff Officer	Promotion
Principal Civilian Staff Officer (Stores)	Promotion

[4] Group 'C' Post

[5] The practice of Direct Recruitment into this category, which started in 1978, was stopped in 1982. There has been no direct recruitment in this category since that time.

It was observed from the above that the civilian cadre at present consists almost entirely of departmentally promoted supervisory staff and officers who start the service with the basic qualification of matriculation.

Considering the nature of their functions and the impact of their performance on the management of sophisticated and expensive equipment, it is felt that the intake standards of personnel to this cadre should be reviewed. The storekeepers perform the tasks of receipt/issue of inventory, their maintenance apart from being responsible for their serviceability and security. The clerical staff performs the functions of provisioning and procurement in addition to progressing repairs and disposal of surplus and unserviceable stock. These functions require personnel with good working knowledge of forecasting techniques besides computer literacy. In addition to these duties they have to extract work from industrial and non-industrial manpower including artisans, which makes supervisory and interpersonal skills of considerable importance. However, the present system provides for recruiting candidates with minimum academic qualifications of SSC, without any exposure to fundamentals of materials or human resource management.

A beginning towards improving the intake standards was made by the Ministry of Defence in May 1998, based on the recommendations of the 5th Central Pay Commission, by reserving 25 *per cent* of the posts of Store Superintendent through direct recruitment of persons with Diploma/Degree in Engineering. However, this plan could not be implemented due to resistance from staff. Direct recruitment of Civilian Ordnance Officers, which started in 1978, also remained suspended since 1982.

b) Training

In the development of an efficient and dedicated work force, training plays a pivotal role. Regulations of Army Ordnance Services hold Deputy Commandant of a Depot responsible for training of all depot personnel. DGOS issues Technical Training Directive annually as a policy document to guide training in the Ordnance. These are required to be translated into training programmes. However, in none of the depots, reviewed in Audit, there are dedicated training facilities. Training, whatever little was imparted to the depot personnel, was by the College of Material Management Jabalpur or under arrangements by them. The details of training thus imparted during 1994-99 are indicated below: -

Table: 6.4. Number of personnel trained during 1994-99 by CMM Jabalpur

Category	COD Agra		COD Delhi Cantt.		COD Jabalpur		COD Kanpur		CAFVD Kirkee	
	Total strength	Number trained	Total strength	Number trained	Total strength	Number trained	Total strength	Number trained	Total strength	Number trained
Civilian Officers	9	0	13	0	12	0	11	0	8	0
Percentage		0		0		0		0		0
Civilian NGOs	1260	13	1204	14	953	12	830	12	760	7
Percentage		1.03		1.16		1.26		1.45		0.92

It can be seen from the above table that very few civilian personnel undergo any structured training and at the present rate of training it would take more than four decades for all the civilian personnel to undergo even one formal training module. Roughly 2/3 of the staff would retire without any training during their entire service.

c) Manpower cost

The average annual expenditure on manpower for running these depots was about Rs.106 crore. To derive best value for money, it is essential to deploy these personnel in the most effective manner. Audit observed in COD Kanpur that only 11 Artisans out of a total of 318 borne on the strength of Materials Stores Sub-Depot (MSSD) were deployed for effective work whereby Rs.1.55 crore per annum was being spent on idle manpower (307 persons), while there was a shortage of 989 personnel in the overall strength of the depot. This situation indicated that the manpower was not optimally deployed/used. The cost ineffectiveness of the Returned Stores Sub-Depots (RSSDs)/MSSD vis-à-vis manpower employed therein is discussed separately in the chapter 'Repair Arisings' of this report.

d) Norms for authorising staff

Army HQ laid down the norms for assessing requirements of staff for various store keeping and store accounting functions in 1956. Norms for industrial personnel were laid down in 1982. The Army Standing Establishment Committee, a committee at Army HQ empowered to examine and approve all types of establishments in the Army, periodically (once in four years) reviews the manpower requirement of all CODs. In the case of industrial employees, Depot Manpower Committee, chaired by the Deputy Commandant, carries out the review annually. The purpose of these periodic reviews is to ensure a balanced establishment in line with the actual workload in which all personnel are fully utilised, duplication of work is avoided and rank of personnel is justified by the responsibility carried or by the technical knowledge required.

6.5 Recommendations:

a) Recruitment policy

Audit on examination of the system and interaction with various functionaries involved in its operation is of the view that the present system of recruitment in the light of changing scenario like computerised inventory control systems needs re-examination.

Considering that the selection of feeder cadres (Store Keeping and Clerical) are out of the candidates sponsored by Employment

Exchanges of the region, it is needless to mention that the personnel recruited by a particular depot normally come from the general area around the depot. As a result, the depot loses the opportunity of assessing the candidatures of other meritorious candidates from other regions of the country.

Keeping in view the system requirements and the practices in vogue in other organizations like PSUs, Railways and Financial Institutions, Audit recommends a revision of recruitment policies. To illustrate, in the Railways, the candidates with a minimum educational qualification of Diploma in Engineering are recruited for the posts of Assistant Store Keepers through Railway Recruitment Boards and they are imparted compulsory induction training for a period of six months paying stipend. Similar arrangements exist in the Department of Post as well.

b) Training

i) A Training Policy Statement envisaging a vision for 'Training All' should be developed. It should be planned in such a way that every individual would be deputed for special or refresher courses soon after putting in certain period of service as a means of career development which would serve both the organisational and individual interest.

ii) The departmental and technical training of civilian personnel be brought in line with the system obtaining for the service personnel in so far as these relate to clerical and store keeping functions.

iii) A system of identifying training needs with reference to knowledge, skill and change in attitude of the employees should be introduced.

iv) Training should be ab initio, i.e. immediately on recruitment and thereafter for specialisation.

c) Revision of norms

The norms fixed in 1956 are out dated and with likely automation in office and material handling functions, a re-look at the same by carrying out proper studies is necessary.

6.6 Defence Response

MGO agreed to all the above recommendations.

Response of MGO to the above recommendations is summarised below *ad seriatim*:-

(a) Agreed and stated that future induction to clerical cadre should be graduates with minimum 'O' level of computer qualification and diploma in material management. The practice of invitation of applications through advertisement had since been introduced.

(Para 6.5 (a))

(b) Agreed and added that all civilian employees need to undergo training and their promotion would be linked to such training. Apart from training at CMM, regional training at certain hub centers like 'Pune' 'Delhi' etc. would be considered. Further, offloading training to civil institutions merits consideration and specialised training on warehousing at the OEMs premises might be useful.

(Para 6.5 (b))

(c) Agreed and admitted that a re-look into the norms fixed in 1956 was necessary in view of the likely future environment of automation in the management of inventory, though automation may not impact storekeeping as it is a manpower intensive activity.

(Para 6.5 (c))

6.7 Conclusion

Audit suggests speedy implementation of the proposed improvements to the system, by formulating suitable policies on norms, recruitment and training, commensurate with the changing environment. Ordnance should take the initiative to secure the Ministry's approval to the proposed changes.

While Audit appreciates that storekeeping is manpower intensive activity, automation of material handling and accounting activity will definitely offer enough scope for retraining/redeployment of manpower without compromising efficiency.

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CHAPTER 7: VALUATION OF INVENTORY

7.1 Summary:

The present system of valuation of stores for the purpose of reporting in Management Information System (MIS) is based on rates published by DGOS in September 1990, by grouping inventories into different categories such as General Stores, Clothing, Engineering Stores and Mechanical Transport (MT) stores. The rates were arrived at by dividing the cost of stores purchased, during the three years preceding September 1990, by their tonnages.

Audit analysis of value of a selected samples of MT stores at COD Delhi Cantt. and CAFVD Kirkee revealed that the actual value was much higher at Rs.9.74 lakh at COD Delhi Cantt. and Rs.48.88 lakh at CAFVD Kirkee per ton, respectively, as against Rs.0.49 lakh fixed in September 1990. The existing valuation could not help in application of Selective Inventory Control practices like ABC analysis, which are necessary for proper decision-making.

A system of maintaining priced inventory by modifying the formats of basic records like receipt vouchers and account cards to capture the data with regard to purchase rates should be introduced.

7.2 General

Inventories involve investment of funds and are carried essentially to provide logistics support service. Any objective evaluation of inventory management policies, practices and procedures thus requires two basic inputs i.e. the level of funds invested and the levels of user satisfaction achieved.

Whereas user satisfaction levels can be gauged to an extent from the response time of the system and demand fulfilment rates, the levels of investment can only be measured in financial terms.

7.3 Audit Observations:

Audit observed that the Ordnance Services have historically never maintained any records indicating the value of inventory carried either at any given echelon or in the system as a whole. It is, therefore, not possible for the Ordnance Services to indicate with any degree of accuracy the value of their inventories, making any evaluation difficult. The details are discussed below.

a) Existing System of Inventory Costing

The system of valuation of Ordnance inventory has always been one of converting tonnages held into money terms using conversion formulae approved from time to time for different categories of stores.

Ordnance felt in 1958 that the then existing conversion formula did not hold good as the same was based on the prices of stores prevailing as on 1 April 1947 and therefore, a criteria was laid down to work out the value. This criteria was to find out the average amount spent during the last three years on the purchases of various categories of stores and divide it by the average tonnage purchased in each category (nos, in case of vehicles). The value was consequently raised in 1958 and this was changed over to metric system in 1962. It was further revised in 1977 and 1990.

The conversion rates adopted were based on the tonnage of the equipment and accordingly different conversion rates have been worked out for different types of equipment/vehicles. However, these conversion rates were quite unrealistic and cannot help the management in any way in decision making for better inventory control.

b) Inaccurate Valuation

To workout the deviation from the actual value of the inventory, Audit carried out valuation of a selected sample of inventory of the depots under review, except COD Agra. This value was based on the unit rate of the equipment given in the PRF.

A comparative picture of the variation in respect of various categories of stores is given below.

Table: 7.1 Comparative statement of variation in the valuation of various categories of inventory as followed in Ordnance and the actual value worked out by Audit as per the unit rate given in the PRF

(Value in Rupees)

Name of the Depot	Nature of store	Sample Size	Value per MT worked out by Audit as per the unit rate given in PRF	Value per MT as per AHQ's policy	Difference	Percentage of variation
COD Delhi Cantt.	MT Stores	16	973,908	49,040	924868	1886
COD Jabalpur	Armament Stores	6	24,47,536	2,81,314	21,66,222	770
COD Kanpur	Clothing	12	2,71,857	23,810	2,48,047	1042
CAFVD Kirkee	MT Stores	100	48,88,653	49,040	48,39,613	9869

The maximum impact would be in case of electronic items of COD Agra where the value per tonne of Signal stores, Engineering stores and Fire Control Instruments was Rs 6.55 lakh, Rs 0.56 lakh and Rs 5.96 lakh respectively, though keeping in view the nature of the stores their unit value would be much higher.

It would be seen from the above that the variation between the conversion rates being followed by Army HQ and the actual rate worked out based on the unit rate of the inventory ranged between 770 *per cent* and 9869 *per cent*. This underlines the fact that the methodology followed in working out the value was not only unscientific but far from realistic. This information, apart from not serving any meaningful purpose, cannot be relied upon by the management for any decision-making. This becomes more critical for applying Selective Inventory Control Techniques like ABC/VED analysis where the value of the inventory is one of the essential inputs for the exercise.

7.4 Recommendations:

(a) Ordnance should adopt a system of maintaining priced inventory instead of the present system of only quantitative accounting.

(b) To accomplish the above objective, the basic records like receipt vouchers and account cards should be modified to capture the data with regard to purchase rates.

(c) After averaging the value of items received from different sources with reference to the quantity, the average rate so arrived should be used for valuation of closing stock held on 31 March each year.

7.5 Defence Response

MGO agreed with two of the three recommendations and partially agreed with the third. Ministry also agreed with the views of MGO.

The response to the above recommendation is indicated below, *ad seriatim.*

(a) Agreed to implement on completion of CICP.

(Para 7.4 (a))

(b) Agreed, but on implementation of CICP.

(Para 7.4 (b))

(c) Agreed partially and stated that since CODs would be capturing actual data from receipt vouchers through computers, average value might not

be necessary. However, in the case of stocks already held, the system suggested by Audit could be applied.

(Para 7.4 (c))

7.6 Conclusion

Audit suggests incorporation of suitable module in the CICP for facilitating maintenance of priced inventory, besides incorporating appropriate provisions in the regulations.

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CHAPTER 8: COMPUTERISATION

8.1 Summary:

The initial efforts made by the Army towards computerisation of its inventory dates back to late sixties. The progress has, however, been discontinuous, fragmented and devoid of direction. The PCs possessed by the depots were being used as stand alones for generating a few internal reports. With the exception of COD Delhi Cantt., the major activity of all the depots i.e. provision function is being performed manually. Even after decades of embarking on the process of computerisation by the ADP Branch of COD Delhi Cantt., the computerised output are put to manual check ostensibly to avoid over provisioning indicating the unreliability of the system. Computerisation could have acted as a boon for addressing the shortcomings like poor stock visibility, lack of Selective Inventory Control, large-scale extraction of demands and poor user satisfaction. The AOC hopes to address these problems through a Computerised Inventory Control Project (CICP) sanctioned in 1994, implementation of which is presently lagging behind schedule.

Introduction of real-time processing systems through accelerated computerisation by setting definite time frame for implementation of the CICP warrants high-level attention.

8.2 General

Of all the fields of logistics activity, Inventory Management offers, perhaps the greatest scope for full-scale application of Information Technology based solutions. The repetitive nature of activities, voluminous transactions involving a wide range of items dispersed at several locations and the need to ensure maximum visibility of assets right from the sources of supply to the end user, make up an environment where manual processes and controls become difficult, if not impossible. Additionally and perhaps more importantly, computational work relating to data analysis and forecasting, which involve use of some sophisticated mathematical techniques make the use of computers almost indispensable.

8.3 Audit Observations

For minimising and solving most of the problems encountered by the depots that handle sizeable quantities and variety of stores, automation of their inventory functions is indispensable. The operators of the system also confirmed this view during the course of their interaction with the Audit. The results of audit analysis are given below;

a) Existing system

The history of automation in the Ordnance dates back to the year 1968 when an Automated Data Processing (ADP) cell was created at COD Delhi Cantt. for a pilot project for automation of Ordnance inventory. On completion of the pilot project, in 1974, the Ministry sanctioned an implementation team for designing procedure for conversion of the existing manual system to automated system. It then culminated into the sanction of a full-fledged ADP Establishment in COD Delhi Cantt., in 1979. However, even after almost 32 years, since its initiation, the depot could not establish a reliable system as evident from the fact that the output generated by the automated system continues to be checked manually, ostensibly to avoid overprovisioning, as already discussed in the Chapter on Provision. Thus, while the computerisation pioneered at COD Delhi Cantt., remained an evolving process, the Ministry sanctioned the Computerised Inventory Control Project (CICP) in July 1994 for full-scale computerisation of Ordnance Services.

Viewed in the context of the technological advancements in the field of Information Technology world over, the pace of automation in the Central Ordnance Depots which have been working in isolation without any central automation policy has been very slow, discontinuous and fragmented as could be seen from the state of computerisation in these depots, briefly narrated below: -

Name of Depot	**Status of Automation**
COD Agra	Held 26 PCs. They were utilised for jobs like pay bills preparation, control functions and limited MIS.
COD Delhi Cantt.	A separate wing known as Automated Data Processing (ADP) Branch had been functioning for the last 32 years. Receipt, Issue, Dues Out functions in respect of 60,000 items out of a total inventory of 1,03,894 items were computerised. Provision related activities were also reportedly computerised. However, the reports generated were still being manually re-checked to avoid over provisioning. Surprisingly, a large percentage of computer-generated demands had undergone changes after manual check.
COD Jabalpur	Certain activities like simultaneous check, Selective Inventory Control, Local Purchase and identification of obsolescent/obsolete items were computerisaed
COD Kanpur	Held 17 PCs. They were utilised for jobs like accounting of receipts/issues and maintaince of dues out records.
CAFVD Kirkee	Held 8 PCs for word processing and creation of certain database.

While the induction of these PCs in the depots had without doubt helped in creating a measure of computer awareness, the pattern of use had differed from depot to depot. The modules developed in different depots differ widely and were unlikely to form part of the CICP as and when it is ported to these depots. Further, the absence of computer literate work force to carry forward the developmental work and any attempt to integrate the efforts made so far are likely to render the effort of several years, futile.

b) Computerised Inventory Control Project (CICP)

The CICP was launched in 1994 with a high power committee chaired by Defence Secretary to monitor its progress. The main objective of CICP was to develop a networked, on-line transaction processing multi user Relational Data Base Management System (RDBMS) based computerised Inventory Management System linking all the echelons in Army Ordnance and the Ministry within a ***targeted period of five years***. The long list of benefits it was expected to yield included financial savings of Rs. 374 crore by reduction of inventory, better asset visibility, improved customer confidence and satisfaction, restricted wastage, on line MIS for efficient management, reduction in Inventory Carrying Cost, instant reaction to operational requirements, reduction in Vehicle-Off-Road (VOR)/Equipment Out of Action (EOA) down time, faster elimination of obsolete inventory, better utilisation of manpower and resources and downsizing of the existing manpower by 1650 which alone was expected to result in reduction in man power costs by Rs 5.94 crore per annum at pay levels that existed in 1994.

The project, lagging behind the schedule, was divided into three phases for the purposes of implementation and now slated for completion as under, as reported by Army HQ in January 2000.

Table 8.1 The estimated cost and expected schedule of completion of Computerised Inventory Control Project (CICP)

(Cost in Rupees crore)

Phase	Objective	Estimated cost	To be implemented by
I	Pilot project to develop real time on line inventory management system for COD Delhi Cantt. and MIS for Army HQ and Ministry of Defence	12	2001
II	Porting of the pilot system to other CODs and selected RODs	40	2002
III	Implementation of the system in the remaining RODs /DOUs	25	2003

Although the estimated cost of the project in 1993 was Rs 53.52 crore and stood revised to Rs 77 crore, sanction of the competent authority, then the Cabinet Committee on Political Affairs (CCPA), was not obtained for the project. The Ministry held the view that sanction of the competent authority could be taken at the stage of replication of the project in other depots, after the successful implementation of the pilot project in two depots. Nevertheless, approval of the competent authority was required at the very beginning for going ahead with the project of this magnitude rather than electing to wait for the successful completion of the first phase, to ensure top level involvement and commitment for its successful and timely completion.

c) Impact of lack of automation

Lack of effective on-line automation integrating all the concerned echelons has a major impact on the system's operation and its effect on user satisfaction. Although these are discussed in detail elsewhere in this report, a few of these are dealt with below to highlight the need for automation.

i) Stock visibility

The present system does not provide for clear stock visibility both at macro and micro levels. Ordnance Services replied in the negative to a question posed by the Audit whether in the existing set up, the total quantities, tonnages and value of any given item, with the exception of class 'A' stores, could be known on All India basis with reasonable accuracy and in reasonable time. The system simply does not have any inbuilt design feature for such information being generated. Obviously, the only solution is computerisation.

ii) Selective Inventory Control

Automation will be a boon for the exercise of Selective Inventory Control measures, which are well-established set of scientific techniques to control the inventory in organisations handling large range and depth of stores. The underlying approach of these techniques is to focus management attention on items which are vital and expensive or both and the availability of which can be problematic while leaving the remaining items to routine controls.

The problems faced in implementation of these techniques in the Ordnance services during their efforts made in the past have been discussed elsewhere in the report and stem essentially from the enormity of data to be handled and the segmentation of inventory that the application of these practices demands.

Computerisation will make data analysis both fast and accurate and allow for selective treatment of inventory items based on their criticality, cost and ease of availability. It will then be possible to undertake provision reviews

at different intervals for different categories of items and eventually move to the system of "Perpetual Review" where every single item in the inventory is watched over by the computer continually to initiate both provision and disposal actions as may be warranted in line with the corporate policies.

iii) Provision Review

The shortfall, both reported and unreported, in provision review to forecast the requirement of spares and its ramifications have been comprehensively dealt with elsewhere in this report. There were instances of arithmetical inaccuracies in calculations of vital modification factors, which led to over provisioning of stores.

Vital inputs like dispersed stocks and WWR holdings were ignored during provision review due to human error again leading to over provisioning.

The Financial Advisor, Defence Services, in April 1994, while acknowledging the need for early automation of AOC had cited an instance of exaggerated projection for import of spares of Tanks 'A' and 'B' at Rs 90.55 crore as against the actual requirement of spares worth Rs 27.74 crore, due to erroneous calculation of requirement made in the manual system.

Instances of this nature can effectively be controlled, if these activities are automated.

The Royal Army Ordnance Corps was reported to have achieved a saving of Pounds 1.85 million due to the reduction in inventory as a result of automation, way back in 1973-75[1]. Further progress and even larger savings are no doubt likely to have been made since then.

iv) Large Scale extraction/return of demands

The CODs receive a very large number of demands mainly from their dependant depots/ workshops. As worked out by the Audit, 19 *per cent* in COD Agra to 29 *per cent* at COD Delhi Cantt. of these demands were extracted[2] during the period of Audit. This was largely due to lack of information sharing amongst the demanding agencies and the supplying depots.

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[1] History of Royal Army Ordnance Corps by Major General L.T.H. Phelps CB, OBE, page 534.

[2] Extraction refers to transmission of demands by the demand-receiving depot to the depots dealing with those specific stores.

Obviously such a situation would have an adverse impact on timely fulfillment of the users demands[3]. Reportedly, the fault often lies at the demand generating levels due to wrong perception about the depots to be approached for the type of stores they need or lack of adequate information about the stores they need. An automated database accessible to both the parties would eliminate this problem through increased information sharing.

v) Non receipt of No.2 copy of the receipt vouchers from the consignee end

The consignees, as a token of receipt of stores at their end return No. 2 copy of the issue voucher to the concerned issuing depot. Audit observed that there were heavy backlogs in the receipt of these copies in all the depots.

Under these circumstances, the depots were not in a position to know whether the users had received the consignment or not and to link up this data in the concerned registers maintained by the depots. Such cases in a computerised environment can easily be detected and followed up at a faster pace through automated generation of reminder/ expeditors. This is essential since the delay in receipt of No.2 copies could be due to loss/pilferage in transit, which need to be investigated without any loss of time.

vi) Inordinate delays in reconciliation of stock taking discrepancies

During the course of stocktaking, quite a number of discrepancies are noticed which require to be reconciled. Such discrepancies might be due to delay in posting issue/receipt vouchers in the account cards, errors in posting perhaps due to illegible entries in the vouchers and other documents.

In a computerised environment through an on-line updation of data, such discrepancies can be better monitored. Discrepancies can be easily traced and reconciled. This would save considerable clerical effort and result in accurate stock reports.

vii) Management Information System (MIS)

The Management Information System presently available was in the form of periodical reports and returns being rendered by CODs to Army HQs. Most prominent of these was the DGOS Statistical Summary submitted on quarterly basis. The information furnished in these reports, which is used both for monitoring and decision-making purposes was not totally reliable. There was more than mere window dressing in these reports, which could be misleading. Audit, despite efforts could not trace the source documents on which these reports were based to verify the correctness of the data furnished

[3] See data on delays in Chapter on User Satisfaction.

therein. The present system also involves gargantuan paper work. The manual system does not permit the generation of exception reports as and when required by the Management. The MIS is historical in nature and, therefore, of little value for pro-active monitoring.

Generation of accurate and timely information being essential in the functions of inventory management, the case for automation of these depots was fully established.

8.4 Recommendations

(a) The process of computerisation of Ordnance activities needs to be accelerated

(b) Definite time frame needs to be set for the implementation of the CICP

(c) Audit requirement to ensure auditability of the systems in computerised environment need to be ascertained and incorporated in the specifications at system development stage itself

(d) All Ordnance echelons be provided faster communication facilities for transmitting unclassified information. Use of Electronic Data Interchange (EDI) forms for demands and other routine exchange of data among the different Ordnance establishment be explored. Even ordering for supply of stores from Defence PSUs/Ordnance Factories can be taken over by EDI in the long run provided it is indicated now.

8.5 Defence Response

MGO accepted all the above recommendations. Ministry also agreed with the views of MGO

Response to the above recommendations is mentioned below, *ad seriatim.*

(a) Agreed that automation needed acceleration, but indicated that the Corps had no control over its implementation. MGO added that bureaucratic delays and delays in internal audit approval to the system were the main hurdles in the race towards accomplishing automation. (Para 8.6 (a))

(b) Agreed and stated that the time frame set for implementation of CICP, after taking into account the delay of two years already occurred, varied between December 2001 for completion of Pilot project and

December 2007 for porting of the packages down to Brigade Ordnance Units/Ordnance Field Parks.

(Para 8.6 (b))

(c) Agreed and explained that the package would have facility for on-line audit. Controller General of Defence Accounts was requested to actively participate at system development stage, but the response had not been so encouraging. The CGDA had not cleared the System Requirement Specification even after six months of its submission.

(Para 8.6 (c))

(d) Agreed and elaborated that CICP once implemented would function on WAN. Procurement of EDI facility was being examined and if found cost effective, it would be provided to all Ordnance Units. E-commerce with DGOF and PSUs would be introduced after the depots and those organisations get proper connectivity.

(Para 8.6 (d))

8.6 Conclusion

Audit failed to understand as to how the stumbling blocks could not be removed despite the creation of empowered Committee for speedy execution of CICP, by the Ministry in 1994. Audit recommends the Ministry and the empowered Committee to take action to arrest further slippages in the execution of an essential project like CICP, which when implemented is expected to provide multiple benefits to the Ordnance and the entire Army. The target date of 2007 is too distant to be acceptable in the fast changing e-commerce scenario. Audit suggests the Ministry to ensure implementation of the essential element of CICP no later than 31 March 2002, with stage-wise project monitoring.

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CHAPTER 9: STOCKTAKING

9.1 Summary:

Annual stocktaking and reconciliation of discrepancies is a mandatory requirement.

There existed no agreement in inventory reported as verified by the depots and reflected in the Annual Audit Certificate rendered by the concerned Controller of Defence Accounts (CDA). Consequently, the actual inventory level held by a depot could not be vouchsafed and the reported stock taking could not be relied upon. Completion of stock verification was achieved by enhancing the prescribed speed of verification of items per day and over loading the task of verification of the existing stock-verification groups, affecting its accuracy. Further, discrepancies i.e. surpluses/deficiencies remained unreconciled. At COD Delhi Cantt., unreconciled discrepancies amounted to Rs.14 crore in which some were unreconciled for nearly two decades. Huge inventory of Weapon systems 'C' and 'D' held by COD Agra and CAFVD Kirkee were lying unidentified, even after, four years of their receipt. Interestingly, the reports of the concerned Controller of Defence Accounts (CDA) revealed that no stock-taking was done at COD Jabalpur during the last five years. Yet, the depots continued to report stock-verification of their inventory as 100 per cent complete without any arrears. Shortage of manpower for stock taking was a common excuse.

The adequacy and accuracy of stock taking carried out by the stock taking teams should be test checked by the concerned supervisory officers. Feasibility of resorting to biennial or cycle stocktaking, need to be explored if manpower cannot be found for the task.

9.2 General

Stocktaking is the process of physically counting, measuring or weighing the entire range of items in the stores and recording the results in a systematic manner with a view to reconciling the physical stocks with store accounts.

According to the laid down instructions, in Ordnance, stocktaking is carried out under the control of Depot Accounts Officer and reconciliation of discrepancies between the actual holdings and Account Card balances is undertaken in order to make correct index of stocks held.

9.3 Audit Observations:

a) Unreliable Stocktaking Process:

i) *Items stocked*

Audit scrutiny of the data with regard to stocktaking gave an impression that the total number of items held were not known with any degree of precision.

The details with regard to the number of items stocked in the beginning of the stock taking cycle and those counted in respect of all the depots as given in the DGOS Statistical Summaries are given in the Annexure H.

According to these reports, stocktaking was complete in all respects in all the depots. These figures could not be relied upon since a test check of these with the statistics given in the statistical report for the month ending March during 1994-99 in respect of COD Jabalpur gave a different picture. Similar position existed in respect of the figures given in the DGOS Statistical Summary and the Annual Audit Certificate (AAC) issued by the concerned Controller of Defence Accounts (CDA) in case of COD Delhi Cantt. Details are given below;

Table: 9.1 Variation in the figures reported regarding the number of items stocked in the begining of stock taking cycle at COD Jabalpur, during 1994-99

Year	Items stocked in the begining of stocktaking cycle	
	As per DGOS Annual Statistical Summary	As per the Depot's statistical report for the month ending March
1994-95	54910	71534
1995-96	55177	72099
1996-97	53238	70731
1997-98	56488	74507
1998-99	58133	74992

Interestingly, the reports of the concerned Controller of Defence Accounts (CDA) revealed that no stocktaking was carried out by COD Jabalpur during the last five years.

Table: 9.2 Variation in the stock verification figures reported by COD Delhi Cantt., *and the Annual Audit Certificate issued by the CDA, during 1994-99*

Year	Items stock verified	
	As per DGOS Statistical Summary	**As per Annual Audit Certificate**
1994-95	73798	1,00,131
1995-96	72126	NA
1996-97	75602	1,01,582
1997-98	85030	1,06,178
1998-99	79507	1,00,852

This anomaly gets further highlighted by an observation made at CAFVD Kirkee during a test check of receipt vouchers in August 1999 wherein 51 discs procured at a cost of Rs 3.26 lakh at 1986 price levels, though held in stock from July 1988 were not taken on charge till pointed out by Audit in August 1999. Incidentally, these stores remained invisible to the stocktaking teams for over a decade and thereby remained unaccounted.

ii) Number of items to be counted:

A comparison of the data given with regard to number of items to be counted and balance there of, in respect of the figures given in the DGOS Statistical Summary and the Statistical report for the month ending March1994-99 in respect of COD Jabalpur is tabulated below;

Table: 9.3 Variation in the figures reported regarding number of items to be stock verified at COD Jabalpur during 1994-99.

Year	**As per DGOS Statistical Summary**	**As per statistical report for the month ending March**
1994-95	Nil	4090
1995-96	Nil	1000
1996-97	1301	1996
1997-98	Nil	Nil
1998-99	Nil	2713

Results of a further examination of stocktaking related issues at COD Jabalpur are given as an illustration;

It showed that the depot was not effectively organised into cells as required under procedure. The main reason was ostensibly the shortage of staff. The details of staff strength of the depot employed on stocktaking are as below: -

Table: 9.4 Position of manpower employed on stocktaking at COD Jabalpur.

Category	Proposed	Authorised	Posted	Deficient
Clerical establishment	12	7	3	9
Stocktaking personnel	43	30	21	22
NCO	0	5	1	4

From the above, it was observed that posting of staff for stock verification in comparison to proposed strength based on yard stick and work load, was much less than the requirement which would have adversely affected efficiency and execution of stocktaking cycle. While as per yardstick, six items were required to be physically verified per day per storekeeper, distribution register at COD Jabalpur showed that one storekeeper had physically verified 20 to 60 items per day, which reflected that accuracy of stocktaking was possibly sacrificed for speed. Similar position, though to a lesser degree, was noticed at COD Agra.

Audit, therefore, is of the view that stocktaking as an activity is generally neglected in most depots.

iii) Skewed Stock Taking Cycles

Distribution of stocktaking of items in different quarters at COD Jabalpur revealed a very skewed distribution as given in the table below;

Table: 9.5 Skewed stocktaking cycles at COD Jabalpur during 1994-99

Year	Items stocked in the beginning of Stock Taking cycle	Items checked during the quarter ending			
		June	September	December	March
1994-95	54910	Nil	9960	17100	27850
1995-96	55177	794	18640	17830	17913
1996-97	53238	240	15160	11840	24697
1997-98	56468	Nil	15070	14420	26998
1998-99	57133	Nil	15320	15396	27417

This raises a doubt whether stocktaking was satisfactorily conducted, especially in view of the fact there had been no increase in staff strength in stocktaking section during the last two quarters of the year.

iv) Pending stock verification of unidentified stores of weapon systems 'C' and 'D'.

Weapon systems 'C' and 'D' were inducted into service during 1973 and 1984, respectively. Two CODs viz. COD Agra and CAFVD Kirkee were responsible for stocking the spares of these systems till June 1986. In July

1986, Army HQ, without obtaining approval of the Ministry, raised a COD at Meerut on *ad-hoc* basis and all the stores/ spares relating to these weapons were transferred to the new COD from COD Agra and CAFVD Kirkee. This *ad hoc* arrangement continued and in September 1996, Army HQ issued orders for winding up of the COD Meerut and transfer back spares to COD Agra and CAFVD Kirkee. The transfers were completed by December 1996. Consequent to the above, a large number of spares back- loaded by COD Meerut were received in COD Agra and CAFVD Kirkee in unlabelled condition, besides causing mix up of spares of these two different systems. This resulted in a chaotic situation in the recipient depots making identification of these stores a herculian task. As of April 2000, the total stores unidentified were as under;

Table: 9.6 The status of unidentified items of Weapon system 'C' and 'D' of COD Agra and CAFVD Kirkee[1] responsibility

Name of the Depot	**Total items received**		**Total unidentified items**	
	Weapon System 'C'	**Weapon System 'D'**	**Weapon System 'C'**	**Weapon System 'D'**
COD Agra	5287	904	691	Nil
CAFVD Kirkee[1]	3987	2495	1100	1429
Total	9274	3399	1791	1429
Percentage of unidentified stores			19	42

Though the problems associated with the non-identification of the stores was quite considerable as it adversely affected user satisfaction and provisioning, it also affected the process of stock verification. Interestingly, the depots did not report arrears in their stock verification for over three years even though these items have been taken on ledger charge based on the vouchers received from COD Meerut. No action for condonation of non-verification of stock of these stores was initiated. Audit could not understand as to how the depots could have completed stock verification without identifying those items.

b) Mounting Discrepancies:

The position of discrepancies outstanding at the end of the stocktaking cycle reported by the depots for the last five years is given below;

[1] *Position as on 1st January 2000*

Table: 9.7 Mounting discrepancies in items found after stocktaking at the depots under review during 1994-99

Year	COD Agra	COD Delhi Cantt.	COD Jabalpur	COD Kanpur	CAFVD Kirkee
1994-95	5106	205	4285	61	Nil
1995-96	5081	396	5215	46	Nil
1996-97	5085	309	3941	61	Nil
1997-98	Nil	986	5526	110	Nil
1998-99	33	1026	5428	55	Nil

Although CAFVD Kirkee did not report any discrepancies outstanding for reconciliation, the internal inspection of the depot by the Director OS, Inspection, done in February 1998 had highlighted 242 cases of 1995-96 and 2259 cases of 1996-97 outstanding for reconciliation, besides, 7830 cases of 1997-98. Similarly, at COD Jabalpur and COD Kanpur, discrepancies since 1993-94 and 1983-84 onwards, respectively, were pending for reconciliation as of March 1999. At COD Agra, there were unspecified numbers of discrepancies outstanding for reconciliation as revealed during the internal inspection of the Depot in February 1999.

The items pertaining to the period 1983-84 and upto 1993-94 were pending for reconciliation in respect of COD Delhi Cantt., as reported by the depot for incorporation in the Annual Audit Certificate (AAC) of the Controller of Defence Accounts Chandigarh. This involves surpluses comprising 608 items and deficiencies in respect of 859 items. Taken together the surpluses and deficiencies detected in the stocktaking cycles from 1994-95 to 1998-99, these figures as of September 1999 amounted to surplus of 921 items valuing Rs 9.06 crore and deficiencies of 1913 items valuing Rs 14.17 crore.

In respect of General Stores and Clothing items of COD Kanpur, the value of deficiencies was Rs. 24.47 lakh and Rs. 1.18 lakh for the year 1995-96 and 1996-97, respectively. Surpluses for the year 1996-97 were Rs. 3.51 lakh.

Considering that the period of audit was for the preceding five years only, similar exercise to probe the arrears pending prior to 1994-95 was not taken up at the other depots.

9.4 Recommendations

(a) The accuracy of stock-verification undertaken by the stock-verification teams was not being ensured at the supervisory levels. Audit, therefore, recommends that the stock-verification carried out by the team should be checked again at random at supervisory level immediately after their verification by the teams during the day, covering at least a few items and discrepancies

investigated to fix responsibility for laxity on the part of stock-taking teams. This process should also be documented.

(b) In case stock verification can not be completed on annual basis, with the existing staff without compromising accuracy, keeping in view the Government policy of downsizing the existing establishment, Ordnance may consider alternatives like switching over from the annual stock verification to a biennial cycle, cycle counting or introducing some form of selective inventory control techniques to reduce the work load.

9.5 Defence Response

Response of MGO to the above recommendations is as under:-

(a) Not agreed, arguing that the present system of stocktaking incorporated in built checks and balances.

(Para 9.4 (a))

(b) Agreed and admitted that stocktaking had been relegated to lower priority vis-à-vis other activities which affect operational preparedness, due to deficiency of manpower in depots and, therefore, proposed to switch over from the present annual cycle of stocktaking to varying periodicity as under:
'A'/'F' items – Annual
'B'/'N' items – Biennial
'C'/'S' items – Triennial

(Para 9.4 (b))

9.6 Conclusion

Audit suggests that the Ministry should consider switch over of the present stocktaking cycle to that suggested by MGO, in view of the existing shortage of staff initially for a period of three years on an experimental measure. However, any switch over should have a system of judicious mix of random/surprise check of the physical stock of those items with more samples from those falling in the biennial/triennial category, to act as a deterrent against possible theft or misuse of stores. The system should make it mandatory to document such random/surprise checks undertaken and to produce such documents to Audit. Defaults in stocktaking should invariably attract disciplinary action.

It is imperative that all measures are taken to ensure that the new stocktaking procedure when adopted is not relegated again to low priority. As the entire future planning of procurement depends on existing stock levels, stocktaking exercise is required to be carried out meticulously.

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CHAPTER 10: USER SATISFACTION

10.1 Summary:

Timely supply of right material at right time at right place to the dependant units is the ultimate concern of the Ordnance.

Ordnance has been unable to achieve the goal of attaining high levels of customer satisfaction due to persistent non-availability of stores in the range of 12 to 40 per cent and perennial delays in meeting their demands ranging between one to 48 months. The customers (EME) overhaul programmes were affected due to non-availability of critical and vital spares. Cases of rejection of stores not meeting the specifications were a common occurrence. Precious man-hours were lost in segregating demands and 30 to 40 per cent demands remained outstanding for registration itself. Customers did not acknowledge the receipt of stores in some cases even after three years of supply. Mandatory dues out audit, intended to weed out fictitious dues out headings and to find alternative way of meeting the demands was invariably in arrears. Absence of real time data link amongst the CODs, Army HQ and the dependant units was a constraining factor.

Increased availability, enhanced stock visibility through appropriate Management Information System and timely issue of stores to the users are the identified system needs. DGQA inspection needs to be made more stringent to prevent rejection of stores for not meeting quality norms.

10.2 General

Ordnance services attempt to achieve the highest level of user satisfaction by issuing right quality and quantity of stores at right time to meet the users' needs. Poor availability of stores from the Ordnance sources only invites wrath of the users and it often ends in a general remark that Ordnance stocks what they do not want and do not stock what they need. The CODs, as brought out in the chapter on the **'Unbalanced Inventory',** were full of stores, yet there was high inability percentage in meeting demands. Even if the stores were available, these were not issued within the stipulated time. While on one hand the depots were saddled with certain stocks to last for centuries, some other items of inventory were unavailable for issue to the troops. The inventory held appeared unbalanced.

10.3 System Status

Each Central Ordnance Depot is responsible for the all India supply of specified items of Ordnance stores, holding them in bulk and replenishing the

stocks of ODs, FODs and OSSs of EME Workshops. All Army Base workshops are co-located with CODs since they are the main users of ordnance spares. Their repair/ overhaul programmes are linked to the availability of stores with Ordnance. In other words, the availability of spares in the CODs have a direct bearing on the repair/overhaul programme and its achievement. The stocking responsibility of each COD is defined, as given out in the introductory chapter of this report.

Army HQ stipulated in December1972, standard time for issue of stores from a depot. According to stipulation, the entire process of registration of demands till issue should not take more than 22 days. As a measure of ensuring accountability, the standard time was broken up as under:-

Section	**Nature of Job**	**Prescribed time (Days)**
Control Branch	Receiving, sorting, vetting and registration of demands	3
Sub Depots	Identify, pick and pack the stores for issue to Traffic Branch	4
Traffic Branch	Arranging despatch to the consignee	15
	Total	**22**

A process known as "Issue Time Check" recorded on the documents was in vogue to ensure compliance with the above schedule and investigation of delay. There was, however, no provision in policies/procedures for fixing responsibility for delay and remedial/punitive action to rectify the position.

10.4 Audit Observations

Audit observed that the depots reviewed were not able to achieve the proclaimed objective of maximising customer satisfaction. There had been low demand satisfaction, undue delays in despatch of stores from the available stocks and issue of poor quality stores which did not meet customers requirements leading to avoidable rejection at consignee end. These are discussed in the succeeding paragraphs.

a) Persistent high inability percentage

Audit analysis of demand satisfaction at the CODs under review during 1994-99 revealed that the general feeling that depots are full of stores but were unable to issue the stores for which requirement existed was true to some extent. The average inability percentage during 1994-99 as worked out by the CODs was as under: -

Table: 10.1 Inability percentage *in supply of stores to dependant units by the depots under review.*

Sr. No	**Name of the Depot**	Inability **Percentage**
1.	COD Agra	16.20
2.	COD Delhi Cantt.	19.54
3.	COD Jabalpur	4.70
4.	COD Kanpur	35.34
5.	CAFVD Kirkee	25.62

The depots in working out the Inability Percentage followed the formula given below.

$$\text{Inability percentage} = \frac{\text{Total Dues Out Headings x 100}}{\text{Total Live PRFs}}$$

This computation did not really reflect the level of demand satisfaction achieved. The true performance indicator would be the percentage of demands met out of demands received. Audit analysed the demand satisfaction level with reference to the demands received at CAFVD Kirkee and found that the demand satisfaction was much less than the availability percentage (100 – inability percentage) reported as could be seen from the table below;

Table: 10.2 Details of demands extracted and demand met by CAFVD Kirkee during 1994-99

Year	**No of items demanded**	**No of item extracted/ returned**	**Net item on demand**	**Items issued**	**Percentage of issues w.r.t net items on demand**	**Percentage of items demanded not issued**	**Inability** percentage **reported by depot**
1994-95	84721	32261	52460	24868	47.40	52.60	20.1
1995-96	80512	15874	64638	30972	47.91	52.09	21.2
1996-97	86712	32432	54280	30216	55.66	44.34	26.0
1997-98	114704	37057	77647	27794	35.79	64.21	27.2
1998-99	92009	13132	78877	20176	25.57	74.43	33.6
					Average	57.53	25.62

Thus, the inability percentage worked out by the depots had no co-relation with the level of demand satisfaction. Since the aim of Ordnance is to maximise level of demand satisfaction, the actual performance indicator would be to work out the percentage of demands satisfied as against demands received.

Thus, the depots while holding stocks that in some cases may last for centuries as reported elsewhere in the report, could not meet demands in respect of items demanded by units in a substantial number of cases.

b) Delay in registration of demands

The demands received by the depots are registered after extracting the demands pertaining to other depots or returning the demands with incomplete details to the users. Audit observed that the phenomenon of large-scale extraction/return was common in all the depots as brought out below;

Table: 10.3 Summary of demands received/ extracted/returned by the depots under review during 1994-99

Year	COD Agra		COD Delhi Cantt.		COD Jabalpur		COD Kanpur		CAFVD Kirkee	
	Demands received	Demand extracted	Demands received	Demands extracted	Demands received	Demands extracted	Demands received	Demands extracted	Demands received	Demands extracted
1994-95	64413	10525	72456	15723	32784	7082	64671	22644	84721	32261
1995-96	55044	9357	62700	14985	30252	7321	54090	8847	80512	15874
1996-97	59856	4077	57408	13893	35328	8055	61090	14416	86712	32432
1997-98	55668	3746	56940	17082	39420	9047	61392	16962	114704	37057
1998-99	58058	10973	80370	30460	40848	9947	59375	14171	92009	13132
Average	58608	7735	65975	18429	35726	8290	60123	15408	91731	26151
Percentage	*13.19*		*27.93*		*23.20*		*25.63*		*28.51*	

As brought out in the chapter on 'Computerisation', this perpetual problem was due to poor interface between the users and the depots. This had a direct bearing on meeting the users needs, as some time was lost in extraction and redirecting the demands to the concerned depots. However, delays in registration of demands by control branch even after indent checking was noticed at COD Delhi Cantt., as shown below;

Table: 10.4 Delay in registration of demands by Control Branch at COD Delhi Cantt.

Month	**Cumulative demand**	**Demands registered in the month**	**Percentage of registration**	**Outstanding for registration** (percentage)
May 99	6367	3733	58.63	41.37
June 99	7713	5306	68.79	31.21

Issue Time Check in respect of extracted demands became abnormally high. At CAFVD Kirkee, of 7227 demands received between January 1998 and March 1999, 1393 demands constituting 19.27 *per cent* were registered after a delay of three to 24 months due to their late receipt in the depot, as most of these demands were those extracted by other depots.

c) Delay in issue of stores

Audit observed that while the percentage of demand satisfaction remained low, even for issue of stores from the available stock there were considerable delays compared with the prescribed time limit of 22 days. This is evident from the data tabulated below: -

Table: 10.5 Delay in issue of stores to the users by CODs Agra, Delhi Cantt., Jabalpur, Kanpur and CAFVD Kirkee

(Delay in months)

Name of the Depot	Sample size	Issued within time limit of 22 days	Delay over the ideal time						
			Upto 1	1-3	4-6	7-12	13-24	25-36	37-48
COD Agra	145	3	61	73	8	-	-	-	-
COD Delhi Cantt.	235	-	10	131	61	30	3	-	-
COD Jabalpur	399	-	6	214	146	33	-	-	-
COD Kanpur	273	11	7	29	42	52	77	45	10
CAFVD Kirkee	429	37	89	148	38	68	40	9	-
Total sample size	1481	51	173	595	295	183	120	54	10
Per cent to total sample		*3.44*	*11.68*	*40.18*	*19.92*	*12.36*	*8.1*	*3.65*	*0.67*

Thus, the depots could seldom meet the demands within the laid down issue time limit of 22 days. There was a delay in the range of one to three months in respect of 40.18 per cent of the sample selected. Apparently, the delay was a rule rather than an exception, in all the depots.

d) Equipment Out of Action (EOA)/Vehicles Off-Road (VOR) Demands

For want of spares, equipments remain out of action and vehicles become off-road. Both these conditions are unacceptable and are, therefore, critical from the point of view of operational preparedness. Accordingly, the demands for stores to set right this state of affairs should receive highest priority and every endeavour needs to be made to meet such demands within the shortest time. The position of such demands outstanding at COD Agra showed delays above three years as indicated below;

Table 10.6 Status of non-availability of items in Equipment Out of Action (EOA) and Vehicles-Off-Road (VOR) demands of COD Agra responsibility during 1996-99

Year of receipt of Demands	No. of items in EOA/VOR Demands	Inability percentage as on	
		March 1999	January 2000
1996-97	2412	16	5
1997-98	2737	29	20
1998-99	2599	68	38

Inordinate delay in satisfying such demands obviously affects the operational state of warlike equipment including combat vehicles.

(e) Failure to carry out Dues out Audit

According to orders on the subject, dues out audit section in a depot should review dues out records on a continuous basis every month. The objectives are to weed out dues out headings, which remain on account of human error or to locate alternatives i.e. *in lieu* items for issue. In increasing the user satisfaction levels, dues out audit has an important role to play.

Audit observed that in all the depots, dues out headings were high. The dues out audit section in COD Delhi Cantt. was made defunct consequent upon maintenance of dues out records on electronic media. This immobilisation of dues out audit section did not have approval of any competent authority. The argument that since the records were on electronic media, no dues out audit was required also lacked logic and conviction since dues out audit does not confine itself to mere perusal of records but extends to verification of stock on ground and/or survey of repairable stock in RSSDs to retrieve items available in serviceable/repairable condition and arrange for immediate issues after repairs if needed to meet the outstanding demands.

Dues out audit at CAFVD Kirkee showed a declining trend over the period from 1994-95 to 1998-99 with shortfall in audit increasing from 83.40 to 92.33 *per cent*. At COD Agra the monthly dues out audit averaged at 11.91 *per cent*. At COD Kanpur, the depot did not produce any records to Audit to verify as to whether dues out audit was ever carried out.

Failure to comply with the codal provisions and letting the system to break down is a disturbing trend and needs to be addressed and arrested, for arraying the disarrayed.

(f) Confirmation of receipt of store at user end

Receipt of stores at the consignee end is confirmed by the consignees through return of No. 2 copy of issue voucher which is enclosed in the stores

packages. Issuing depots are required to monitor such return and progress the same till the receipted copies arrive back duly acknowledged.

Audit observed that huge backlog existed in the receipt of receipted copies from the consignees. The position in COD Agra and CAFVD Kirkee was as under: -

Table: 10.7 Status of non-receipt of No.2 copy of the issue vouchers at COD Agra and CAFVD Kirkee

(Delay in Months)

Name of the Depot	Outstanding in years as of March 2000			Total
	1 to 2	More than 2 and upto 3	More than 3	
COD Agra	2658	607	146	3411
CAFVD Kirkee	113	128	24	265

The figures of outstanding for more than three months in respect of COD Delhi Cantt., and COD Kanpur as on 31 March 1999 were 62313 and 5378, respectively. In respect of COD Jabalpur, the number was 18977 as on is 31 December 1999.

The non-receipt of No.2. copies needs thorough investigation as it could be due to wrong despatch of stores, loss of stores in transit or pilferage.

(g) EME satisfaction

(i) Impact on EME programme of repairs/overhauls:

As mentioned earlier, Army Base Workshops are invariably the major consumers of spares procured and stocked in Central Ordnance Depots. Army Base Workshops plan their annual repair/overhaul target and firm it up based on the assurance/availability of stores in the Central Ordnance Depots concerned. Audit analysis revealed that even the firmed up targets could not be achieved since certain critical and vital spares required for the overhaul/repair were not forthcoming from the CODs.

The finalised EME repair/overhaul programme could not be completed in time attributable to non-availability of certain critical and vital spares. Such shortfalls in targets ranged from one to 100 *per cent.*

Apart from non-availability of critical and vital stores from the CODs, even those supplied were at times found unfit for use in the workshops. The incidence of rejection of stores by Army Base Workshops during 1999 alone was as indicated below-

Table: 10.8 Incidence of stores rejected by 505 ABW, 510 ABW and 512 ABW

Name of Army Base Workshop	COD that supplied spares	No of lots rejected in full	No. of lots partly rejected	Reasons for rejection
505 ABW	COD Delhi Cantt.	10	Nil	Defective
510 ABW	COD Delhi Cantt.	Nil	2	Not as per specification
512 ABW	CAFVD	99	21	Dimensional inaccuracy, poor quality of material.

(ii) Non-availability of Critical/Vital spares

Certain items are considered vital for carrying out repair/overhaul of equipment/vehicle in the Army Base Workshops. Non-receipt of such items hampers the repair programme of the ABWs concerned. Consolidated Vital Inability Lists (CVILs) are, therefore, prepared by the depot to list out such items demanded but not available, for the purpose of giving priority treatment. Even then a large number of items remained in the Consolidated Vital Inability Lists indicating that CODs were unable to meet demands of such critical and vital items. This position is illustrated in the following tables;

(A) The details of CVIL position in respect of 505 ABW out of the items supplied by COD Delhi Cantt., is given below;

Table: 10.9 Inability in supply of Critical and Vital spares to 505 ABW by COD Delhi Cantt., during 1994-99

Year	Items demanded	Items supplied	Balance at year end	Inability percentage
1994-95	2226	485	1741	78.20
1995-96	2265	661	1654	73.02
1996-97	1943	395	1548	79.67
1997-98	1394	348	1046	75.03
1998-99	1128	283	845	74.91

(B) In respect of 512 ABW, the CVIL position pertaining to spares of CAFVD Kirkee responsibility during 1998-99 was as under: -

Table: 10.10 Inability in supply of Critical and Vital spares to 512 ABW by CAFVD Kirkee, during 1998-99

Equipment	No. of items to be issued	No. of items issued in full	No. of items not issued or partly issued.	Inability *per cent*
Tank 'B' and variants (for vehicle)	2092	1998	94	5
Tank 'B' and variants (for engine)	447	435	12	3
ICV I and II (vehicle)	3408	2896	512	15
ICV I	471	322	149	32

(C) The overall CVILs position noticed for the year 1999-2000, in respect of COD Agra, for the items of its responsibility to various dependant ABWs, varied from 8.52 *per cent* to 66.90 *per cent* as shown below;

Table: 10.11 Inability of COD Agra in supply of Critical and Vital spares to the dependant Army Base Workshops during the year 1999-2000

Army Base Work Shop	No of items in CVIL	No of items issued	Percentage of non-availability of Critical/Vital items
505	47	43	8.52
506	92	73	20.66
508	514	433	15.76
509	612	553	9.64
510	420	139	66.90
512	977	518	46.99
3 Adv Base Wksp	22	19	13.64

10.5 Recommendations

(e) On-line linking between the CODs, dependant units and Army HQ would enhance stock visibility and users satisfaction.

(e) Demanding agencies need to be educated to avoid raising demands on wrong depots. The practice of raising demands without ascertaining the right Depot to be approached not only delays the materialisation of demands at user end, but also leads to avoidable work load and wastage of man hours at COD. Efforts need to be made to ascertain the reasons that have led to increases in inability percentages ***and to find ways and means to minimise such inabilities.***

(e) CODs should be impressed upon to adhere to the time schedule of 22 days for completing the entire process of issue of stores on demand. Delays should be investigated/analysed and remedial action taken. Even punitive action can be considered against persons responsible for such delays, wherever warranted.

(e) Every EOA/VOR demand needs to be monitored at the highest level in the depot and all efforts should be made to speed up clearance of such demands.

(e) The reasons for abnormally high rate of rejection of stores, which are apparently attributable to faulty inspection before acceptance, need to be quickly investigated and responsibility fixed. All efforts should be made to get free replacement from the suppliers within warranty period. Such cases too need timely monitoring at the level of the Commandant or Deputy Commandant of the depots. Cases where rejections of stores is due to faulty inspection by personnel of DGQA should be promptly reported to DGQA for taking action against those responsible for accepting such stores.

10.6 Defence Response

MGO agreed to all the above recommendations.

MGO's response thereto is mentioned below, *ad seriatim*

(a) Agreed on the need for on-line linking and hoped to achieve the same with the implementation of CICP.

(Para 10.5 (a))

(b) Agreed and explained that educating user/demanding agencies for raising correct demands was an ongoing process and that monitoring of inabilities was carried out by key functionaries at Army HQ. MGO, however, highlighted that causes of inabilities were many, like slippage in production at Ordnance Factories or PSUs, delay in indigenisation of stores, poor performances of Small Scale Industries, bureaucratic delays in decision-making and delays in preparation of ISG and Scales. MGO, therefore, suggested certain remedial measures to improve the system which *inter alia* included restricting vendor base to highly reliable and quality conscious suppliers as was being done in corporate world, time bound decision making on matters relating to procurements, change in inspection procedure for reducing delays in inspection, tightening of contractual provisions, improvements in procurement procedure from DGOF/PSU by granting self certification to DGOF for procurement of raw materials and supply for finished products, warranty replacement of defective goods supplied by DGOF

and import of items directly by the Army, than through PSU, where PSU quoted higher rates.

(Para 10.5 (b))

(c) Agreed and admitted that issues from CODs were not being made within the stipulated 22 days, but attributed it to inefficient and non-productive labour force with the Ordnance, inadequate and antiquated infrastructure in the depots, ban on recruitment and the Railways' reluctance to provide piecemeal wagons. MGO, therefore, suggested to:

(i) bring civilian work force under Army Act or at least at par with rules applicable to General Reserve Engineering Force personnel,

(ii) accept civil hired transport as a normal mode, besides permitting piecemeal dispatches of non-sensitive stores through civil goods carriers,

(iii) allot separate funds to MGO for improvement in storage and working conditions in the Depots, de-linking them from normal works procedure,

(iv) recruit personnel to fill up at least 20-25 *per cent* of vacancies arising due to retirements/deaths on continuous basis to maintain acceptable age profile of workers and

(v) issue of Government letter authorising material handling equipments like forklift trucks, tractors, dozers and cranes for all Ordnance installation.

(Para 10.5 (c))

(d) Agreed to create computer records of every EOA/VOR demand for proper and timely action by higher management of the Depots and to mark it as key result area.

(Para 10.5 (d))

(e) Agreed to take up the matter of high rates of rejection of stores with DGQA.

(Para 10.5 (e))

10.7 Conclusion

The suggestions made by MGO to improve the system are far-reaching and radical. These require in depth study by the Ministry keeping in view the wider ramifications. However, matters like improvement of infrastructure of CODs need immediate attention.

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CHAPTER 11: REPAIR ARISINGS

11.1 Summary:

Stores rendered either repairable or surplus with the units are returned to the sub-depots known as Returned Stores Sub-Depots (RSSDs)/ Material Stores Sub-Depot (MSSD) of the concerned CODs for repair and reissue or disposal as the case may be.

Low technology nature repairable stores weighing 7896 tonne, were held as on 31 March 1999 by the CODs although the provisions stipulated for their repairs through civil contracts in cases where they are unlikely to be repaired in RSSDs/MSSD. In one depot, timely repair of the inventory could have saved Rs.17.59 crore involved in fresh purchases. RSSDs/MSSD were cost-ineffective and the value of repairs vis-à-vis manpower cost was in the range of four to 19 per cent. At MSSD of COD Kanpur, Rs.1.55 crore per annum was being spent towards pay and allowances to 307 idle tradesmen employed there.

There is a need to review all the repairables held and reassess their utility and arrange for repair/disposal. Need also exists to reassess the cost-effectiveness of the RSSDs/MSSD vis-à-vis laid down performance indicators. It is also necessary to re-assess and explore the feasibility of repairs through civil contracts

11.2 General

A sound inventory management system must provide maximum possible material supply from given resources. This principle of maximising returns from the minimum resources assumes greater importance in a scenario where the resource itself is scarce. In this context, quick repair of repairable inventory to recoup depleting stocks of serviceable inventory, sounds a better option than resorting to fresh purchases. It would serve the twin objective of stock replenishment at lesser cost and lessening the burden of carrying huge repairable inventory by Ordnance.

11.3 System status

Repair of Class 'A' equipment follows a set pattern of preparation of Repair Programme by EME in consultation with Ordnance and its approval by the Ministry of Defence. Only such Class 'A' stores which are unlikely to become obsolete and are likely to be used for at least half the period of their renewed life after repair are ordinarily included in the repair programme, which currently spans a period of five years. Stores, which do not fit into the category of those that cannot be repaired cost effectively or have no prospects

of future utilisation, obviously find their exit from Ordnance through disposal agencies.

In the case of Class 'B' stores, there are two repair agencies involved i.e. EME for complex stores and Ordnance for low-tech items. Returned Stores Sub Depots (RSSDs) forming an integral part of CODs handle repairs in the depots. Repair of Class 'B' stores also follows an annual programme prepared by EME for repair of technical Class 'B' stores and Ordnance for items of RSSD repair responsibility. Repair priority lists prepared by CODs at the time of provision review and amended at periodical intervals assist Ordnance in prioritising the repairs. These lists contained items of repairable nature, which were required to be repaired in Army Base Workshops (EME) and RSSD.

11.4 System implementation requirements

1 A precise forecasting of the need based repair size, with adequate thought to the economics of repairs vis-à-vis fresh procurement.

2 Proper identification of the repair agency, realistic assessment of their capabilities and capacities, prompt allocation of work and result oriented monitoring of repairs.

3 Periodic review of the repairable stock to identify and weed out unwanted repairables.

4 Speedy repair of repairable inventory and their merger with serviceable stock.

11.5 Audit Observations

Audit review of the repairable stocks held in the RSSDs and the pace of repairs, revealed that serious damages have been caused to the system over the years as given in the succeeding paragraphs.

(a) Mounting repairable stock

The repairable stocks in the CODs had assumed gigantic proportion in all the depots as shown in Annexure J. Repairs carried out vis-à-vis total stock position in tonnage of the repairable stores held during the review period was abysmally low as mentioned below. Some of the accumulations had their origin dating back to 1965, which mean that for over 35 years, the repairables continued to remain as repairable.

Table: 11.1 Mounting repairable stock during 1994-99 at CODs Agra, Delhi Cantt., Jabalpur, Kanpur and CAFVD Kirkee

Year	Percentage of repairs carried out vis-à-vis the total repairable store held by the Depots				
	COD Agra	COD Delhi Cantt.	COD Jabalpur	COD Kanpur	CAFVD Kirkee
1994-95	28.35	2.09	NA	8.25	1.55
1995-96	21.71	2.24	NA	4.81	0.26
1996-97	22.07	1.20	NA	30.40	0.98
1997-98	16.59	7.99	NA	8.20	0.66
1998-99	42.24	3.37	2.39	19.40	2.32

The above data speaks for itself and highlights the need for greater importance being given to speeding up of repairs.

According to RSSD procedure (DGOS Technical Instruction. 008), it is incumbent upon RSSD to undertake repairs of maximum range of items of repairable nature. Where repairable stores were unlikely to be repaired in RSSD workshop in a period of two months, CODs should make a list thereof and send it to Army HQ to examine the feasibility of getting the same repaired elsewhere, failing which the possibility of entering into contracts with civil firms for repair were to be explored. This notwithstanding, the repairables continued to mount, indicating that adequate attention was not being given to this vital area. CAFVD Kirkee attributed the low output to the non-availability of spares and low rate of 'call in' notices for repair received from Army Base Workshop.

(b) Avoidable fresh purchases

DGOS Technical Instruction 040 provides that items of RSSD/MSSD repair responsibility will not be counted as assets in advance. They will get reflected automatically in stock holdings when restored to serviceable condition. The Technical Instruction, however, permit CODs to take any portion of the repairable stores held in RSSD towards assets during the periodic provisioning review at their discretion, whereas a percentage of repairables of EME repair responsibilities included in the repair programme is reckoned as assets for provision purposes.

Audit, during test check of five *per cent* of the repairable items held in RSSD of CAFVD Kirkee vis-à-vis the provisioning made observed that timely repair of the repairable inventory could have saved an estimated Rs.17.59 crore involved in the procurement of fresh stock to make up the deficiency.

This is a pointer to the savings that are possible if potential of RSSDs/EME for repair of Class 'B' store is better utilised.

(c) Manufacture in RSSD

Apart from repairs of low-technology items, RSSD is charged with the responsibility for manufacture of items for adding to the depot stock. The value of stores manufactured in RSSDs was, however, negligibly low in all the depots as indicated below: -

Table: 11.2 Value of stores manufactured in Returned Stores Sub-Depots (RSSDs) and Materials Stores Sub-Depot (MSSD) of the depots, during 1994-99

(Rupees in lakh)

Year	COD Agra	COD Delhi Cantt.	COD Jabalpur	COD Kanpur	CAFVD Kirkee*
1994-95	7.66	17.22	4.59	26.34	4.01
1995-96	8.75	11.76	7.21	52.27	8.30
1996-97	12.08	10.42	3.92	24.21	2.86
1997-98	13.76	10.38	7.25	40.19	2.58
1998-99	10.50	7.88	7.76	15.25	2.58
Average	10.55	11.53	6.15	31.65	4.07

**Includes cost of items repaired.*

(d) Unproductive manpower in RSSDs/MSSD

The expenditure on the manpower employed in RSSDs/MSSD and out-put as mentioned above and the benefit there of during the period of review stood as under;

Table: 11.3 Cost-effectiveness of RSSDs/MSSD

(Rupees in lakh)

Name of the Depot	Value of items manufactured/repaired	Manpower cost	Productivity percentage
COD Agra	10.55	127.12	8.29
COD Delhi Cantt.	11.52	161.39	7.13
COD Jabalpur	6.15	139.00	4.42
COD Kanpur	29.63	381.04	7.77
CAFVD Kirkee	4.45	22.86	19.47

Audit is aware of the fact that the duty of RSSDs was not confined to repair and manufacture only. The sub-depot receives and conditions all stores returned by the lower echelons and formations. However, it cannot be ignored that repair or arranging for repair and manufacture assume primary importance in RSSDs/MSSD. The productivity of the RSSD/MSSD with reference to their primary role was very low viewed in the light of the low percentage of repairs and manufacture in RSSDs/MSSD.

Apart from the fact that the output at COD Kanpur was low despite its massive manpower, Audit scrutiny of the manpower booked at its MSSD made a startling revelation. About Rs.1.55 crore was spent annually towards pay and allowances of 307 idle tradesmen employed there. Audit could bring out this by checking the mandays booked against work orders of MSSD, according to which, during 1998-99, only 3159 mandays were booked on various work orders, justifying the requirement of only 11 tradesmen as per norms fixed by the Ministry. Audit could not understand as to how the depot did not notice this overstaffing during the periodic (annual) manpower review carried out by the Depot Manpower Committee chaired by Deputy Commandant. Incidentally, the files and documents relating to the manpower review were also not produced to Audit for scrutiny despite repeated requests.

11.6 Recommendations

Audit recommends:

(a) an immediate review of the repairables held by the sub-depots to re-assess their necessity and technical/economic viability of undertaking repairs;

(b) disposal of all unwanted repairables, which are not technically/economically viable to be repaired;

(c) prioritisation of the remaining repairables on need basis and insist upon their repair within a definite time frame;

(d) upgrading or closing down of the RSSD workshops, which were presently showing symptoms of unproductive work by way of low rate of repair or low output of manufacture;

(e) prescribing performance indicators that can be measured and compared to assess the performance/output of RSSD workshops;

(f) deploying the idle manpower elsewhere in the depot or Ordnance where they can be gainfully employed and

(g) identifying and off-loading repairs to trade where it is technically and economically feasible.

11.7 Defence Response

MGO agreed with five of the seven recommendations, partially agreed with one and disagreed with the remaining one.

Their response to the above recommendations is mentioned below *ad seriatim*

(a) Agreed and stated that a Board of Officers would be detailed for re-assessment of repairables.

(Para 11.6 (a))

(b) Agreed and assured that disposal activity would follow the findings of the above Board.

(Para 11.6 (b))

(c) Agreed to prioritise repairs based on requirement of stores.

(Para 11.6 (c))

(d) Agreed and maintained that RSSD workshops need upgradation and become production centers for low technology items.

(Para 11.6 (d))

(e) Agreed to set performance indicators, measure and compare to assess the performance/output of RSSD, periodically.

(Para 11.6 (e))

(f) Partially agreed and stated that since tradesmen employed in RSSD workshops were locally recruited personnel without all India transfer liability, they could not be deployed on alternative employment or retrenched. Utilisation of the full potential of their pay and allowances would be feasible if RSSDs/MSSDs are made production centers.

(Para 11.6 (f))

(g) Not agreed as local repairs ex-civil market were not dependable and genuineness of the repairs could not be guaranteed.

(Para 11.6 (g))

11.8 Conclusion

Audit feels that while constituting a Board of Officers may be a one time solution, there is a need for institutionalised mechanism to ensure that accumulations do not recur in future. The proposal of MGO to upgrade RSSD/MSSD to production centers of low technology items needs to be considered by the Ministry to avoid continued idling of manpower and the unproductive expenditure on their pay and allowances which had already assumed serious proportion at COD Kanpur. MGO needs to come up with concrete proposals for using RSSDs/MSSDs as production centers for ensuring that these work to the optimum capacity.

A system of setting performance targets, measuring achievements and comparing them with the targets for suitable remedial action needs to be devised, bearing in mind the axiom that what is not measured is not managed. The apprehensions regarding the quality of repairs through trade need to be reconsidered in the light of DGOS Technical instructions 008, where it is visualised that CODs should report all such items, which could not be repaired within two months in RSSD workshop to Army HQ, to explore feasibility of getting these repaired elsewhere or through civil firms under contract, by incorporating adequate clauses for inspection during the course of work and before acceptance.

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CHAPTER 12: STANDARDISATION

12.1 Summary:

Standardisation is required not only for variety reduction and minimisation of inventory but also for over all cost reduction.

There was considerable proliferation of even readily available civil end use inventory in Ordnance to meet the same purpose giving standardisation a back seat. There were 189 types of 'B' vehicles and in passenger carriers alone there were vehicles of five different types. The futuristic policy for standardising 'B' vehicles, proposed some time in 1971 is now a matter of history. There were eight to ten types of generating sets with a spare support in the range of 53 to 448 items. Similarly five to eleven types of charging sets with a spare support in the range of 72 to 588 items were in service. The clothing items consisted of 24 sizes of Boot Ankle, 10 sizes of Shoes Canvas white/brown, 15 sizes of Hats-Gorkha and 15 sizes of shirts plain Olive Green/Khaki.

Efforts should be made to initiate/gear up standardisation of vehicles, general stores and clothing items to reduce the cost of inventory and ensure better control there of.

12.2 General

Induction into the Army of a variety of sophisticated and complex weapon systems and electronic equipment of different makes and types has the effect of increasing the range of inventory required for maintenance and repair in geometric progression, besides straining repair and maintenance infrastructure. Expedient induction leads to vehicle/equipment proliferation and compounds problems of the already complex task of spares management. It is in this context that the concept of standardisation assumes significance. Standardisation helps in variety reduction and minimisation of the range of inventory, besides easing the maintenance/repair problems and thereby increases the assurance levels while keeping the system costs low.

Induction of Class 'A' vehicles and war-like equipment into the Army are dictated primarily by the perception of its needs to meet the threat, which is reviewed periodically. Since the procurement of major equipment other than the indigenous is dictated by several factors including political and financial, a degree of multiplicity is unavoidable and is not being discussed further in this report. This is, however, not so in the case of Class 'B' vehicles, non war-like equipment and spares as well as general stores and clothing.

Cases of proliferation of inventory in second category mentioned above as revealed during test check in audit are given below: -

i) 'B' vehicles

The Army had a variety of 'B' vehicles in its fleet for support role. In all, about 189 types of vehicles were held in its transport fleet.

The Army's family of vehicles from the load classification point of view, dates back to the period of Second World War. While the organisation of units and formations, weapon systems, tactical concepts and load patterns have changed, vehicle classification continued to remain unchanged. Army HQ in 1971 studied the requirement in the changed scenario and decided to introduce a new family of 'B' vehicles to meet its future needs.

This plan remained in a state of flux and the futuristic policy of 1971, is now no more than history. The Army carried on with its fleet of outdated, fuel guzzling and uneconomic 'B' vehicles. Replacing 1 Ton NSN/Petrol vehicles, which give an average kilometerage of 4 per litre with 2.5 Ton diesel driven vehicle with increased fuel efficiency of 7 Km. per litre was expected to result in a saving of fuel cost by Rs.61.88 crore at 1992 price level on a population of 'X' vehicles over their life cycle. This apart, standardisation would reduce the range of inventory. It was after two decades that the Ministry approved the introduction of ½ Ton Maruti Gypsy, LCV Swaraj Mazda, Tata 2.5 Ton and 5/7.5 Ton Stallion into service during the nineties. The necessity for speeding up decision making on such issues needs no emphasis. Since technology in every field is rapidly advancing, evaluation of new technology for induction into service should be a regular process.

ii) Generating and Charging Sets

Audit observed at COD Agra that a large variety of Generating and Charging sets were in service. Each type of set has spares, which are unique to it. Presently the following varieties of such sets are in service: -

Table: 12.1 Varieties of Generating and Charging sets and their spares held by COD Agra

Main Equipment	Types held	Origin	Range of spares for each equipment	
			Minimum	Maximum
Generating set 2KVA/ 2.5KVA	9	Indigenous	53	184
Generating set 4 KVA	10	Indigenous	57	235
Generating set 5.5/5.6 KVA	8	Indigenous	75	286
Generating set 11.2/11.25 KVA	8	Indigenous	122	448
Generating set 30 KVA	10	Indigenous	56	416
Charging set 2KW	8	Indigenous	72	Not known
Charging set 150 W	5	Indigenous	107	121
Charging set 500 W	11	Indigenous	122	588

The introduction of different types/makes of equipment had the effect of multiplying the range of spares required to support the same. In reply to an audit query, COD Agra stated that a separate study on standardisation of these sets could be ordered.

iii) Clothing

The Army was keeping different sizes of clothing items, shoes and caps in its wardrobe. The number of sizes maintained in each category was as under;

Table: 12.2 Categories of Shirts, Shoes and Caps maintained under clothing items of COD Kanpur responsibility

Category	Number of sizes
Boot Ankle	24*
Shoes Canvas white/brown	10
Caps FS Disruptive	6
Hats - Gorkha	15
Shirts plain Olive Green/Khaki	15
Shirts Men's Khaki for Basic training period	8

**8 sizes each with extra large, large and medium varieties*

Prior to 1986, there were two more sizes of caps totalling the number to eight. In 1986, the sizes of these were cut down from eight to six. , however,, 4484 caps of size 1 and 235 caps of size 2 which were deleted from the inventory continued to be kept in the Army's warehouse even though it was almost 14 years since they were removed from the Ordnance inventory. Similarly, there were 18 sizes of hats prior to 1993, which was reduced to 15 in 1993.

The necessity of keeping a large number of sizes of clothing items needs to be reviewed for reducing the multiplicity of clothing items and to facilitate handling of the inventory.

12.3 Recommendation

Audit recommends that standardisation of vehicles, equipment and clothing needs to be given urgent attention, if efforts to reduce inventory and costs thereof are to bear fruit.

12.4 Defence Response

While partially agreeing to the above recommendations, MGO accepted that there was a scope for reduction in the sizes of footwear and

clothing items but stated that for every vehicle/equipment three generations perforce had to be in service at any point of time and that variety was due to specialist roles within the same category. MGO added that in the past, number of vehicles were introduced in the same category due to various compulsions. DGQA was seized of the problem and addressing the same.

(Para 12.3)

12.5 Conclusion

Standardisation and variety reduction need to be given due importance and the Ministry may address it to find ways and means of solving the problem of proliferation, keeping in mind the observations and recommendations of Audit. While Audit acknowledges the need to have three generations of vehicles/equipments in service at any given point of time, it still maintains that there should be no proliferation through induction of too many models, as happened in the case of load carriers, generating and charging sets.

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CHAPTER 13: UNBALANCED INVENTORY

13.1 Summary:

Optimally, the stocks of items held in a maintenance system should be so balanced that huge surpluses in some cases and large-scale non-availabilities in others do not co-exist.

Whereas no more than 10 per cent of the items held in the depots were found to be demand bearing, the inabilities ranged as high as 35.34 per cent in some of the depots suggesting major imbalances in the holdings.

The total stocks held in the depots ranged from 2.79 times the annual issues in the case of one depot to 29.28 times in another depot. Based on prevailing consumption trends, stores on hand may last for 100 years and beyond in some cases.

Faulty scales, incorrect forecasting, avoidable delay in provision review, indent processing and disposal were some of the major causes for this malaise.

Better management through Selective Inventory Control practices, Standardisation and timely identification of surpluses followed by prompt disposal are the areas warranting attention.

13.2 General

Effective inventory management aims at keeping inventories as low as possible consistent with responsive and focused service to the users. Besides working out the requirements as realistically as possible, it should be the endeavour to order the right quantities at the right time with right delivery schedules. Balanced inventory implies that at any given time, inventory should not be in excess of the requirement for various commitments nor fall below the optimum level in range and depth. Both situations have adverse ramifications and the causes of surpluses and shortfalls should be eliminated or remedied to the extent possible. It is also necessary that the paucity of critical items is not allowed to coexist with large non-moving inventories of unwanted items.

The Ordnance Services held nearly half-a-million items valuing about Rs. 50,000 crore. The problem of management of such a large and diverse inventory, formidable as it is, gets further compounded by the fact that the entire process of forecasting, procurement and holding of inventory is fraught with many uncertainties both internal and external to the organisation. The warlike nature of a large range of inventory, which has little, if any peace time wastage, the continual change in the Army's equipment profile due to rapid

technological developments and complexities of disposal, make a fine balance in inventory holdings, nearly impossible.

13.3 Audit Observations

Audit analysis of the inventory held by the depots under review with reference to the quantum of inventory held and the annual issues made to the users revealed that the stock held by the depots were quite unbalanced as discussed below: -

a) Inventory Turnover:

One of the most widely followed measure for evaluating inventory performance in any organisation is to determine the "Inventory Turnover Ratio", which implies the annual consumption with reference to the average inventory held in the system and benchmark it against the best. Such a simplistic approach is, however, not possible in the case of the Army inventory as the main purpose for which the Army holds inventories is to avoid stock outs that would impact operational readiness or compromise the full development of its war potential. In addition, lifetime requirements of certain equipment are held as the sources of their supply may have dried up and further procurement may not be possible. There is also the need for reserves for contingencies and stocks of some insurance spares. All in all, a proportion of the inventories is by design, incapable of being turned over in peace and must be excluded from any measurement of the inventory turnover ratio.

The above notwithstanding, it is essential to adopt some performance evaluation criteria, that would indicate whether public funds invested in Army inventory are justified. Towards this end, Audit undertook an analysis of Inventory Turn Over Ratios in the depots that were reviewed.

The data given below with regard to the inventory held by all the selected depots vis-à-vis their annual issues made to the users during the last five years revealed that the stocks held by them were 2.79 times at one depot to 29.28 times at another depot, as compared with the annual issues made. The details are given below:

Table: 13.1 Turnover of the stock held by CODs Agra, Delhi Cantt., Jabalpur, Kanpur and CAFVD Kirkee

(Rupees in crore)

Sr. No	Name of the Depot	Value[1] of the stock held	Value of the issues made	Inventory Turn Over
1.	COD Agra	6448.75	285.56	22.58
2.	COD Delhi Cantt.	606.89	32.28	18.74
3.	COD Jabalpur	1623.60	79.21	20.49
4.	COD Kanpur	808.64	288.95	2.79
5.	CAFVD Kirkee	282.87	9.66	29.28

The holding of such large inventory of MT spares, electronic and General Stores and Clothing items were not justified considering that most of the stores held were commonly available civil end use items, barring spares of armoured vehicles. Most of this inventory was slow and non-moving in nature. The value of working inventory was just Rs. 66 crore at COD Delhi Cantt. while the total value of the inventory held was nearly Rs.600 crore. The depot in its reply to the observation stated that old vintage inventory was to be held by the depot till it became obsolete and further disposed-off. The fact that there were 9251 slow and non-moving electronic items valuing Rs.3.36 crore lying with COD Agra since 1989 and 4864 items of APCs TOPAZ and SCOTT valuing Rs. 10.53 crore lying for the last ten years at CAFVD Kirkee further supported this finding. These inputs were supplied by the Depot to Lt. Gen. Vijay Lal Committee constituted in the year 1999 by the DGOS to examine reduction of Ordnance inventory in the Indian Army. Although lesser in number, unwanted repairable GS&C items of MSSD responsibility of COD Kanpur were pending for disposal for the last 10 years.

Audit is of the view that a re-examination of the inventory held vis-à-vis actual requirement is essential due to the fact that the users demands require only a minor portion of these holdings as detailed below: -

b) Extremely low percentage of demand bearing items

An average of the details for the last five years in respect of the selected depots revealed that only nine to 10 percentage of the total items held by the depots were demand bearing in nature as illustrated below: -

[1] The figures in respect of COD Agra and COD Jabalpur were for the period 1998-99 and the values of issues in respect of these depots were as stated in AOC Annual Report 1998-99.

Table 13.2 Percentage *of demand bearing items of the stocks of the responsibility of CODs Agra, Delhi Cant, Jabalpur, Kanpur and CAFVD Kirkee*

Name of the Depot	**Percentage of demand bearing items for the years**					
	1994-95	**1995-96**	**1996-97**	**1997-98**	**1998-99**	***Ave rage***
COD Agra	6.8	6.5	9.6	10.2	7.4	*8.1*
COD Delhi Cantt.	NA	9.3	5.4	4.4	4.4	*5.9*
COD Jabalpur	6.6	11.8	11.3	10.8	14.1	*10.9*
COD Kanpur	9.1	8.6	8.6	9.0	9.1	*8.9*
CAFVD Kirkee	9.9	17.5	18.0	12.7	9.7	*13.6*
Average	*8.1*	*10.7*	*10.6*	*9.5*	*9.0*	*9.5*

Most of the remaining inventory obviously was either slow or non-moving in nature pending for identification of disposable items and their disposal.

While the demand bearing items revealed during the provision review of live PRFs varied between 5.9 and 13.6 *per cent* in the depots under review, their inability percentages which also had relation with the total live PRFs showed a very high rate and it ranged between 4.7 and 35.34 *per cent*. Even assuming that the items in the pipeline, dues-in are reckoned as the assets during provision review and as such not readily available for issue, the magnitude of variation between these parameters was abnormally high requiring justification. Audit is of the opinion that long internal lead-times that the depots take for processing the demands and placing the supply orders were some of the chief contributing factors for this situation.

c) Stock to last for centuries

Audit, with a view to quantify the fallout of this situation, stratified the surplus inventory held by the selected depots based on the current consumption trends. The stock sufficiency was stratified under the categories such as upto 10 years, 10-50 years, 50-100 years and infinity as shown in the Annexure K. The analysis in respect of a randomly selected 437 items of CODs Agra, Delhi Cantt., Jabalpur and CAFVD Kirkee gave a startling revelation as shown below;

Table: 13.3 Stratification of surplus store

(Rupees in crore)

Stratification (Years)	Sample size	Value	Percentage to total sample size
Up to 10	48	0.83	11
>10-50	110	6.65	25 (48)
>50-100	52	3.83	12
Beyond 100	141	8.76	32
Infinity	86	3.65	20 (52)
Total	*437*	*23.72*	*100*

From the above sample analysis it would be seen that while 48 per cent of the inventory valued at Rs 11.31 crore which included spares for Radars Radio sets, signal equipment which were prone to rapid obsolescence was likely to last up to 100 years, the remaining 52 per cent of the inventory valued at Rs 12.41 crore would last beyond a century. (Also see Annexure K)

Interestingly, 15 *per cent* of the MT store of COD Delhi Cantt., valuing Rs 1.81 crore, and 50 *per cent* of the store in respect of Tanks 'A' and 'B' and ICV of CAFVD Kirkee's responsibility valuing Rs.1.84 crore had been projected to last for an indefinite period of time since no consumption had been recorded as on date in respect of these stores.

Notwithstanding the quantity of inventory held under WWR, special reserves, spares procured under life time buys and full reserves maintained in respect of special nature of items, Audit is of the view that stocks held by the depots were too voluminous and substantial public funds had been locked up which could have been used for meeting other priority requirements.

Surprisingly, in spite of the abundant availability of the stock and sufficient budgetary support, the depots' performance with reference to users satisfaction was far from healthy. Although this topic is discussed in detail separately, the same viewed in the context of high inability percentage merits a mention here.

Table: 13.4 Inability percentage *in supply of stores to the dependant units during 1994-99 by CODs Agra, Delhi Cantt., Jabalpur, Kanpur and CAFVD Kirkee*

Name of the Depot	Inability percentage					Average
	1994-95	1995-96	1996-97	1997-98	1998-99	
COD Agra	18.20	20.40	16.43	13.78	12.18	16.20
COD Delhi Cantt.	19.40	16.20	13.50	12.70	35.90	19.54
COD Jabalpur	4.80	5.00	3.80	5.10	4.80	4.70
COD Kanpur	28.70	30.90	36.80	38.50	41.80	35.34
CAFVD Kirkee	20.10	21.20	26.00	27.20	33.60	25.62

13.4 Possible causes for unbalanced inventory:

It was practically not possible for Audit to examine the circumstances under which these surplus stores had entered the depots. However, based on the experiences gathered during the examination of the system, Audit is of the view that the following causes or deficiencies in the system could have contributed to the problem. Although these issues have been discussed elaborately at appropriate places, a brief of the same is given below;

a) Incorrect forecasting of requirements:

One of the most important tasks of materials management is computing detailed requirements for spares support and materials. This entails computation of wastage, assets and liabilities, the details of which are supplied by several agencies. Incorrect forecasting results in faulty procurement, unbalanced inventories, locked up funds and poor service levels as brought out under the chapter **'Provision'** of this report.

b) Faulty Scales:

In the case of newly inducted equipment, the consumption pattern of spares and accessories is not known and procurement is based on ISGs and MRLS. Cases of large variation in consumption vis-à-vis scales in case of initial fill, maintenance and overhaul scales and resultant pile up of surplus store are given under the Chapter 4 on **'Scales'**.

c) Multiple Procurement Agencies:

Although the Ordnance is finally responsible for providing the spare support, often the procurement of equipment/ spares is undertaken by the other agencies like DGQA, DDPS, and MOD resulting in duplication.

d) Avoidable Delays:

This could be due to the following;

i) Delayed Provision Review
ii) Delays in Financial sanctions
iii) Delay in vetting of indents by AsHSP
iv) Indents processing delays
v) Delays in Disposal

Cases noticed in the above categories have been discussed elsewhere in detail at appropriate places in this report.

13.5 Implications of unbalanced Inventory:

Without proper controls, inventories have a tendency to grow beyond manageable limits. Holding excess inventories means capital tied up which is not available for more productive uses. It adds to the inventory carrying costs by way of cost of capital, storage, accounting, preservation and also costs involved in deterioration and obsolescence.

13.6 Recommendations:

a) Provision review based on Selective Inventory Control: Application of ABC analysis to inventory control implies constant vigilance and frequent review of 'A' items, a fair amount of vigilance in respect of 'B' items and a routine treatment for 'C' items. This can be further refined by using a mix of VED (Vital, Essential, Desirable) and SDE (Scarce, Difficult, Easy) analysis. Selective Inventory Control techniques enable the senior levels of management to identify the items needing their close attention as well as those items where the responsibility may be delegated to lower levels without detriment to overall efficiency. The overall result is reduced inventory.

b) Monitoring wastage data: In the present system, wastage data for computing the requirement takes into account the issues made by the Ordnance including the inter-echelon stock transfers. This does not reflect the actual wastage. The actual consumption should be monitored at the user level and should form the wastage data for provisioning purposes thereby ensuring economy.

c) ***Improving the quality of scales by incorporating inputs from agencies outside the EME, such as Original Equipment Manufactures, AsHSP, Ordnance and Finance with a view to avoid excessive provisioning. The multiplier effect on inventory, with errors in scales can result in large unwarranted investment and needs to be very carefully controlled. Financial approval of all scales prior to promulgation is warranted.***

d) ***Codification and Standardisation of the equipment is urgently needed.***

e) ***Timely identification and disposal of the surplus store need greater attention.***

13.7 Defence Response

Since responses to these recommendations were made in Chapters 2 and 4, MGO maintained that there was no need for offering any separate comments.

13.8 Conclusion

Audit had repeated the recommendations to highlight the essence of the factors that contributed to build up of unbalanced inventory for taking appropriate remedial action.

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CHAPTER14: SURPLUS MANAGEMENT (DISPOSAL)

14.1 Summary:

Surplus inventory arises due to various reasons like phasing out of main equipment/vehicles, modernisation, over provisioning, replacement of old items with new ones in the main equipment.

The system of identification of surplus stores and their disposal was burdened with time consuming procedures involving several agencies for their clearance at various levels. There was a heavy pile up of surplus inventory referred to stores section at Army HQ for obtaining approval for declaration of the equipment as obsolete and issue of Assignment Lists (ALs) by the DGQA. There were delays in disposal action even after publication of ALs. While the inventory valuing Rs.55.09 crore was pending for disposal, serviceable stores valuing Rs.156.4 crore were lying in open exposed to vagaries of weather since the unwanted stores occupied precious covered accommodation.

The system of back loading of surplus inventory by lower formations to the concerned CODs needs re-examination. Formation of a permanent body analogous to the disbanded Special Surplus Stores Disposal Committee (SSSDC), timely declaration of status and issue of ALs followed by speedy disposal are some of the areas that merit attention.

14.2 General

Acquisition of new and disposal of vintage equipment are ongoing processes in any organisation that intends to keep abreast with changing environment. Army with its holding of nearly half-a-million items is no exception to this universal phenomenon.

Surplus store are revealed after every provision review and the 'in flow' of salvage items results from constant wear and tear of equipment during training or operations. Disposal of such inventory, although an incidental function, has gained the status of a vital function in the recent past due to modernisation of armies world over. When equipment becomes no longer cost effective to maintain, replacement becomes the only option. Therefore, it is of utmost importance that the arisings of surplus stores and salvage are disposed off expeditiously so that money realised can be put to better use and valuable covered space released.

14.3 Causes for surpluses and their identification

Surplus inventory is the end product of all or any of the following: -

(a) Reorganisation of Army units and the change in their equipment profile.
(b) Total phasing out of main equipment or vehicles or reduction in population of main equipment, due to changes in Unit Entitlement (UE).
(c) Modernisation and upgradation of equipment/vehicles involving replacement of major assemblies/sub-assemblies.
(d) Continuous evaluation by Maintenance Advisory Group (MAG) of EME and CODs of the requirements based on past experience leading to identification of unwanted items.
(e) Deletion of items from the scales both for overhaul and maintenance.
(f) Overstocking due to over provisioning in the past, as detected during the periodic provisioning review.

In the above cases, it is not only the main equipment/vehicles that are rendered surplus but also major and minor assemblies as well as spares that are used for their maintenance repair and overhaul.

14.4 Disposal Mechanism:

In the past, Ordnance alone was engaged in disposal activity. It could not cope up with the task of such magnitude effectively due to its pre-occupation with its primary role. The pace of disposal actually was not commensurate with the arisings and this led to formation of Special Surplus Stores Disposal Committee (SSSDC) on 16 July 1991 with the approval of the Cabinet on a tenure basis for disposal of surplus accumulated warlike stores/equipment and obsolete/obsolescent/non-moving current store lying unused in various Ordnance Depots. The Committee's tenure expired in March 1996. During its existence, the Committee disposed off 35,685 'B' vehicles and over 32,970 tonnes of brass/copper scrap besides 54,480 tonnes of inactive surplus inventory and realised a sale value of around Rs. 400 crores.

The Ministry of Defence signed an agreement in August 1997 valid up to July 2000 with MSTC for it to act as an auctioneer to arrange disposal of all scrap, secondary arising, salvage and surplus stores, condemned vehicles, vessels, equipment, warlike stores and miscellaneous articles as offered by the Ministry of Defence at a service charge of 1.75 *per cent* on sale proceeds. The MSTC disposed off salvage/vehicles valuing Rs.298 crores, approximately, between April 1997 and March 2000.

A Disposal Cell headed by an officer of the rank of a Colonel under ADGOS (CN&A) has been functioning at Army HQ.

14.5 Audit Observations:

A review of the existing system revealed that the practices followed in identification of surplus store and their disposal needed re-examination. The stage wise complexities are given below;

i) Inadequate arrangements in identification of surplus

In the existing set up, surplus store is identified basically at three levels;

a) Identification by the depots themselves as an end result of Annual Provision Review. Thereafter, it follows a lengthy process of obtaining clearance from the General Staff Equipment Policy Committee (GSEPC)/DGQA/AsHSP.

b) MAG of EME identifies unwanted items in scales based on past experience. Consequential reduction/deletion from scales result in surplus.

c) Identification through Special Committees set up for this purpose. *Ad hoc* Committees constituted to identify surplus stores. Some of the more recent committees were those headed by Brigadier S. Bindra (1997) and Lt. General Vijay Lall (1999).

The efforts put in at these levels, except the Annual Provision Review were mostly sporadic in nature. Considering the volume of inventory held, a full-fledged committee to visit the depots/units on a regular basis for identification of surplus was required.

ii) "Just in Case" attitude on revealed surpluses

According to the laid down procedure, when surpluses are revealed during annual provision review, items, which are unlikely to be of any use and exceeding the permissible limit, are required to be declared for disposal. As mentioned in the chapter on **'Unbalanced Inventory'**, surplus stores lasting for indefinite periods are kept in the depots with no action taken for exploring ways and means for their early disposal. This reflects a "Just in Case" attitude on the part of materials managers.

iii) Time consuming procedures

Identification and disposal of obsolete and obsolescent (serviceable and repairable) inventory concurrent with the change in status of the equipment is supposedly a regular ongoing process. However, it takes long time for General Staff Equipment Policy Committee (GSEPC) to declare the change in status from current to obsolescent and obsolescent to obsolete. Thereafter, considerable time is taken in processing the cases with DGQA and AsHSP for vetting the status of the equipment/store followed by the approval of the Competent Financial Authority for disposal of the items. This long

drawn time frame results in accumulation of obsolete, obsolescent and non-moving inventory in various Ordnance depots leading to avoidable inventory carrying costs and blocking of scarce storage accommodation. It also causes deterioration of such stores/equipment in storage.

Audit quantified the time taken between declaration of surpluses and disposal in respect of certain obsolete items of the depots under review, except COD Jabalpur. The data is tabulated below;

Table: 14.1 Time taken in disposal of surplus store

(Time in months)

Name of the Depot	Store/ equipment	Date/Year of declaration of surplus	Dates of disposal	Time elapsed since declaration of surplus and awaiting disposal	Time taken in disposal
COD Agra	Spares of Radio sets, Radars	1996-97	February 2000*	-	24 (Partly disposed off)
COD Agra	Spares of Radio sets,	1998-99	-	12	-
COD Delhi Cantt.	MT spares	June 1998	-	24	-
COD Kanpur	GS&C items	May 1997	September 1997		3
		March 1998	August 1999		17
		March 1998	-	27	-
CAFVD Kirkee	Churchill Tank spares	June 1998	November 1999	-	17
			January 2000	-	19
			March 2000	-	20
CAFVD Kirkee	T-54 spares	September 1998	-	20	-
CAFVD Kirkee	PT-76 spares	December 1998	-	14	-
		January 1999	-	17	-

As already discussed in the paragraph 2.8.5 of the Chapter on Provision, T-54 and PT-76 were declared obsolete in November 1994 and April 1996, respectively. However, their spares, as shown above were declared surplus between September 1998 and January 1999.

Instances of delay in disposal even after the declaration of the equipment as obsolete and issue of the Assignment Lists by the DGQA were also noticed. The case of electronic equipment of COD Agra which is prone to fast obsolescence is illustrated below;

* Disposal action was initiated on 14 April 1999 and 17 September 1999

Table: 14.2 Delay in disposal action even after declaration of the status and issue of Assignment Lists (ALs) by DGQA

(Value in Rupees lakh)

Type of equipment	Range of items	Pending since		Value
		Oldest	Latest	
Radio equipment	510	1980	1998	604.92
Power equipment	1098	1987	1997	16.61
Line equipment	1087	1991	1997	169.11
Instruments	3157	1948*	1997	209.00
Total	**5852**			**999.64**

** The item is "wood borers pneumatic drill"*

iv) Re-utilisation check by Convenor Technical Team:(CTT)

In the existing system of disposal, all items, which are surplus to requirement, are required to be cleared by Convener Technical Team (CTT), located at Army HQ, in order to identify the surplus stores fit for re-utilisation before these can be disposed off.

Audit, on analysis of the details of CTT check carried out at the depots under review noted that CTT check was one of the main causes for delay. The time taken in disposal of the sample selected ranged between 7 and 21 months. Further, only a meagre percentage of items were recommended for re-utilisation thereby questioning the very necessity of CTT check. The details are given below: -

Table: 14.3 Time taken in checking of surplus store by Convener Technical Team (CTT) and percentage *of items recommended for re-utilisation*

Name of the Depot	Name of the store/ equipment	Date of declaration of surplus/ intimation to CTT	Date of CTT visit	Time taken (months)	*Per cent* recommended for reuse
COD Agra	Radio sets and Radars	1996-97	October 1997	7	25.0
		1997-98	-	-	-
		1998-99	February 2000	11	1.7
COD Delhi Cantt.	MT spares	June 1998	March 2000	21	20.0
COD Kanpur	GS&C items	May 1997	NA	NA	0.8
		March 1998	NA	NA	1.0
		March 1998	NA	NA	1.0
CAFVD Kirkee	Centurian American/ British Tank spares	June 1998	March 2000	21	'Nil'
CAFVD Kirkee	PT-76	December 1998	October 1999	10	5.4
CAFVD Kirkee	T-54 spares	September 1998	September 1999	12	24.0

v) Back-loading of surpluses to the CODs from the lower echelons/formations

With wide dispersal of army inventory, CODs, regional depots and all the concerned workshops including Base Workshops hold the same inventory but limited in range and depth to the extent needed at those levels. Hence, when equipment or its spares become obsolete, these stocks are back-loaded to the respective CODs for disposal.

This arrangement was aimed at saving the time involved in inspections, lot lifting and better realisation value.

However, in the existing set up, the stores and spares declared surplus at the lower echelons were transported all the way back to the respective CODs involving substantial costs towards transportation and stock maintenance. Considering that the time taken in disposal as brought out in the preceding paragraphs of this Chapter is too long, sizeable quantities of such store were likely to deteriorate during storage thereby further reducing their value.

A study conducted by a Committee headed by Brigadier Bindra in 1997 to identify obsolete, obsolescent and non-moving inventory had recommended delegation of powers to the lower echelons to dispose off their respective surpluses regionally wherever local markets existed or feasibility be assessed for one Commandant of a COD per geographical area viz., COD Dehu Road for Southern Command and COD Chheoki for Central Command to manage disposal activities in their regions there-by relieving the parent COD of their workload.

vi) Pile-up of Disposable Inventory

The tonnage and the value of the surplus stores disposed off and those awaiting disposal at CODs Agra, Delhi Cantt., Jabalpur and CAFVD Kirkee during the period of review, for period ending 31 March are given in the Annexure L. It showed that these depots had disposed off stores weighing 8532 tonne valuing Rs.17.14 crore leaving a balance of 2783.2 tonne.

The number of surplus items and their value pending for disposal as in September 1999 in respect of the depots under review is given below;

Table: 14.4 Surplus store pending for disposal at CODs Agra, Delhi Cantt., Jabalpur, Kanpur and CAFVD Kirkee

(Value-Rupees in crore)

Name of the Depot	Store pending for disposal	
	Number of items	Value
COD Agra	1332	1.40
COD Delhi Cantt.	10097	2.14
COD Jabalpur	13701	44.81
COD Kanpur	21	0.06
CAFVD Kirkee	1957	6.68
Total	*27108*	*55.09*

vii) Maintenance of reserves of unwanted items

The depots hold certain reserves authorised as per Army HQ directives issued in this regard. At COD Agra, it was observed that four types of reserves viz., Army HQ Reserve Annexure No.1, Theatre Stores Signal Reserve, Engineer Theatre Stores Reserve and Expendible Airborne Equipment Reserve, which were authorised by Army HQ, vide letters issued during 1979 and 1986, continued to be held by the depot. The depot in 1997 and 1999 had taken up the matter with Army HQ to revise the list of reserves, as due to fast changing technology of electronic and sophisticated equipments, number of equipments had been changed/downgraded/replaced. No action was taken on this issue as of February 2000.

viii) Serviceable store lying in open:

Most of the existing depots are of World War II vintage. Since then, pending their modernisation, almost all have continued to manage with old and insufficient storage accommodation. However, the inventory in the meanwhile had increased manifold necessitating exploration of means for effective space management, besides construction of additional storage accommodation. A review of the space utilised by the CODs under review reveals that store weighing 30413 tonne valued at Rs.156.4 crore were lying in open exposing the same to vagaries of weather and deterioration. Certain rubber items with low shelf life of CAFVD Kirkee responsibility formed a part of this class of stores.

On the other hand, the depots were storing the unwanted stocks in covered accommodation. The depots were using covered accommodation ranging between 2.25 *per cent* at CAFVD Kirkee to approximately 10 *per cent* at COD Delhi Cantt. for storing unwanted store.

Details as on 31 March 1999 are given below;

Table 14.5 Status of serviceable store lying in open at CODs Agra, Delhi Cantt., Jabalpur, Kanpur and CAFVD Kirkee as on 31 March 1999

(Value-Rupees in crore)

Name of the Depot	Total storage space of the Depot (Square metre)	Covered Space occupied by the unwanted store (Square metre)	Percentage of covered space occupied by unwanted store	Serviceable stores lying in open	
				Tonne	Value
COD Agra	148647	2300	1.55	73	0.4
COD Delhi Cantt.	13155	1307	9.94	13211	65
COD Jabalpur	155474	NA	NA	NA	NA
COD Kanpur	184819	Nil	Nil	1217	13
CAFVD Kirkee	54501	1225	2.25	15912	78
Total				*30413*	*156.4*

While noting the anomaly brought out by the Audit, CAFVD Kirkee stated that they had initiated efforts to re-organise the sub-depots with a view to achieve effective space utilisation.

14.6 Recommendations

a) ***GSEPC/DGQA/AsHSP should be tasked to issue their approvals and publish Assignment Lists in a time bound manner to enable early disposal.***
b) ***Reduction in time taken for CTT check.***
c) ***The desirability of continuing with the CTT check where the delays were not justified by the realisations, need examination.***
d) ***A separate study for examining the advisability of continuing with the existing system of back loading of disposable stores to the CODs by the lower formations and echelons need to be carried out. After working out the cost-benefit analysis, the lower formations/echelons may be allowed to dispose off surplus inventory in a stipulated time frame.***
e) ***Considering the progress made during the tenure of SSSD, a permanent body analogous to this be formed to dispose off the surpluses on a regular basis.***
f) ***Automation of inventory to facilitate speedy identification for disposal.***
g) ***Scaling norms be reviewed.***

14.7 Defence Response

MGO agreed with all the above recommendations. However, the Ministry stated that decision on four of the recommendations would be taken after receipt of proposals from Army HQ.

Their comments thereon are indicated below *ad seriatim*

(a) Agreed and stated that the aspects of timely changing of status of an equipment and publishing of documents by DGQA had been analysed in depth by a study group and the group was coming up with certain suggestions. MGO expects that the implementation of those recommendations would help to overcome the problems highlighted by Audit.

(Para 14.7 (a))

(b) Agreed and emphasised the need for doing away with the system of CTT check as the aspect of establishing commonality should be carried out by AHSP at the time of introduction of the equipment.

(Para 14.7 (b))

(c) Agreed that CTT check would be a redundant exercise, if AHSP addresses the matter of establishing commonality at the time of induction of equipment.

(Para 14.7 (c))

(d) Agreed that back-loading of surplus stores by RODs was not economical due to transportation cost and man power for conditioning activity at COD after receipt and suggested retention of surplus stores at RODs for disposal, barring items of sensitive nature or of import origin.

(Para 14.7 (d))

(e) Agreed that there was a need to set up an empowered committee for disposal of surplus inventory in an expeditious and judicious manner.

(Para 14.7 (e))

(f) Agreed and stated that once CICP becomes fully functional there would be enhanced transparency to identify surpluses at various echelons.

(Para 14.7 (f))

(g) Agreed and added that the matter rested with the EME.

(Para 14.7 (g))

14.8 Conclusion

Since MGO agreed with the recommendations of Audit, the Ministry may direct MGO to come up with concrete proposals in respect of recommendations at (a) to (c) and (e) for taking a final decision. Regarding the establishment of commonality of items with other equipment, which are in service, Audit agrees with MGO that this task should be that of AsHSP and that CTT has little role to play. The establishment of commonality of spares between the new equipment and those already in service, at equipment induction stage, should facilitate easy identification and disposal of unwanted stores.

Sudha Rajagopalan

(SUDHA RAJAGOPALAN)
Director General of Audit
Defence Services

New Delhi
Dated: 15 DEC 2000

Countersigned

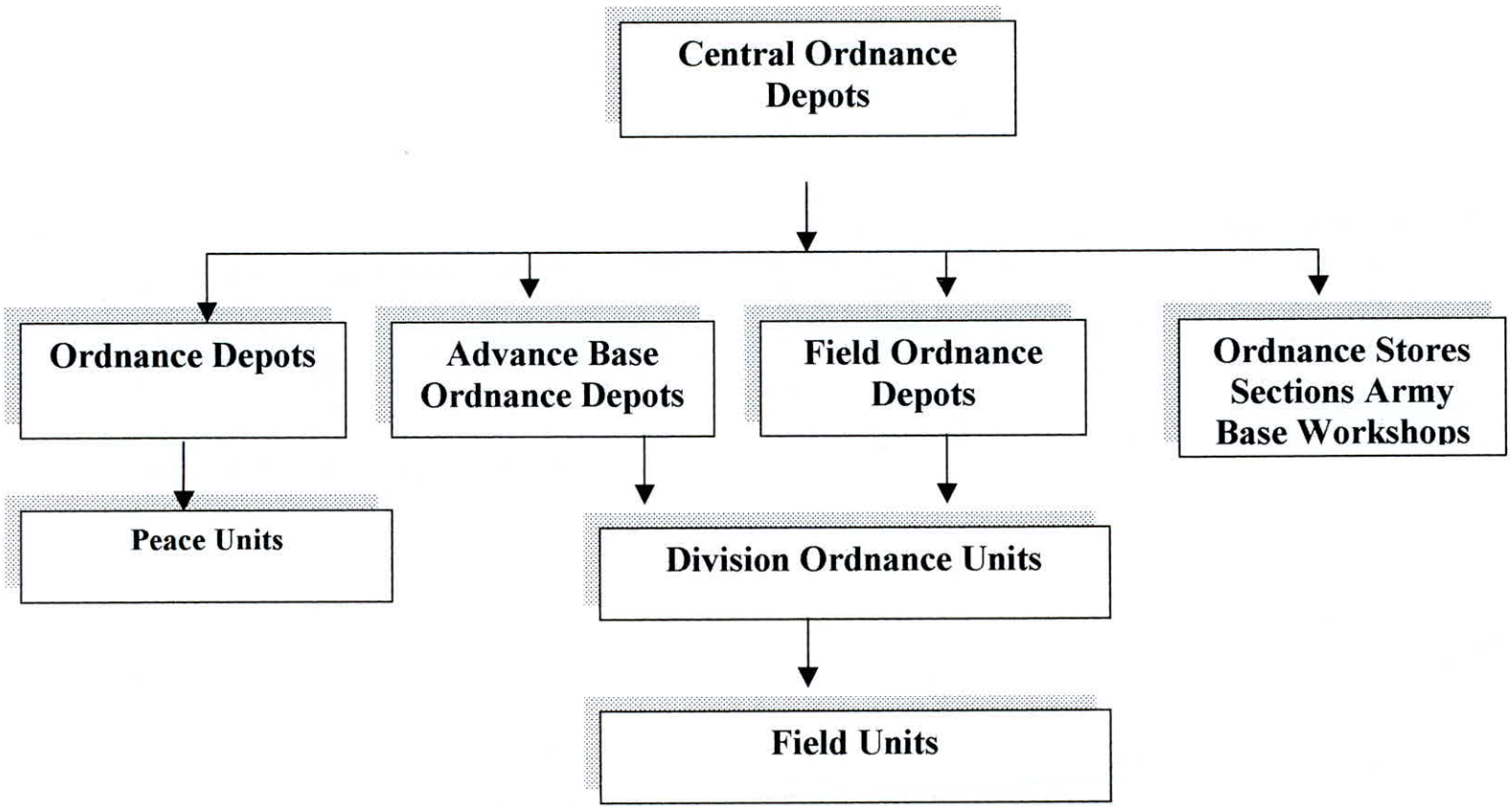
V. K. Shunglu.

(V.K. SHUNGLU)
Comptroller and Auditor General of India

New Delhi
Dated: 15 DEC 2000

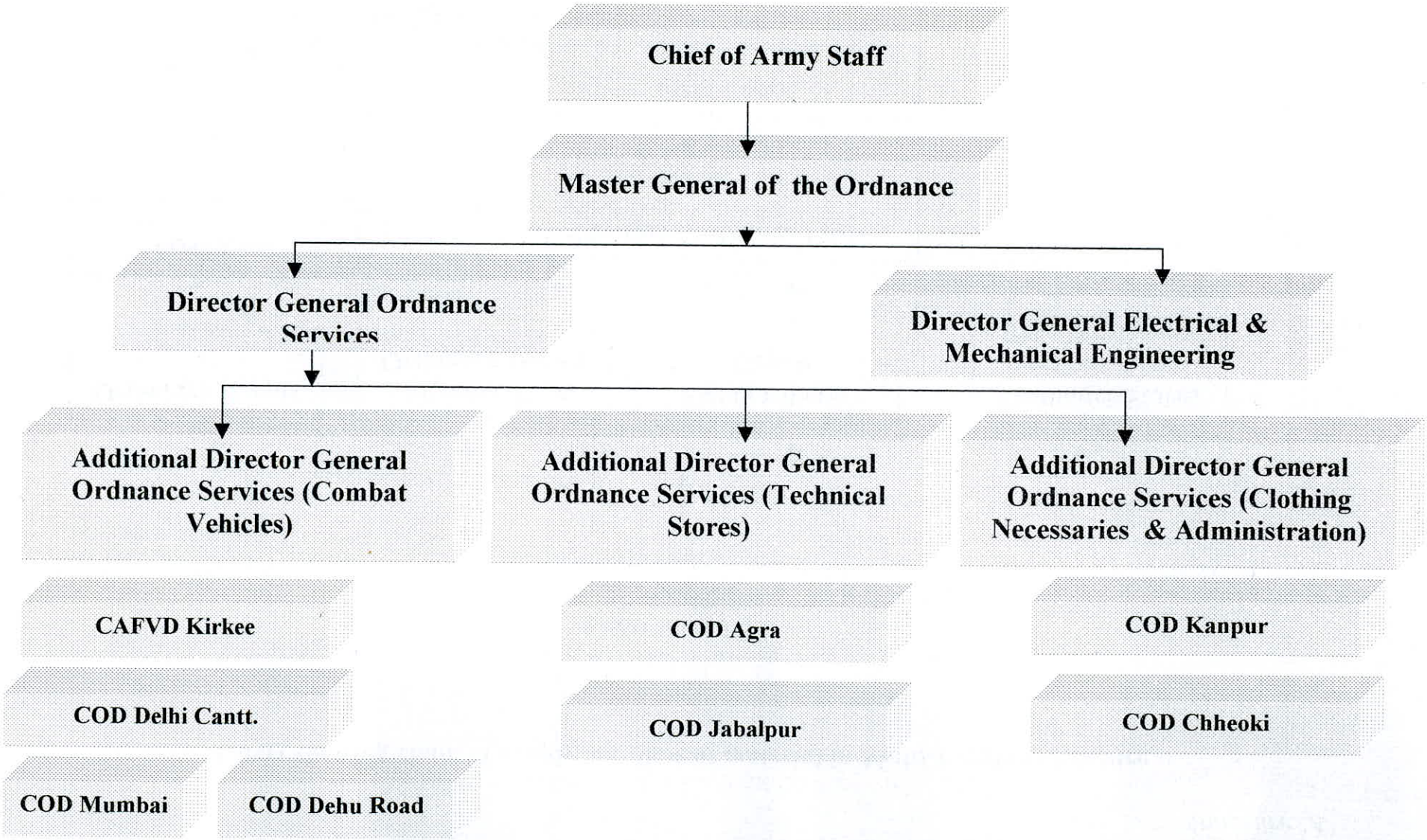
Annexure 'A'

Chart showing chain of supply and flow of material in Multi-Echelon structure



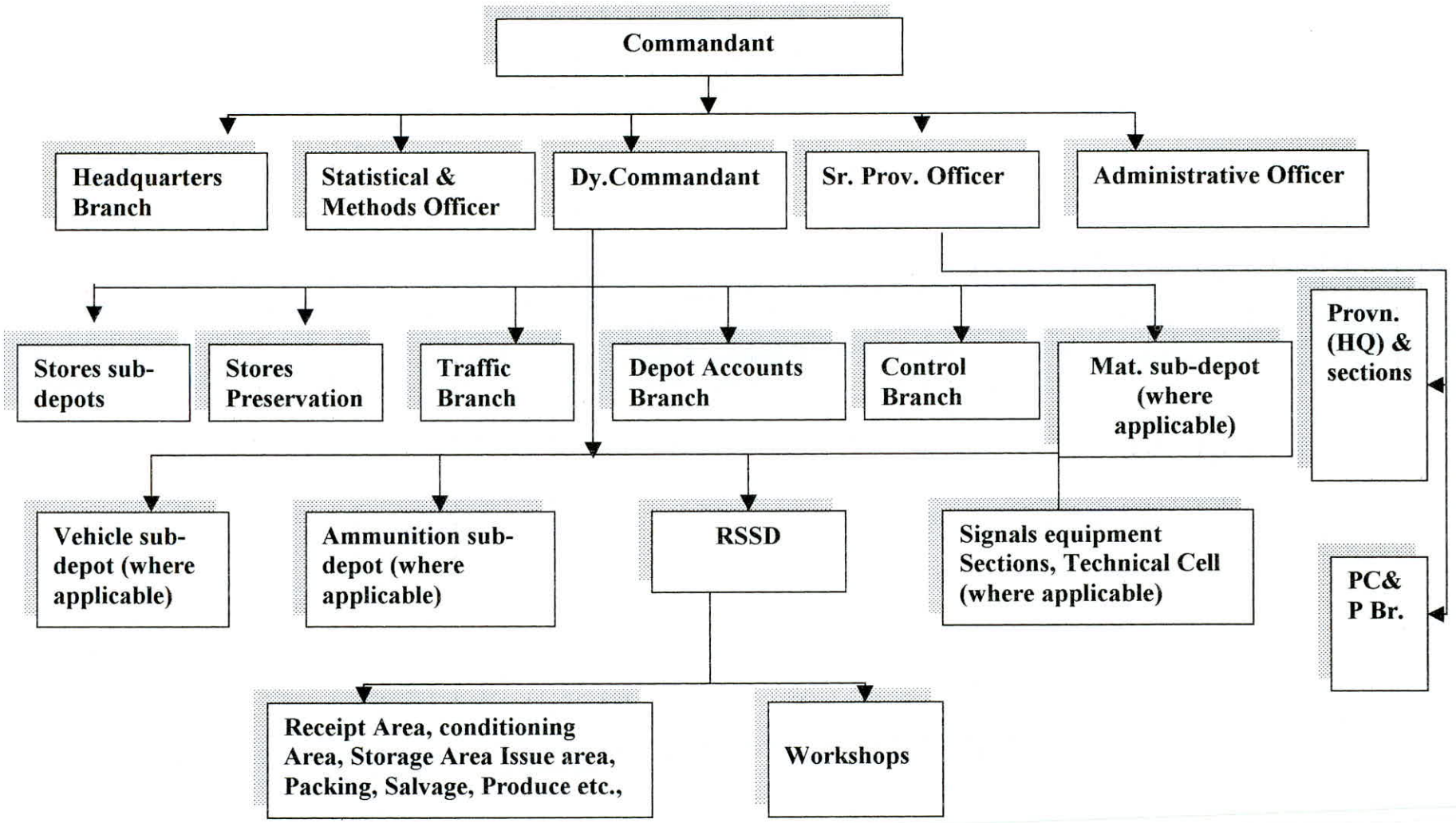
Annexure 'B'

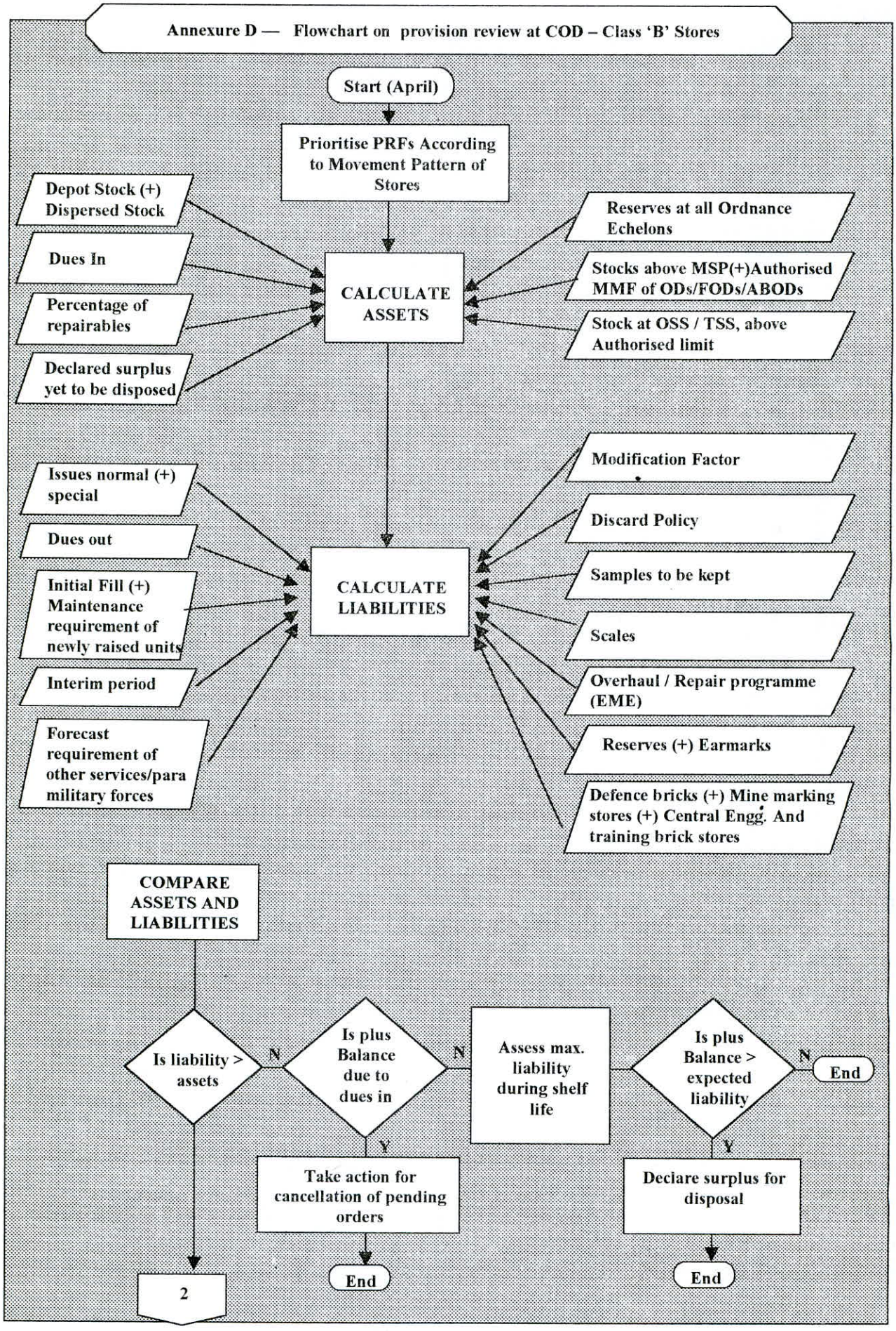
Organisational Chart of Ordnance at Army HQ

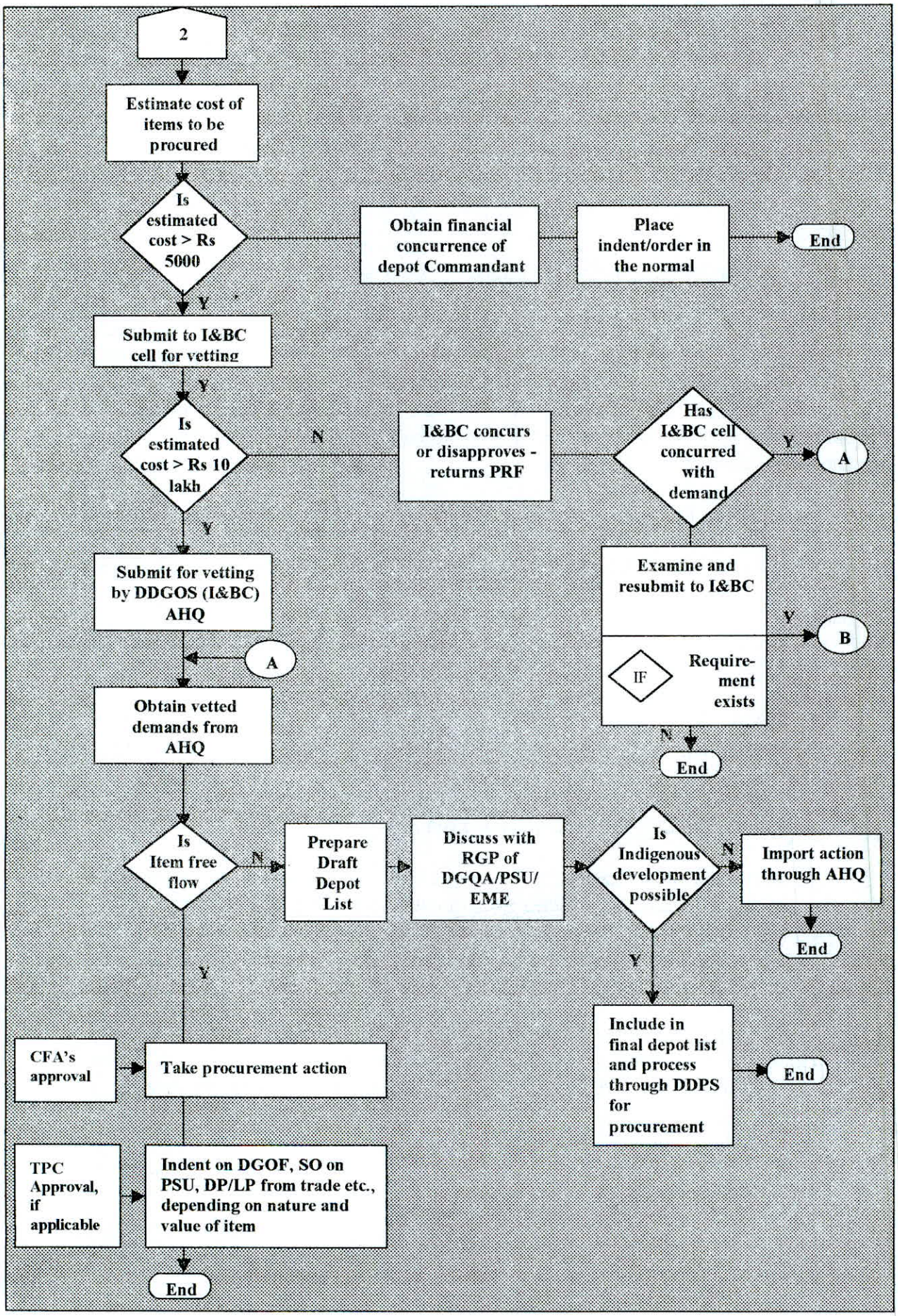


Annexure 'C'

Organisational Chart of a Central Ordnance Depot




Annexure D — Flowchart on provision review at COD – Class 'B' Stores
Start (April)
Prioritise PRFs According to Movement Pattern of Stores
Depot Stock (+) Dispersed Stock
Dues In
Percentage of repairables
Declared surplus yet to be disposed
CALCULATE ASSETS
Reserves at all Ordnance Echelons
Stocks above MSP(+)Authorised MMF of ODs/FODs/ABODs
Stock at OSS / TSS, above Authorised limit
Issues normal (+) special
Dues out
Initial Fill (+) Maintenance requirement of newly raised units
Interim period
Forecast requirement of other services/para military forces
CALCULATE LIABILITIES
Modification Factor
Discard Policy
Samples to be kept
Scales
Overhaul / Repair programme (EME)
Reserves (+) Earmarks
Defence bricks (+) Mine marking stores (+) Central Engg. And training brick stores
COMPARE ASSETS AND LIABILITIES
Is liability > assets
N
Is plus Balance due to dues in
N
Assess max. liability during shelf life
Is plus Balance > expected liability
N
End
Y
Take action for cancellation of pending orders
End
Y
Declare surplus for disposal
End
2


2
Estimate cost of items to be procured
Is estimated cost > Rs 5000
Y
Obtain financial concurrence of depot Commandant
Place indent/order in the normal
End
Submit to I&BC cell for vetting
Y
Is estimated cost > Rs 10 lakh
N
I&BC concurs or disapproves - returns PRF
Has I&BC cell concurred with demand
Y
A
Y
Submit for vetting by DDGOS (I&BC) AHQ
A
Obtain vetted demands from AHQ
Examine and resubmit to I&BC
Y
B
IF
Require-ment exists
N
End
Is Item free flow
N
Prepare Draft Depot List
Discuss with RGP of DGQA/PSU/ EME
Is Indigenous development possible
N
Import action through AHQ
End
Y
Include in final depot list and process through DDPS for procurement
End
CFA's approval
Take procurement action
TPC Approval, if applicable
Indent on DGOF, SO on PSU, DP/LP from trade etc., depending on nature and value of item
End

Annexure 'E'

Illustration on over provisioning due to inflated modification factor at COD Delhi Cantt.

i) Overhaul of old engines (Nissan) repair

For the years 1999-2000, the programme for overhaul of Nissan Engines was fixed as 3800 Nos. as per SPRD issued under Army Headquarters DGOS Br letter No.22268/Prov. Rev Dir/05-4B dt.22.04.99 as per Appendix 'A' thereto. The stock of engines held in engine pool assembly was only 537 Nos., leaving a deficiency of 3263 engines. As a result of this, 3263 vehicles would be off-road pending overhaul of their engines under the overhaul programme.

Consequently, the vehicle population of Nissan category would get reduced by 3263 Nos. The total vehicle population of Nissan 1 Ton/Jonga/W/vehicle is 26941 (16880 +7440 + 2621). Accordingly, the revised modification factor would be as below;

	As per PRF	Revised Mod. Factor
Veh. 2000	31532 = 1.00	26941 = 0.862
98-99	31256	31256

The reduced liability in respect of few selected items of study alone works out to Rs.33.64 lakh.

ii) Maintenance liability for newly inducted vehicles.

a) The SPRD issued by the DGOS Br/Army HQrs. for 1999-2000, other than East European vehicles, of Class 'B' vehicles issued under letter No.22268/prov. rev Dir/05-4B dt.22.04.99 showed that the maintenance liability of Shaktiman 414 LIAR with HENO engine as 6500 Nos. (Lorry 3 Ton 4x4 9S-PRF No 045), whereas, as per Unit holding it was only 5783 Nos. i.e. an excess of 717 vehicles.

b) A total population of 24912 nos. of Shaktiman 415 LIAR was adopted by the depot for the provision review as on 01.04.99 which includeed the figure of 6500 Nos. reference to in para (a) above, whereas this should have been 24195 Nos. (24912-717).

c) Similarly, in respect of Maruti Gypsy vehicles 410 / 413 the maintenance liability and Unit Holding for the years 1998-99 and 1999-2000 were as under;-

Model	1999-2000		1998-99	
	Maintenance. Liability.	Unit Holding	Maintenance. Liability.	Unit Holding
MG-410	3216	3216	(2730+2)	2700+2)
MG-413	1735	400	400	400
Total	4951	3616	3132	3102

Accordingly, the revised modification factors would be as given below;

Vehicle	*As shown in PRF*	*To be worked as per Unit holding*	*Difference in Mod. Factor*
Shaktiman	24912 = 0.88 28102	24195 = 0.80 28102	+ 0.08
Maruti Gypsy	4951 = 1.58 3132	3616 = 1.165 3102	+ 0.415

The consequent additional liability worked out was examined by selecting few items, which were taken up for provisioning by the depot as on 01.04.99. The additional liability resulted in over provisioning of store in respect of 7 items of Shaktiman costing Rs. 33.26 lakh and 11 items of Maruti Gypsy costing Rs. 34.66 lakh.

****

Annexure 'F'

SELECTIVE INVENTORY CONTROL CONCEPT

The "Pareto Principle", in simple terms states that a few activities in a group of activities or a few items in a group of items made, purchased, sold or stored, account for the larger part of the resources used or gained. This characteristic, which is also referred to as the 80:20 principle is exhibited by most inventories and can be usefully utilised to focus management effort and attention on such items as are expensive, fast moving, vital or difficult to obtain.

Several variations of this basic technique are available and can be applied for segmentation of inventories for differential treatment.

The most commonly used variant, called the ABC analysis, based on the criteria of funds usage is described below:-

The ABC analysis, uses this principle to divide inventories into three classes according to funds usage.

A items, which represent about 10% of the total inventory range but account for almost 70% of the usage value, call for a tight control system. Order quantities and order points are carefully determined. Close attention is paid to record accuracy. Variables are reviewed each time an order is placed.

B items, which constitute about 20% of the total inventory range and account for 20% of the annual usage value, require normal controls. Variables can be reviewed periodically.

C items are the remaining 70% of the inventory which involve only about 10% of the usage value. Relatively loose controls and less frequent reviews suffice in their case.

Other variants of this technique are the Vital, Essential and Desirable (VED), a classification based on criticality and Fast, Slow and Non Moving (FSN) items where there movement pattern determines their classification. These classifications can be used either individually or in combination with each other.

Inventory control systems

There are two major variables in an inventory control system. They are the order quantity & the frequency of ordering. The **perpetual review system** holds the order size constant & lets the frequency of ordering fluctuate according to demand requirement. The **periodic review system** holds the frequency of ordering constant by establishing a fixed order period & let the order size fluctuate according to demand requirement.

Perpetual Review System

- The stock position is monitored after each transaction (or continuously).
- When the stock position drops to the Re-order Point, a fixed quantity 'Q' is ordered.
- Excellent for high cost items needing close attention.

Advantages

- An efficient, meaningful order size.
- Safety stock needed only for the lead-time period.
- Less attention for slow moving items.
- Relatively insensitive to forecast and parameters change.

Disadvantages

- Requires perpetual auditing of inventory in stock.
- Prevents the economics, which result from the amalgamation of several items from one supplier into one order.

Periodic Review System

- The stock position is reviewed at fixed intervals.
- An amount equal to a target inventory T minus the stock position is ordered after each review.
- The periodic system is well suited for inventory control when there is one central supplier and items are expensive.
- Compared to the perpetual system;

1. it does not have reorder point but rather a target inventory.
2. it does not have an Economic Order Quantity, since the quantity varies according to demand.
3. the order interval is fixed, not the order quantity.

Advantages

- Multiple items can be ordered from the same supplier and delivered in the same shipment.

- Less record keeping due to scheduled replenishment.

Disadvantages

- Requires safety stock for protection against demand fluctuations during both the review period and the lead-time.
- This results in a larger safety stock as compared to the perpetual system.

Annexure 'G'

Percentage of demand bearing items to the total PRFs held by the depots during 1994-99

Year	COD Agra			COD Delhi Cantt			COD Jabalpur			COD Kanpur			CAFVD Kirkee		
	Total PRFs held (TPH)	Demand bearing items (DBI)	Percent (P)	TPH	DBI	P	TPH	DBI	P	TPH	DBI	P	TPH	DBI	P
1994-95	180227	12340	6.85	73798	NA	NA	46599	3073	6.59	7397	676	9.14	71395	7057	9.88
1995-96	181389	11709	6.46	73798	6869	9.3	45846	5433	11.85	7341	630	8.58	68149	11905	17.47
1996-97	186703	17968	9.62	75602	4117	5.4	47498	5392	11.35	7338	632	8.61	67084	12072	18
1997-98	181809	18478	10.16	85030	3734	4.4	47291	5111	10.81	7321	661	9.03	65729	8341	12.70
1998-99	166980	12355	7.4	79507	3537	4.4	48000	6785	14.14	7207	659	9.14	65729	6408	9.7

(Source: DGOS Statistical summaries)

Annexure 'H'

Stock verification details of the depots during 1994-99

Year	COD Agra			COD Delhi Cantt			COD Jabalpur			COD Kanpur			CAFVD Kirkee		
	Total items (TI)	Items Verified (IV)	Discre-pancies (D)	TI	IV	D	TI	IV	D	TI	IV	D	TI	IV	D
1994-95	127310	127310	300	73798	73798	106	54910	54910	1221	5875	5875	6	44049	44049	264
1995-96	128953	128953	331	72126	72126	73	55177	55177	1847	5784	5784	24	44485	44485	108
1996-97	128727	128727	128	75602	75602	129	53238	51937	2048	5611	5611	206	46338	46338	Nil
1997-98	129093	129093	68	85030	85030	234	56488	56488	1159	5778	5778	112	47437	47437	13
1998-99	132171	132171	174	79507	79507	1026	58133	58133	2053	5893	5893	14	47835	47835	401

Annexure-'J'

Statement of repair arisings and repairables of stores held by RSSDs/MSSD

Name of the Depot	1994-95					1995-96					1996-97					1997-98					1998-99				
	Arisings	Included in Priority List	Repair ed	Percent w.r.t. Total holding	Percentage of repairs w.r.t. to Priority List	Arisings	Included in Priority List	Repair ed	Percent w.r.t. Total holding	Percentage of repairs w.r.t. to Priority List	Arisings	Included in Priority List	Repair ed	Percent w.r.t. Total holding	Percentage of repairs w.r.t. to Priority List	Arisings	Included in Priority List	Repair ed	Percent w.r.t. Total holding	Percentage of repairs w.r.t. to Priority List	Arisings	Include ed in Priority List	Repair ed	Percent w.r.t Total holding	Percentage of repairs w.r.t to Priority List
COD Delhi	3866.7	1462.3	81	2.09	5.54	4035.6	1723.5	90.3	2.24	5.24	4727.6	2402.9	56.8	1.2	2.36	5670.5	3368.7	453.4	7.99	13.46	5390.8	3089.5	181.8	3.37	57.88
CAFVD Kirkee	2068.3	291.26	32.1	1.55	11.0	2219.3	256.6	5.8	0.26	2.2	2277	238.6	22.3	0.98	9.3	2288.4	240.2	15.1	0.66	6.3	2381.3	131.9	55.2	2.32	41.8
COD Kanpur	509	193	42	8.25	21.76	519	198	25	4.81	12.63	328	123	100	30.4	81.3	179.8	78	14.9	8.2	19.1	152.5	84.8	29.6	19.4	34.9
COD Agra	1319	1318	374	28.35	28.38	1277	1276	277.23	21.71	21.73	1216	1215	268.37	22.07	22.09	535	534	88.76	16.59	16.62	495	495	209.9	422.4	42.24
COD Jabalpur	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	2.39	NA

(Source:-DGOS Statistical Summary)

Annexure 'K'

Stratification of Surplus Stores held by the depots

(Value in Rupees lakh)

Name of the Depot	Type of store	Sample size	Stock sufficiency for									
			Upto 10 years		10-50 years		50-100 years		Beyond 100 years		Indefinite period	
			No. of items (N)	Value (V)	N	V	N	V	N	V	N	V
COD Agra	**Radio sets**	63	8 (12%)	1.38	31(49%)	264.22	11	172.23	12	377.46	1	0.25
	Radar	16	11 (69%)	41.12	4 (2.5%)	22.02	1 (6%)	0.16	-	-	-	-
	Signal equipment	13	4 (31%)	0.19	5 (38%)	0.18	4 (31%)	0.97	-	-	-	-
Average												
COD Delhi Cantt.	**MT Stores**	201	25 (13%)	39.85	51 (25%)	291.67	21 (10%)	161.59	74 (37%)	338.58	30 (15%)	181.31
COD Jabalpur	**Artillery**	21	-	-	-	-	-	-	21 (100%)	36.02	-	-
	Small arms	13	-	-	1 (8%)	0.97	-	-	12 (92%)	45.39	-	-
Average												
CAFVD Kirkee	**Tank 'A'**	54	-	-	18 (33%)	85.62	13 (24%)	43.37	19 (35%)	72.15	4 (8%)	123.29
	BMP	50	-	-	-	-	-	-	-	-	50 (100%)	59.00
	Tank 'B'	6	-	-	-	-	2 (33%)	4.2	3 (50%)	6.82	1 (17%)	1.47
Total		**437**	**48**	**82.35**	**110**	**664.68**	**52**	**382.52**	**141**	**876.42**	**86**	**365.32**

Annexure 'L'

Surplus stores disposed off and pending for disposal

(Value : Rs Lakhs)

Year	Depots											
	COD Agra			COD Delhi Cantt.			COD Kanpur			CAFVD Kirkee		
	Disposed		Tonnage held for disposal	Disposed		Tonnage held for disposal	Disposed		Tonnage held for disposal	Disposed		Tonnage held for disposal
	Tonnage	Value		Tonnage	Value		Tonnage	Value		Tonnage	Value	
1994-95	'Nil'	'Nil'	1000.3	1881.0	172.6	29.6	200.0	21.1	267.0	NA	NA	1968.0
1995-96	841.0	149.1	851.5	614.0	65.35	987.0	161.0	35.9	334.0	NA	NA	2022.3
1996-97	852.0	167.3	177.6	1256.0	584.4	613.0	226.0	54.0	281.0	NA	NA	1961.4
1997-98	706.0	191.0	680.2	NIL	NIL	596.0	323.0	26.8	403.0	NA	NA	1930.2
1998-99	1245.0	198.3	555.7	NIL	NIL	738.0	78.0	16.6	393.0	149.0	32.0	1096.5
	3644	**705.7**		**3751**	**822.25**		**988**	**154.4**		**149**	**32**	

(Source: DGOS Statistical Summaries)

Summary for the period 1994-1999

Depot	Disposed		Tonnage held for Disposal
	Tonnage	Value	
COD Agra	3644	705.7	555.7
COD Delhi Cantt	3751	822.25	738.0
COD Kanpur	988	154.4	393.0
CAFVD Kirkee	149	32	1096.5
Total	**8532**	**1714.35**	**2783.2**

Annexure 'M'

Extracts of Paragraph No. 6 of Report of the Comptroller and Auditor General of India Union Government (Defence Services) Army Base Workshops (No. 14 of 1992) for the year ended March 1991.

6. Target vis-à-vis output

6.1 Every workshop receives programmes from the TGEME regarding number of vehicles (both 'A' and 'B'), equipment, engines, armament, guns, to be repaired/overhauled and body building/fabrication over a planned period of 3-5 years indicating the targets to be achieved during the initial year of the programme. The programmes for the first year is firmed up and fixed whereas targets for subsequent years are in the nature of planned and forecast figures to enable advance planning for provision of necessary maintenance/overhaul spares etc. Based on these programmes, each workshop calls for repairables from the feeding bodies. The system provides for the Ordnance Stores Section attached to the workshops to arrange the stores from the CODs. The workshops also resort to local purchase of material, where necessary, on the basis of non-availability certificate rendered by the CODs. **The current year programme is therefore, updated with reference to availability of all inputs since a four year lead time is envisaged for fixing up all requirements. This is assisted by the Ordnance Procedure which lays down mandatory stocking programme for stores. The output is the product of yard sticks for each activity formulated by the EME and approved by Government and the number of units overhauled/repaired/fabricated.**

6.2 The targets, vis-à-vis, output are illustrated below:-

T=Target, O=Output, S=Shortfall

Name of the Army Base Workshop	Nature of equipment	1987-88			1988-89			1989-90			1990-91		
		Target	Output	Short-fall	Target	Output	Short-fall	Target	Output	Short-fall	Target	Output	Short-fall
'A'	'A' Vehicle O/H	91	62	29	80	84	-	90	53	37	80	11	69
	'A' Vehicle engine O/H	406	402	4	450	338	112	355	246	109	485	135	350
	'B' Vehicle engine O/H	250	257	-	300	278	22	513	385	128	510	436	74

Annexure 'N'

Extracts of Paragraph No. 19 of Report of the Comptroller and Auditor General of India Union Government (Defence Services) Army and Ordnance Factories (No. 7 of 2000) for the year ended March 1999.

Infantry Combat Vehicles (BMP) having improved fighting capabilities, mobility and protection against nuclear radiation was introduced in the Army in 1977. Majority of the fleet of BMP-I was imported during 1981-85. An improved version of the BMP vehicle known as BMP-II was introduced into service in 1986. While 24 *per cent* of BMP-II fleet was imported during 1986-90, 76 *per cent* was manufactured indigenously between 1988-99.

Overhaul facilities sanctioned in 1986 were put on hold in 1988 due to reduced induction rate and shifting of first overhaul to 12th instead of 8th year. Ministry issued fresh sanction after six years in 1994 for establishing overhaul facilities at an existing workshop by March 1998. The overhaul facilities were yet to be fully established, even after 15 to 19 years of the induction of the BMP-I vehicle in service.