

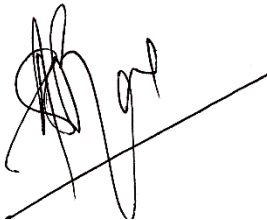
PREFACE

Materials Management Dept. has prepared and published a document/manual titled as **REFERENCE DOCUMENTS AND POLICY GUIDELINES FOR AIRCRAFT DIVISION.**

This document was circulated to MMD users as a basic tool for procurement, preservation and distribution of aircraft spares/materials in MMD and to serve the purpose of one consolidated document for Aircraft Division.

Though this document was issued as a General Guideline document, it is felt necessary that the same should be issued as an official Aircraft Division Manual document under MMAO reference no 690 so that it can serve as an official guideline for all concerned for exercising official duties pertaining to Aircraft Division.

The policies, process and guidelines are subject to changes/ amended from time to time to keep pace with the latest trends, changes in systems and process, mandatory regulations/ directives and instructions.

A handwritten signature in black ink, appearing to be 'A.S. Rane', written over a diagonal line that extends from the bottom left towards the middle right of the signature area.

A.S.Rane
GM (In-charge) - MM

25th Feb 2011

Note: *This document is not a supplement to any of QC manuals but only for internal use and reference by MMD personnel for carrying out their routine duties and assignments.*

Materials
Management
Department

REFERENCE DOCUMENTS AND POLICY GUIDELINES



24/09/2007

Procurement, Receipt and Bond, Storehouses and storage for Aircraft Material and Spares

Aircraft Division

Aircraft Spares Procurement Section

Aircraft Receipt and Bond Warehouse

Aircraft Stores

PREFACE

This document is prepared and published with a view to communicate to the MMD users of the document a basic and reliable information regarding procurements, preservation and distribution of aircraft spares / materials in Air India Materials Management Deptt and to serve the purposes of one consolidated reference document for Aircraft Division.

The very object of the document is to use it as an effective tool to bring about the consistency in process and operations thereby impart and enhance the efficiency of the division and improve the quality of services

The purpose of this document is thus to assist and provide guidance on the procurements, storage & preservation and distribution of aircraft parts and materials. This document also covers most of the relevant policies, practices and guidelines as applicable to the Aircraft Div of MMD.

The policies, process and guidelines are subject to changes / amended from time to time to keep pace with latest trends, changes in systems and process, mandatory regulations / directives and instructions.

Anil Sondhi

GENERAL MANAGER –MM

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Note: This document is not a supplement to any of QC manuals but only for internal use and reference by MMD personnel for carrying out their routine duties and assignments

Reference Documents and Policy Guidelines

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REFERENCE DOCUMENT & POLICY GUIDELINES - I

Aircraft Spares Procurement Section

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Aircraft Division Manual
Materials Management Department

1 - INTRODUCTION

Air India is the national flag carrier of India with a worldwide network of passenger and cargo services and also having in-house maintenance, repair and overhaul capabilities to support its present fleet of owned and leased aircrafts.

Air India's Department of Engineering has obtained the coveted ISO-9002 Certification for its engineering facilities for maintenance of its fleet of Aircrafts and family of Engines and APU's - also included are such services provided at other operators and customers

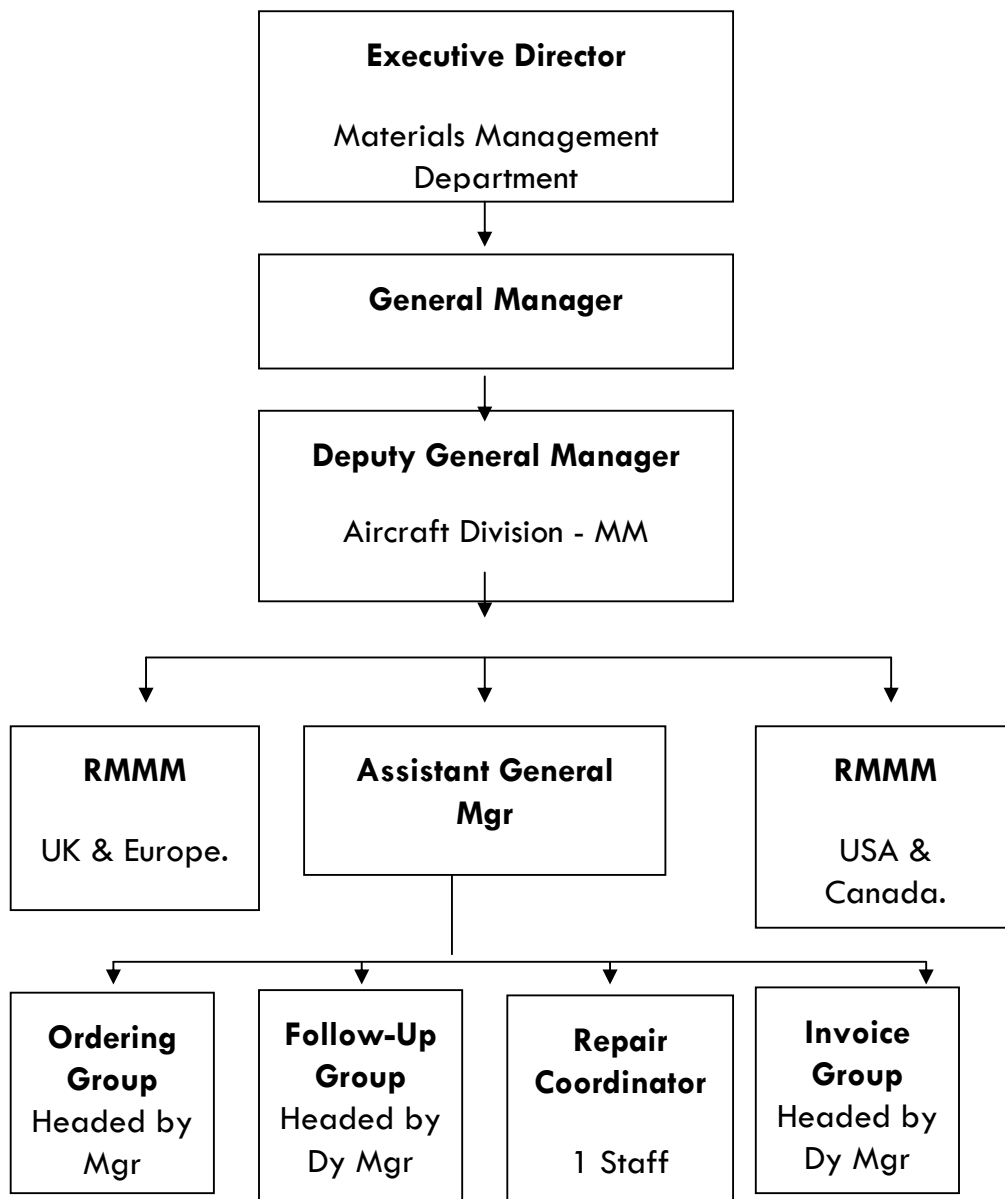
The crucial function of procurement of spares, components and related materials required for the maintenance of Air India's entire fleet of aircrafts and Customer Engines is performed by the Aircraft Spares Procurement Group of Materials Management Department in close coordination with Materials Planning Division of Engineering Department, Regional Offices of MMD at New York and London, Cargo Offices and Freight Forwarder's at various On-line Stations, Finance Department and large spectrum of Vendors from all over the world.

The primary objective of Aircraft Spares Procurement Group is to procure the right quality of aircraft spares, components and related materials at the right time at the right price from right and approved sources - Original Equipment Manufacturers, Authorized Distributors and Surplus Sources duly approved by regulatory agencies such as FAA, EASA, DGCA, etc. as per the laid down Company procedures.

The Aircraft Spares Procurement Group is fully e-enabled and uses a real-time on-line ERP System called Maxi-Merlin implemented in 1998. The other IT resources used extensively are the Spec-2000 ATA Aviation Marketplace and EDI System, Vendor's and Freight Forwarder's Web Portals and SPEED Portal developed in-house by the IT Department.

2 - DIVISIONAL STRUCTURE OF AIRCRAFT PROCUREMENT SECTION.

The overview of aircraft purchase division structure, its position in the MM Department and organization hierarchy and brief on activities of aircraft purchase section and duties and responsibilities of Staff and Officials are as below –



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3 - DUTIES & RESPONSIBILITIES

The broad job functions / responsibilities of various personnel in aircraft spares procurement section are as below –

3.1. Divisional Head (Deputy General Manager)

- 3.1.1. Direct and supervise the functions of reporting officers in aircraft spares purchase section and CRABS, performance review and appraisal of the reporting officers.
- 3.1.2. Assist the Departmental Head on policy matters and effective functioning of the aircraft spares purchase section. As a member of the Provisioning Committee, participate in the periodic meetings for effective budgetary control.
- 3.1.3. Review the progress of the Sections, and conduct inter-departmental coordination meetings with Engineering, Finance and IT Department for constant improvements in communication and efficiency.
- 3.1.4. Approve orders as per the financial limits.
- 3.1.5. Undertake vendor development, vendor evaluation and rating.
- 3.1.6. Approve claims and entitlements of personnel as per Company Policy.
- 3.1.7. Formalize the guidelines for divisional policies and procedures.
- 3.1.8. Represent Departmental Head on various projects involving capital procurement and execute administrative policies and functions.
- 3.1.9. Liaison and interaction with Government / Regulating and Professional bodies.
- 3.1.10. Any other job / project assigned by Management.

3.2. Sectional Heads (Senior Manager / Assistant General Manager)

- 3.2.1. Supervise and oversee the day to day functioning of the Section and guide the team effectively. Assist the management in devising policy programs and guidelines for the section and department and implementation of same through sectional team.

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- 3.2.2. Approve orders falling in their financial limits.
- 3.2.3. Facilitate the training of their team.
- 3.2.4. Manpower planning, Job rotation within section and transfers to other sub groups.
- 3.2.5. Liaising and interacting with government agencies and other external agencies.
- 3.2.6. Participate in review meetings and implemented decisions.
- 3.2.7. Compilation of required reports for top management and to assist the management in budget preparation of the Section and periodic review of the same.
- 3.2.8. Approve the indents covering various requirements of the section.
- 3.2.9. Performance appraisals of all the personnel in the section.
- 3.2.10. Conducting other administrative and disciplinary functions in the Section.
- 3.2.11. Devise and implement steps to improve work environment, culture, system updates and coordinated team efforts for overall efficiency.
- 3.2.12. Liaison and interaction with Government / Regulating and Professional bodies.
- 3.2.13. Any other job / project assigned by Management.

3.3. Deputy Manager and Manager Levels

- 3.3.1. Supervise and guide the above team of Assistant Managers and Staff.
- 3.3.2. Review and release orders against urgent, AOG, critical requirements.
- 3.3.3. Review and approve the orders falling under their financial powers.
- 3.3.4. Facilitate general correspondence with Vendors on subject of supplies & queries regarding payments.
- 3.3.5. Review open purchase orders and close the same after due scrutiny of records.
- 3.3.6. Guide buyers on processing and settlement of DR's.
- 3.3.7. Facilitate the processing of invoices and settlement of advances in time.

- 3.3.8. Assist the Sectional heads in purchase of project related equipments, preparation of management reports and budgetary controls.
- 3.3.9. Participation in review meetings and deliberations in appropriate forums.
- 3.3.10. Interact with System Group in DIT regarding issues encountered in System and their timely resolution.
- 3.3.11. Obtain price catalogues from various vendors and update the System.
- 3.3.12. Assist Sectional and Divisional heads in administration and job allocation to staff.
- 3.3.13. Interact with clearing agencies for sea shipments and bulk supplies such as tires, lubricants, oils, chemicals, etc.
- 3.3.14. Assist Sectional and Divisional heads in vendor development, performance review, etc.
- 3.3.15. Any additional job allotted from time to time.

3.4. Staff & Assistant Manager

- 3.4.1. Receive and scrutinize the SAR's cleared by the Planners in the System and the Memo's received for TL-1/2/3 items.
- 3.4.2. Convert these SAR's and Memo's into Firm or Quote orders or send RFQ's to Vendors.
- 3.4.3. Receive the bids against RFQ's, update prices in System, tabulate comparative statements for multiple bids if applicable.
- 3.4.4. Transmit orders to Vendors electronically through System or SITA, Fax, E-mail, etc.
- 3.4.5. Attend training programmes on relevant subjects as and when conducted.
- 3.4.6. Follow-up of AOG, Critical, Routine and overdue orders with vendors.
- 3.4.7. Filing and maintenance of records.
- 3.4.8. Scrutinize and process the Discrepancies generated.
- 3.4.9. Any other job assigned.

4 - SECTIONAL PROFILE & OBJECTIVE OF AIRCRAFT SPARES PURCHASE SECTION

This Section works under the overall leadership of Executive Director /GM–MMD and direct leadership of Deputy General Manager – Aircraft Spares Purchase and CRABS.

- 4.1 The Sectional Team consists of Assistant General Manager, Senior Manager, Deputy Managers, Assistant Managers and Staff.
- 4.2 The objective of Aircraft Spares Purchase Section is to procure aircraft spares and related materials for the maintenance of entire fleet of Air India and Air India Express and for third party engine maintenance in proper time and at best possible prices from sources approved by regulatory agencies like FAA, EASA and DGCA.
- 4.3 The procurements are need based and classified as Routine (RTN), Critical (CRI), Work Stoppage (WSP) and Aircraft-On-Ground (AOG). Whilst arranging to procure the spares and components, the section keeps continuous communications with various agencies such as the Planners in Material Planning Division of Engineering Department, Overseas purchase offices at New York and London, Cargo Agencies at various Airports, Finance Departments at Mumbai/New York/London and various Suppliers located all over the world.
- 4.4 To carry out the day-to-day work, aircraft spares purchase section has a flexible internal organization as below –
 - Ordering Group - To process purchase orders for supply of fresh material.
 - a) Follow-up Group - To review & expedite & track previously released orders.
 - b) Invoice Group - To process invoices of suppliers based outside USA.

5 - DEFINITIONS & TERMINOLOGY

5.1. Policy

A managerial statement about what will be done in support of the goals and objectives of the organization - often strategic in nature and broad in scope.

5.2. Procedure

An operational statement about how the objectives described in policies will be met. Usually detailed descriptions of specific activities and narrow in scope.

5.3. ABC Analysis

Classification of stocked items is in decreasing order of annual consumption value into three classes, namely A, B, and C. This classification estimates as follows.

- A-Class items comprise 10% of the total items held in inventory and account for 70% of annual consumption value.
- B-Class items comprise 20% of total items held in inventory and account for 20% of annual consumption value and
- C-Class items comprise 70% of the total items held in inventory and account for 10% of annual consumption value.

Thus, A-Class items constitute the highest annual consumption value and receive the maximum attention, B-Class items constitute the lesser annual consumption value and receive medium attention and C-Class items which constitutes a minimal annual consumption value receives the least attention. Typically,

The ABC principle is that effort saved through relaxed controls on low consumption value items which can be applied for effective control of high

consumption value items. ABC Analysis thus allows the prioritization of effort and is applicable to inventories, purchasing, sales, and all other managerial areas.

5.4. Account Code

It is a 6-Digit Code Number given to every CCN for accounting purpose which indicates the Aircraft Type, where the item is used and its tracking level.

5.5. Administrative Lead Time

The time interval between the initiation of a requisition and the placement of an order - this is also referred to as the Internal Lead Time.

5.6. Bar Code

A series of alternating bars and spaces printed or stamped on parts, containers, labels, or other media containing encoded information that can be read only by electronic readers. Bar Codes are used to facilitate timely and accurate input of data into computer systems and typical applications range from inventory control, handling, billing, etc.

5.7. Bill of Material (BOM)

A complete list of all the pieces parts necessary to make one of the described components.

5.8. Buyer

An individual whose functions include receiving indent, supplier selection, negotiation, order placement, contract finalization, follow-up, measurement and control of supplier performance, value analysis, evaluation of new

materials and processes, etc. A Buyer is designated for every CCN based on the prime FSC for every CCN.

5.9. Company Code Number (CCN)

It is a 7-Digit Company Code Number given by Engineering Department to every item created or held in Inventory.

5.10. Certificate of Compliance (COC)

The manufacturer's or supplier's certification stating that the supplies or services being provided meet the relevant specifications.

5.11. Change Order

A formal notification to a supplier that a previously placed purchase order or contract must be changed in some form. This can result from changes in terms such as price, quantity, delivery date, delivery point, specification, etc.

5.12. Components Maintenance Manual (CMM)

It is prepared by the Component Manufactures and list all the parts in the component and the procedure to be followed for its maintenance.

5.13. Consignee

The person or organization to whom a carrier is directed to deliver a shipment. Such person or organization is generally the Buyer or his organization to whom the goods are being shipped and is called as a "Consignee". In short, the inbound identified receiver of a shipment is a Consignee.

5.14. Consignment

The goods shipped by virtue of a sale or other purpose is called as a Consignment, with the title remaining with the consignor or transferring to the consigner depending on the incoterms indicated in the purchase order. The receiver (consignee), upon his acceptance, is accountable for the consigned goods although he or she does not pay for them until goods are received and invoice processed based on payment terms.

5.15. Consigner

The person or organization that delivers goods or freight to a carrier for shipment is called a 'consignor' or shipper.

5.16. Contract

A deliberate agreement, constituting an offer and an unconditional acceptance, between two or more competent persons to perform or not to perform a specific act or acts. A contract may be verbal or written. An offer, conveyed by a purchase order, when accepted by a supplier, becomes a contract. Similarly, a supplier's offer becomes a contract when accepted by the Buyer. Acceptance may be either in writing or by performance, unless the offer requires that acceptance be in writing.

5.17. Cycles Since New (CSN)

CSN refers to "cycles since new" and relates to the number of takeoffs and landings of the aircraft. One takeoff and one landing constitute one cycle though the aircraft may have flown for 10/12 hours.

5.18. Discount

An allowance or deduction granted by the seller to the Buyer that reduces the price of goods purchased. Such reductions are typically associated with reduced costs to the seller doing business. Quantity and volume discounts that reflect either production or handling economies of scale or full utilization of transport equipment are examples.

5.19. Distributor

A firm that buys products from manufacturers in large quantities and then sells them to customers in smaller lots is called a Distributor. The distributor usually maintains inventories of finished goods and offers goods and services for the products being sold.

5.20. Economic Order Quantity (EOQ)

Economic Order Quantity is a model that defines the optimal quantity to order that minimizes the total variable costs required to order and hold inventory. EOQ is that purchase quantity which represents the lowest total of the combination of inventory carrying cost and ordering cost. In other words, it is that purchase quantity when ordering costs and inventory carrying costs are equal.

5.21. Electronic Data Interchange (EDI)

It is a set of standards for structuring information that is to be electronically exchanged between and within businesses, buyers, sellers, organizations, government entities and other groups. The standards describe the structures that emulate documents, for example purchase orders to automate purchasing. EDI facilitates computers to communicate with other computers and is extensively used in the aviation industry. Typically, computers of Buyer and seller are directly linked through EDI to exchange information about orders, acknowledgement, delivery dates, shipping information, etc.

5.22. Expediting

The process of hurrying with orders that are needed in less than normal lead time or are overdue is called expediting. It involves checking on important orders to determine their status and progress, interacting with Suppliers and other related agencies, etc.

5.23. Expendables

These are items / spares for which normally the repair cost is not economical and the items are subject to one time use. These can be 100% replacement items such as packing seals, gaskets, etc, or condition replacement items such as bearings, springs, housing, inserts bushings, etc, or hardware items such as nuts, bolts, screws, etc, or raw materials and consumables such as chemicals, compounds, paints, adhesives, fabric, etc.

5.24. Ex-works (EXW)

It is an Incoterm which means that the seller has the goods ready for collection at his premises (works, factory, warehouse, plant, etc) on the date agreed upon. The buyer bears all transportation costs and also bears the risk for bringing the goods to their final destination.

5.25. Factory New (FN)

FN refers to “factory new” and the procurement of factory new part is associated with original certification / documents of the manufacturer.

5.26. Federal Supplier Code (FSC)

This is also called as the Cage Code and is defined as the vendor code or the supplier code. It is called the federal supply code because the majority of the codes used are codes that the federal governments have assigned to

suppliers. FSC with 5 digits beginning with a number is generally a US based Vendor. FSC with 5 digits beginning with alphabet is generally a non-US based Vendor. Repair vendors are also allocated by Air India for internal reference with alpha-numeric vendor codes as below for logical generation of repair order numbers as below –

Normally, US based repair vendors codes begin with numeric digit and end with a alpha digit 'R', whereas non-US based repair vendors codes begin with alpha digit 'R' and end with a numeric digit – only some exceptions.

5.27. Free on Board (FOB)

It is an Incoterm commonly used when shipping goods to indicate who pays loading and transportation costs and to indicate the point at which the responsibility and ownership of the goods transfers from seller to buyer. Indicating "FOB" means that the seller pays for transportation of the goods from his facility to the port of shipment, plus loading costs. The buyer thereafter pays for freight, insurance, unloading costs and transportation from the port of destination to his facility. The passing of risks occurs when the goods pass the port of shipment. Thus the FOB point is usually the location where title of the goods passed from the seller to the Buyer.

5.28. Illustrated Parts Catalogue (IPC)

It is the complete parts catalogue prepared in accordance with ATA-100 specifications by the airframe manufacturers.

5.29. Insurance Items

The insurance items generally refers to the items which are held by an airline, operator, manufacturer purely as a precaution or safe guard against any serious delay should there be accidents or incidents or any other contingency, such as landing gears, wing tips, slide rafts, etc. These are normally very expensive items and are of strategic importance from geographical location vis-à-vis operating routes of the airlines.

5.30. Inventory

It is a listing of goods and materials held available in stock by a business. Inventory is held in order to protect a business from vagaries in supplies and to ease the effect of imperfections in the manufacturing process and supply chain logistics. The amount of goods on hand at any given time, or an itemized listing thereof is called Inventory. A 'physical inventory' is the one determined by actual physical count of the items. A 'book inventory' is one determined from records maintained in connection with day-to-day business activities.

5.31. Inventory Carrying Cost

The cost incurred for acquiring, transporting, handling, holding, and issuing inventories is called as inventory carrying cost. The largest element of inventory carrying cost is the interest component on the cost of money invested in holding inventory and other elements include manpower and labor costs, facility and building cost, material handling equipment cost and other variable costs such as electricity, taxes, insurance and inventory tracking costs.

5.32. Inventory Control

The set of activities and techniques utilized to maintain optimal inventories is called Inventory Control. Commonly used techniques are ABC, XYZ, FSN, VED analysis, etc.

5.33. Inventory Turnover

It is the number of times, on an average, that each item in inventory is issued and replaced during a year. A common way to compute inventory turnover is to divide the total annual consumption value of all inventory items by the current inventory value. For example, if total consumption value of inventory for the entire year were \$10 million and the value of the inventory, as determined by year-end count, were \$2 million, then the inventory turnover

would be five times. This means that, on average, each item in inventory would have been replaced five times during the year.

5.34. Invoice

It is the bill or a document showing the characteristics, specifications, quantity, price, terms, nature of delivery, and other particulars of goods sold or of services rendered.

5.35. Issue

The physical disbursement of an item from inventory is called an Issue.

5.36. Just-In-Time (JIT)

In a broad sense, it is an approach to achieving excellence in manufacturing based on the continuing elimination of waste (waste being considered to be anything that does not add value to the product).

In the narrow sense, it refers to the movement of material at the necessary place at the necessary time. The implication is that each operation is closely synchronized with the previous and subsequent ones to make that possible.

The benefits of implementation of JIT include the elimination of all unnecessary inventories. Other benefits include less space required (no inventory storage), faster throughput times, increased productivity, and lower costs.

5.37. Kit

It is a group of piece parts of a component or assembly that have been pulled from stock and packaged together for ease in shipping and handling and there-after its optimal usage. For examples - a group of gaskets

readied for a complete engine overhaul. The process of creating kits is called Kitting.

5.38. Lead Time (LT)

It is the span of time required to perform an activity. In our logistics context, it is the time between recognition of a need for a product or service and its receipt. Individual elements of lead time include - order preparation time, order transmittal time, queue time, manufacturing time, transportation time, receiving and inspection time. In other words, purchasing, manufacturing, transportation, receiving, and inspection are individual lead time activities.

5.39. Manufacturer's Part Number (MPN)

It is the part number consisting of alpha numeric characters given to every item manufactured by the manufacturer. It is basically a part number given to an item to uniquely identify it in a particular industry. Its purpose is to simplify referencing to that part. These MPN's are entered in System by Planners from Engineering Department along with corresponding FSC and also allotted with a CCN.

5.40. Materials Management

The grouping of all management functions to support the complete cycle of material flow, commencing from vendor selection to purchasing and transportation of materials to the warehousing and distribution of the finished product.

5.41. Maxi Merlin

It is the real-time on-line MRO System used to transact all items used on Air India and Air India Express fleet.

5.42. New Surplus (NS)

NS refers to “new surplus” which means items is in new condition but available with surplus sources. The certification that material is new along with all other appropriate / relevant documents is required.

5.43. Next Higher assembly (NHA)

NHA is the abbreviation for ‘next higher assembly’ and indicates the equipment part number for which a specific part is required to be procured / installed.

5.44. Ordering Cost

The cost incurred for placement of an order is called the ordering cost. The elements of ordering cost are facility and building cost, manpower and labor cost, communication cost, equipment cost, electricity, etc.

5.45. Original Equipment Manufacturer (OEM)

It is a term that refers to a situation in which one company purchases a manufactured product from another company and resells the product as its own, usually as a part of a larger product it sells. OEM is the company that originally manufactured the product.

5.46. Open Order

An order that has been placed with the supplier but that has not been completed or received is called an Open Order.

5.47. Overhauled Condition (OH)

OH refers to “Overhauled” item and requires certification from authorized signatory stating item is overhauled and should be accompanied with all relevant documents along with details of work performed during the overhaul and no incident confirmation, etc.

5.48. Packing Slip/List

It is the document supplied by the shipper or supplier that itemizes details of contents of a particular package or shipment. Details typically include item description, part number, and quantity for each item in the shipment.

5.49. Payment Terms

They are the terms under which the Buyer will pay the Seller for goods or services supplied. The various payment terms is used are cash-in-advance, cash-on-delivery, Nett-30days, etc.

5.50. Planner

This is the Engineering Person designated for every CCN.

5.51. Physical Inventory

It is the process of determining the actual inventory held by physically counting every item held in the inventory. Physical inventories can be taken on a continuous, periodic or annual basis as per the company policy based on the class of the item.

5.52. Provisioning Committee (PC)

An apex body called the Provisioning Committee, headed by Director Engineering and comprising of senior level representatives from Engineering, Materials Management and Finance Departments, oversees the commitment vis-à-vis the Budgeted figures and also ratifies the procurement done on a periodic basis. An Annual Budget for Procurement of Aircraft Spares is finalized for every year by Engineering and Finance Departments.

5.53. Purchase Order (PO)

A purchase order is a commercial document issued by a Buyer to a Seller indicating the item, quantity and agreed price for product or service that the seller will provide to the buyer. Sending a PO to a supplier constitutes a legal offer to buy a product or service. Acceptance of a PO by a seller usually forms a once-off Contract between the buyer and seller, so no contract exists until the PO is accepted and acknowledged by the seller.

The PO also specifies additional conditions such as terms of payment, incoterms for liability and freight responsibility, required delivery date, delivery point, etc.

5.54. Purchase Requisition

It is an internal form of communication used to convey to the Purchasing Department a need for products or services.

5.55. Quantity Discount

It is the price reduction allowed by the seller in recognition of the lower per unit cost of service for larger orders compared to smaller ones.

5.56. Quotation

It is a bid or a statement of price, terms of sale, and description of goods or services offered by a supplier to a prospective purchaser. When given in response to an inquiry, a quotation often is considered as an offer to sell.

5.57. Recommended Spare Parts List (RSPL)

RSPL is the abbreviation for “recommended spares parts list” and is prepared by the Original Equipment Manufacturers indicating all the parts which are recommended for provisioning in order to support the operation and maintenance of a particular number of aircrafts in fleet.

5.58. Re-Order Point (ROP)

It is a pre-determined inventory level that triggers a stock replenishment request/indent. If the total of stock-on-hand plus qty-on-order plus safety-stock falls to or below that point, action is taken to replenish the inventory.

5.59. Repairables

These are spares that are economically repairable and can be continuously rehabilitated through a fully serviceable condition by authorized repair procedure over a period of time which is normally less than the life of aircraft or the engine to which it relates and have some economic value in serviceable or unserviceable condition until declared as no longer fit for operation / scrap.

5.60. Rotables

These are the spares having serial numbers for control purposes and are capable of replacement on aircraft or engine based on time between overhaul, etc. and have extensive life expectancy through continued

rehabilitation to fully serviceable condition which will under normal operative conditions / circumstances equal the life of aircraft or engine. Rotables are capitalized as depreciable assets.

5.61. Rush Order

It is an order that requires shipment in less than the supplier's normal lead time. An order that must be processed by the purchasing department outside of its chronological order of receipt.

5.62. Safety Stock

It is that quantity of inventory, above normal usage, that is kept as protection against uncertainty of demand and delays in supplies.

5.63. Scrap

It is the material that has no value except for its basic material content.

5.64. Serviceable Condition (SV)

SV refers to "serviceable condition" of the item and requires certification and relevant documentation as in case of overhauled condition items stating item as repaired / modified / functionally tested / inspected, etc. or a combination of these with no incident confirmation.

5.65. Shelf-Life

It is the length of time an item may be held in inventory before it begins to deteriorate or becomes unusable.

5.66. Time Since New (TSN)

TSN refers to “time since new” for aircraft, engines and majority of rotables where overhauled life is specified and records are kept to calculate the total flown hours for the unit on an aircraft.

5.67. Tracking Level (TL)

It is the number given by Engineering Department to each CCN for identification, classification and tracking purpose. The four types of tracking levels are –

TL – 0	Consumable Items.
TL – 1	Non-Serialized Expendables / Repairables.
TL – 2	Generic Serialized Rotables.
TL – 3	Location Specific Serialized Rotables.

5.68. Unit Of Measure (UOM)

It is the unit in which the quantity of an item is expressed. For examples – each, kilograms, meters, barrels, dozens, pounds, gallons, feet, etc.

5.69. Warranty

It is an undertaking, either expressed or implied, that a certain fact regarding the subject matter of a contract is presently true or will be true. The word should be distinguished from ‘guaranty,’ which means a contract or promise by one person to answer for the performance of another. The Uniform Commercial Code provides for warranties of merchantability, fitness for particular purpose, title, and express warranties.

6. A FEW MAXI-MERLIN DEFINITIONS AND TERMINOLOGY

6.1. Recommended Buy Quantity (RBQ)

It is the system recommended quantity to replenish the inventory of an expendable item at its Controlling or Stocking Location.

The RBQ is calculated as follows:

$$\begin{aligned} \text{RBQ} = & \text{Reorder Point (RP)} \\ & + \text{Economic Order Quantity (EOQ)} \\ & - \text{Balance On Hand at Location (BOH)} \\ & - \text{Quantities In Transit To Location (ITT)} \\ & - \text{Quantities Due on Purchase/Repair Orders to Location (OO)} \\ & + \text{Quantities Backordered From Location (BO)} \\ & + \text{Quantities Reserved From Location (RS)} \end{aligned}$$

The RBQ is reported on the SAR and is also displayed on the transaction MSPU as the Order Quantity. However, the RBQ seen on MSPU screen is real-time and current while that on the SAR is not as it does not reflect the changes that would have occurred since it was printed.

6.2. Stock Action Report (SAR)

Stock Action Report is generated in Maxi Merlin for every expendable T/L-0 Item. It is the alert that is generated by the system for every expendable item which is then cued to the Planner suggesting that action should be taken to replenish this item to the desired level.

SAR's are triggered during the daily and monthly batch programs (MSCS). The daily analyzes certain activity for SAR needs; the monthly also evaluates SAR needs since re-order points may have changed

The following are the SAR rules –

6.2.1 SAR applies to controlling & stocking locations for part numbers falling in T/L-0 and Class codes 0, 6 and 7 only.

6.2.2 SAR is not generated or printed if one already exists, even if the new reason differs from the old.

6.2.3 SAR types are -

- 1 = Special Request

- 2 = Expedite; safety level (BOH + ITT - BO - RS) < Safety Stock

- 3 = Reorder; reorder level (safety.level + OO) < Reorder Point

- 4 = Duplicate request

6.3. Economic Order Quantity (EOQ)

6.3.1 It is the calculated order quantity to optimize the total cost of a purchase.

6.3.2 Factors considered are the arbitrary cost of creating one P.O.

6.3.3 This may consider the budget cost of the Purchasing Department divided by the total P.O.'s created for a period, i.e. Ordering Cost.

6.3.4 Carrying Cost is the cost of storing the material, rentals, utilities, insurance, interest, etc.

In MERLIN the EOQ formula is –

The square root of below is the EOQ.

$$2 \times \text{Annual Usage} \times \text{Ordering Cost}$$

$$\text{Carrying Cost \%} \times \text{Unit Cost}$$

6.3.5 As delivered, the Ordering Cost is hard-coded @ 35.00 USD per Order.

As delivered the Carrying Cost Percentage is hard-coded at 30%.

6.3.6 If the EOQ is greater than a 12 months supply, then the EOQ is reduced to a 12 months supply to guard against obsolescence.

6.4. Re-order Point (RP)

It is a calculated stock level quantity at which the system will automatically generate a Stock Action Report (SAR) to start the replenishment process.

RP is re-calculated in the MSMTPLY batch job list. At this time it is stored in the Stock Record (MSSD) and is used as a baseline figure until the next MSMTPLY process. The program name is MS2223MU.

$$\text{RP} = \text{Safety Stock} + (\text{Old-forecast} * \text{Monthly.Lead.Time})$$

$$\text{Safety Stock} = \text{ABC.Mad} * \text{Old.Forecast.Mad} * (\text{Monthly.Lead.Time})$$

ABC.Mad is derived from the service level set for the ABC category & subcategory.

Old.Forecast.Mad is derived at month-end by comparing forecast & actual after adjusting for error variations using alpha factors.

On any given day when an inventory items Stock Level has been Adjusted, Issued or Transferred down to less than or equal to the RP, then a SAR is

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generated based on the RP provided in the last MSMTPLY. During the process of creating the SAR in the MSDAILY batch list, the RP is recalculated for reporting on the SAR, but does not update the monthly calculated figure. This is done in program MS2800RA.

For other / detailed transaction please refer to Mxi Merlin Guide.

7. ORDERING GROUP PROCESSES

The Ordering Group of aircraft spares is responsible for placement of orders for aircraft spares required for maintenance of the entire fleet in Air India and Air India Express.

The entire gamut of aircraft spares activities such as planning, indenting, ordering, receiving, issuing and accounting is handled through Maxi Merlin Enterprise Resource System, an On-line MRO and Materials Management System, implemented at Air India Old Airport in 1997-98. This resulted in total automation of all the aircraft spares activities and provided a single-point real-time visibility on all the events and transactions that take place in this area. It also reduced the internal lead-time immensely as the thrust is on imparting efficiency to the entire process through quick actions and decisions based on transparency and an improved online information support and MIS.

7.1. Budgeting

7.1.1 An approval is obtained by Engineering Department from the Board for a budget sanction for procurement of aircraft spares and related items required for the routine maintenance of aircrafts in fleet. This budget is generally of a revenue expenditure nature covering all tracking levels of items and only the TL-3 items procured are capitalized.

7.1.2 For capital items other than TL-3 items, a separate capital sanction budget is obtained by Engineering for projects such as special modifications and equipments or engines.

7.1.3 The budget obtained is categorized aircraft-wise, and within that it is categorized on the basis of airframe, engine, modification and repairs.

7.1.4 In case the actual commitment exceeds the budgeted sanction, fresh budget approval is obtained by Engineering Department. The Provisioning Committee regularly reviews the budgeted sanctions vis-à-vis the commitments made from time to time and takes corrective steps. The sanctioned budget amount is updated in Maxi-Merlin in Table-56 as per the account codes and the budget report is generated using the transaction MSBBSR.

7.2. Sourcing and Purchase Policy

The purchasing policy is to predominantly procure from OEM's or their Authorized Distributors and to some extent from FAA-AC-00-56 accredited Surplus Vendors based on approvals obtained from QC to mainly meet the requirements of Leased Aircrafts and Customer Engines.

For some of hardware items, raw materials, consumables, chemicals and compounds, where quantities involved are large and which are amenable for multiple sourcing through annual ordering concept and for selective surplus procurement, sourcing is done through Vendors identified by Engineering Department duly approved by their Quality Control.

7.3. Indenting

7.3.1 For all TL-0 items, Maxi Merlin Generates Stock Action Reports (SAR's) recommending the quantity to be ordered based on Reorder Point, Stock on hand, etc. The respective Planners from Engineering review such SAR's and then release them for Buyer action.

7.3.2 The Planner also has the discretion to amend the SAR quantity recommended for ordering and the respective.

7.3.3 For TL-1/2/3 items, respective Divisional Heads of Materials Planning Section of Engineering Department forward Manual Indents (Memo's) for such Items considering the Float, Scrappages, Stock on hand, Open Orders, etc.

7.3.4 The respective Buyer then releases orders to the respective Vendors.

7.4. Pricing Source

- 7.4.1 The catalogue prices of various items are obtained from Spec2000 Procurement Price Data in ATA-200 Format and are loaded in Maxi Merlin every year in the month of January. Price Tapes in soft form and printed catalogues from Vendors are also referred to obtain the prices of items which are not available in Mai-Merlin.
- 7.4.2 Additionally, On-line access to Spec2000 Price Data Website and Vendors Websites and Portals has also been provided to all Buyers to obtain the prices of various items.
- 7.4.3 In absence of all the above, manual RFQ's are sent by Buyers to Vendors to obtain price.
- 7.4.4 RFQ's may be sent by Spec2000, SITA messaging or E-mail and responses received through any of these modes are updated in the price file of Maxi-Merlin using MSUP before generation of orders. All Spec2000 quotes are automatically updated in price files.
- 7.4.5 Quotes are also obtained through regional offices on case to case basis if necessary.
- 7.4.6 If no quotes are available or are accompanied with queries such as Part number change, supercession, applicability or any other query for want of which a source selection is impeded, the case is referred to Engineering Department and the indent is kept in abeyance or deleted from the system if not resolved in time.

7.5. Generation and release of purchase orders

- 7.5.1 The source selection is normally based on vendor status, whether OEM or Distributors or accredited surplus source and criticality of use, priority, price, lead time and availability.
- 7.5.2 Upon source selection, RFQ response and completion of price updates in Maxi-Merlin, the Buyer creates a purchase order in the system which can be of two types – Firm and Quote orders. Minimum Order Quantity and Value are to be taken into consideration.
- 7.5.3 Firm Orders are those that are released directly to Vendors and Quote Orders are those that are released to New York or London Offices for quick actioning locally.

- 7.5.4 The firm Orders are of two types – Spec Orders and Non-Spec orders.
- 7.5.5 Spec orders are those that are released to Vendors through Spec2000 EDI messaging platform which is configured for S1BOOKED/S1ORDEXC/ S1SHIPPED messaging.
- 7.5.6 Non-Spec orders are those that are released to Vendors through SITA, Fax or E-mail mediums.
- 7.5.7 The Spec2000 and SITA messaging systems are directly integrated into Maxi Merlin and as such all these orders get transmitted to Vendors instantaneously.
- 7.5.8 Purchase orders are created by Buyers from MMD and every purchase order has a 7-digit alpha-numeric number. The first two alpha digits being KU or HU for orders on USA based Vendors and KE or HE for orders on all other Vendors.

The next 4 numeric digits are as follows –

0001 to 0444 – Quote Orders on RMMM – New York / London.

4445 to 7777 – Spec Orders on Spec2000 Vendors.

7778 to 9999 – Non-Spec Orders on Non-Spec Vendors.

The last numeric digit is 1 to 9 as line item of that purchase orders, i.e. maximum 9 line items per order per vendor.

- 7.5.9 Purchase orders are created in System through MSBR-BUY transaction for the selected SAR and system will generate purchase orders for quantity equal to or less than the RBQ. For increased quantities purchase orders have to be created using MSPU transaction with APO option.
- 7.5.10 The purchase orders so generated are released through Spec-2000, SITA telex, Fax or by E-mail to the respective Vendors.

The financial limits for approving of purchase orders and as provided in System in Table108 and Natural Security are as follows –

Designation	Financial Powers in USD or equivalent Currency.
Buyer (Staff Category)	100
Assistant Manager	1000
Deputy Manager	2500
Manager	5000
Senior Manager	10000
Assistant General Manager	25000
Deputy General Manager	100000
General Manager	500000
Executive Director	Over 500000

7.5.11 For non-system orders, a separate block series (AZ) is utilized by Engineering and which is issued from time to time towards procurement for special AOG requirements, No-CCN items, FOC Orders, special projects orders, etc.

7.5.12 Sometimes, dummy PO's have to be created in System to regularize the receipt of items against AZ series orders released by Engineering or

to accept excess shipments or pending shipments of closed PO's. The dummy PO numbers are taken from the Quote PO block 0001 to 0444 block.

- 7.5.13 Repair orders are created in System by the Planners of Engineering Department and have a prefix of RU for USA based Vendors and RE for all other Vendors.
- 7.5.14 Presently, no financial authorization limits are prescribed for repair orders created by Engineering Department as repair charge and selected agency are as per repair contract for engine items or as finalized at initial stage for airframe items by respective Shops or Planners in Engineering during the evaluation of the unit before sending it out for repair.
- 7.5.15 Repair orders are created by Engineering Department for TL-1/2/3 Items based on inputs from various Shops and monitored by Engineering Department themselves. Items are then sent to Vendors through Dispatch Section of MMD.
- 7.5.16 Repair quotes are also approved by Engineering Dept and after repairs, items are returned to Mumbai.
- 7.5.17 For the Engines Group – a long term contract usually for a period of 2 years is finalized with various repair agencies by a Committee comprising of representatives from Engine Overhaul, Materials Planning, Materials Management and Finance Departments for selected items with defined work-scopes. Repair orders are then created in System by Materials Planning Section attached to Engine Overhaul Division based on the contracted repair agencies directory.

7.6. Acknowledgement of Purchase Orders

- 7.6.1 Purchase orders are acknowledged by Vendors through Spec-2000, SITA telex, Fax or through E-mail.
- 7.6.2 For all Spec-2000 orders, using the GPSPI transaction, orders acknowledgements (S1BOOKED) are automatically updated against the respective purchase orders on a daily basis. In case of variation in price, quantity or delivery, a formatted S1ORDEXC message is received through GPSPI and is handled by the respective Buyer for corrective action in consultation with Supervisory Buyers and respective Planners in Engineering Department. Other relevant information on

status of a PO, can also be updated in the MSOD screen of the purchase as remarks using transaction MSPORMKS. Besides, for all the Spec-2000 orders the status can also be viewed on expected ship date through transaction MSRSPE.

- 7.6.3 For all Non-Spec orders, orders acknowledgements have to be entered in System manually by the respective Buyers using MSPOACK transaction.
- 7.6.4 The acknowledgements of quote orders converted into confirmatory orders by the Regional Offices at New York and London are updated upon receipt in the system towards price, quantity using the MSPU-CPO and MSPOACK transactions.

7.7. Amendments and Cancellation of Purchase Order

- 7.7.1 Amendment and cancellation of purchase order, whenever required, are carried out using transaction MSPU and option CPO. The amendment or cancellation may be necessary due to change in part number, price, quantity, vendor change, etc. Fresh signatures and approvals have to be sought as per the revised PO value limits whilst amending orders.
- 7.7.2 Amendments to the quote orders are necessary to update the order price, quantity and Vendor as per the confirmatory orders released by New York and London Regional Offices. The confirmatory orders are released by New York Office through an internet based System developed by First-line Services which enables all the Buyers at Mumbai to see the further action on every quote order.

7.8. Deliveries, Supplies and Logistics

- 7.8.1 Normally, all orders are on Ex-works basis as per the international industry standard and deliveries are shipped to the nearest Air India online station with the exception of some repair cases where the terms are FOB Air India online station. Shipments are sent by air or surface transport by Vendor generally through agency nominated by Air India or through agency preferred by the vendor in some cases.

- 7.8.2 These shipments are received at the respective Air India Cargo Terminals who then forward these on our services as Company Material (COMAT) to Air India Mumbai under an Airway Bill.
- 7.8.3 As such COMAT shipments are normally subject to load basis, in case of urgencies or AOG situation, these have to be forwarded even at the cost of revenue.
- 7.8.4 A constant liaison needs to be maintained with Regional Office and Cargo Stations on status of priority shipments of aircraft items. The local Indian vendors also forward items up to the nearest Air India online cargo office in India for onward shipment to Air India base station at Mumbai.
- 7.8.5 All purchase orders and repair orders are shipped by Vendors using our UPS/FEDEX Freight Accounts or through our regular Freight Forwarders in their region to the nearest Air India Online Stations NYC/LAX/FRA/PAR/LHR/SIN/KUL/HKG/DXB/BKK/etc. from where these shipments are sent by respective Cargo Stations to Mumbai on our own passenger flights. Some consignments are also sent by Sea or Other Airlines/Operators directly to Mumbai, by suppliers, in case big in size, Hazmat, urgency, etc.
- 7.8.6 An Internet based On-line Ragini Portal is maintained at JFK to monitor the receipt of all shipments at JFK and thereafter their movement from JFK to Mumbai. Shipments are also tracked on Air India Cargo's Website as well as on other airlines websites.
- 7.8.7 In case of capacity constraints during urgency or AOG situation, direct shipments are also requested through other carriers from the Vendor or Cargo Station to Air India Mumbai. Such Cargo Arrival notices when received in Aircraft Purchase Section are quickly forwarded to Air-Unit for collection of the item.
- 7.8.8 The aircraft spares and tools are covered for any transit loss and damage under the annual insurance policy obtained by the Insurance Section of Finance Department.

7.8.9 For aircraft spares, the qualifying amount for the loss or damage is presently minimum USD 10000 per claim and only the amount in excess of USD 10000 is claimable through insurance. For loss of items costing less than USD 10000 each, the same has to be adjusted against self insurance and is written off.

7.8.10 All the insurance claims are processed through Insurance Section of Finance Department who then liaise with the Underwriters. Such claims are to be registered immediately on loss or incident coming to the notice and necessary tracer action to be initiated through concerned agencies.

7.9. Discrepancy Report Settlements (DR)

7.9.1 Items received against purchase orders in Aircraft Bond in MM System after Customs examination / classification are offered for inspection to Stores Inspection Group of Engineering QC for inspection and acceptance before processing a GRN.

7.9.2 If item is not fit for acceptance, for any of the reasons (13 reasons, refer Maxi-Merlin Document), and need further clarification or action from other groups, a Discrepancy Report is generated and queued to Planner or Buyer as per reason of the DR.

7.9.3 DR's are queued to the respective Buyers on account of –

- No Certificate of Compliance (COC) and
- Short-Shipment.

Based on reasons DR are also queued to other concerned in MMD /Engg.

7.9.4 A First Information Report for above discrepancy is prepared and referred to the Vendor or Regional Office by Aircraft Bond and a copy to the Purchase Division for follow-up and settlement.

7.9.5 The DR listing is constantly reviewed by the Buyers for above reasons as well as to liaise with DR section in Aircraft Bond and MPD for other reasons which are queued up to the Planner.

- 7.9.6 Assistance of Regional Office is sought if response from Vendor is not forthcoming or urgent action on DR settlement is required, particularly for want of COC.
- 7.9.7 Such No-COC DR's are settled on receipt of relevant documents and short-shipment DR's are settled upon replacement or credit. The short-shipment DR's of transit loss, etc. are to be adjusted by settling against self insurance or write off, etc. or register insurance claims wherever applicable.
- 7.9.8 For other DR's, if Planner has initiated / completed his part of action on DR, the said DR thereafter will get queued to the Buyer for further processing, acceptance and booking into the system as a formality.
- 7.9.9 Due to system limitations, if it is not possible to settle the DR in the system for any reason, and item is found suitable for use (requisition) or offered to the Shop under IRO, such DR's are manually settled with the help of DIT Group.
- 7.9.10 At such time when the items are required to be returned to the vendor, normally an MRA is obtained and items are returned to vendor for examination, replacement or credit as the case may be.

The transactions for DR processing and settlement are BSDRDAI, BSDRPAI. etc.

8 - FOLLOW-UP GROUP & REPAIR GROUP PROCESSES

Follow-up is mainly done in the following two methods –

- 8.1 Routine follow-up of overdue orders on periodic basis to obtain supplies or to cancel such overdue orders and release another order on a new supplier.
- 8.2 Expediting on case-to-case basis against work-stoppage/critical/AOG messages received from Engineering on a daily basis.
- 8.3 This group conducts their work with a team comprising of two Deputy Managers and three staff with the assistance of Ordering Group whenever necessary. The relevant data is obtained from the SPEED

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Portal developed by IT Department wherein data from Maxi-Merlin is extracted every month-end. This Group interacts with Suppliers, Regional Offices and Foreign Cargo Stations, visit Vendor Portals and other Forwarders Portals to execute their job.

- 8.4 Follow-up is done in the manner explained below –
 - 8.4.1 Review the status of orders in the system.
 - 8.4.2 Check the status of orders for major vendors through their interactive website and track the shipments accordingly.
 - 8.4.3 If orders are overdue send follow-up or expedite message to vendor through Spec-2000 or SITA telex or E-mail.
 - 8.4.4 Seek assistance from Regional Offices for direct telephonic contact with vendor or local Cargo Office if necessary.
 - 8.4.5 If orders are already shipped by vendor, and are lying at Foreign Cargo Stations, send message for priority shipment.
 - 8.4.6 Interact with CRABS or Air-Unit (if items arrive through other carrier) for urgent collection and booking into system.
 - 8.4.7 Update the order with remarks using transaction MSPORMKS.
 - 8.4.8 For Un-resolved queries if any, interact with Buyer or Planner.
 - 8.4.9 The rotable and repairable items which cannot be repaired in our Shops are sent to external repair agencies known to Engineering Department in India or abroad.
 - 8.4.10 All repair items have a long lead-time and for each item being sent for repairs, a Defect Report is prepared in System by the concerned shop and repair orders are created in System by the Planners in Engineering Department. Often the repair cost is obtained from Vendor or negotiated by Engineering with Vendor. Follow-up of repair orders is done primarily by Engineering and supported by aircraft spares purchase section if required.

9 - INVOICE GROUP PROCESSES

- 9.1 Invoices of all Vendors based outside of USA are processed by this Group mainly through Maxi-Merlin using the transaction MSIV and to some extent through a stand alone Fox-Base System based on the proof of receipt at Mumbai or against proof of receipt at our On-line Stations. Payments are then remitted by wire transfers to respective Vendors by Mumbai Finance Department. This group comprises of one Deputy Manager from Finance Department and one Staff from MMD for assistance and they process the invoices of all Vendors based outside of USA and having currency USD/EUR/SGD/CHF.
- 9.2 Advance payments made to certain vendors are also monitored by this Group manually to ensure goods have been shipped and periodically reviewed by the Sr Officials (Advance payments are authorized only at level of DGM and above).
- 9.3 The invoices so certified by this Invoice Processing Group are authorized for payments and then forwarded to Finance at OAP , Santacruz, for effecting the payments to the vendors- mostly electronic remittances / wire transfers by them or paid through regional offices as directed./applicable.
- 9.4 Invoices of all UK based Vendors having currency as GBP are processed from MMD's London Office based on the proof of receipt at London Cargo Terminal. MMD's London office maintains a manual record of all shipments received at London and payments are remitted by cheques to respective vendors by London Finance Department.
- 9.5 Invoices of all US based Vendors are processed from MMD's New York Office based on the proof of receipt at JFK. An Internet based On-line Portal maintained at JFK to monitor the receipt of all shipments at JFK and thereafter their movement from JFK to Mumbai enables them to ascertain all shipments received at JFK and process vendors invoices in quick time. Payments are remitted by wire transfers to respective vendors by New York Finance Department.

10 - OTHER SECTIONAL ACTIVITIES

A Stenographer cum secretarial assistant maintains –

- 10.1 Various correspondence files of the section.
- 10.2 Indents for regular Office stationary and materials.
- 10.3 Receives and distributes incoming postal mail to concerned personnel in the Section.
- 10.4 Sends hard copies of purchase orders to Regional Offices.
- 10.5 Maintains a record of indents (Memo's) received for TL-1/2/3 items from Engineering Department.
- 10.6 Interacts with System Admin personnel in DIT for generation of Budget Reports, Inventory Reports, Purchase Orders, etc.
- 10.7 Assists Sectional Heads in preparing documents, statements, reports, etc.

11 - ACTIVITIES AT NEW YORK AND LONDON REGIONAL OFFICES

The Regional Offices at New York and London are headed by Regional Materials Managers and they execute their job with a team of 2 - 3 local staff. Briefly their responsibilities are – to convert quote orders to firm orders after ascertaining quotes locally and to procure items against these quote orders , process invoices of vendors in their respective regions, orders, interact with vendors for critical and AOG requirements, expedite dispatches through respective Cargo Stations and manage the logistics and supply chain for efficiency as also to monitor and track the COMAT /Repair orders and provide feedback to Mumbai when requested. They have been provided with a view access to Maxi-Merlin System.

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REFERENCE DOCUMENT & POLICY GUIDELINES - II

Aircraft Bond
&
'CRABS' Section

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Aircraft Division Manual
Materials Management Department

1. INTRODUCTION

To cater to day-to-day maintenance of our aircrafts, Air India imports aircraft spares, consumables, and temporarily storing them in our customs bonded warehouse and thereafter using them as spares/ consumables as “ships stores” in our foreign going aircrafts. Considering the nature of import & it’s ultimate utilization ,the Central Board of Excise & Customs had given Air India the permission vide their Order No 482/2/74-Cus dtd 14th July 1975 for establishment of a customs bonded aircraft spares Bonded Warehouse- the license was issued u/s 58 of customs act 1962

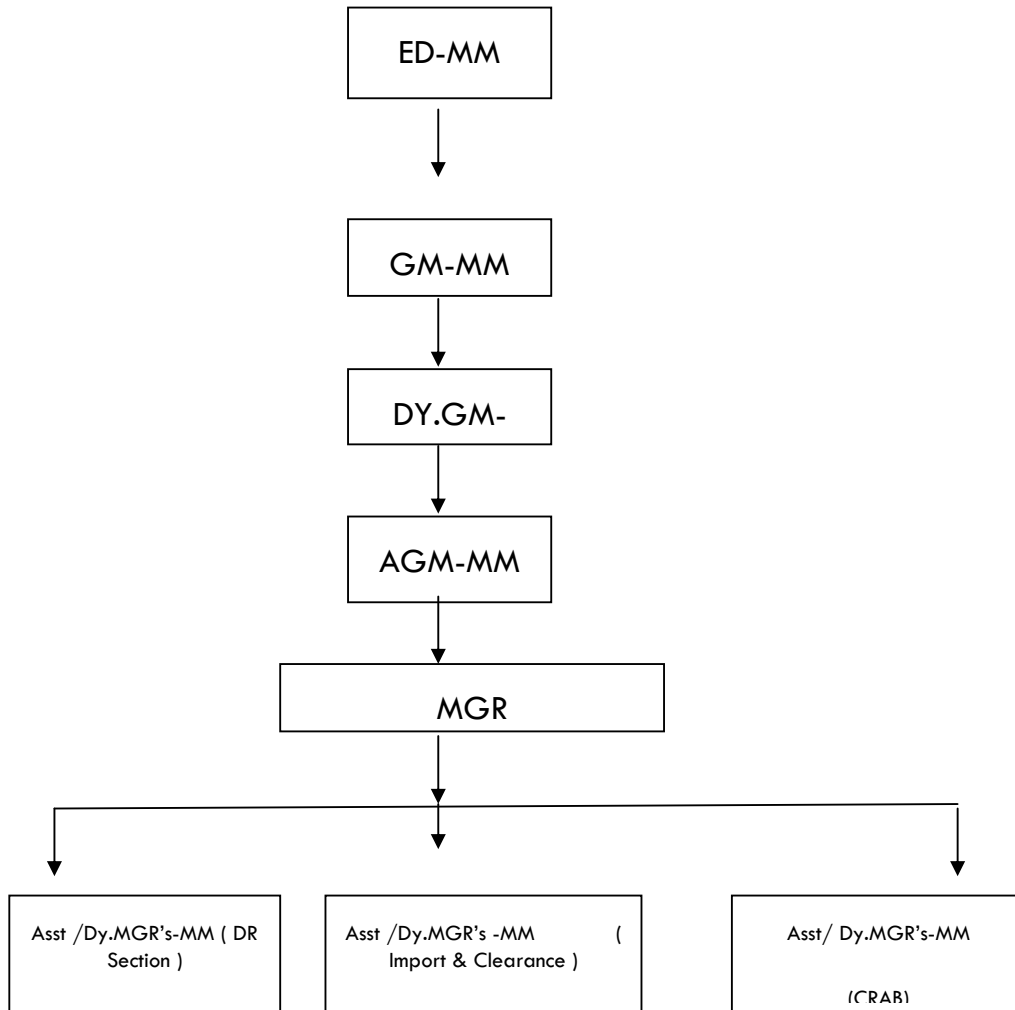
Since then, and with passage of time, various provisions of customs / Exim Policy / DGFT and other regulating bodies directives and our own business plans / requirements have necessitated and lead to the current process being adopted in the Aircraft Bond Section which performs the allied functions of collection / clearance / receipt / transit storage & warehousing for the inward and outward aircraft spares shipments.

With the liberalization and introduction open sky policy/ opening of aviation sector, the duty structure of Aircraft parts have undergone changes. Based on circumstances and merits of cases and consignments , Air India currently avail of both the Bond facility , as also clearance of material and parts for home consumption or against DFCEC Licences

The Aircraft Bond Section is fully e-enabled with online transactions/ filling of online Bill Of Entry with Customs, apply and processing the import and export and other duty benefit licences with DGFT as also to interact with its large cross section of global vendors and suppliers.

The process and transactions of Bond section are briefly covered in next few pages with relevant illustrative annex.

2. ORGANISATIONAL CHART – AIRCRAFT BOND SECTION



3. SECTIONAL PROFILE & FUNCTIONS

- 3.1 Entire Imports of aircraft spares /consumable by air are cleared through Customs by Aircraft Bond Stores. The various activities of customs clearance are shown in flow chart-1.
- 3.2 After clearance through customs other activities such as items classification in Maxi-Merlin system, inspection followed by GRN and dispatch of goods to various stores locations are shown in flow chart -2.
- 3.3 Everyday staff from Aircraft Bond stores visit ETV Cargo Arrival cell and collect import documents e.g. AWB/Invoice for the goods arriving through AI flights.
- 3.4 Air Clearing & Despatch unit receive cargo arrival notice CAN from other airlines for goods arriving through other airlines, make payment for DO/handling charges to agents of other airlines and collect import documents e.g. AWB/Invoice for the goods.
- 3.5 Import documents are segregated and feed data to Customs EDI system on-line as Bill of Entry for home consumption or warehouse depending upon mode of shipment /nature of items.
- 3.6 AI already having ACP status under Customs risk management system (RMS), mostly appraisalment of Bill of Entry done by the system, some times appraisalment of Bill of Entry done by group appraisers.
- 3.7 Bill of Entry number automatically generated by the system. Three types of Challans are printed from our office.
- 3.8 Challans where “No Examination of goods” are reflected. Documents are registered with customs shed Appraiser, Customs Examination Officer (EO) deputed by the shed Appraiser physically checks only Shipping Marks & Nos and give his report on Bill of Entry duplicate copy. Customs “Out of charge” obtained from the shed Appraiser.
- 3.9 Delivery challans are made at ETV cargo, obtain AI cargo official’s signature and bring goods to Aircraft Bond Stores at Old Airport.
- 3.10 Challans where “With Examination of goods order” are reflected. Docs are registered with customs shed Appraiser, Customs Examination Officer (EO) deputed by the shed Appraiser physically checks the goods inside boxes ,then check Shipping Marks & Nos and give his report on Bill of Entry duplicate copy.
- 3.11 Customs “Out of charge” obtained from the shed Appraiser.

- 3.12 Challans where Customs duty debited to DFCEC license, Appraisement of Bill of Entry carried out by appraiser at Customs license Section other formalities are completed, then documents are registered with customs shed Appraiser, Customs Examination Officer (EO) deputed by the shed Appraiser physically checks only Shipping Marks & Nos and give his report on Bill of Entry duplicate copy . Customs “Out of charge” obtained from the shed Appraiser.
- 3.13 Delivery challans are made at ETV cargo, obtain AI cargo official's signature and bring goods to Aircraft Bond stores at Old Airport.
- 3.14 Challans of ware house Bill of Entry. W/H Bill of Entry challan first registered with Bond Section bond details are fed in EDI and bond No is allotted, Appraisement of Bill of Entry carried out by Group appraiser other formalities are completed at bond section then documents are sent for registration at customs shed Appraiser's office, Customs Examination Officer (EO) deputed by the shed Appraiser physically checks the goods inside boxes, then check Shipping Marks & Nos and give his report on Bill of Entry duplicate copy. Customs “Out of charge” obtained from the shed Appraiser.
- 3.15 Delivery challans are made at ETV cargo, obtain AI cargo official's signature and bring goods to Aircraft Bond stores at Old Airport.
- 3.16 Goods thus collected are binned in proper locations with location No.
- 3.17 Collection details such as AWB, IGM, Flt No &Dt No of pkgs, weight are fed and goods are classified in maxi-merlin system.
- 3.18 AWBs are distributed among the CRABS staff according to last No 1, 2, 3...9 of each AWB. Face sheet is prepared against each AWB by individual staff. Delivery received by the staff at their individual rack as per last No of Q Note/AWB eg 1,2...9 and stock items separately at their individual rack/table, However in case of exigency, the pkgs may also be placed in the respective officer/store keeper's inspection table /rack for further inspection booking to various stores locations. Concerned staff again does binning in system due to change of LOC.
- 3.19 In case of any shortages of package/ box / items, an e-mail /fax are sent immediately by the concerned officer/staff to the respective vendor for their perusal &necessary action.
- 3.20 Unserviceable items received from outstations- Pkgs opened inspected by stores inspector and IRO tag generated through system.

- 3.21 Individual pkgs are opened, item quantity checked with invoice- Each Pkg/box opened on exam table/floor or lying at Out Entrance, quality checked with invoice & C.O.C certificate by the licensed QC Inspection Officials /inspectors posted in CRABS.
- 3.22 Set of COC & Invoice are made and Modification carried out in M&M system by the CRAB staff with regard to Pt No change, Qty variation etc.
- 3.23 Licensed QC Inspection official carryout BSIP in M&M system - BSIP transaction carried out in M&M system by licensed inspectors, Tag generated showing – LOC, description, MPN, CCN Qty, remarks and inspector's seal with license Number. If COC of imported goods/items are not matches with ordered specifications, Discrepancy Report (DR) raised.
- 3.24 GRN raised in M&M system by CRAB staff if COC of imported goods/items are exactly matches with ordered specifications.
- 3.25 Location wise Delivery Challans are made at ACB Stores and Consignments are moved to respective stores locations.
- 3.26 COC Xerox copy attached with Tag for T/L 1, 2, 3, IRO & DR.
- 3.27 System generates GRN and LOC No is written on all docs eg Tag[Inside and out side] for T/L 1,2,3 items, Invoices.
- 3.28 Stores inspector's signature taken on all Tags in case T/L 1,2,3 items.
- 3.29 Pkgs repacked keeping system generated Tag inside and hand written Tag out-side the box for ease of identification.
- 3.30 Stores Asst attached to each table remove items to delivery rack.
- 3.31 Delivery challan prepared for delivery of items to all 30 stores locations including 7 in NIPTC, IRO to shop and DR section.
- 3.32 For A/C Tyres, presently hand written Tags are prepared and sign of stores inspectors obtained, physical inspections are done by stores inspector- Existing stores Assts are utilized for cleaning of tires, attaching Tag to each Tyre.
- 3.33 Items issued on AOG basis – in case of an emergency even on holidays items are issued on AOG basis, on the basis of acceptance given by shift in charge or available licensed QC Inspection Officials.
- 3.34 Booking stock items – Mobile jet oil, Paint, thinner etc COC as well as its shelf life plays an important roll. After physical inspection, shelf life, Pt

No Batch No are manually stenciled on each container before sending these to respective stores locations.

- 3.35 Aircraft Bond warehouse has a Bond Section which deals with bond licensing, bond period monitoring and bond extensions as well as submit periodic statements to the Customs officials for compliance of formalities towards fulfillment of Bond procedures. This Bonded warehouse operates under the supervision of Customs Department where officers are posted on cost recovery basis and the normal period of bond warehousing is one year subject to shelf-life of the items or the extended bond periods thereof. The bond status / open bond/ bond extension reports are submitted on regular basis and licenses renewed every year.
- 3.36 If required, goods are cleared for home consumption under Section 68 of Customs Act, while bond to bond transfers are also made subject to fulfillment of conditions and the processes as mandated from time to time under Section 67 and re-export is completed under Section 69 of Customs Act.

4. PROCESS & TRANSACTIONS

4.1 Following Bond Transactions are generally carried out in Maxi Merlin system

	Transactions		to perform a particular job
i)	BSDCAI	-	Daily Collection
ii)	BSBINA I	-	Binning at Air unit
iii)	BSCLAI	-	Classification
iv)	BSFN54AI	-	FROM 54 PRINTING
v)	BSDEAI	-	Delivery challan to CRABS
vi)	BSBINA I	-	Binning at CRABS
vii)	BSGRNAI	-	GRN with 'M' Option

- viii) BSIPAI - Inspection
- xi) BSGRNAI - GRN with 'V' Option & 'T' for Print
- x) BSDEAI - Delivery challan to Stores

FOR SETTLEMENT OF DRs

- i) BSDRDAI : DR DISPLAY (PENDING DRs)
- ii) BSDRPAI : DR PROCESSING

IN CASE OF SHELF LIFE ITEMS, EXPIRY DETAILS TO BE ENTERED IN

“BSEXPAI” before “BSIPAI”

4.2 Flow of sequential activities in Aircraft Bond stores

4.2.1 DAILY COLLECTION OF CONSIGNMENTS FROM : MANUAL ACTIVITY

CARGO & STORE THEM IN WARE HOUSE

4.2.2 VERIFYING DOCUMENTS AND SPLIT : MANUAL ACTIVITY

CONSIGNMENTS IF REQD. TO FACILITATE

FASTER BOOKING OF CLEAR CASES

4.2.3 ENTER CONSIGNMENT DETAILS INTO SYSTEM : BSDCAI

4.2.4 ENTER BINNING DETAILS IN THE SYSTEM : BSBINAI

4.2.5 CLASSIFY THE ITEMS RECD IN THE CONSIGNMENT : BSCLAI

4.2.6 CUSTOMS EXAMINATION ON THE CONSIGNMENT :MANUAL
ACTIVITY

4.2.7 CUSTOMS DOC. PRINTING (FORM 54) :
BSFM54AI

4.2.8. CUSTOMS CLEARANCE ON FROM54 DOCUMENT : MANUAL ACTIVITY

4.2.9. PREPARE DELIVERY CHALLAN TO CRABS : BSDEAI

4.2.10. TRANSFER ITEMS FROM CUSTOMS WAREHOUSE: MANUAL ACTIVITY
TO CRABS

4.2.11. OPEN BOXES / PACKAGES AND BIN THE ITEMS : BSBINAI
AT CRABS.

4.2.12.VERIFY DOCUMENTS WITH ITEM DETAILS AND :MANUAL ACTIVITY
PACKING SLIPS.

4.2.13.MODIFY DATA IN THE SYSTEM WHEREVER REQD. :BSGRNAI (M)
AS PER THE ACTUAL RECEIPT.

4.2.14. OFFER THE ITEMS FOR INSPECTION. : MANUAL ACTIVITY

4.2.15. INSPECTION GROUP INSPECTING THE ITEMS : BSIPAI

4.2.16. ITEMS ARE ACCEPTED / QUARANTINED / SENT : BSIPAI
TO SHOP FOR VERIFICATION

4.2.17.ACCEPTED:

-GRN DOCUMENT IS PREPARED BY CRABS :BSGRNAI (P)

-DELIVERY CHALLAN IS PRINTED FOR THE ITEM : BSDEAI

-DESPATCH THE ITEM TO STORES BOOKING LOC: MANUAL ACTIVITY

- STORES RECEIVE THE ITEM & UPDATE IT IN : MSRU / MSBIN

4.2.18. QUARANTINED:

- DR IS QUEUED TO CONCERNED BUYER /PLANNER: BSDRDAI

- PLANNER / BUYER SETTLES THE DR

- DR SECTION PROCESS THE DR FURTHER AND : BSDRPAI

CLOSE DR

4.2.19. SENT TO SHOP:

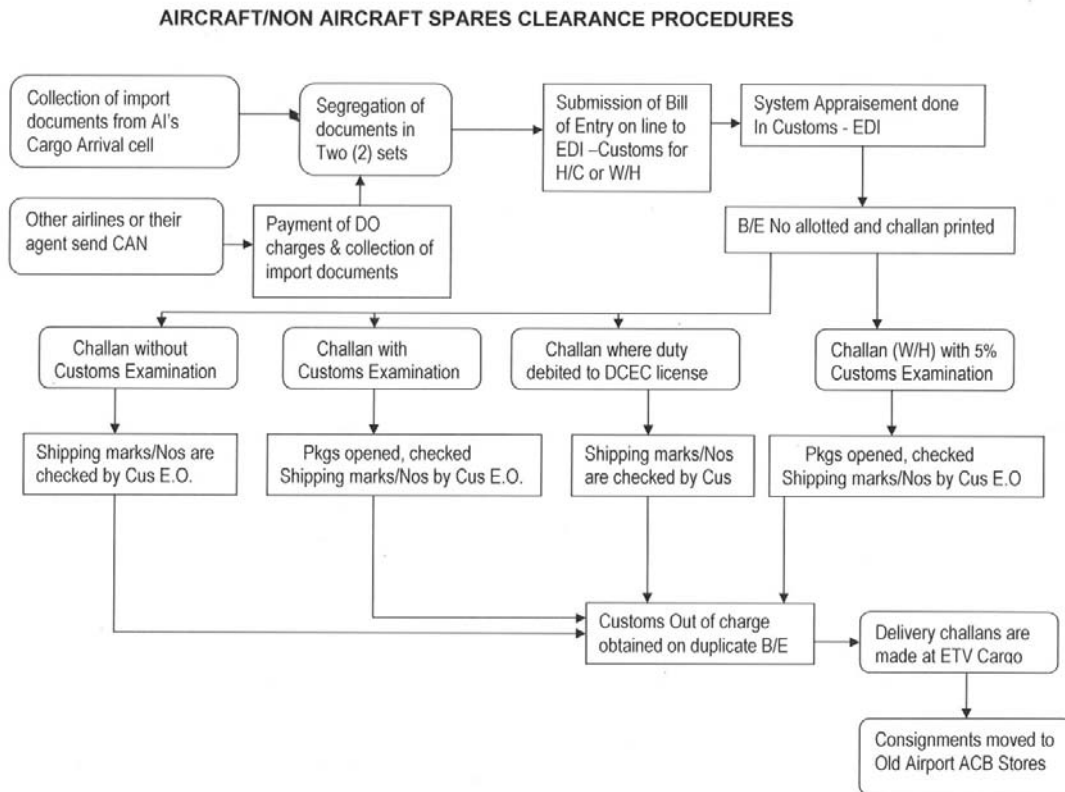
- SHOP WILL HANDLE THE ITEM AND SETTLE THE : BSDRPAI
IRO IN THE SYSTEM
- STORES INSPECTION GROUP WILL PROCESS THE : BSIPAI
ITEM FURTHER AND CONVERT IT INTO EITHER
GRN OR DR.

4.3 Discrepancy Report (DR): Reasons for DR

1. NO C.O.C. - Goods received without Certificate of Compliance
2. P/N CHANGE - Part No on item not matches with Order Part No
3. SHORT SHIPMENT - Actual quantity recd less than Invoice quantity
4. EXCESS QUANTITY - Some times quantity recd more than Invoice/ Order quantity
5. S/L EXPIRED - Consumable's shelf life found expired
6. DAMAGED RECEIPT - Goods received in damaged condition
7. EXCESS VALUE - Invoice value exceeds the value mentioned in PO
8. WRONG SHIPMENT - Entirely different item shipped
9. NO INDIVIDUAL PACKING -
10. LAST PRESSURE TEST - Applicable for pressure vessels.
11. NO INVOICE - Shipping Invoice not received.

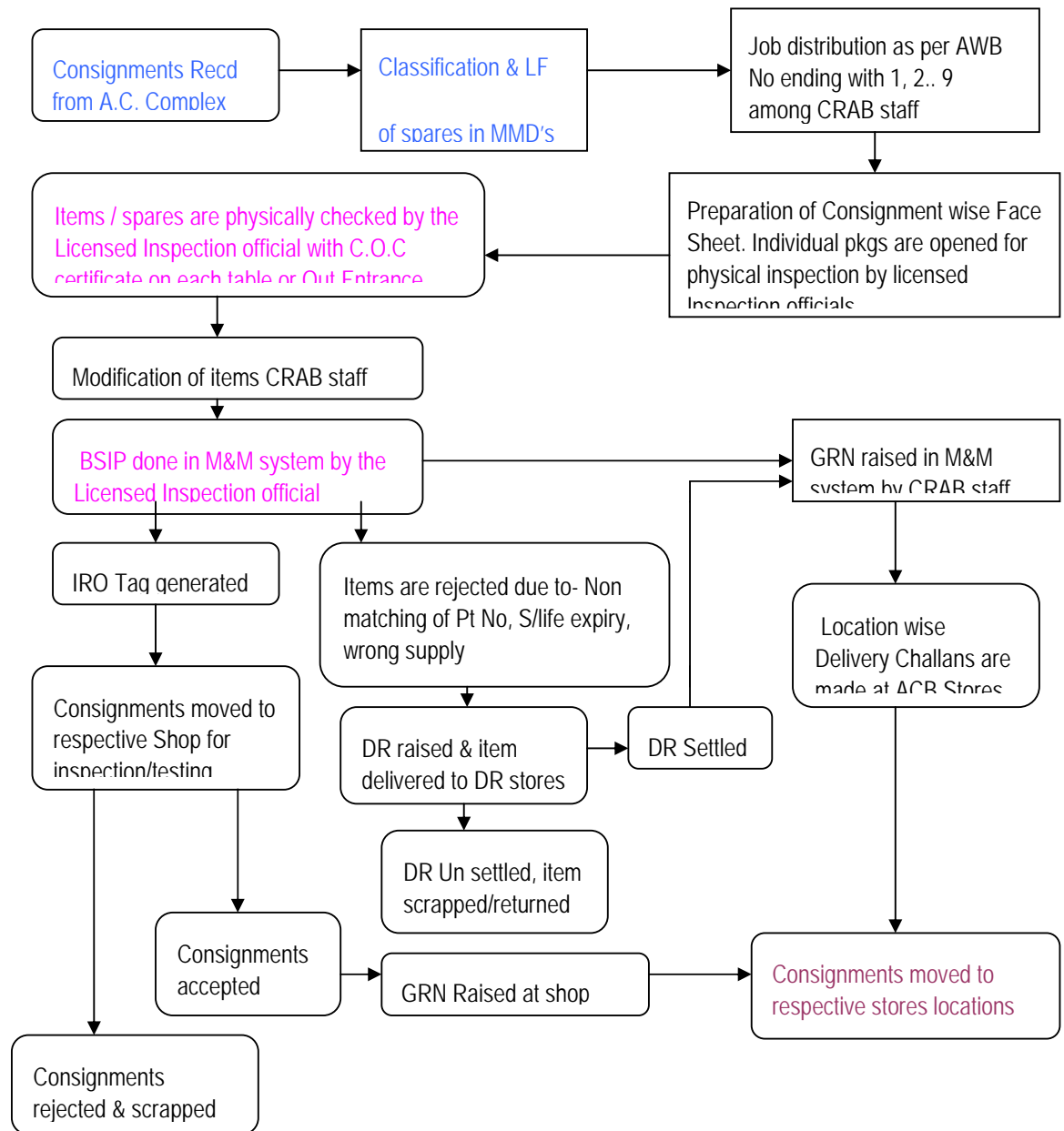
5. FUNCTION FLOW CHART

5.1. Flow Chart- 1



5.2. Flow Chart -2

AIRCRAFT SPARES CLASSIFICATION, INSPECTION & GRN PROCESS



REFERENCE DOCUMENT & POLICY GUIDELINES - III

**A/c Storehouses & Storage Procedures
for
Aircraft Spares & Materials**

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Aircraft Division Manual
Materials Management Department

1. INTRODUCTION

Air India aircraft storehouses have been accorded approval by the Director General Civil Aviation (DGCA) for storage and distribution of aircraft spare parts and materials. The approval has been given, on the conditions that Air India will comply with all the conditions of storage of aircraft spares and materials.

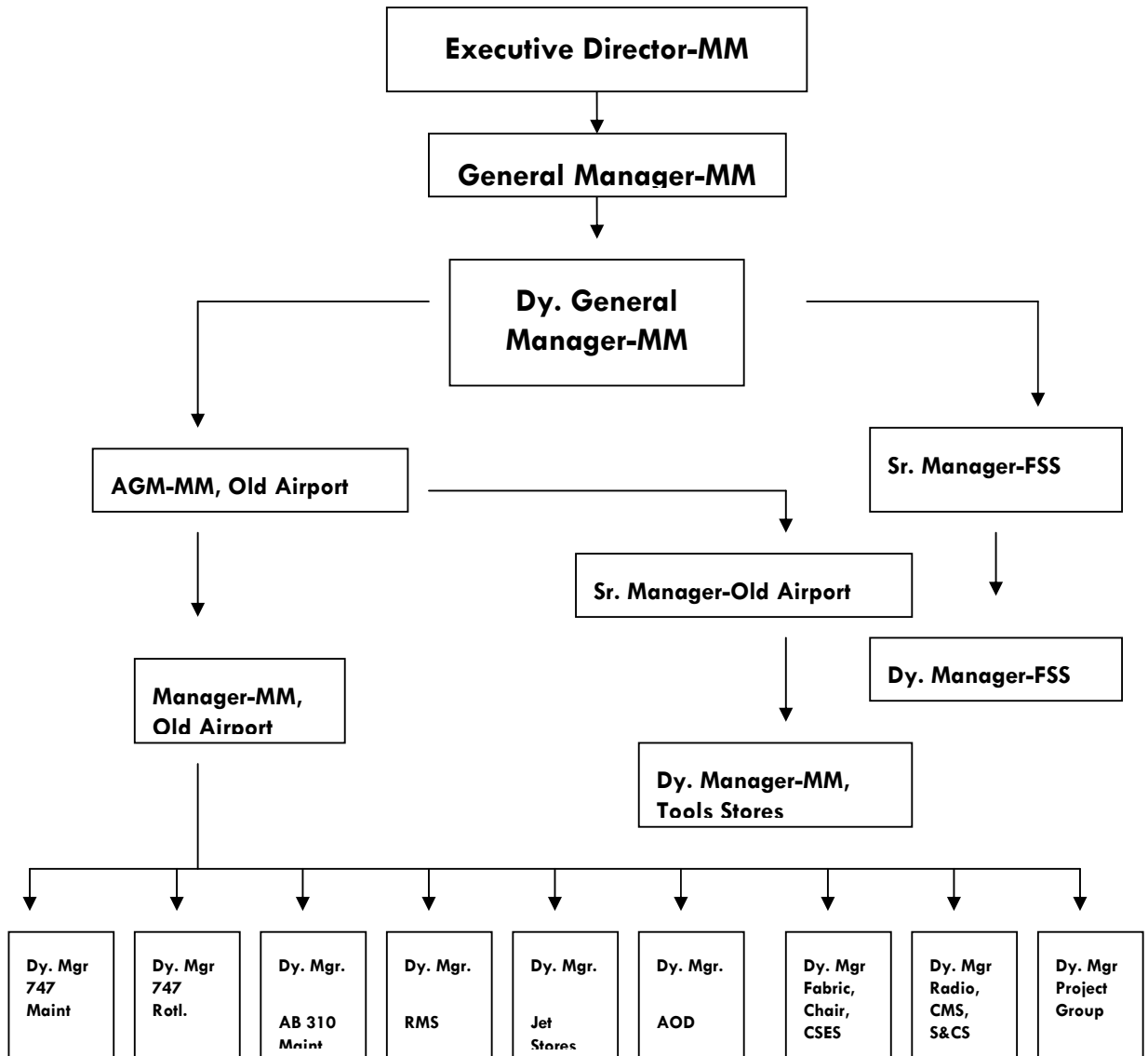
The information in this booklet has been compiled from the Maintenance Manual and deals with the storage requirements and procedures pertaining to aircraft spares and material. The manual is maintained the Quality Control Division / Technical Services - Engg Deptts, and is updated from time to time to comply with the latest DGCA requirements. The Maintenance Manual can be referred for any clarification

The purpose of this document is to bring to the attention of all concerned that we are required to follow the guide lines given to comply with and meet DGCA / Quality Control guidelines and standards.

All concerned in MMD are requested to study this and follow for storage of Aircraft Parts and Spares and keep you abreast. The queries / clarifications, if any, can be asked from Senior Officials / Executives of MMD who may visit storehouses from time to time and to refer to other relevant documents such as DGR handling / Maxi Merlin transaction guide and QC /Maintenance Manuals, Air Safety , Factory and Fire Safety guidelines etc. , if/ as required.

The suggestions are welcome.

2. DIVISIONAL STRUCTURE OF AIRCRAFT STORES



3. RESPONSIBILITIES OF THE MANAGEMENT

3.1. EXE DIRECTOR - MM

A senior personnel responsible to manage and administer the entire functionalities and operations of the Department. Also responsible to Management for making decisions, policies so as to run the department and divisions smoothly and efficiently. He exercises his power to promulgate all policies, decisions for implementation and application. He is also have responsibility towards existing and all future business and expansion plans to develop with the team the systems for procurement, warehousing and disposal of materials. He ensures the integrity of the procurement System and process and reviews of all policies thereto.

3.2. GENERAL MANAGER –MM

The experienced executive and knowledgeable personnel in the field of procurement of aircraft spare parts responsible to the Exe Director, Material Management Department to develop and transact the business with the vendors / suppliers and regulating bodies to assume the duties of the Exe Director in his absence. His specific functions are:

- 3.2.1. Management of purchasing function.
- 3.2.2. Management of the operation of contract with suppliers/vendors.
- 3.2.3. Approval for payment / advances to the suppliers.
- 3.2.4. Development of MM System and process to the requirements.
- 3.2.5. Controlling and Administration of the warehouse through team.
- 3.2.6. Management of the Company's inventory of spare parts/material.
- 3.2.7. Management of repair and other major contracts
- 3.2.8. To initiate various procurement policies, agreements with suppliers.

- 3.2.9. Monitoring the performance of vendors/suppliers.
- 3.2.10. Any other duties as assigned by the Management.

3.3. DY GENERAL MANAGER –MM

The executive in the middle management cadre of company responsible to the GM/ Director of Material Management Department for dealing with aircraft material purchases as regards to:

- 3.3.1. Initiation of Procurement actions
- 3.3.2. Assessment the performance of suppliers
- 3.3.3. Initiation of new policies and business terms with the suppliers.
- 3.3.4. Administration of staff under his control.
- 3.3.5. Inventory and Logistics Management
- 3.3.6. Approval for payment of Bills/Invoices to suppliers.
- 3.3.7. Responsible for the effective and efficient operation of Aircraft Division.
- 3.3.8. Outstations.
- 3.3.9. Any other duties as assigned by the Management.

3.4. ASST GENERAL MANAGER –MM

The experienced officer in the middle Management cadre holding the charge of all Aircraft Store Houses is responsible to the Divisional and is involved with the following activities:

- 3.4.1. Controlling and administration of the Store Houses function.

- 3.4.2. Ensures that all Store Houses are meeting requirements and procedures including fulfillment of mandatory requirements
- 3.4.3. Ensures that all records/ documentation are maintained and recorded up to date.
- 3.4.4. Ensures that all approvals/licenses, issued by the appropriate authorities are obtained / renewed / exhibited at the correct locations and having valid date.
- 3.4.5. Controlling the Company's inventory and maintains the required stock levels.
- 3.4.6. Ensures the safety aspects related to the work place and warehouse.
- 3.4.7. Ensures that all staff is given adequate training in their respective fields.
- 3.4.8. Liaisons with other departments as regards to their demands and assistance.
- 3.4.9. Liaisons with the Duty Storekeeper and other supervising staff to ensure demands are met.
- 3.4.10. Advises the managers about the problems and stock deficiencies.
- 3.4.11. Any other responsibilities as assigned by the higher authorities.

3.5. SR MANAGER / MANAGER– MM

- 3.5.1 Responsible to Section Head of Aircraft stores about smooth operation of store house and reports on discrepancy or short-fall.
- 3.5.2 Ensures that airworthiness requirements and safety requirements of store houses are properly observed.
- 3.5.3 Ensure that non-conformity items are segregated, labeled and removed from store house.

- 3.5.4 To supervise that all environmental conditions as cleanliness, illumination, temperature, humidity emergency equipment's are maintained and parameters are logged as per schedule.
- 3.5.5 To ensure that the copies of documents such as Goods Receipt Notes, Credit Notes and Issue Documents are readily available for verification and investigation purpose.
- 3.5.6 To ensure that all spares/materials are being transferred from one store house to other without any transit damage and relevant information's like storing procedures, expiry of shelf life etc. are communicated accordingly.
- 3.5.7 To ensure that '**FIRST IN, FIRST OUT**' system is strictly followed at the stage of issue of any spares from store.
- 3.5.8 To arrange to display copies of certificates, Approvals, etc. at an accessible place.
- 3.5.9 To organise to train the concerned persons regarding handling of spares, operation of emergency equipment's etc. and a list of such staff should be available in each store house.
- 3.5.10 To supervise that all excess materials drawn from store, are immediately rebooked.
- 3.5.11 To see that all environmental sensitive materials of non conformed nature are kept in controlled environmental condition and DR's are settled without lapse of time as to prevent deterioration and degradation.
- 3.5.12 He will supervise that all major items are staged in order.
- 3.5.13 Any other responsibilities as assigned by the higher authorities.

4. PROCESSES & TRANSACTIONS

4.1. Receipt Documents

4.1.1 GOODS RECEIPT NOTE (GRN)

Is raised in Aircraft Bond stores (OAP) after properly checking the air worthiness of spares through stores inspection. The COC (Certificate of

Compliance) is document of air worthiness annexed for inspection of the spare. Following are points considered by inspection during the inspection of aircraft spares:

4.1.1.1 Shelf life expiry, dangerous commodity (DC item), serial number, quantity, description, etc.

4.1.1.2 After GRN is raised same is delivered to the respective store location by way of a delivery challan which gives details of each spare i.e. GRN No., PO/RO No., CCN, MPN, Quantity Booked, Unit of measure and remarks if any. Same is rechecked by storekeeper, who confirms the MPN, CCN, Description, Quantity, Release Note number, serial Number, etc. and credits the same by using MSRU command and then gets the spare binned in the faibash mentioned in system of that location or allocates a new faibash accordingly.

4.1.2. SHOP CREDIT

Repairable spares are sent to the shop through IRO for repair and re-certification. Same is received in the stores after re-certification by authorised personnel of respective shop. The document on which such spare is received in stores is called Stores –Despatch Sheet and following are the details mentioned therein. Store location code, ICT number, Shop reference, MPN, Description, Work order number, MSN and Quantity. The storekeeper receives the items, reconfirms the above details and credits same by using the MSRU command.

4.1.3. NOT USED

Spares drawn by the progressman/progress chasers and which are not utilised by the engineering department on the aircraft are credited to the store as “NOT USED”. This is done after it is recertified by authorised personnel in the engineering department on a “Not Used” tag. The document used is similar to that of Shop Credit and spare is credited to the store by using the MSRU command and following the same system as used in the Shop Credit.

4.1.4. TRANSFER ICT

Whenever there is low stock of spare in a particular store location same is recouped from another store location having the spare. This recoupment document is called a Transfer ICT, wherein the recouping store receives the spare and credits same in the system by using the MSRU command after checking the details of the spare so received.

4.2. Issue Documents

4.2.1. ISSUE ICT

Whenever there is requirement of spare by engineering an ICT is fired/raised/prepared by the progress man or a person authorised to do so. The ICT so fired indicates the ICT type, ICT number, CCN, T/L, Shipped From Location, Description, Date, Time, Shipped To Location, Work order, Aircraft Registration, MPN, Faibash, BOH, Quantity Required, etc. On receipt of an Issue ICT the spare is issued after checking all details through the MSIS command. On completing the MSIS transaction a COI (Certificate of Issue) is generated which is attached to the issued spare and handed over to the engineering.

4.2.2. TRANSFER ICT

Whenever there is low stock of spare in a particular store location same is recouped from another store location having the spare. This recoupment document is called a Transfer ICT, wherein the store receiving the recouping request issues the spare after checking details mentioned i.e. ICT type, ICT number, CCN, T/L, Shipped From Location, Description, Date, Time, Shipped To Location, Work order, Aircraft Registration, MPN, Faibash, BOH, Quantity required, etc. using the MSIS command.

4.2.3. EMERGENCY SALE/LOAN

This document is used for issuing items to other Airlines on sale or loan basis after proper authorisation of same.

4.3. COMMANDS/TRANSACTIONS IN MAXI MERLIN SYSTEM

<u>Sr. No.</u>	<u>TRANSACTIONS</u>	<u>DESCRIPTION.</u>
1	ADD-MMG	Left out Parts for MMG Certification.
2	ADD-MPN	Validation Transaction for T/L ' O ' & ' 1 ' Items.
3	AIDFTREP	Defect Report.
4	AIDRPG	To revert DR to BSIP Stage.
5	AIDR-REP	Outstanding DR listing (DR
6	AIDR-SUM	Summary report on/s DRs (Reason wise).
7	AIMAIL	To view or send email to any Maxi-Merlin user. PF1 AIPRTD : By entering a persons name, it gives details of that person's user-id, printer and Department. PF2 AIMAILBK: Mail backup.
8	AIMAILBK	To get display of email back-up.
9	AIMSDAR	NIL Stock Report for T/L - 2 & 3.
10	AIMSLID	Will give a listing of all ICTs due to the desired Location.
11	AIMSLID	Listing of all ICTs.
12	AIMSPJ	For Perpetual Inventory Stock Adjustment.

13	AI-NIS13	NIS List display.
14	AIPRTID	Listing of Maxi Merlin users with details such as Name, user-id Stn. Dept. and Printer.
15	AIPWREP	P & W consignment
16	AISHELF	Report to review shelf life data of T/L ' 2' & ' 3 '.
17	AI-TL3	100 % Listing of T/L - 1, 2, 3, items in Location.
18	AITOTTON	Report on Total Tonnage imported.
19	BSQUAI	To look for information about items in Bond - System.
20	BSRELUPD	To update R / Note Balance only for Crash GRNs.
21	BSRE-NRS	To see listing of GRNs delivered to Stores but MSRU not done for particular Location or all Locations.
22	CCDPS	Display part status.
23	CCDUS	Display Unit Status.
24	CCFSN	Display unit serial number.
25	CCUS	Make item Unserviceable.
26	CHG-FSC	To change Vendor Code on an Order. This Programme is to be used when only when no quantity is remaining.
27	CHGLOCN	Change Location of any user.

28	CHGPRT	Change Location and Printer ID of any user.
29	CHG-STN	Change Station, Location and Printer - ID of any User.
30	DI-MMG	Display of ADD-MMG transactions.
31	DI-NES	Display of validation records of T/L ' 1 ' ; ' 2 ' ; ' 3 ' .
32	DIT-OPOR	Vendor-wise listing of overdue orders.
33	DI-VLDT	Display of validation records of T/L ' 0 ' items.
34	GPDOC	Display original Maxi Merlin Transaction.
35	GPSP	Re-print or display document giving User - ID and date of document.
36	GPSPO	Spec 2000 outbound driver menu.
37	GPTD	Display of Staff name by Staff No.
38	LISTCARD	Display of MSBIN transaction prior to CCS implementation.
39	LISTSPC	To view and delete Inbound/Outbound Processed/Not processed messages.
40	MS2651SL	Shelf life expiration batch report by CCN.
41	MS2652SL	Shelf life expiration batch report by location and bin.
42	MSADJAI	For changing the Unit of Issue (UI) for a CCN.
43	MSAJ	Stock adjustment.
44	MSANIV	Display / Report of annual inventory list.
45	MSBBSR	Annual Budget Statement.

46	MSBD	To display any backorder or reservation.
47	MSCRM	If MPN is known, displays CCN, T/L, NOUN, DESCRIPTION, Locations, TYPE OF LOCATION, ALLOCATED QTY., UI & FAIBASH. It also displays BOH for T/L - ' 0' & ' 1'.
48	MSCRS	If CCN is known, displays MPNs (P & M), T/L, BOH, CCBOH, UI, REC, NOUN & DESCRIPTION, STORES COMMENTS, LOCATIONS & TYPE OF LOCATION, FAIBASH FSC etc.,
49	MSCU	Create or update Stores Comments. These Comments can be seen in MSCRS and all ICT documents generated for the item e. g. Fragile, Handle With Care.
50	MSDAR	Display rotatable distribution analysis.
51	MSDB	To see items binned in specific FAIBASH.
52	MSDIA/XSDIA	Menu for shortage report.
53	MSDR/MSDSR	To display reservation data.
54	MSDT	Display tag movements status by CCN for T/L ' 2' & ' 3'.
55	MSHP	Printing Repair Order Hard Copy.
56	MSID	Issue / Transfer details for a given CCN - APPROVED / UNAPPROVED / SHIP-CMP / SHP-DTL / COMPLETE / DELETED.

57	MSINVC	Annual consignment inventory report for a given Vendor.
58	MSINVREP	Perpetual inventory Report.
59	MSIP	Transaction for inspecting Non-Bonded Items.
60	MSIS	Option - ADD To Issue or Transfer against ICT.
61		Option - NIS To DECLARE ITEM Not-In-Stock in Stores.
62	MSIU	Issue Update (APR / DEL / DUP / B / O)
63	MSIV	Invoice processing.
64	MSLID	Issue/Transfer details for all ICTs for given Location - APPROVED/ UNAPPROVED / SHP-CMP / SHP-DTL / COMPLETE / DELETED
65	MSLM	Update FAIBASH by MPN (ADD or DEL)
66	MSLU	Update FAIBASH - by CCN or MPN (ADD or DEL)
67	MSMI	Multiple Issue / Transfer request (Transaction to be used by MMG)
68	MSMS	Partial Part No. search.
69	MSNS	Noun search.
70	MSOD	To look for P. O. details if Order No. is known.
71	MSODH	To look for P. O. details from history file which were removed from
72		production area if P. O. No. is known.
73	MSOFLINE	To see Offline Parts made thru PARTSTAT.

74	MSPA	Add rotatable inventory (T/L ' 2 ' & ' 3 ')
75	MSPD	To look for P. O. details if CCN is known.
76	MSPDH	To look for P. O. details from history file which were removed from production area if CCN is known.
77	MSPJ	Physical inventory Adjustment.
78	MSPORMKS	Display updates PO Remarks. (This Transaction is similar to MSPO-CPO but no Financial check.
79	MSPU	Purchase Order / Repair Order Update. (Options - APO / CPO / ARO / CRO / DRO / NPO)
80	MSRD	To look for P. O. details if MPN is known.
81	MSREVP	Input entry for vendor performance report.
82	MSRL2AI	To see Release Note-wise stock display of T/L ' 2 ' & ' 3 ' items
83	MSRLS	To see Release Note-wise Stock break up of T/L ' 0 ' & ' 1 ' items.
84	MSROSTTV	Report on quantity in Transit and in Other Location.
85	MSRQ	Single issue / Transfer request (Transaction to be used by MMG)
86	MSRSA	Input entry for Stores performance analysis.
87	MSRSPE	Spec 2000 report Inbound / Outbound or Inbound or Outbound (Input Field valid Order No. or Part No.)

88	MSRU	Receiving update for Bonded GRN, Non Bonded GRN, Shop certified items having ICT No. or Tag No. Unused credits, Transfer from our Location to another etc.,
89	MSSB	Shared business operation. Add / Update / Shared / Delete Business operation.
90	MSSD	Display of Stock items (created by MPD) all the relevant details (Static data) are displayed for a CCN.
91	MSSH	Shipping details Multiple update. This Transaction will change ICT Status SHP-DTL to SHP-CMP.
92	MSSLD	To review shelf life data of T/L ' 0 ' & ' 1 ' .
93	MSSLRTAI	Sale / Return Request for T/L ' O ' & ' 1 ' .
94	MSSTKADJ	Release Note wise Stock Adjustment.
95	MSTCJ	To look for transactions done on an item... (Current Date.)
96	MSTCJB	To look for transactions done on an item... (Data purged.)
97	MSTCJH	To look for transactions done on an item... (Past Date.)
98	MSTD	Transfer display.
99	MSTRF	Transfer request for recoupment action (T/L O, 1, 2, 3.)

100	MSTRFCI	Report on usage statement of consignment inventory transferred from CI location.
101	MSUP	Update Purchasing information.
102	MSVER	To declare no discrepancy found in Perpetual Inventory.
103	MSVOD	To look for P. O. details if Vendor is known.
104	MSVS	To search for a Vendor by entering Vendors partial name. Blank value will display all Vendors.
105	MSVU	Vendor update.
106	PARTSTAT	Change Part Status for a Location (ONLINE / OFFLINE)
107	PCU	Work order update / create / display.
108	PTDELAI	Delivery challan for items transferred from a Location to another - (Serviceable or Unserviceable)
109	PTDFTAI	Print duplicate Defect report.
110	TBL1	Indicates the Location (Dept.Code) in which the user is at a given time
111	VLD-SCR2	Validation Transaction for T/L ' O ' & ' 1 ' Items.

4.4. ABBREVIATIONS

1. **FAIBASH** is defined as the bin location of a spare. **'F'** denotes Facility, **'AI'** denotes Aisle, **'BA'** denotes Bay and **'SH'** denotes Shelf.
2. **NIS** – NOT IN STOCK

3. **BOH** – BALANCE ON HAND
4. **MRA** – MATERIAL RETURN ADVICE
5. **GRN** – GOODS RECEIPT NOTE
6. **ICT** - ISSUE CREDIT TRANSFER
7. **MPN** – MANUFACTURER’S PART NUMBER
8. **CCN** – COMPANY COMPONENT NUMBER / CLASS CONTROL NUMBER
9. **RN** – RELEASE NOTE
10. **DGCA** – DIRECTOR GENERAL OF CIVIL AVIATION
11. **IOSA** – IATA OPERATIONAL SAFETY AUDIT
12. **EASA** – EUROPEAN AVIATION SAFETY AUDIT
13. **FAA** – FEDERAL AVIATION ADMINISTRATION
14. **FIFO** – FIRST IN FIRST OUT
15. **MDR** – MATERIAL DESPATCH REQUEST
16. **SEB** – SPECIAL EQUIPMENT BOX
17. **CO** – CONFIRMATORY ORDER
18. **COI** – CERTIFICATE OF ISSUE
19. **DIT** – DEPARTMENT OF INFORMATION TECHNOLOGY
20. **FSC** – FEDERAL SUPPLY CODE
21. **FTP** FILE TRANSFER PROTOCOL
22. **IRO** – INSPECTION REPAIR ORDER
23. **MMG** – MATERIAL MANAGEMENT GROUP
24. **PO** – PURCHASE ORDER
25. **RO** – REPAIR ORDER
26. **SAR** – STOCK ACTION REPORT
27. **SL** – SHELF LIFE
28. **STN** – STORES TRANSFER NOTE
29. **SCN** – STORES CREDIT NOTE
30. **TL** – TRACKING LEVEL
31. **WO** – WORK ORDER

5. STORES LOCATIONS AND LISTING

Spares are classified into expendables/consumables, rotatable and repairable and have been allotted tracking levels (T/L) of 0, 1, 2, and 3 and stocked at various locations as below:

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5.1. Central Modification Store

It holds all spares, required to carry out modification of Aircraft's and their components.

5.2. Raw Material Store

Raw Material Store is responsible to hold all raw materials like sheets, bars, extrusions, section and fasteners etc.

5.3. Cold Room

Environmental Condition is maintained by monitoring temperature and humidity. Special groups of materials such as sealant, Adhesives, etc. that are required to be kept at low temperature are kept in this storehouse.

5.4. Dark Room

Dark room facilities are available in store houses, where rubberised goods are kept to monitor their shelf life. Tyre stores are falling under this category.

5.5. Quarantine Store

Quarantine Store (DR) is provided in the receiving stores to stock materials, which are treated as 'Suspect' due to want of complete information and data.

5.6. Goods Receipt Stores

Goods Receipt store is provided for the purpose of offering materials to inspection with the receiving reports and other documents. Goods are transferred to the respective stores houses on completion of all formalities.

5.7. Redundant and obsolete store

Surplus or obsolete parts/ components are segregated and transferred to the stores before initiation of final disposition action.

5.8. Dangerous Commodity Store

Various chemicals, cleaning agents, paint, thinners, oil, grease etc. are kept in this store house. It is specially approved by the explosive commissioner for storing such item.

5.9. Tools Store

All precision Gauges, handle tools, fixtures etc. are kept in serviceable condition for maintenance use.

5.10. Oxygen cylinder hold

A separate area is allocated to keep all charged oxygen gas and compressed gas cylinders. Special precautions are taken against fire and ozone generation.

5.11. Scrapped items hold

A separate area is allotted for holding all scrapped items awaiting disposal action.

5.12. Box Stores

Containers of heavy and odd size items are kept in this store. Special handling equipments are required for such items for its transportation and movement.

5.13. Rotational Stores

Major rotational items having shelf life are held in this store house.

5.14. Non-Rotational Stores

Most of the non-major spares, those that may not have shelf life are held in such store. However, they are subject to periodic inspection.

5.15. At outstation stores

At outstations, independent store houses are set up and it is maintained by store keeper on duly consultation with AME posted there. Again, where there is no independent store set up, the AME posted at the station maintains a shelf period register to monitor and control storage life of aircraft spares having stipulated shelf life.

5.16. Special Equipment Box

There are Special boxes fitted on the aircraft containing all categories of spares per the list provided by the Line station of Engineering

Department, which may be required while emergency servicing of the aircraft at various outstations. These spares so kept in the SE Box are inspected once in three months for its serviceability by stores inspector. When additional spares are to be kept in the aircraft same is done by keeping the spares in additional boxes having serial numbers and list of same is added to the Main SE Box list.

LISTED STOREHOUSES AT OAP AND FSS MERLIN LIST

Sr	AREA	STORES CODE	NAME OF STORES
1	OAP	BOMST04	Central Modification Stores
2	OAP	BOMST10	Accessories Overhaul Divn. Stores
3	OAP	BOMST11	Instrument Stores
4	OAP	BOMST12	Electronic Stores (Radio)
5	OAP	BOMST13	AB-310 A/c Stores
6	OAP	BOMST14	AB-A310 Rotational Stores
7	OAP	BOMST15	AB-310 Leased Stores
8	OAP	BOMST16	Raw Materials Stores
9	OAP	BOMST17	Fabric Stores
10	OAP	BOMST18	Jet Stores
11	OAP	BOMST19	Jet Stores - Cold Room

12	OAP	BOMST20	Oil & Dope Stores
13	OAP	BOMST21	747 Maintenance Stores
14	OAP	BOMST22	747-200/300/ Rotational Stores
15	OAP	BOMST23	747 Component Overhaul Divn. Stores
16	OAP	BOMST24	Cabin Maintenance Stores
17	OAP	BOMST25	Chair Stores
18	OAP	BOMST26	Systems & Controls Stores [TRF Stores]
19	FSS	BOMST27	747-200/300 FSS Maint. Stores
20	FSS	BOMST28	747-200/300 FSS Rotational Stores
21	FSS	BOMST29	A300 FSS Maint. Stores
22	FSS	BOMST30	A300 FSS Rotational Stores
23	FSS	BOMST33	AB310 FSS Maint. Stores
24	FSS	BOMST34	AB310 FSS Rotational Stores
25	OAP	BOMST35	747-NM Stores
26	OAP	BOMST36	Cabin Survival Equipment Stores

27	OAP	BOMST37	Auxilliary Power Unit Stores
28	OAP	BOMST38	PW4056 Stores
29	OAP	BOMST39	Leased A/c Engine Stores [PW4056]
30	FSS	BOMST40	747-400 FSS Maint. Stores
31	FSS	BOMST41	747-400 FSS Rotational Stores
32	OAP	BOMST42	747-400 Maintenance Stores
33	OAP	BOMST43	747-400 Rotational Stores
34	FSS	BOMST44	777-200 FSS A/c Stores
35	FSS	BOMST46	737-800 FSS A/c Stores
36	FSS	BOMST47	777-200 Rotational Stores
37	OAP	BOMST48	747-400 Maintenance Stores
38	OAP	BOMST49	747-400 Rotational Stores
39	OAP	BOMST50	787-8 Maintenance Stores- OAP
40	FSS	BOMST51	787-8 Maintenance Stores- FSS - NIPTC
41	FSS	BOMST99	Special Equipment Box

42	OAP	BOMUS01	Boeing Stores	Unserviceable	Spare
43	OAP	BOMUS02	Airbus Stores	Unserviceable	Spare
44	DEL	DELST01	DEL Aircraft	Stores	
45	DXB	DXBST01	DXB Aircraft	Stores	
46	HYD	HYDST01	HYD Aircraft	Stores	
47	JFK	JFKST01	JFK Aircraft	Stores	
48	LHR	LHRST01	LHR Aircraft	Stores	

FK ST01 is the location code for store house located at Newyork. The other outstation stores locations have not been created in Merlin system and are operated in manual system.

6. STOREHOUSES – REQUIREMENTS

6.1. GENERAL HANDLING PROCEDURES

- 6.1.1. Materials should be stored and delivered in manufacturer's original packaging. Packaging should identify the manufacturer, distributor, Part number, lot or Batch number and quantity.
- 6.1.2 Before placing the items on Bin/racks/cupboard etc., the storekeeper shall ensure that metal parts are properly treated with protective treatment and are properly packed for safe storage.

- 6.1.3 The store keeper shall ensure that the receipts are correctly recorded and items are located in correct “faibash” as indicated in the Maxi Merlin System.
- 6.1.4 Supervisor/ Manager of the storehouse should ensure that all certificates/ approvals and caution instructions are exhibited at the proper locations.
- 6.1.5 Supervisor/ Storekeeper of the respective Store house is responsible to check the shelf life, Part number, Batch number/ Stock number are stamped on individual item.
- 6.1.6 Personnel attached to store houses, should be properly trained to perform inspection, handling of materials, record keeping procedures.
- 6.1.7 Coiling, folding or tying in bundles of extruded sections fabricated parts/raw materials for transportation purpose is undesirable and should be avoided.
- 6.1.8 Teflon or fabric covered seals shall not be coiled, folded or tied in bundles.
- 6.1.9 Sheet metals shall be suitably identified and marked in accordance with specification, batch number, Release Note and stock number at the appropriate locations.
- 6.1.10 All items are to be issued on the basis of 'First in, First out' basis except in the cases of Shelf Life items.
- 6.1.11 All Serviceable and unserviceable parts are to be segregated and labeled.
- 6.1.12 High strength al-allays should be handled carefully ensuring safe loading, unloading and storage to avoid damaging by chaffing scratching, burning, or stained by bending, otherwise mechanical properties of materials may be seriously affected. Alclad AL-Alloys sheets should be handled in such a way that no cladding material is damaged or removed.
- 6.1.13 Temperature and humidity of the stores should be logged in the register provided for on daily basis.

6.1.14 All precision tools/gauges mentioned below are to be sent for calibration and must be used only after having valid calibration certificates.

- a. Overdue for calibration
- b. Dropped
- c. Damaged
- d. Reported of having lost their accuracy but to wear must be sent for rectification and calibration.

6.1.15 All gauges may be protected from rust by applying a thin coat of WD40 lubricant.

6.1.16 The following documents should be available in GRN-file:

- a) The JAA Form I or FAA Form 8130-3
- b) The Workshop Report
- c) The Delivery Note
- d) The Airway Bill
- e) The components hours/life

6.2. STORAGE REQUIREMENTS

General Storage :

6.2.1 The storage of aircraft parts should be in clean, well ventilated with adequate space.

6.2.2 In many instances the manufacturer will specify the temperature and relative humidity in which the products should be stored. Dry temperature condition is to be maintained to minimise the effects of condensation.

6.2.3 When required the temperature and humidity should be checked at regular intervals by means of a hydrometer which measures the amount of humidity in atmosphere. All spacers and knife-edge of seals are properly protected.

6.2.4 No metal-to-metal contact between parts.

- 6.2.5 Avionics components are to be stored in controlled environment or as recommended by manufactures.
- 6.2.6 Stores should be properly illuminated such that all part numbers, package instruction, etc. can be read easily.
- 6.2.7 Heavy and long parts should be adequately supported, to prevent from sagging, distortion and stains.
- 6.2.8 Heavy items or boxes should be kept underneath the light boxes.
- 6.2.9 The source of heat should be more than 3 feet from the articles stored.

6.3. Preventive / Protective Storage:

6.3.1. Racks and Bins:

Open racks allow a free circulation of air and are preferable when the nature of the stock permits their use. The painted metal type of bins is more suitable. Polyethylene, rigid PVC, corrugated plastics/ cardboard bins may also be used. Many molded plastics bins can also be fitted with removable dividers which will allow segregation of small parts whilst making use of space.

6.3.2. Rotation of Issue:

Methods of storage should be such that materials or parts are issued in rotation, i.e. old stock should be issued before new stock. This is of particular importance for perishable goods, instruments and other components which have definite storage limiting periods.

6.3.3. Storage Limiting Period:

The manufacturers of certain aircraft units impose storage limiting periods after which they will not guarantee the efficient functioning of equipment. On expiry of recommended storage periods the parts should be withdrawn from stores for checking or overhaul as recommended by the manufacturer..

6.3.4. Segregation of Stock:

Care should be taken to segregate materials which may have deleterious effects on other materials, e.g. carboys of acid should not

be placed in a store where escaping fumes may affect raw materials or finished parts, phenol plastics should be segregated from cadmium plated steel parts to prevent corrosion of the steel parts, magnesium alloys should not be stored in the vicinity of flammable materials.

6.3.5. Packaging of stock:

This should normally be done from the following:

- a) **Materials:** Plastics filled, 'Jiffy' bags, lanolin grease impregnated cloth, plastic film lined paper envelopes, etc.
- b) **Methods:** Oiling and placing in jars or plastics bags, individual packaging of scales, etc.

Note: Magnesium fittings should not normally be kept in sacks, as the materials used in making the sacks may cause corrosion of the fittings).

6.3.6. Materials in long lengths:

The long lengths of material, such as extrusions, tubes bars, etc., should generally be stored vertically, which tends to reduce problems caused by bow and handling damage. Care should also be taken when placing the material in the storage racks to prevent indentations and scratches, especially when handling the high strength aluminum alloys.

6.4. Material / Items Specific Storage:

6.4.1. Ball and Roller Bearings:

Ball and roller bearing should be stored in their original wrappings in dry, clean conditions with sufficient heating to prevent condensation caused by significant temperature changes.

Note: In many instances orders for bearings are endorsed with a requirement that special grease should be applied by the manufacturer. If this grease is removed for any reason, it is essential that grease of the correct specification is re-applied).

6.4.2. Aircraft Batteries:

6.4.2.1. LEAD-ACID BATTERIES:

A charged battery which is to be stored for any length of time should be in the -fully charged condition. Before storing, the electrolyte levels should be checked and the battery bench charged in accordance with manufacturer's instructions. When fully charged, the battery should be stored in a cool, dry, well ventilated store on an acid-resistant tray. Batteries may also be stored in the dry, uncharged state. Additional points to note are as follows:

- i) Batteries should be removed from storage and fully recharged i.e. until voltage and specific gravity readings cease to rise. (Note: Damage to the battery will occur if it is allowed to stand idle beyond the period for charging specified by the manufacturer).
- ii) Regardless of periodic check charges, the battery should be completely charged and capacity checked immediately before being put into service.
- iii) For new batteries, a complete capacity test to the manufacturer's instructions should be made every 6 months, but if the battery has been in service this test should be made every 3 months.
- iv) Every twelve months or earlier if a leak is suspected, an insulation resistance test should be carried out on manufacturer's instructions.

6.4.2.2. SILVER-ZINC BATTERIES AND SILVER-CADMIUM BATTERIES:

These batteries should be stored in clean, dry, cool and well ventilated surroundings, not exposed to direct sunlight or stored near radiators.

- i) New batteries will normally be supplied in the dry condition with the electrolyte contained in polythene ampoules. If possible, new batteries should be stored in their original packaging together with the related ampoules of electrolyte. For storage periods of more than

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two years, special instructions should be requested from the manufacturers.

ii) Filled and formed batteries required for use at very short notice may be stored in the charged condition. Manufacturers normally recommend that such batteries should be discharged and recharged every four to six weeks. The manufacturer's schedule of maintenance should be applied to batteries stored in the charged condition.

Under no circumstances should sulphuric acid or acid contaminated utensils be used in close proximity to silver-zinc or silver-cadmium batteries.

6.4.2.3. NICKEL-CADMIUM BATTERIES:

This type of battery can be stored for long periods without damage, in any state of charge, provided the storage place is clean and dry and the battery is correctly filled.

i) For the battery to be ready for use in the shortest possible time, it should be fully charged, correctly topped up and then discharged at normal rate for a period of one hour before storage.

ii) The battery should be cleaned and dried and the terminals and connectors lightly smeared with pure mineral jelly.

iii) The battery should be inspected at intervals of six to nine months and topped up, if necessary.

iv) Before going into service, the battery should be given a double charge and capacity check as recommended by the manufacturer of the particular type of battery.

v) The battery should be stored on a shelf or rack, protected from dirt or dust, and where metallic objects such as bolt, hand-tools, etc., cannot drop onto the battery or touch the cell sides. (Note: The above refers to pocket plate nickel cadmium cells and not to sintered plate nickel cadmium cells, for which reference should be made to the manufacturer's instruction).

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Precautions: It should be noted that sulphuric acid will destroy alkaline batteries; therefore, utensils which have been used for this acid should not be used with such batteries. It is also important to avoid any contamination from the fumes of lead-acid types of batteries.

6.4.3. Braided rubber cord:

Braid rubber cord should be stored in a cool, dark place with an even temperature preferably not exceeding 18 degree Celsius with relative humidity of approximately 65%. The cord should not come in contact with any radiant heat, grease, oil, water, organic solvents or corrosive materials. (Note: Storage at elevated temperatures may cause permanent determination of the rubber, and prolonged storage at low temperatures will cause temporary stiffening of the rubber).

a) Storage Limiting Period: Braided Rubber cord has a storage limiting period of four years if stored in good conditions. Cord which has been issued from stores within the four years period from the date of manufacture may remain in service until the expiry of five years from that date.

6.4.4. Compressed Gas Cylinders:

Stores which are used for storage of compressed gas cylinders should be well ventilated. The cylinders should not be exposed to the direct rays of the sun and no covering should be used which is in direct contact with the cylinders. Cylinders should not be laid on damp ground or exposed to any conditions liable to cause corrosion. Gas storage cylinders should normally be fitted with a transportation/storage cap over the shut-off valve to help prevent handling damage and contamination of parts which could cause a risk of explosion or fire. Portable gas cylinders (e.g. therapeutic oxygen, fire extinguishers) should be stored on racks and, where appropriate, control heads and gauges should be protected against impact.

a) No heating is required in stores where compressed gas cylinders are kept, unless specified by the manufacturer.

- b)** Lighting for stores containing combustible gas cylinders (i.e. acetylene) should be flameproof or installed outside the building, lighting the interior through fixed windows.
- c)** Store rooms should be at a distance from corrosive influences, e.g. battery charging rooms.
- d)** Full and empty cylinders should be stored in separate rooms, and appropriate notices displayed to prevent confusion.
- e)** Oxygen and combustible gases such as acetylene should not be stored together. Acetylene cylinders should be stored in the upright position.
- f)** Oxygen cylinders are generally rounded at the bottom, thereby making it unsafe to store in an upright position without suitable support. If cylinders are stacked horizontally special wedges should be used to prevent the cylinders rolling, and the stack of cylinders should not be more than four high.
- g)** Breathing oxygen and welding oxygen should be segregated and properly labeled to avoid confusion. In some cases welding oxygen may be used for testing oxygen components not installed in the aircraft, but welding oxygen should not be used in aircraft oxygen systems.

Precautions_: If cylinders are exposed to heat, the gas pressure will increase and the cylinder walls may be weakened, causing dangerous condition. Cylinders should be stored at some distance from sources of heat such as furnaces, stoves, boilers, radiators, etc.

- i)** Cylinders should be kept away from sources of contamination, such as oil barrels, overhead shafting, hydraulic components or any container or component that may contain oil or grease.
- ii.** Smoking, exposed lights or fires should not be allowed in any room where compressed gases are stored, and oily or greasy clothes or hands should be avoided when handling the cylinders.
- iii.** Grit, dirt, oil and water should be prevented from entering the cylinder valves.

6.4.5. Electrical Cables:

Where electrical cables are stored in large reels it is necessary that the axes of the reels are in a horizontal position. If stored with the axis vertical there is possibility that the cable in the lowest side of the reel will become crushed.

6.4.6. Fabric:

Fabric and fabric covering materials(e.g. strips and thread) should be stored in dry conditions at a temperature of about 21 degrees Celsius away from direct sunlight. Most synthetic fiber fabrics should be stored away from heat sources. Rubber proofed fabrics should be stored away from plasticised material such as PVC

6.4.7. Raw Materials (Forging, Casting and Extrusion):

All large forging, castings and extrusions should be carefully and separately stored on racks to avoid superficial damage.

- a) Aluminum alloy forging which are anodised normally need no protection in a heated store.
- b) Aluminum alloy castings in store should not be contained in sacks or absorbent packages. It is not normally necessary to protect castings before machining, but finished details should be protected as for forging.

6.4.8. Instruments:

The smaller types of instruments are usually delivered in plastic envelopes and these should be used during storage to minimise the possible effects of condensation. The transit containers of the larger instruments contain bags of silica gel to absorb moisture. It is essential that all instruments should be stored in a dry, even temperature, and that the storage limiting period recommended by the manufacturer is not exceeded.

6.4.9. Oil Coolers and Radiators:

Oil coolers and radiators are normally filled with and an inhibiting fluid during storage; the fluid used should be in accordance with the manufacturer's instructions. The components should not be stored on the

floor, but placed on raised wooden supports to permit a free circulation of air and minimise the possibility of damage to the mattresses.

6.4.10. Paints and Dopes.

For the storage of paint and related materials (i.e. all low flash point materials) it may be necessary to obtain a license to comply with the requirements . Paints should be kept in a dry store at a controlled temperature between 7° and 23° C.

- a) Paint containers should be marked with the date of receipt so that the oldest batches may be used first, as pigments tend to 'settle out' when paint is stored. A simple method of avoiding settlement is to invert containers at regular intervals,
- b) Toxicity of Solvents: If paints are handled or mixed in a confined space it is important to ensure adequate ventilation during such operations as the fumes from volatile liquids are harmful if inhaled in sufficient concentration..
- c) **Follow relevant DGR guidelines as applicable**

6.4.11. Pipes:

Rigid pipes should be adequately supported during storage to prevent distortion. Flexible pipes should, unless otherwise stated by the manufacturer, be suitably wrapped, for example, in a sealed plastics sleeve before being stored in a darkened room, maintained at a temperature of approximately 15° C.

- a) Flexible pipes should stored in completely unstressed condition and where possible be preferably be suspended vertically.
- b) The ends of all pipes should be blanked, using a type of blank which does not allow it to be left in position when the pipes are fitted. (do not use rags or paper for this purpose). The blanks should not be removed until just prior to fitting the pipe.
- c) Chloride based materials, such as Neoprene and glass fibre tape should not be used for the wrapping of Stainless Steel and Titanium pipes.

6.4.12. Pyrotechnics:

Pyrotechnics should be stored in a dry, well ventilated building and kept at constant room temperature and at the periods specified by the manufacturer pyrotechnics should be examined for any signs of damp or other external damage.

(Note: The most likely effect of storage deterioration is a loss of brightness and range).

6.4.13. Rubber Parts and Components:

The following storage conditions are generally acceptable for a wide range of components containing rubber in their construction or parts made of rubber. In many cases manufacturers make special recommendations and these should also be observed.

a) Temperatures: The storage temperature should be controlled and sources of heat should be at least 3 feet from the stored article (unless screened) to minimise exposure to radiant heat and temp below 40° C.

b) Humidity: The relative humidity in the store room should be about 65%. Very moist or very dry conditions should be avoided.

c) Light: Rubber parts should not exposed to direct daylight or sunlight. Unless the articles are packed in opaque container, store room windows or skylights should be screened or covered with a suitable transparent red or amber coating. Store rooms should be kept as dark as practicable. Use of artificial light which has a high ultraviolet level should be avoided.

d) Oxygen: Isolation from atmospheric oxygen greatly increases the storage limiting period of rubber parts. Where possible, parts should be packed in airtight containers or wrapping using tale or French chalk. Where parts are packed in airtight tins, the tins should be lined with wax paper or polythene to avoid direct contact with the metal.

e) Ozone: Exposure to air containing ozone even in minute quantities should be avoided Storage rooms should not contain any apparatus liable to generate ozone, such as high voltage electrical equipment, electric motors or other plant which may

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give rise to electrical sparks. Free access to outdoor air, which in temperate climates always contains ozone, should be avoided. Still indoor air is normally ozone-free because wall and ceiling coverings and organic materials rapidly destroy ozone.

f) De-formation: Rubber parts should be soared in a 'relaxed' position free from compression or distortion, with the least possible deformation. Deformation greatly aggravates the action of ozone and also leads to permanent changes in shape and dimensions. Articles received prepackaged in a strain-free condition can, with advantage, be stored in their original packing, as long as they are clearly identified and labeled.

g) Contamination: Rubber parts should not come in contract with liquids or vapor concentrations during storage even though they may be subsequently used in contact with a similar fluid. Contact with copper, brass or corroded iron or steel, or with any confounds of manganese should be avoided.

h) Hydraulic and Pneumatic System Components: Hydraulic and pneumatic components generally have a nominal seven year shelf life which may be extended by inspections / authorization..

6.4.14. Tyres

a) Tyres should be stored vertically in special racks embodying support tubes, so that each tyre is supported at two points. Two-thirds of the tyre should be above the support tubes and one-third below. By this way, it is to be turned to a new position every two or three months. Where tyres are delivered in bituminised Hessian wrappers, the wrappers should be left on during storage.

b) Stacking is permissible if care is taken to prevent distortion of bottom tyre.

c) They shall be stored in dark room, to avoid direct sunlight and in dry and draught free area.

d) They shall not come in contact with oil, grease, dust etc. (Note: If no dark room is available, they shall be covered with tarpaulin

or by an opaque water proof covering for 10/ 15 days with less temperature and high humidity.

e) Inclined storage position is not ideal. It should be away from equipment, generating ozone, heat such as: motors, switches, fluorescent light battery chargers, welding machines etc. Ideal storing conditions are; Temperature - 50° F / 70° F Relative humidity - 65 % Ozone level - not exceeding 0.08 pm.

6.4.15. Storage of Rubber Loos and Hose Assemblies

Unless otherwise specified by the manufacturer, rubber hoses should be inspected and tested every two years; they should also be inspected and tested immediately prior to installation.

a) **Storage Condition:** Hose and hose assemblies should be stored uncoiled and supported to relieve stresses. Air should circulate freely about the hoses unless they are contained in plastic envelopes. Temperatures in the store should be controlled as detailed in paragraph (Note: Care should be taken to ensure that the plastics envelopes selected are compatible with the hose material, since some, including PVC can have a deleterious effect on rubber).

b) **Sealing Blanks:** The correct **sealing** blanks should always be fitted to items in store. Plugs and caps conforming to AGS specifications are suitable but, where standard blanks cannot be fitted, the blanks used must be so designed that they cannot enter the pipe or be left in Position when the assembly is coupled up. It is also important that the material used for blanking purposes will not pick-up or leave small particles inside a coupling after long periods of storage. Tape, rag or paper should not be used.

c) **Bore Protection:** In some special cases, to prevent deterioration of the bore or inner lining of the hose, it may have to be stored filled with the liquid which it is intended to contain in service and instructions concerning this procedure are normally attached to the assembly. If a hose assembly is enclosed in an airtight plastics envelope; this should not be removed until the hose assembly is to be fitted. If this envelope becomes damaged

during banding, it should be resealed or renewed after any desiccant inside has been checked for condition.

d) Markings on Hose: Various methods are employed to mark the date of manufacture on hose. It is sometimes stenciled on the external surface, or impressed on a tab or bank secured to the hose. In instances where the external surface is of cotton braid, some of the 'picks' are woven in black and some in color which indicates the month and year of manufacture, as required by the appropriate Specification.

e) Cleaning: Any cleaning of rubber parts and components containing rubber, after storage, should be done with water or methyl spirit. If synthetic detergents are used, care should be taken to select those that are not harmful to rubber. Neither Petrol, nor other petroleum spirit, benzene, turpentine, etc., should not be used, nor cleaning be carried out with sharp or abrasive objects such as wire brushes or emery cloth. Disinfectants should not be used. After cleaning, articles should be rinsed in water and dried at a distance from any direct heat.

6.4.16. Elastomer Materials:

An elastomer is a substance which maintains its structural integrity under mechanical stress and which rapidly and forcibly resumes its original shape upon removal of the stress. The physical and chemical properties of an elastomer are developed upon its temperature, its three dimensional molecular network structure and the presence or absence of fillers and other additives.

a) Storage Condition: Electrometric items, products, and assemblies shall be protected from circulating air, sunlight, fuel, oil, water, dust and ozone (which is generated by electrical arc, fluorescent lamps etc.). The storage temperature shall not exceed 125° F.

6.4.17. Sheet, Bar and Tube Metal:

It is recommended that sheet material should be stored on edge in racks; care being necessary to prevent the bending of single sheets. Flat stacking is not recommended (unless suction pads are used to lift

the sheets are almost invariably slid from the stack, often resulting in detrimental scratches on the sheet removed and on the adjacent sheet. Where vertical storage is employed, the material should be kept clear of the floor to prevent possible damage by scraping, splashing from disinfectants used for floor cleaning (which may cause corrosion) and the possibility of edge corrosion, which can occur with light alloy materials when in contact with composition floors. Temporary protective such as grease, paper or plastics coating, should be left in position until the material is required for use. If the temporary protective becomes damaged or partially removed, it should be restored without delay, and a periodic inspection of stock should be made.

a) There may be some merit in storing the sheet material in the transit cases. After the initial checking of the sheets, the case should be closed to eliminate dust/dirt which can cause surface scratching during handling operations.

b) Metal bars should be stored in racks either horizontally or vertically, well supported along the length when stored horizontally to prevent bending under weight. Metal tubing is normally stored in racks, well supported, the smaller diameter tubing being wired along the length, in bundles, to prevent damage..

6.4.18. Sparking Plugs:..

The plugs should be stored in a warm dry place, preferably in a heated cupboard, as additional precaution against the ingress of moisture. Protector caps should be screwed on both ends of the plugs to prevent the ingress of moisture or foreign matter

6.4.19. Survival Equipment:

Survival equipment should be stored in a room which can be maintained at a moderate temperature is to be free from strong light and any concentration of ozone.

a) _The manufacturer's instructions should be carefully followed when preparing survival equipment for storage. These instructions normally include ensuring that the component is completely deflated; removing easily detachable components; fitting

protection blanks or pads to inflation valves and other connections; dusting the component with French chalk and folding it loosely; wrapping in waterproof paper; and placing it on shelf above the floor.

b) A tie-on label should be attached to the wrapping stating:

- i The types, serial number and part number of the equipment.
- ii. Date of inspection and inflation tests.
- iii. Date of overhaul.
- iv. Date of component overhaul.
- v. Date of next inspection and/or test.

The life jackets or life-rafts should not stored one on top of the other without a separation of corrugated paper or similar shock absorbing material.

- i) In the case of life-rafts, not more than three should be stored on top of each other.
- ii) In the case of light texture of life jackets, it is important that they should be handled with care to avoid damage.

6.4.20. Tanks:

The precautions to be taken during storage will depend on the type of tank and the packaging method. Some manufacturers of flexible tanks specify that the tanks should be coated with a special preparation if they are to remain empty for more than two or three days, and that this preparation should be removed before the tanks are put into service.

'Short term' storage is the period between transport of the tanks from the manufacturer's works and delivery for immediate installation by the aircraft firm.

'Long term' storage covers the period during which the tanks are held following receipt by the aircraft firm before installation, or shipment to locations at home or abroad, involving an extended period of storage prior to installation.

Flexible tanks can be divided into two categories for packaging and storage Purpose:

- i) Tanks that can be folded, e.g. those not fitted with rigid internal members, heavy coverings or fittings which would preclude satisfactory folding.
- ii) Tanks with heavy coverings or fitted with rigid internal members, anti-surge valves, gauge units, etc.

6.4.21. Folding and Packing:

When packing a tank for storage purposes it is important to fold it in such a way that no strain or creasing is imposed on the folded areas and in many instances folding diagrams are provided. All openings should be sealed with the specified blanks and corrugated cardboard interposed between the folds.

- i) After folding, the tank should be encased in an airtight wrapping, such as a polythene bag, and sealed.
- ii) The tank in its airtight envelope should then be placed in a cardboard box, which should also be sealed.
- iii) Flexible tanks, which are unsuitable for folding because of internal or external fittings, etc., are often packed in an air-inflated state suitable supported in sealed cases. This method of packing is used only for short-term storage. For long term storage of this type of tank, the manufacturer's instructions should be followed which will vary with the shape and type of tank concerned.

6.4.22. Storage Conditions:

Generally, flexible tanks should be stored in the original airtight containers supplied by the manufacture and if this is not possible a similar airtight storage container should be used. The manufacturer's instructions should be observed closely. The tanks should be stored in cool, dry, draught-proof conditions, at a moderate temperature not exceeding 35° C

6.4.23. Tanks (Rigid):

Rigid tanks should be carefully cleaned and any moisture dried out before storage. All apertures should be sealed with closely fitted blanks. A silica-gel cartridge attached to a blank and placed inside the tank assists in preventing internal condensation and subsequent corrosion.

6.4.24. Timber:

Plywood panels should be stored flat, away from all of heat or damp. Other timber sections should be stacked with spacers between each section to permit the free circulation of air. The timber should be checked periodically for moisture content.

6.4.25. Transparent Acrylic Panels:

Acrylic sheets should be stored on edge, with the protective paper left in position as this will help to prevent particles of grit, etc., becoming embedded in the surfaces of the sheets. When this is not possible, the sheets should be stored on solid shelves, and soft packing, such as cotton wool, should be placed between each sheet. The pile of sheets should be kept to a reasonable limit of say twelve sheets.

- a) Curved panels should be stored singly with their edges supported by stops to prevent -spreading¹.
- b) There are several proprietary lacquers available for the protection of acrylic panels and shaping during handling and storage, To prevent deterioration of the adhesive between the protective paper and the sheet, store rooms should be well ventilated, cool and dry. The material should not be placed near steam pipes or radiators as hot conditions will cause the adhesive to harden and make the subsequent removal of the paper difficult.
- c) Material in storage should not be exposed to strong sunlight, particularly when the light shines through a glass window. This could cause a -lens formation resulting in local overheating to the detriment of the material.

d) Acrylic materials should not be stored with certain other materials because of the adverse effects which may arise from the vapours given off..

e) When sheets are moved they should be lifted off (not drawn from) the adjacent sheet. The vulnerability of transparent plastics to surface damage by scratching and bruising should be impressed on all personnel handling the material.

6.4.26. Windscreen Assemblies:

All Types of windscreen panels should be carefully protected from scratches, abrasions or other damage as small scratches or abrasions may considerably weaken the panels and impair their optical qualities. The manufacturer's recommendations relating to packaging or protective wrapping for storage Purposes should be carefully followed.

a) Glass Panels and Windscreen Assemblies: All glass panels should be carefully protected from scratches, abrasions or other external damage.

b) Sandwich Type Windows: Sandwich type windows should be stored vertically in dry conditions, each window having its own desiccant cartridge attached, which should be inspected and renewed at specified periods. Spare windows are usually despatched with desiccant cartridges attached and these should not be removed until the window is to be connected to the aircraft desiccation system.

i) Windows in transit should be allowed to '-breathe', this being particularly important when windows are transported by air, as considerable atmospheric pressure variations may be encountered.

ii) In addition to desiccant breathing cartridges, some manufacturers build into each window airspace, another desiccate which consists of small discs of activated alumina strung on wire and encased in a cylindrical fabric stocking. Normally the desiccate does not require renewing.

c) Electrically Heated Windscreens: Extreme care is necessary in handling and storing windscreens. It is generally recommended that windscreens are stored in the manufacturer's packing, which usually consists of protecting both surfaces with adhesive polythene, wrapping in acid-free paper and cellulose wadding and storing in reinforced cartons.

i) The panels should be stored separately in their cartons on racks, away from any strong light at a controlled temperature of approximately 15 to 25 degree Celsius in well ventilated conditions.

ii) It is important that during handling or storage the thick glass laminate is kept uppermost to prevent delamination and that the polythene film is not removed until the panel is fitted to the aircraft.

6.4.27. Wire Rope:

Wire rope should be stored in ventilated and dry, reasonably well temperature controlled condition to prevent condensation. Wire ropes should not be stored where they might be exposed to the corrosive influence of acid fumes, steam or other corrosive agents, and should never be placed on a stone or concrete floor.

a) Wire rope in store should be inspected periodically for signs of corrosion or other damage. Where a wire rope dressing has been used, this should be renewed when necessary.

b) Wire rope should be wound on a reel, the diameter of which will be specified by the manufacturer according to the size and type of rope

c) If reels are made locally, it is important that oak, chestnut or western red cedar is not used in their construction as these timbers may corrode the wire rope. The inside of the reel should be lined with waterproof paper.

d) When unwinding wire rope, a spindle should be placed through the center of the reel and fixed so that the reel is free to rotate and the free end of the cable can be pulled out in direct line with the reel. The cable should not be unwound by paying

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off loose coils, or by pulling the wire away from a stationery reel laid on its side. When cut-off lengths of wire rope are hand coiled, the coils should be of diameter not less than 50 times the diameter of the wire rope concerned, with a minimum of 152 mm (6 in) diameter. When hand coils are unwound, the coil should be rotated so that the wire rope is laid out in a straight line. If the wire rope forms a loop on itself, this indicates a localisation of turn and should be eliminated by taking the turn out and not by pulling straight.

e) Before cutting the cable to length, it should be bound either side of the proposed cut to prevent loss of tension from the woven strands.

6.4.28. ESDS Items :

Computers/ Components Containing Electrostatic Discharge Sensitive devices, shall be stored in a special grounded metal racks, if the part is in an unprotected container, conventional Storage is permitted for ESDS parts in shielded conductive wraps and LRU in metal containers with conductive dust caps installed on all connectors. The premises shall be dust free. Minimum humidity of air-conditioned premises shall be at least to 50 to 60%

6.4.29. Self Illumination Signs:

These contain radio active tritium as filled in capsules and should be stored in original packing safety to avoid any damage or breaking. In case, the capsule is broken, then shall be sent to component overhaul division in special airtight metal containers for onward despatch to BARC, for further disposal action.

6.4.30. Engines:

Boxed engines shall be stored with a minimum of 30" of free space at each end. Always store within a building. Prepare engines for storage according to procedures in maintenance manual/process bulletins. Engines which have been removed from aircraft for storage or uninstalled engines should be drained of all oil, fuel system, inhibited oil system treated, desiccants placed as specified and with all openings blanked and be packed in MVP (Moisture Vapour Proof)

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envelopes and sealed. The humidity indicator should be checked at specified intervals.

6.4.31. APU:

In general, the inlet and tail pipe should be covered, all external taps, parts, fittings and other openings capped. Desiccants are placed in the exhaust and inlet areas before covering. Humidity indicator should be located in a reading visible area and checked at specified intervals.

6.5. Storage Period

- 6.5.1. For all aircraft spares for which storage periods are specified by the manufacturers in documents like MPD (Maintenance Planning Data/Document), CMM (Component Maintenance Manual), OHM (Overhaul Manual), these automatically become the limiting period. Where storage periods are not specified, these are determined taking into account the construction of the component viz. whether it contains rubber parts, or parts which can corrode, cease, etc.
- 6.5.2. Aircraft Tyres will be reinspected after every one year of storage. Their maximum storage life is normally limited to ten years from the date of manufacture or as recommended.
- 6.5.3. Storage life of aircraft wheel assemblies is one year, after which an extension permissible subject to inspection and certification.
- 6.5.4. All other items such as oil tanks, electrical relays, switches, solenoids, mechanical and electrically operated instruments, etc. whose storage lives are not mentioned, will have no limiting storage periods. but to preclude the possibility of deterioration in storage, they will be subject to inspection as decided by QC.
- 6.5.5. The Storage Life for hoses is limited to 10 years from the cure date, provided they are stored under standard conditions. During storage, periodic inspections should be carried out for signs of deterioration, weather cracks, signs of corrosion on end fittings etc.

- 6.5.6. The Storage life for some other Rubber Parts , Seals etc.. used in Hydraulics and Pneumatic system is limited to 6 years from the cure date, provided they are stored in standard conditions. Seals stored for more than four years should be examined and discarded if evidence of hardening or softening, blistering or peeling are found.
- 6.5.7. For some items passed out from Overhaul Shops, the storage period is certified as per Certificate of Inspection accompanying the part. The period is also mentioned in the work orders cum Repair Label. For items received from vendors / manufacturers, storage periods derived from the incoming Release Notes / Certificates (counting from the date of last inspection), are written on the Stores Inspection Tag by Stores Inspection,. Storage periods are also given in the Component Reliability Programme document.

6.6. INSPECTION OF COMPONENTS ON SHELF-LIFE EXPIRY

6.6.1. At Base

On the instructions of the Stores Inspection personnel, the Stores will prepare necessary advice in IRO (Inspection and Repair Order) for all storage time expired units and such items will be immediately transferred to a quarantine rack to avoid inadvertent issue. Necessary Work Orders to carry out the reinspection/tests are immediately issued by the Stores Inspection personnel.

6.6.2. At Outstations

The shelf life expired items are sent to Base for its Inspection as and when required or follow as practiced at Base.

7. STOREHOUSES – SAFETY, HEALTH & HYGIENE

Safety and health are two essential requirements for storehouses. Lack of care may cause industrial accidents or work related ill health.

7.1. Fire Prevention

Prevention means to take all precaution to avoid the start of fire; otherwise it may cause loss of lives and properties.

1. Employees should become conscious and must always do their utmost to prevent fires occurring.
2. Smoking should be prohibited inside and outside the building.
3. Area should be free from flame, smoke or other sources of ignition.
4. Good house keeping and tidiness are to be maintained.

7.2. Fire Protection

Building/ Storehouses should be properly protected from fire occurrence.

1. Suitable alarm system to activate all concerned individuals / departments and fire services.
2. All fire working cautions and notices should be displayed at the entrance of the building/ storehouses.
3. Personnel should be trained to operate equipment and monitor/supervise the situation in cases of emergency.
4. Only approved type fire extinguishers should be placed at the correct locations. They are to be maintained in serviceable condition.

7.3. Health

1. First-Aid-Kits should be located at a readily accessible place.

2. All medicines/items should have lives and serviceable condition.
3. Personnel should be trained about the use of first-aid-kits materials incase of emergency.
4. Persons working in health hazardous weather/condition should be medically examined annually and a record is to be maintained.
5. Fumes detector/analyser should be available in stores where hazardous chemicals are kept.
6. A list of medicines/drugs approved by Medical Department should be kept and replacement of items, to be actioned immediately on consumption.
7. Material Safety Data Sheet (MSDS) for all hazardous materials should be available in stores.

7.4. Clean Rooms

In order to maintain clean rooms to the necessary standards, good housekeeping practices and monitoring of the air handling system are of prime importance.

7.4.1. Cleaning:

Rooms should be cleaned when usually no work processes are being performed. Minor dry floor and bench vacuuming can be done, if necessary, during normal room operation if the equipment and procedures used ensure a minimum of disturbance to settled particles. Cellulose mops and sponges can be used with water which meets specific particle-count requirements. High-grade which are not subject to flaking should be used. Plastic ladders are required; they should preferably be of the anode aluminum anodised type. The use of detergents should be restricted to those which produce the minimum amount of residue after drying. For vacuum cleaning, a central vacuum cleaning system or a specially designed portable vacuum cleaner should be employed..

7.4.2. Monitoring of Clean Rooms:

Monitoring refers to the procedures adopted for checking the factors influencing clean room environment. Such factors are the level of contamination, temperature, humidity and pressure. The exact requirements for monitoring and methods to be employed depend on the type of clean room and classification of cleanliness level, and are therefore determined on an individual basis.

a. Contamination Monitoring: This is the most difficult monitoring problem of clean room operation owing to the variations in contamination level throughout a room and also to the many factors which must be considered in selecting a specific monitoring technique. Some of the factors causing variations in contamination level are; filtered air entering a room at one or more locations; contamination being generated in various amounts throughout a room; contaminated air exhausted from a room at one or more locations. The areas of most concern are those immediately surrounding the component on which work processes are to be carried out.

b. Humidity Monitoring: This may be achieved by the use of conventional wet and dry bulb thermometers and psychrometric charts. These thermometers may be supplemented, if necessary, by automatic recording devices. For those components where humidity tolerance is critical, special control measures should be employed.

c. Pressure Monitoring: A clean room should always be slightly pressurised and it is, therefore, necessary to monitor the pressure difference between the room and its outside surroundings. Monitoring may be achieved by a simple U-tube manometer, or a differential pressure gauge calibrated in mm water gauge.

8. REDUNDANT AND OBSOLETE ITEMS

"OBSOLETE" and "REDUNDANT", means::

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OBSOLETE: Disused, discarded, antiquated, less developed than formerly.

REDUNDANT: Superfluous, Excessive.

As it will for Engg Deptt, on the recommendations of their concerned divisions and in conjunction with Material Management Department, to decide as to which of the items are redundant to our requirements or Obsolete.

The slow moving / non moving items by movement pattern alone cannot be termed as redundant / obsolete

Further action on redundant / obsolete items with due follow of process will be initiated by MMD to process the sale / disposal of such identified items

8.1. SCRAPPAGE OF MATERIALS

Once the part/component/material is declared unfit for use, scrappage action is initiated. by the concerned division of Engg/MMD:

Reasons for Scrappage

There are **various reasons** and criteria to scrap any part/**material among** those, principal **reasons are** as underlined:

1. Damage beyond the scope of repair.
2. Corrosion/ deterioration beyond economical repair.
3. Shelf life expired.
4. Scrap life of components recommended by manufacturer or other authorities
5. In operation/ unserviceable.
6. No repair recommended.
8. 100% replacement basis.
9. Faults.
10. Any other reason

8.2. Disposal of Material

All consumable materials (CM) should be disposed as soon as they are declared excess or shelf life expired, to protect from further deterioration and pollution of environment. RCRA (Resource Conservation and Recovery Act) is a Federal Regulatory Statute designed to provide management of hazardous waste Programme regulating use, storage and disposal of waste materials. Improper disposal may cause contamination of soil, drinking water, ground surface. Contamination can result in aquatic plants, animals and human health hazard.

8.2.1. Consumable Materials (CM)

- a) They should be labeled and separated from serviceable items.
- b) It should be kept in special polythene rolls, stocks boom, pillows, and pads, sheets specially made for drips, leaks and spill proof.
- c) They shall be buried in a deep pit specially earmarked for such disposal. Area should be far away from localities, rivers or sea bed. Area shall be fenced to prevent entry of human, animals, etc. Pits should be minimum 4ft. / 5ft. deep. Top mud should be compressed and must be covered by polythene paper so that no erosion from rain and wind.

8.2.2. Highly Radioactive

They should be packed in air-tight container, specially designed to carry out such elements/compounds. The container should be handed over to BARC, Trombay with handling manual, MSDS, after furnishing all details in their prescribed form. In some manuals, manufacturers have specified their disposal action.

8.2.3. Self Illuminating Signs

They contain radioactive tritium gas filled in capsule. For the purpose of disposal they shall be packed in special air-tight metal containers

and to be handed over to Component Overhaul Division for onward despatch to BARC, Trombay.

8.2.4. Highly Explosive/ Flammable

Before any disposal action is initiated, Explosive Inspector/Commissioner for the locality should be informed and action will be taken according to his instructions/procedures.

8.2.5. Highly Toxic

It could be better if they are neutralised before disposal action. Water can be mixed up to dilute its concentration. Further action will be taken as for CM, otherwise suppliers can be consulted.

8.2.6. Chemicals of reactive nature

- a) Contaminated solvents should be stored away from inhabited building, water supply. They shall be properly labeled and kept in sealed leak proof containers.
- b) Spilled solvents should not be flushed into sewers.
- c) Sands/sand bags are to be used for spilled materials.
- d) Sand waste to licensed reclaimers or permitted incinerators for recycling evaluation and processing. [NOTE: Local Authorities should be consulted before disposing any material.

8.2.7. Hazardous Materials

Some chemicals are hazardous and potentially harmful to the people and environment

In case of spillage of such materials, following to be followed as:

- a) Identify the hazardous materials and its potential dangers.
- b) Determine the physical limitations of accessing the spill location.
- c) Observe special clean up consideration.

In case of flammable, identify whether the vapour concentration of flammable liquid spill is above or below 10% LEL (lower explosive limit). In case, it is above 10%, all ignition system should be isolated

and use insulation blankets for protection. Cleaning to be done by approved absorption method. Before final disposal, reaction of the chemical is to be tested- For details refer to the authorities and DGR Guidelines.

9. PACKAGING

Packaging plays an important role, since it protects aircraft components from any physical damage and deterioration. It guards the parts from environmental degradation and contamination. It saves not only handling damage but also storage up to the moment of installation. It provides shielding to instruments from external magnetic field.

9.1. Classification of Components

All components are required to be identified and classified before they are packed, since materials to be used for making containers/ package largely depends on the nature of parts/material to be housed. Basically, they are categorised as:

9.2. Quality of Containers

Containers' should be capable of absorbing jerk or shock. It should protect the part inside from humidity. For delicate parts, packing materials are used to fill up the extra gap inside the package and it restricts the component from moving/dangling inside. Various types of materials are used for making package and containers depending upon the nature of component to be housed. Containers are of two types: Disposal or Reusable. Reusable containers could be used for a number of round trips. The size of the container should be minimum and regular shape. They should have minimum of tare weight.

9.3. Magnetic Fields

Assemblies or components, which generate a magnetic field must be packaged and properly spaced in shielding materials, which will prevent the magnetic field from adversely affecting adjacent items and instrumentation.

9.4. Electrostatic Discharge Sensitive Devices

Electrostatic Discharge Sensitive Devices be individually packaged in appropriate protective packaging and labeled with ESDS precautionary labels. They shall be protected by a plastic bag or container that is conductive, static dissipate or antistatic having sufficient properties to provide electrostatic discharge protection to electrostatic discharge sensitive devices and assemblies such as microelectronic metal oxide semiconductors (MOS), field effect transistors (FET) and printed circuit board (PCP). Cushioning materials shall provide electrostatic discharge protection and be non-corrosive.

Dust covers and connector protective caps will be conductive or fabricated out of plastic that affords equivalent protection to static sensitive devices. Packaging shall be designed to provide physical and environmental protection to electrical and electronic parts and assemblies during transportation, storage and handling up to the point of use. Packaged items shall be marked in accordance with internationally recognised caution label or equivalent.

9.5. Hazardous Materials

The terms Hazardous Materials includes hazardous substances, hazardous wastes, marine pollutants and elevated temperature materials. They shall be properly classified, described, packaged marked with handling symbols/signs, cautions and mode of transportation. Packaging should be in accordance with DGR Regulations

9.6. Material (Container)

Although, the material of the containers depends upon the type or nature of the goods to be packaged, certain materials are tested and found satisfactory for the purpose of packaging. They are listed as:

1. Metal
2. Wood
3. Plastic
4. Fiberboard
5. Fibre Glass
6. Cardboard
7. laminated Sheets
8. Special category (Recommended by manufacturers of the goods)

9.7. Quality of Materials

1. All materials must be of sufficient thickness, strength and quality to meet the requirements.

2. Materials shall maintain performance characteristics and be capable of withstanding long term exposure to temperature range

3. Materials shall withstand deterioration by industrial solvent, hydraulic fluid, petroleum products and jet fuels to which the container may normally be subjected. Metals should be of flammable nature for absorbing shocks, impacts. For absorbing shock and cushioning effects, materials should possess the following properties:

a) Resilient. b) Non-dust producing. c) Mold Resistance. d) Durability.

Foam Sheets, bubble wrap or other cushioning and void fill materials are used. Hard or compressed cushioning materials should be replaced with new material of reusable containers.

9.8. Handling

All hardware including fasteners used to secure lid, shall be recessed, flushed or guarded so that no protrusions could cause damage to side container or other parts. All handles/hand holds shall be recessed flushed with the container surface. Reusable containers shall be marked to identify.

9.9. Markings

Markings shall be clear, legible, non-fading and contrasting and it will loose or fall during opening or closing of the container. Marking can be done by stenciling, printing, stamping or by the use of labels or tags. Identify all unit containers with the following information:

1. Part Number.
2. Shipment Quantity.
3. Special Markings (when applicable)
 - a) Part Serial Number.
 - b) Manufacture date.
 - c) Expiration date.
 - d) Hazardous material code.
 - e) Storage requirements.

9.10. Handling requirements/precautions.

Information regarding marking and labeling symbols commonly used to identify materials contained inside the packages/ containers for reference as listed below:

- 1) A.O.G. Label.
- 2) Package Orientation
- 3) Fragile Label / DGGR Labels

- 4) Unit Pack Label for Bags, etc.
- 5) Packaging of electrostatic discharge sensitive devices

10. DANGEROUS COMMODITY STORES

10.1. General

There are various chemicals, cleaners, paints, varnishes, oils, compounds, and grease, etc. required to be stocked for issue and use in aircraft maintenance division, overhaul and process shops which are materials are procured as per recommended specifications

The premises in which the above commodities, are stored are licensed by Municipal authorities (Bombay Municipal Corporation) and the Controller of Explosives. The conditions under which the licenses are issued are complied with on a continuous basis. The premises in which the referred items are stocked are designated as Dangerous Commodity Stores which is more generally referred to as Oil & Dope Stores.

10.2. Storage Conditions and Requirements.

The commodities are stored in their original packing/containers (excluding wooden crates). Storage conditions for different types vary. For example acids, chemicals and oil based paints are of explosive nature and these must be stored separately and away from inflammable materials. Acid stored in jars and bottles should be kept in Sand Pits. Oil barrels are to be stored on wooden planks and in a rolling position to facilitate easy moving and lifting. Storage conditions in general must meet manufacturer's instructions and any conditions if specified by Acts / Rules such as Indian Explosives Act, Gas Cylinders Rules etc.

10.3. Storage of Denatured spirit, Petrol based Products

- (i) Denatured spirit is stocked after obtaining a permit in form D.S.V.Q. (13) from prohibition and Excise Collector. This permit is issued on yearly basis and is to be renewed annually.
- (ii) For storing Ammonia and Petrol based products which are of explosive nature, a licence is obtained for 3 years in form 14(Article 7, IST schedule) from Controller of Explosives. This is also to be renewed accordingly.

10.4. General Requirements of the Premises

The premises where dangerous goods are stored are under the Official Secrets Act and therefore located at a remote location. Other requirements are:

- (i) **"NO SMOKING"** signs displayed prominently.
- (ii) **"ACTION IN CASE OF FIRE"** boards displayed.
- (iii) Provisioning of sufficient quantities of fire extinguishers around the premises for quick action in exigencies. Availability of serviceable fire hydrant hoses with nozzles.
- (iv) Provisioning of Exhaust fans / systems in all rooms to expel obnoxious fumes.
- (v) Installation of flame proof lamps in rooms, use of flameproof wiring and with switch boards at entrances.
- (vi) Acid resistant flooring for rooms storing chemicals / acids.

10.5. Storage life control

As the item passes incoming stores inspection, details such as Stock **No**, **Release Note No**, Class and Shelf life are marked / etched on the container. Rotation of stock is carried out on first come first out **basis**, thus avoiding piling up of old stock.

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A periodic check is carried out by Stores Inspection personnel for the items held in Oil & Dope Stores for use on aircraft, in Overhaul Shops and Process Shops to ascertain if any container is corroded or for any storage life expired items - if prescribed by manufacturers / suppliers, and such of those requiring test and recertification are sent to approved agencies

10.6. Scrappage of Items

Items held in Oil & Dope Stores and which are definitely to be scrapped, are processed for scrappage in consultation with by Stores Inspection authorised executive of Engg /MMD.

10.7. Disposal of expired stock // scraped items

Permission from regulating bodies / Municipal Corporation is sought and the items dumped in prescribed places at the earliest. This is to avoid such items remaining in 'dangerous commodity' stores and causing harm to personnel and property and other hazards.

Handling of Dangerous/Delicate Commodities should be done in accordance with specific directions given in the Dangerous Goods Receipt Manual (DGR) which is available with the Commercial - Cargo, Staff College, etc. This manual may be referred for exhaustive information on handling procedures for dangerous and delicate commodities.

11. PARTS POOLING AND PROCEDURES

In order to avoid heavy investments at en-route stations by any single airline, holding exhaustive spares and expensive equipment such as the aircraft recovery equipment, etc. most International Operators who are members of IATA, formed a membership body called the International Airlines Technical Pool (IATP) and are participants of the Consolidated

Pool Agreement. Under this Agreement, airline with similar type of operating equipment, agree to provide certain pre-determined spare parts, engines, ground equipment at specified airports for the benefit of the other pool partners upon terms and conditions mutually agreed upon.

The D.G.C.A. under the provisions in Civil Aviation Requirements CAR, permits pooling of aircraft parts by National Airlines of India with foreign airlines subject to fulfillment of conditions laid down in the said C.A.R. Regarding use of pool spares on Indian Registered Aircraft, the following are required to be ensured before they are installed:

Air-India is a signatory to the agreement for the pooling of spares, engines and equipment with the following objectives:

1. To obtain maximum spares coverage for all the pool partners operating a particular type of aircraft/ equipment with the least amount of duplication or capital investment.
2. To continuously review the spares and equipment holdings at the various stations in order to designate the logical providers and participants.

Exhaustive information regarding the procedure of pooling is available in the Manual at the Field Service Store house situated at NIPT /Line station and Line Maintenance divisions of Engg.
