

*Supply Chain Procedure
of
Spare Parts of Aircrafts*



ARIRANG AVIATION

Internship Report
On
Supply Chain Procedure
of
Spare Parts of Aircrafts:
Arirang Aviation Limited



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LETTER OF TRANSMITTAL

December 22, 2016

Dr. Md. Mamun Habib

Associate Professor

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Subject: Submission of internship report

Dear Sir,

I have completed my internship and this is the report which is mandatory requirement for the Internship (BUS699) course. I am an internee in Arirang Aviation Limited and after completing the four months of internship, this report has been prepared, which is titled ***“Supply Chain Procedure of Spare Parts of Aircrafts: Arirang Aviation Limited.”***

The internship program with the Arirang Aviation Limited was a wonderful experience. This gave me an opportunity to learn and understand the corporate culture which will be helpful for my future professional career.

I really hope it will meet the expectation and standard. It would be pleasure for me, if this report can serve its purposes and I will be available to explain your queries if you feel necessary.

Sincerely,

Tarek Zobaer

ID: 14364007

ACKNOWLEDGEMENT

I would like to thank the greatest Almighty Allah for all the immense blessings and to let me and help me all the way through to prepare this report.

Firstly, I want to sincerely thank my course (Supply Chain Management, Project Management and Total Quality Management) instructors Dr. Md. Mamun Habib and Hasan Maksud Chowdhury to give such a learning so that I am able to do my internship report in this issue. Afterward, big thanks to my internship supervisor Dr. Md. Mamun Habib, Associate Professor, BRAC Business School, BRAC University, for giving me the opportunity to do my internship report under his observation, and also for his everlasting support and providing the necessary help for the completion of this report.

I would like to thank Firoz Ahmed, (Maintenance Manager, **Arirang Aviation Limited**) for his strong believe in me with all his experiences, Asaduzzaman Bhuiya (Procurement Manager, **Arirang Aviation Limited**), Dev Nath (Store- Officer, **Arirang Aviation Limited**) for their cooperation and endless supports and transparency towards my work. Special thanks to my friend Faria Simir Mridila for her continuous unconditional support.

I would convey my sincere gratitude to my parents, whose endless reassurance and inspirations have enabled me to give my best effort on and for being a leader at every other aspect of my life. My apologies for any omitted name whose involvement was also harmonizing for any conceivable feature.

DECLARATION

I hereby declare that the report namely “Supply Chain Procedure of Spare Parts of Aircrafts: Arirang Aviation Limited” is completed by me which is based on my practical work experience and a comprehensive study of the existing activities of Arirang Aviation limited.

I also declare that this report is my original work and does not breach any existing copyright. This particular report has not been previously submitted to any other University/College/Organization for academic qualification/ certificate/ diploma or degree.

I have prepared it for the academic purpose of Master of Business Administration degree which requires practical work experience. As a result, permission needs to be conducted with the author before using it for any kinds of purpose.

TAREK ZOBAER
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EXECUTIVE SUMMARY

Arirang Aviation Limited is flight support department of Youngone, operate flight for Youngone Corporate Charter, business charter, Air Ambulance and Flying school. To run their operation smooth and trouble free, they need to ensure their aircraft airworthy. So that need to perform examined the aircraft physically and need to replace the aged equipment and thus introduce supply chain of spare parts. It covers the parts demand, requisition, supplier selection, cargo and customs clearance, store and issue parts. It is not possible to discuss all of this in details as there are some limitations of data and information and also from company. But in this report in brief all section is tried to introduce. Further here discuss about some limitation on spare part supply chain identical Traditional inventory process, miscommunication, vague planning. At last recommended some supply chain theoretical solution given; example: the inventory life cycle, ABC classification, Ishikhawa Fish Bone diagram. New approaches are introducing in supply chain management, it is time embrace them in our own system.

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INTRODUCTION

Internship program is a test drive for a student's theoretical knowledge and skills. In case of business studies the real life experience make the difference in a bigger aspect. To achieve experience through internship program always tries to reflect the real life scenario and the theoretical assumptions side by side. In one side for a student the course works build ones basic and this very internship program gives him the real life exposure. I get the opportunity to do my internship in the Arirang Aviation Limited a sister concern of Youngone Corporation. Previously it known as Youngone Flight Department and provide service to corporates of the Youngone corporation and its valuable guest form foreign and local. Now it becomes a major player in Private aviation filed with its different elite private aircraft.

Aircraft is a sensitive and critical engineering success which is very valuable and become very popular sort of transport. It needs an identical inspection and check of all system to make it airworthy. Vigorous inspection is taken and number spare parts need to change in each inspection and also in unwanted or un-schedule inspection. So the spare part availability and for that spare part supply chain management now becomes a vital factor in aircraft maintenance management.

1.1 OBJECTIVES OF THE REPORT

This project consists of two types of objective. They are-

✓ Primary Objective:

- To understand the requirement of spare parts in Aircraft Maintenance.
- To understand the procedure of supply chain management in Private Airlines.
- To understand how to procure spare parts in Bangladesh.
- To identify the procedures through which procurement process is conducted.

✓ Secondary Objective

The secondary objective of the report is to fulfill a compulsory requirement of having a MBA degree from BRAC University.

1.2 ORIGIN OF THE REPORT

This internship report has been arranged as a part of Internship (BUS699) course of BRAC University. The report titled, “Supply Chain Procedure of Spare Parts of Aircrafts: Arirang Aviation Limited” is being assigned by my supervisor for the completion of the course; moreover, he has approved my preferred topic for the report. I have collected all the required information from the appropriate source. I have tried my level best to combine and relate the information with the concept of the report, but due to time restriction and controlled access to information there still remains some limitations.

1.3 SCOPE OF THE REPORT

I have been assigned to make a report on “Supply Chain Procedure of Spare Parts of Aircrafts: Arirang Aviation Limited” followed in Arirang Aviation Limited. There is a number of multiple ways to endorse the brand but for sustaining a standard I have chosen a sample number of varieties.

1.4 METHODOLOGY

Communally primary and secondary sources would be used to collect information for this report. Main source of information about the Nestlé Professional business and for the analysis is collected from several resources of the company. Most of them can be treated as the secondary data. Additionally, I do have the uninterrupted work experiences gathered from the field.

Primary Data:

- Training Session
- Procurement Management
- Face to face conversations with employees, distributors and customers.

Secondary data:

- Company’s internal website , Arirang Aviation Limited
- Presentation
- Websites

1.5 LIMITATION

The limitations of the report are-

- Covering all the issues might not be possible due to confidential matter.
- All the necessary and additional information might not be possible to get because some companies might be unwilling to provide information.
- Enough secondary sources of information might not be available.



COMPANY PROFILE

Chapter 2

2.1 ARIRANG OVERVIEW

Arirang Aviation Ltd. is a concern of Korean RGM giant Youngone Corporation, established in Bangladesh. Chaired by Mr. Kihak Sung. It is the pioneer in private and charter operation in Bangladesh and with over 17 years of experience in the aviation industry supported by state-of-the-art aircraft, hangar, maintenance facilities, well experienced air and maintenance crew. The safety & regulatory standard is at par with JAA (Joint Aviation Authorities, European Union), FAA (Federal Aviation Administration, USA) as well as CAAB (Civil Aviation Authorities, Bangladesh) that keep people fly with maximum standard of safety. Deprived of negotiating the highest possible standard, it cultivated its concrete foundation with highly qualified personnel, the state of the art aircraft and operating facilities before starting commercial operation for a long time.

2.2 PRODUCT & SERVICE

2.2.1 PRODUCT

Arirang Aviation has three types of aircraft. They are- Cessna Grand Caravan, Pilatus PC12 and Piaggio Avanti II.

➤ **Cessna Grand Caravan C208B**

The United States by Cessna built the **Cessna 208 Caravan**, a utility aircraft which has a single-engine turboprop, fixed-tricycle landing gear, short-haul regional airliner.

Speed: 160 Nautical Miles per hour

Endurance: 06 Hours

Cruising level: Upto 12000 feet

Passenger Capacity: 09

Luggage Capacity: 200 lbs



➤ **Pilatus PC12**



Pilatus is the world market leader in the manufacture of single-engine turboprop aircraft and the Pilatus PC 12 has gained a reputation for outstanding versatility, performance, operational flexibility and reliability.

Speed: 236 Nautical Miles per hour

Endurance: 05 Hours 30 Mins

Cruising level: Upto 28000 feet

Passenger Capacity: 07

Luggage Capacity: 150 lbs

➤ **Piaggio Avanti II**

Today's Piaggio is headquartered in Genoa, Italy, producing a twin-engine turboprop plane; The P180 Avanti II is in short-

Speed: 402 Nautical Miles per hour

Endurance: 04 Hours 30 Mins

Cruising level: Up to 41000 feet

Passenger Capacity: 07

Luggage Capacity: 150 lbs



2.2.2 SERVICE

Arirang Aviation provides four services and those are - Corporate Youngone, Business Charter, Air Ambulance and Flight School.

➤ Corporate Youngone



With excellent flight safety records, ‘Youngone Flight Department’ is the pioneer in corporate flight operation for the last 12 years. Arirang is the only company in Bangladesh which offers Business class aircraft in all segments. It developed as a Business Charter Operator headquartered in Dhaka, Bangladesh after gathering sufficient experiences in both domestic and

international air operations for almost a decade.

➤ Business Charter



Arirang Aviation Limited is a Chartered

Passenger Air Transportation Company duly certified by Civil Aviation Authority, Bangladesh to operate Domestic and International Passenger Charter Air Services. It has deployed the most state-of-the-capable aircraft to carry passengers on its charter flights. The fleet of Arirang is consist of most modern aircraft like one Cessna Grand Caravan (9 seats), one PC12 (7 seats), two Piaggio (7 seats) including highly professional flight crews and ground personnel’s.

➤ Air Ambulance

Alleviating the stress by carefully handling all of details and planning associated with the transport is the main motto of air ambulance service of Arirang Aviation. Transporting the patient safely and compassionately, company used its proper experiences and gave the best service.



List of Medical Equipment:

- a. VS-800 vital sign monitor
- b. LIFEPAK 20e defibrillator/monitor
- c. PARAPAC plus model 310 ventilators
- d. MEC 1000 portable multi-parameter patient monitor



➤ Flight School

Arirang Flying School had occupied the lead in Bangladesh to revolutionize cockpit and pilot training. The mission is to train a world class pilot. Comprehensive flight, ground and



simulator training on instrument procedure are given top priority to mold a trainee pilot into a professional aviator. Both flying and ground instructors come from a wide and varied range of professional aviation backgrounds—commercial airline

pilot careers, corporate aviation and Bangladesh Air Force to civil aviation careers and they are fully trained and certified by CAAB.

2.3 STRUCTURE OF THE ORGANIZATION

Engineering and maintenance organization of Arirang Aviation Limited is based in Hazrat Shah-Jalal International Airport Kurmitola Dhaka. The organization is having its own maintenance facility in the hanger complex.

Engineering is headed by accountable manager and consists of the following three sections:

- Maintenance Section
- Quality Assurance
- Engineering planning

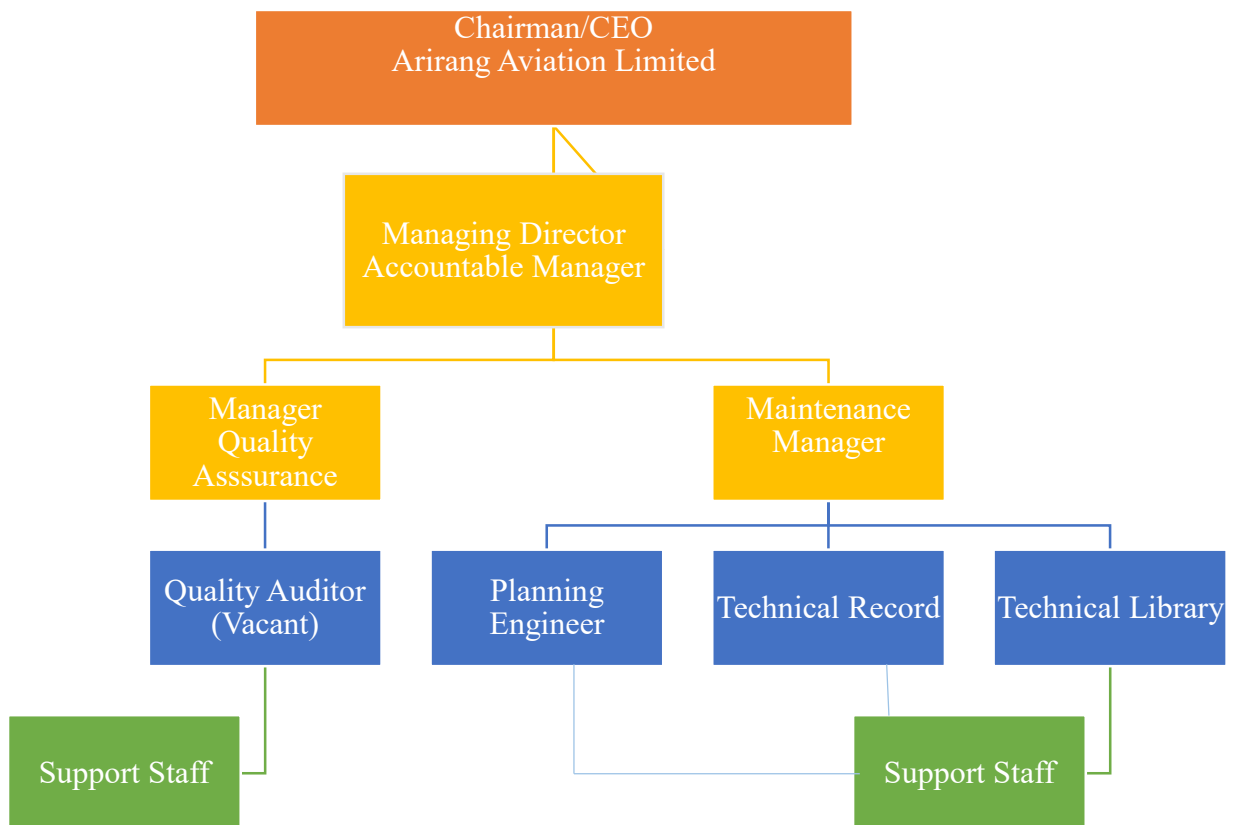


Figure: Organization Chart



Job Description

Chapter 3

3.1 INTERNSHIP EXPERIENCE

I have given an interview for this internship opportunity. In Arirang & general aviation, internship is called OJT (On the Job Training). After joining Arirang, I have never felt bad as it's an unpaid job rather I felt very excited as it was like a permanent job where I have got proper training, under supervision of some licensed Aircraft Maintenance Engineer, store officer and procurement manager. We work 6 days in a week. As it is a small part of Youngone and human resources are limited so employee used to work in different section as their job responsibility. As a result, I have worked with different department of the company like maintenance, planning and partially in procurement.

3.2 JOB RESPONSIBILITY

In Arirang, all aircraft is supervised by respective supervised or Fleet in-charge. I was responsible for an aircraft named Cessna C208B under the supervision of Aircraft Maintenance Engineer, Fleet in charge of C208B. I usually worked on documentation of the aircraft; this documentation includes Certificate of Airworthiness renewal, 100Hrs, 200Hrs and Annual Inspection. I was also responsible Simulator assistant of Arirang Flying School. During inspection I also performed maintenance work along with documentation. Here I got opportunity to get knowledge of spare parts requirement and store procedure as I need to issue spare parts for inspection. I have to do spare demand to store when it is needed and raise requisition for spare parts, deals with the vendor about pricing and shipment of the products. I was also attached with cargo inspection and customs clearance. Here I all got the opportunity have general idea of part supply chain procedure in an airlines.

**Supply
Chain
Procedure
of Spare
Parts of
Aircraft**
Chapter 4



4.1 SPARE PARTS REQUIREMENT IN MAINTENANCE:

Pre-industrial revolution, products were made one-by-one as a whole in workshops by craftsmen. After the industrial revolution and up until today, most products are manufactured in modular form with interchangeable parts. Interchangeable parts bring a vast change in modern manufacturing. For the continuous better performance, life expire of these equipment need proper maintenance operations, it is convenient to think of equipment as a combination of interrelated parts. Maintenance operations consist largely in replacing parts of equipment. Maintenance strategies determine when parts or equipment need to be replaced or maintained. An aircraft is made of millions of parts. Even then it is mandatory to track each and every part as a part of regulations. These regulations are strictly monitored by regulatory authorities of their respective country for ensuring the safety and airworthiness of the aircraft. In our country, Civil Aviation Authority Bangladesh (CAAB) is the regulatory authority.

In airline industries, an operator has to deal with two types of issues: the aircraft operating cost and customer satisfaction. Aircraft maintenance planning plays a major role in both of them. On the one hand, based on an analysis in 2012 conducted by the International Air Transport Association (IATA)'s Maintenance Cost Task Force, the maintenance cost takes up about 13% of the total operating cost, and it can be reduced by a good planning. On the other hand, an excellent maintenance program can effectively avoid flight delays and cancellations, thus improve customer satisfaction and competitiveness in the industry. Compared with other industries, the airline industry is unique due to a combination of four market characteristics: global need for parts, demand unpredictability, traceability of parts for safety reasons, and high cost of not having a part.

Aircraft maintenance is done by the aircraft operators themselves or by third party Maintenance Repair and Overhaul (MRO) organizations. Few airlines own their own MRO organization for carrying out maintenance. The Maintenance is classified mainly into two: Line maintenance i.e. maintenance activity done when aircraft land each time; and Base maintenance when aircraft is taken to hanger for major inspections and schedule inspection. This schedule maintenance is further classified as A-Check, B-Check, C-Check and D-Check depending Aircraft manufacturer specification. For this kind inspection Aircraft flying hours or landings are critical factor. Each of this check varies based on the maintenance interval as well as maintenance tasks associated with it. All of these task and inspection have to approve by Aviation regulators.

So, the supply chain procedures of the spare parts carry a very important role in Airlines industries for their smooth operation of flight and create competitive advantage to gain sustainability in the market and earn profit.

In this report, we will discuss about the spare part supply chain procedure of Arirang Aviation limited. Our Requirements of the Spares for maintenance: Aircraft Spare parts are required for maintaining the aircraft in airworthy condition (safe for flying). Requirements of the spares call for the following reason:

- ✓ **Category A:** To carryout Schedule Inspection (e.g. 100 Hours Inspection/Time limited Inspection/Annual Inspection).
- ✓ **Category B:** To rectify existing defects.
- ✓ **Category C:** Minimum stock quantity of vital items for uninterrupted flight operation.

4.1.1 We Need To Procure Parts For Following Reason:

- 1) For Scheduled Inspection: Before every schedule inspection, maintenance engineers check parts availability in the store in accordance with the inspection package at approximately 3 months ahead.
- 2) For Unscheduled Inspection: Parts required for any defect rectification.
- 3) Due to Nil Stock:
 - In case of technical stock Nil, Maintenance may demand the require parts/components for restocking.
 - In liaison with planning department, engineering maintenance checks schedule inspection package or unscheduled work sheet.
 - After completion of any maintenance work, engineers ensure all the documents duly filled and properly signed.
 - The engineers hand over the documents to the Quality Assurance Department.
 - After satisfactory check by QA, the documents are sent to Planning for record keeping.

4.2 MAINTENANCE STRATEGY

Aircraft maintenance is one of the important activities that one operator has to do under the supervision of the Airworthiness Authority like CAAB. As an AOC (Air Operator Certificate) and AMO (Aircraft Maintenance Organization) holder approved by CAAB, we follow MPM

(Maintenance Program Manual). In aviation, all rules are controlled by CAAB and for each fact obeyed by the CAR'84 rules and ANO (Air Navigation Order). Following all these, there are two types of Maintenance:

- a) Schedule Maintenance
- b) Unscheduled Maintenance

4.2.1 Schedule Maintenance: The schedule Maintenance is the regular maintenance process of an aircraft in accordance with the Aircraft Maintenance Schedule (AMS) derived from Manufacturer Maintenance Manual.

Schedule Maintenance is done at regular interval of flight hours or landings to keep the Aircraft in Airworthy.

4.2.2 Unscheduled Maintenance: In case of any defect rectification, troubleshooting, accident/incident the unscheduled maintenance is carried out. During flight/ ground check if any technical fault occurs, we need to take the corrective actions to solve the problem. These are under unscheduled Maintenance.

Schedule maintenance comes after some periodic interval or after some time limit and inspection tasks so the spare parts requisition is raised by planning department to store.

Considering these inspections and maintenance we do maintenance planning and do forecast of spare parts required in future. Forecast for unscheduled maintenance is done by counting previous failure of the parts history and part self-life consideration, this forecast is prepared by the Engineers, who generally assigned to Aircraft for the maintenance and requisition forward to store.

4.2.3 Spare Parts: The component of the aircraft systems (Landing gear, generator), standard parts (nut, bolt, and washer) and materials (Oil, grease, and adhesive) which are required to maintain the aircraft fly worthy are referred as spare parts. Primarily spare parts are divided into two categories these are:

- a) Consumables: Aircraft consumables are those which is required to change most frequently and this are of one time use type materials like lubricants, chemicals, grease, cleaners, adhesive, sealant, hardware, hydraulic, tire, igniter plug, seals etc. Minimum stocks of the consumables are required for smooth operation of regular flights.
- b) Rotable: Rotable parts/components are the heavy components of the aircraft which may be used again after overhauling or repairing. Basically, these components are replaced if any malfunction is detected or after specific life limit as stated by manufacturer to prevent

system degradation. Example of rotatable includes engine, generator, motors, electronic computers, display, flight controls, landing gear, actuators etc.

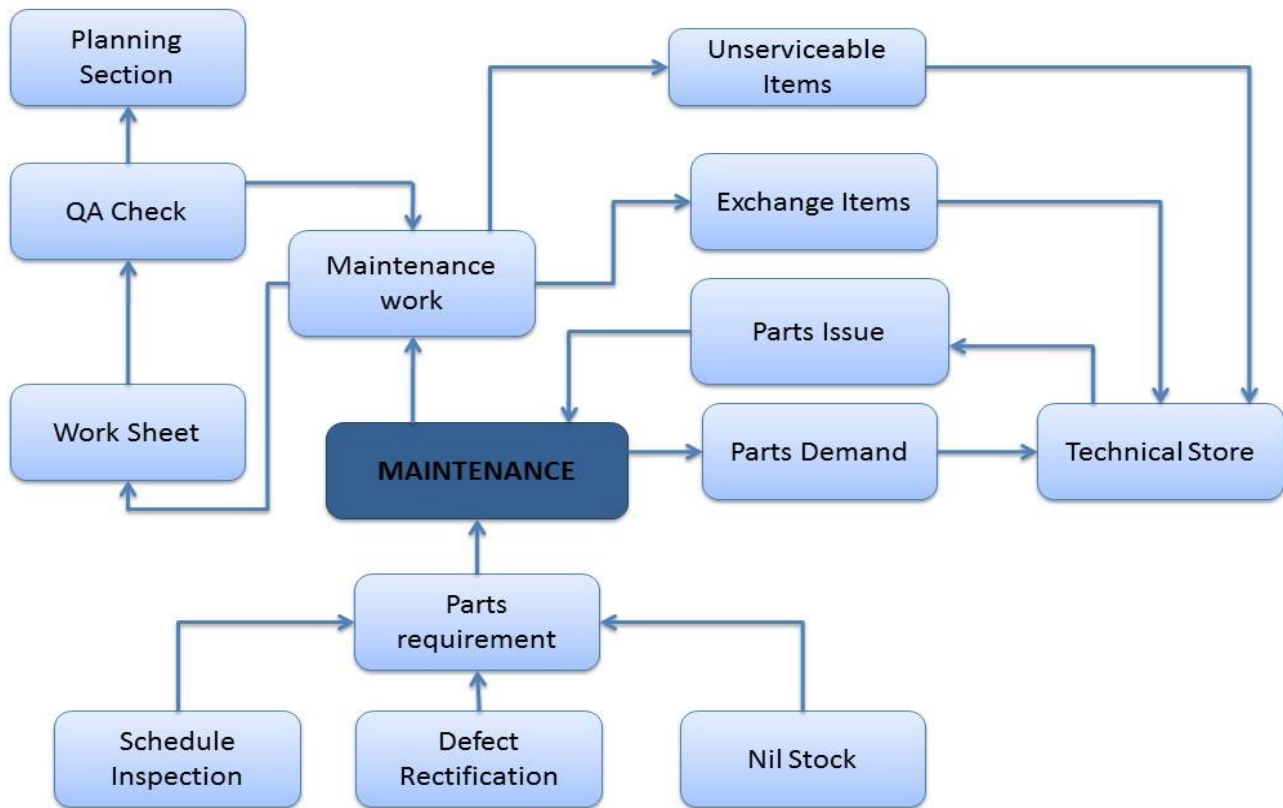


Figure: Maintenance Procedure

4.3 TECHNICAL STORE PROCEDURE:

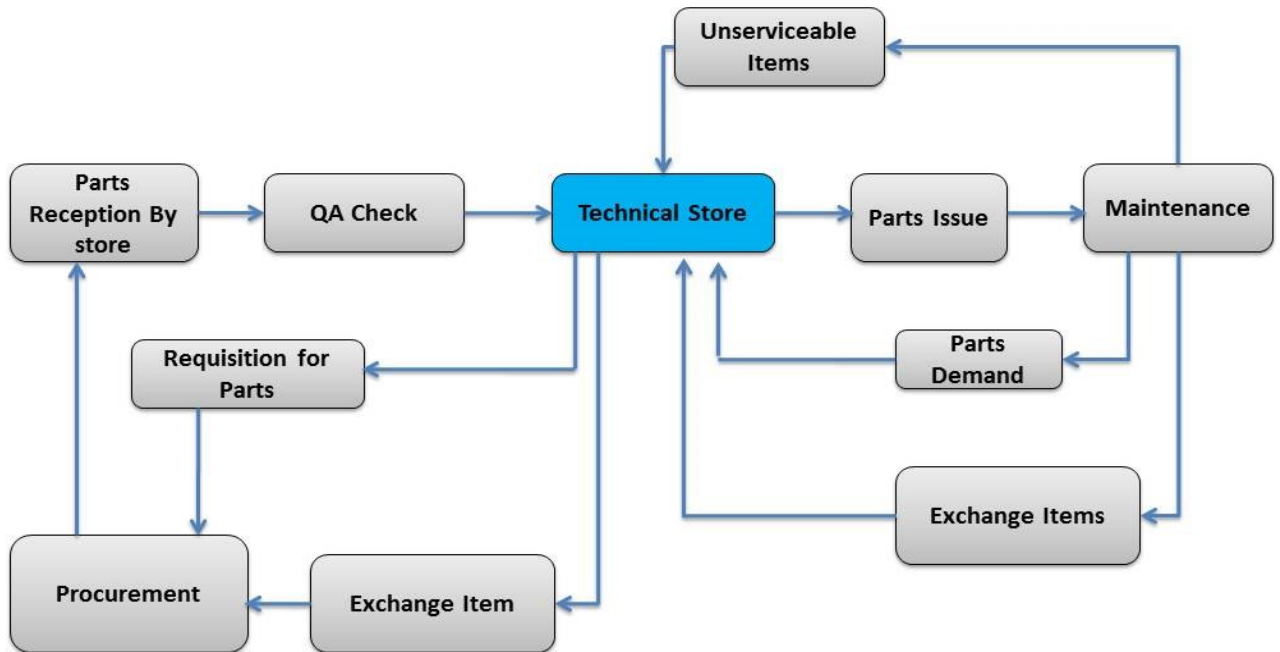


Figure: Spare parts flow in between Maintenance, Store Department & Procurement.

4.3.1 Parts Issue:

- From Maintenance section, Engineers placed their demand for necessary parts in the Store through specified form.
- Store issued the specific part through spare issue record.
- Store Inspector also give an entry in the stock record and BIN Card for maintain the stock updated time to time.

4.3.2 Maintaining Unserviceable Items:

- After receiving an unserviceable item from maintenance section, store inspector put an unserviceable tag on the particular item, then gives an entry in the unserviceable register and keeps the item in the unserviceable Cabinet.

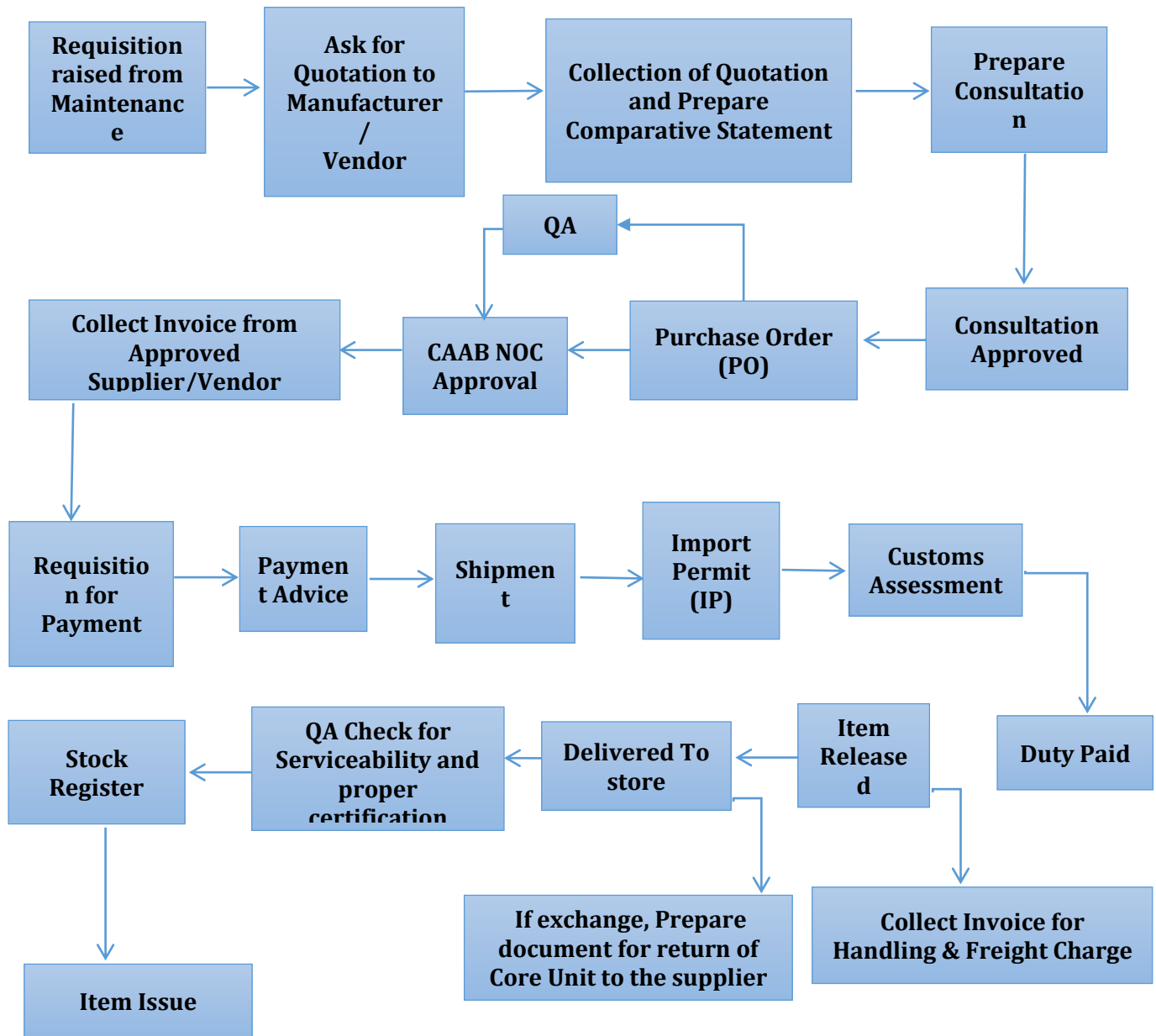
4.3.3 Maintaining Exchange items:

- Parts procure through exchange basis from vendors, are shipped to them on the packaging we received the goods from supplier.

4.3.4 Maintaining Items Required Calibration:

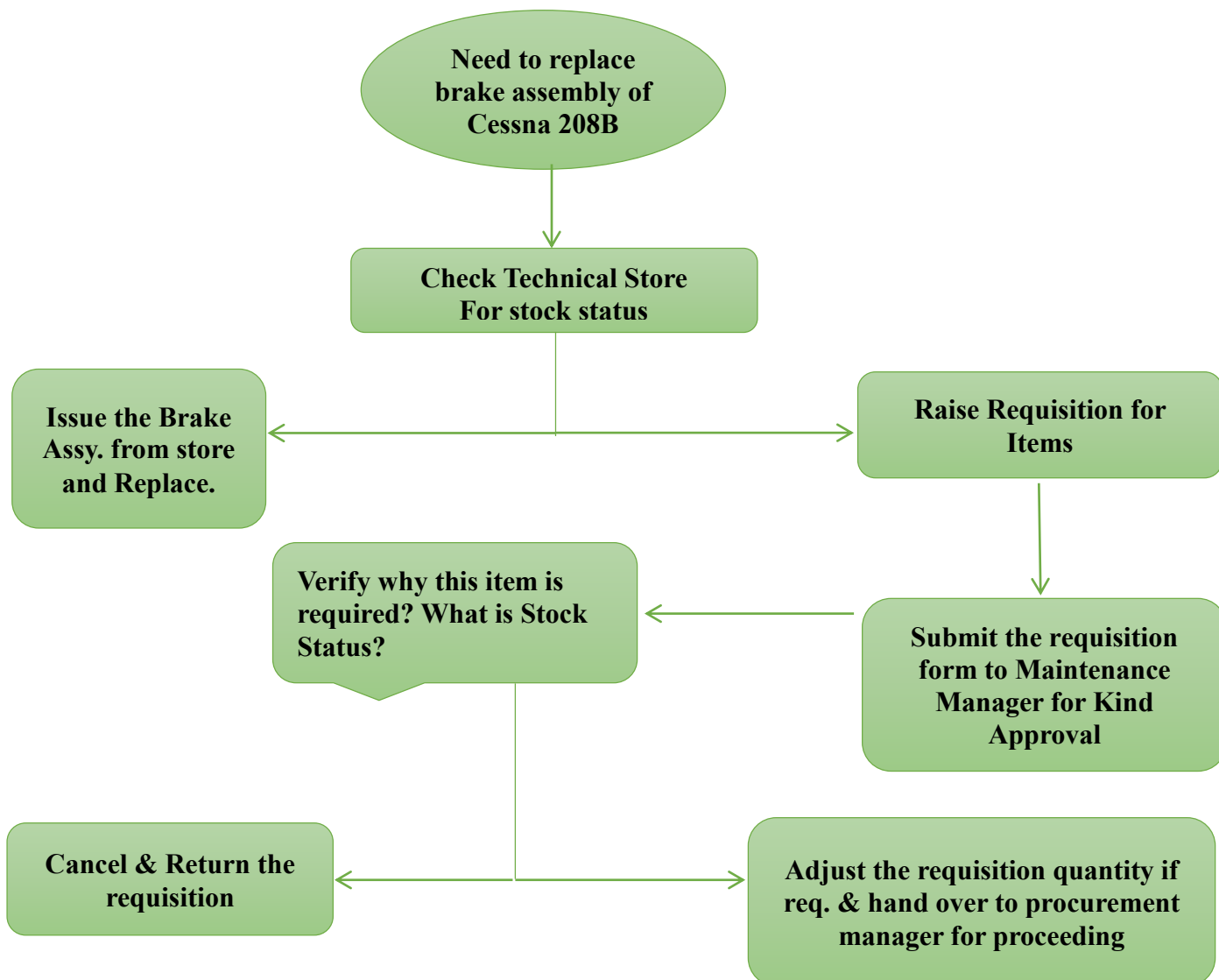
- Calibration: We use some specific test equipment to check the serviceability of the aircraft instrument. Ensure that the test equipment itself functioning correctly, we need to calibrate them at regular interval.
- Technical store maintains a calibration register for all the required calibration.

4.4 SUPPLY CHAIN PROCEDURE OF SPARE PARTS:



4.5 REQUISITION FOR SPARE PARTS:

If spare part is required to service the aircraft due to any of the reasons like schedule, unscheduled, existing defects rectification and maintaining minimum stock, then concerned personnel (fleet in-charge/engineer/store in-charge) raise a requisition for spares in a prescribed form after confirming the stock status in the technical store. The requisition form is then submitted to Manager, Maintenance for his kind consent. After sufficient verification, Manager, Maintenance approves the requisition and hands over the requisition form to Manager, Procurement for further proceeding. The total process is shown on the following flow chart with considering a case sample:



4.6 SUPPLIER EVALUATION AND SELECTION PROCESS

4.6.1 Importance of Supplier Selection:

- ✓ One of the most important processes performed in organizations today is the evaluation, selection and continuous measurement of suppliers.
- ✓ Supplier selection process is a multi-criteria problem, which includes both qualitative and quantitative factors.
- ✓ Organization's ability to produce a quality product at a reasonable cost and in a timely manner is heavily influenced by its suppliers' capabilities.
- ✓ Objective of selecting suitable supplier is to meet the specific need of Organization.

4.6.2 Supplier Evaluation Criteria:

The Four classes for the supplier evaluation measurement (minimum comply with one criterias is stated below)

1. The specific vendor must be holder of authorization from at least three different aircraft manufacturers.
2. It needs to be a member of Aviation Supplier Association (ASA) which main purpose is to ensure the quality & integrity of every Vendor.
3. It must have the approval from European Aviation Safety Agency (EASA) or Federal Aviation Administration (FAA).
4. It also may be in the Civil Aviation Authority of Bangladesh Authorized Suppliers list.

4.6.3 Supplier Evaluation Method:

The three Certification for the supplier evaluation Method (Minimum comply one certificate of stated below)

- FAA 8130-3 CERTIFICATE
- EASA FORM-1
- SUPPLIER HAVE THE AUTHORITY OF FSCM (FUNDAMENTAL SUPPLIER CODE OF MANUFACTURER)

Note : If supplier can provide any one certificate of above three, it means parts is genuine.

4.6.3.1 FAA 8130-3 CERTIFICATE :

A Certificate of Conformity or statement of conformity provides evidence that a part was produced by a manufacturer holding an FAA-approved manufacturing process. This form used for:

- ✓ A statement of certification from the FAA of a new product or article produced.
- ✓ Return to service a used product or article following inspection, maintenance, or alteration.
- ✓ Exporting products. Promote the identification and traceability of products and articles.

It is important to point out that the FAA only issues this form for products and articles under its jurisdiction.

1. Approving Civil Aviation Authority/Country: FAA/United States		3. AUTHORIZED RELEASE CERTIFICATE FAA Form 8130-3, AIRWORTHINESS APPROVAL TAG			3. Form Tracking Number: RH030314	
4. Organization Name and Address: Inno Corporation-5121 Industry Drive-Suite 104-Melbourne-FL-32940						
5. Work Order/Contract/Invoice Number: 2014-XYZ						
6. Item:	7. Description:	8. Part Number:	9. Quantity:	10. Serial Number:	11. Status/Work:	
1	Connector	MTCPQKT1P22PEXX	1	N/A	FACTORY NEW	
12. Remarks: These parts are factory new and traceable to the Manufacturer TE Connectivity (Tyco/Raychem) Certificate of Conformance on file.						
13a. Certifies the items identified above were manufactured in conformity to:			14a. <input type="checkbox"/> 14 CFR 43.9 Return to Service <input type="checkbox"/> Other regulation specified in Block 12			
<input type="checkbox"/> Approved design data and are in a condition for safe operation. <input type="checkbox"/> Non-approved design data specified in Block 12.			Certifies that unless otherwise specified in Block 12, the work identified in Block 12 and described in Block 13 was accomplished in accordance with Title 14, Code of Federal Regulations, part 43 and in respect to that work, the items are approved for return to service.			
13b. Authorized Signature:		13c. Approval/Authorization No.:		14b. Authorized Signature No.:		14c. Approval/Certificate No.:
		DARF511236CA		Not Applicable		Not Applicable
13d. Name (Typed or Printed): Raymond Howell		13e. Date (dd/mm/yyyy): 3/04/2014		14d. Name (Typed or Printed): Not Applicable		14e. Date (dd/mm/yyyy): Not Applicable
User/Installer Responsibilities						
It is important to understand that the existence of this document alone does not automatically constitute authority to install the aircraft engine/propeller/article. Where the user/installer performs work in accordance with the national regulations of an airworthiness authority different than the airworthiness authority of the country specified in Block 1, it is essential that the user/installer ensures that his/her airworthiness authority accepts aircraft engine(s)/propeller(s)/article(s) from the airworthiness authority of the country specified in Block 1. Statements in Blocks 13a and 14a do not constitute installation certification. In all cases, aircraft maintenance records must contain an installation certification issued in accordance with the national regulations by the user/installer before the aircraft may be flown.						
FAA Form 8130-3 (02-14)				NSN: 0012-00-012-9005		

4.6.3.2 EASA FORM-1 :

The EASA Form 1 is the Authorized Release Certificate released by a POA holder for stating that a product, a part, or a component was manufactured in accordance with approved/not approved design data. NB: the same for is suitable for Maintenance Organization as well.

1. Approving competent Authority/Country: Autorité Compétente/Pays DIRECTION GENERALE DE L'AVIATION CIVILE FRANCE		2. AUTHORIZED RELEASE CERTIFICATE Certificat de Libération Autorisée EASA FORM 1 Formulaire 1 de l'EASA			3. Form Tracking Number: N° de registre de l'Annuaire: R2081-01	
4. Approved Organisation Name and Address:  S.E.A.M Aérodrome Montpellier For. 34130 Candillargues FR.145.402						
5. Work Order / Contract / Invoice / Plan de commandes / Contrat / Fiche: 07-16						
6. Item / Item	7. Description / Description	8. Part No / N° de pièce	9. Eligibility / Admissibilité	10. Qty / Qté	11. Serial / Batch No / N° série / Lot	12. Status / Work Etat / Travail
1	ATC KT76A	066-1062-00	Various	1	19026	Inspecté et testé
13. Remarks / Remarques: LAW CMM 006-05143-0008 Rev8 (07/02002) KT76A non concerné par la CN98-446IMP.						
14. Certifies that the items identified above were manufactured in conformity to: Certifie que les éléments identifiés ci-dessus ont été fabriqués conformément aux: <input type="checkbox"/> approved design data and are in a condition for safe operation données de conception approuvées et sont en état de fonctionner en toute sécurité <input type="checkbox"/> non-approved design data specified in Block 12 données de conception non approuvées spécifiées dans le case 12			15. <input type="checkbox"/> Part -145.A.50 Release to Service / Approbation pour remise en service <input type="checkbox"/> Other regulation specified in Block 13 / Autre réglementation précisée en case 13			
16. Approval / Authorization Number / Numéro d'autorisation			17. Certifies that unless otherwise specified in block 13, the work identified in block 12 and described in block 13, was accomplished in accordance with Part-145 and in respect to that work the items are considered ready for release to service. Certifie que, sauf indication contraire précisée en case 13, les travaux identifiés en case 12 et décrits en case 13 ont été réalisés conformément à la partie 145 et qu'en vue de ces travaux, les (les) pièce(s) est (sont) considérée(s) prête(s) à la remise en service.			
15. Authorized Signature / Signature autorisée		16. Approval / Authorization Number / Numéro d'autorisation		17. Certifies that unless otherwise specified in block 13, the work identified in block 12 and described in block 13, was accomplished in accordance with Part-145 and in respect to that work the items are considered ready for release to service. Certifie que, sauf indication contraire précisée en case 13, les travaux identifiés en case 12 et décrits en case 13 ont été réalisés conformément à la partie 145 et qu'en vue de ces travaux, les (les) pièce(s) est (sont) considérée(s) prête(s) à la remise en service.		
17. Name / Nom		18. Date (d/m/y) / Date (j/m/a)		20. Authorized Signature / Signature autorisée		
						
19. Approval / Authorization Number / Numéro d'autorisation		21. Certificate / Approval Ref. No. / N° de certificat / d'agrément		22. Name / Nom		
		FR.145.402		TROVERO		
23. Date (d/m/y) / Date (j/m/a)		24. Name / Nom				
16/07/2008						

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(*) Installer must cross-check eligibility with applicable technical data
(*) L'installateur doit vérifier l'admissibilité avec les données techniques applicables.

4.7 AIRCRAFT WISE SUPPLIER:

After evaluation of the supplier we selected supplier or vendor according to Aircraft wise. It helps to make a good business relation with supplier for regular purchase and spare parts procurement easier. However, we collect quotation from other vendors too to compare the price, as they ask over price for any parts. So, that we regularly evaluate our spare parts supplier price along with their valid certification. As in aviation safety is prior priority and it can be confirmed by certified parts. Here is a table for example of Aircraft wise supplier:

<i>Type of Aircraft</i>	<i>Vendor</i>	<i>Remarks</i>
Falcon 7X & 2000EX	Dassault Aviation	
Piaggio Avanti II	Piaggio Aerospace	.
PC-12/45	Air Charter Services.	
Cessna 208B	Airflite Pvt. Limited.	
Cessna 152	EMTC	
Cirrus SR20	Greek Air	
	Davenport	

4.8 CONSULTATION APPROVAL PROCESS:

Arirang Aviation Limited is a sister concern of Youngone Corporation and it is a Korean based multinational company. For each procurement, we have to take permission or approval from Chairmen, the highest authority of Youngone. Youngone has own server system and web base support for its different section. There we have to submit consultation with proper documentation for approval and for this it takes several steps to complete. From each section one individual is assigned to deal and give necessary clarification for each consignment. Sometimes it takes time to approve a consultation from chairmen. After successful approved consultation procurement section goes for procurement.

4.9 PROCUREMENT PROCESS:

4.9.1 Issuing Purchase Order:

After approval, we issue a purchase order to the selected supplier and it is done by procurement manager or by respective fleet in-charge. Purchase order consists of Billing address, shipment address and terms and condition. It contains a PO No. which is the identity of each consignment.

4.9.2 Pro forma Invoice:

It is the statement of the seller commitment to deliver the products or services as notified to the buyer for a specific price. It is thus not a true **invoice**. After PO we communicate with supplier for issue the invoice to make necessary payment.

4.9.3 Payment Procedure:

Check approved Requisition (Application for Advance, Requisition for Payment & Settlement of Advance) with invoice, approved consultation, comparative Statement (If required) and sent bill to central finance of CEPZ and farther activities of payment carried out by Accounts section.

4.9.4 Shipment:

Procurement manager or respective assigned individual communicate with supplier and merge our nominated freight forwarder Maxpeed (Sister Concern of Youngone) or Fedex to collect the goods from supplier. After pick up the item supplier provide us Air Way Bill (AWB) copy.

4.9.5 Import Permit:

For collecting Import permit we follow two issues:

1. If the consignment value less than US\$ 5,000 we issue the IP from BEPZA(YCL)
2. If the consignment value more than US\$5,000 we collect the IP from CCI&E (Chief Controller Import & Export)

4.9.6 TAX Tariff:

Bangladesh customs asses the document as per customs act 1969 which guideline provided by National Board of Revenue (NBR). Every item consist H.S.Code (Harmonized System Code) as per First Schedule Customs Tariff 2014-2015. According to H.S.Code we calculate the

estimate tax tariff for the goods. Most of the spare items and components are under zero taxation.

4.9.7 Release Goods from Custom:

We need to contact with C & F (Clearing and Forwarding agent) to do the activities for releasing product from customs. C&F agents are authorized by CBC (Custom Bond Commissioner) who are only authorized for clearing Cargo inspection and clearing customs duties and other formalities.

Technical Store Procedure for Parts Reception:

- Consignment received from procurement section with purchase order, invoice & issued Material Receiving Report.
- After receiving the Consignment, Store inspector put it in the quarantine store for material physical checking as well as airworthiness documentation inspection.
- With satisfactory evidence, Store inspector gives an entry in the store inspection register for particular parts.
- After that, with serviceable tag Store Inspector transfer the goods to bonded store for stock record.

4.9.8 Quality Assurance:

Airlines and aviation industries are controlled by regulatory authority. In our country CAAB (Civil Aviation Authority of Bangladesh) is regulatory authority. All rules in ANO (Air Navigation Order). In ANO Section B.14 are for Maintenance, procurement of Aeronautical products and use of the spare parts. When the procurement process is continuing, planning engineering section need to take or collect NOC (No Objection Certificate) from CAAB for issuing import permit form CCI&E.

Individual Quality assurance team of Arirang Aviation limited also performs surveillance on spare items. It helps to have a quality check and documents clarification. There is saying that Aircraft health depends on its documents.



CONCLUSION

Chapter 5

CONCLUSION

5.1 PROJECT SUMMARY

Arirang Aviation Limited is flight support department of Youngone, this is there major objectives. Beside this they operate flight for Corporate Charter, Air Ambulance and Flying school. To run their operation smooth and trouble free, they need to ensure their aircraft airworthy. So that need to perform examined the aircraft physically and documentation thoroughly. Spare parts which are used to replace after some interval of time and during un-schedule inspection. Spare parts need to procure and thus introduce supply chain of spare parts. It covers the parts demand, requisition, supplier selection, cargo and customs clearance, store and issue parts. It is not possible to discuss all of this in details as there are some limitations of data and information and also from company. Then again, in this report in brief all section is tried to introduce.

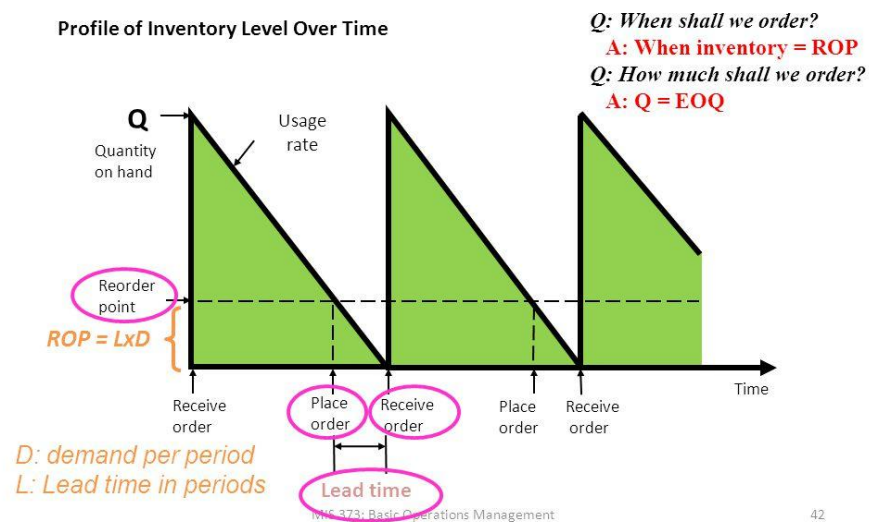
5.2 FINDINGS

1. Parts demand is still traditional forecasting that is considering past demand data and predict future demand, in this traditional forecasting
2. Traditional inventory process is done at the beginning of the period so that all part stored at beginning, sometimes some parts expire at store cell before use.
3. As Arirang is a small company it has limitation in human resource and one single individual operated the procurement and store department. Sometimes work load increase beyond capabilities. Fleet in charge also performed some activities of the procurement process and they do not have any sort basic educational background on supply chain management. Only performed on the base of previous experience.
4. All the spare parts come from abroad so all communication are on based on telecommunication and over internet. So sometimes it causes miss communication in between both parties.
5. Miscommunication sometimes results in part quantity and specification miss match problem, in aviation every part should be met its specification.
6. We have to do payment in advance in parts procurement, so without full or partial payment sometimes suppliers do not ship the parts it results in shortage in store as parts delivery time may be long.
7. In procurement process; Issuing Import permit from CCI&E, Cargo and Customs clearance, they took long time to process. Sometimes takes unusual time to take clearance from Cargo and Customs. Some unethical activities also are done there without hesitation.
8. As we have to take consultation approval from Youngone Chairmen and he has lot of section in business, it is not possible to get early approval and it results in delaying parts procurements

5.3 RECOMMENDATION

1. Spare parts can be recorded in software based instead of Paper and pen and excel sheet. In software market a number software are available like: SAP, Oracle, JDA Software, High jump, IBM, PTC etc.
2. For the inventory management, can introduce the inventory cycle and define and relate the quantity amount, usage rate, reorder point, place order & receive order, lead time in the terms of aviation.

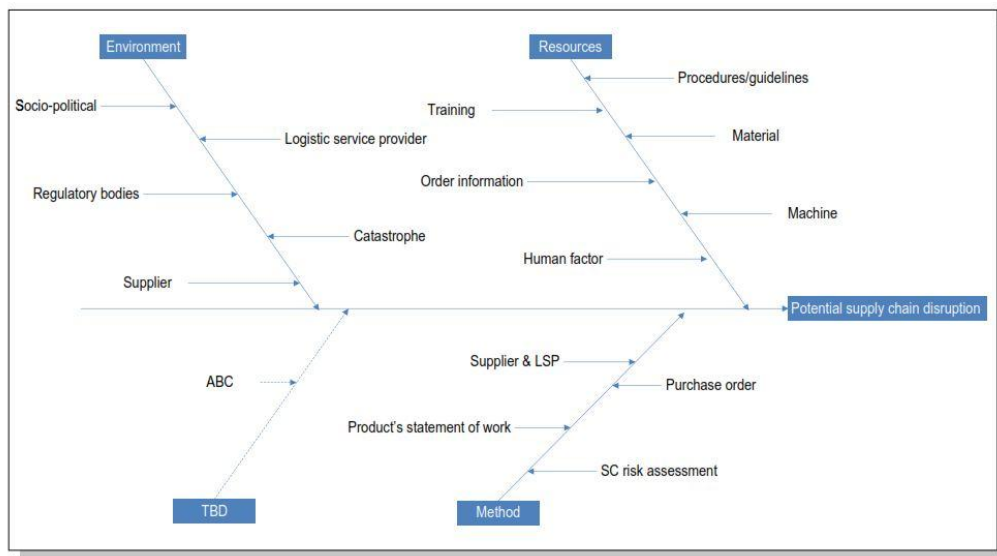
The Inventory Cycle



3. While preparing maintenance planning can use ABC classification system, where they can identify major and important requirement of the parts and use.

Part of the amount in %	Class	Part for the value in %
ca. 10%	A	ca. 60 - 85 %
ca. 20 - 30 %	B	ca. 10 - 25 %
ca. 70 - 85 %	C	ca. 5 - 15 %

4. In Arirang, all of the parts or component transported from supplier by Air which is the fastest transportation mode but expensive. If spare requirements planning done at properly so that parts can be shipped by ship, so that carrying cost can be reduced.
5. Those processes focused on the interaction between the enterprise and suppliers that are upstream in the supply chain which includes Design Collaboration, Source, Negotiate and Supply Collaboration
6. Identify the internal and external environments of the Arirang and from that identify the risk and evaluate the risk like delay of parts, quality assurance, regulatory authority, human factor, appropriate training etc. These risks can be focused by Fishbone diagram.



7. Customs clearance process should be more transparent and authorized personal should practice ethical activities. It will reduce the delay time for spare parts.
8. Assign more skilled and good experienced human resource individually to store and procurement section and provide training to others on supply chain management.

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