College Trainee Development Program

Final Report

Trainee Name: Tsegaab Nigusse
Coach: Getu Zerihun (Eng. IV)
Division: College Trainee Engineering
Department: Line Maintenance | Maintenance Control Centre | Production Engineering
Date: October 18, 2024

Acknowledgements

I would like to extend my sincere gratitude to our team leader, Tewodros Ambaye, my coach, Getu Zerihun, and my seniors, Habtamu Berhanu, Abel Admasu, and Tewodros Gezu, as well as the entire MCC team for their invaluable guidance and support throughout the program. Their mentorship played a crucial role in helping me navigate my training and achieve success during my OJT at Ethiopian Airlines. Additionally, I would like to thank my instructors at Aviation University for familiarizing me with the company's history, culture, and rules, which laid the groundwork for my professional growth during this program.

Table of Contents

Introduction

The College Trainee Development Program, organized by Ethiopian Airlines Group, provided an invaluable opportunity to gain practical experience across diverse fields. My On-Job-Training (OJT) took place at the Maintenance Control Centre within the Production Engineering Division and lasted for five months. During this time, I gained in-depth knowledge and developed crucial skills in various areas related to aircraft maintenance and engineering processes. This report outlines my journey, experiences, and accomplishments throughout the program.

Learning Objectives

The main goal of College Trainee Program is to provide a structured pathways for recruiting, training and placing high calibre graduates directly from University or Institute and developing them to fill current and future leadership gaps, my key learning objectives during the training include:

- **Understanding Corporate culture and familiarizing with the working environment:** To imerse in the organizational culture of Ethiopian Airlines to understand work dynamics, team collaboration, and corporate values.
- **Gaining hands-on experience:** To engage in real world tasks to apply theoritical knowledge in a practical environment. This envolved working on problems that requers following guidelines and procedures, analytical skills, and collaborating with different people and companies.
- **Developing and Enhancing my understanding on aircraft systems:** To aquere a deeper knowlede of various aircraft systems and components through online courses (general familiarization) provided by Aviation University, refereing different company manuals and OEM tools, learning through coaching and discussion with different co-workers.
- **Saftey:** To Learn and adhere to the safety protocols and standards required in aircraft maintenance and engineering to ensure compliance and promote a secure working environment.
- **Communication:** To Strengthen communication skills, especially in a technical and team-oriented setting, to facilitate clear and effective information exchange.
- **Understanding organizational structures:** To gaine insights into the hierarchical and functional structures of the organization to understand roles, responsibilities, and workflow.
- **Enhancing work Efficiency and problem solving:** To develop strategies for improving work processes, solving problems effectively, and increasing productivity in the workplace.

Project Description

During my on-job-training, I was actively involved in various tasks, including both routine activities and tasks that required ongoing follow-ups, some of the key tasks include:

1. Preparing Maintenance Order (MO)

- MO is working document which instructs A/C maintenance sections to execute a specified maintenance action to rectify a problem or to avoid a technical failure.
- The Fleet Experts and Production Engineering team in MCC section provide troubleshooting assistance for Line Maintenance, Base Maintenance and Outstations Technical personnel.
- Maintenance Orders are prepared to tackle Repetitive Remarks, critical remarks which are under follow up, deferred aircraft defects which require further troubleshooting, AHM alerts which require immediate action, AOG situations which require immediate maintenance action and early warnings.
- Maintenix is used for preparing and documenting the maintenance orders, which is then advised to maintenance planning team for assigning the time, personal for the execution.

💡 During my OJT, I prepared several maintenance orders, many of which were successfully completed, helping to identify and resolve faults.

2. Preparing Summary report

- Summary reports are official documents prepared for Ethiopian Civil Aviation Authority (ECAA), which addresses Ethiopian airlines' actions for tackling repetitive remarks on different aircrafts.
- The ECAA aviation monitors the maintenance logbook (MLB), which records different faults identified by flight crews. If any of these faults are repetitive, the civil aviation asks Ethiopian for a documentation on maintenance actions taken to eliminate the issue.
- These reports play a critical role, as the civil aviation give the certificate of airworthiness (C of A) based on the health of the aircraft.

💡 Upon my OJT, I prepared several summary reports, some of them include remarks on Nitrogen generation systems on B777 aircrafts, ensuring that recurring issues were resolved, and the aircraft remained in compliance with airworthiness standards.

3. Maintenance Service letter (MSL)

- Maintenance Service letter is a document to be issued for dissemination of an information as a result of industry experience and MRO operation.
- This Document are prepared my production engineers after certain remark and findings. This include recommending best practices for maintenance crew recommended by OEM and other operators.

- During my time, I prepared different maintenance service letters. Some of them include recommending best practices to avoid damage of axial remote data concentrator (ARDC) while performing maintenance action. This MSL was prepared after communication with the OEM, Boeing through BCS.

4. Minimum Equipment List (MEL) report

- MEL is a document approved by Ethiopian Civil Aviation Authority (ECCA) that contains the conditions under which Ethiopian aircraft operate with particular items of equipment inoperative at the time of aircraft dispatch.
- Since most aircraft systems are redundant, for example if one of three equipment fails, the MEL can be applied to dispatch the aircraft based on some requirements. Most of these deferred defects are categorized based on the time and the MCC follows this MEL's to correct the defect on the given period.
- The MEL report, which is prepared my production engineers, helps different teams to follow the deferred items and correct the on time.

5. Root Cause Analysis and Corrective Action (RCCA)

- Root Cause Analysis report is a document compiled after performing RCCA on a certain remark with a delay time greater than one hour or when the aircraft is AOG.
- It includes various processes for finding the root cause of the fault. Most common tasks include performing deep analysis on the fault history of the remark, collaboration with the different teams such as shops, other operators and communicating with the manufacturers. After the root cause is found, a corrective action is given for preventing similar remarks in the future time.
- During my OJT, I performed different RCCA's on different fleets. I followed the remark with different teams such as fleet experts, aircraft technicians, flight crews, manufacturers and different shops to find its cause and give a corrective action. This helped me to understand different aircraft systems, working procedures, collaborative work and most importantly to love my work.

6. Maintenix Assistance

- Maintenix is a platform for managing different MRO activities. It is used by ET MRO to process its maintenance planning, aircraft maintenance requirements definitions, maintenance execution and materials, parts and tools management.

- When technicians perform different maintenance action, they encounter many errors while using the Maintenix software. Most of the error can be cleared by engineers. As an assistant engineers I helped the maintenance action by providing assistance for the maintenance crew.
- Additionally, I provided Engineering assistance for recommending part applicability and part interchangeability to maintenance crews, procurement teams by referring several company and OEM manuals as well as communications with the OEM.

7. Investigation Report

- A report which is triggered by all safety compromising events, maintenance quality issues, Air Turn Back, Rejected Take-off, and any other incident/accident scenarios, and incorporates all the most probable root cause and possible fix recommendations or conclusions.

8. Maintenance Bulletin

- Maintenance Bulletin (MB), which is similar to MSL, is used to disseminate information related with findings during maintenance or investigation findings of such activities.
- Upon my OJT, I prepared different MB's for giving awareness to the maintenance crew on different

9. Communication with Manufacturers

- Ethiopian Airlines maintains continuous communication with various aircraft and component manufacturers for maintenance support and component repair. Different manufacturers provide specialized platforms for these communications, including Boeing Communication Systems (BCS), Airbus Tech Support, and the DHC Technical Help Desk, among others.
- During my OJT period I communicated with the manufacturers for different purposes, some of them include request for maintenance recommendations, industry experiences for some remarks, part applicability, part interchangeability etc. Through this I gain multiple experiences on how to communicate professionally with the manufacturers.
- These interactions provided me with valuable experience in professional communication, enabling me to understand how to effectively coordinate with manufacturers for technical support and ensuring smooth operational processes.

Skills and Knowledge Gained

Throughout the program, I acquired significant knowledge and skills in both technical and soft areas, including:

1. Technical Skills

- Accessing OEM manuals and tools such as Aircraft Maintenance Manual (AMM), Fault Isolation Manual (FIM), System Description Section (SDS), Illustrated Parts Data (IPD), and Wiring Diagrams (WDM) etc.
- Working with Maintenix Software: Introducing parts and inventories, Creating Requirements and Job Instruction Cards (JIC), troubleshooting Maintenix errors, and determining part applicability and interchangeability.
- Accessing myboeingfleet: Monitoring aircraft health through AHM, communicating with Boeing team using BCS, and referring to different documents such as Fleet team digest (FTD), Spares and Provisioning, Service bulletin (SB) etc.

- Accessing Airbus world: Monitoring aircraft health through SHM, communicating with airbus team, accessing technical follow-ups using WISE, accessing maintenance toolbox using airnavX etc.
- Accessing DHC website: navigating the maintenance toolbox, technical follow-ups, communication with DHC teams etc.
- Able to prepare Root cause analysis and corrective action (RCCA).
- Able to prepare Maintenance Service letters (MSL) and Maintenance Bulletins (MB)
- Able to prepare Service letters (SL) for Ethiopian Civil Aviation Authority (ECAA).
- Able to access company manuals through portal such as maintenance program, aircraft delivery documents etc.

2. Soft Skills

- Collaboration with co-workers: Developed strong teamwork skills, working effectively with co-workers towards shared goals.
- Communication: Enhanced my ability to convey ideas clearly and professionally, both within teams and with external companies.
- Time management: improved my ability to prioritize tasks, organize workloads, and allocate time effectively across different activities.
- Creativity and problem solving: Developed innovative solutions to address day-to-day challenges encountered during the program.

Challenges Faced

During my On-Job-Training, I encountered several challenges, including adapting to new work environment as a recent graduate, balancing multiple tasks, and learning use to new tools and systems. However, I overcome these obstacles by actively engaging with my co-workers, utilizing different task management tools to stay organized, and seeking guidance from my seniors whenever I faced difficulties.

Key Accomplishments

Upon my five months at the maintenance control centre, I contributed to various activities aimed at ensuring the airworthiness of the aircrafts. Some of my key accomplishments include:

- 💡 Together with my colleagues, we utilized our programming skills to develop a web application that significantly streamlined the process of preparing Minimum Equipment List (MEL) reports. This innovation reduced the task time from approximately 45 minutes to less than 5 minutes, enhancing overall efficiency.

- Conducted Root Cause Analysis and Corrective Actions on multiple aircraft, including ET-AVI: Bleed PROSV failure, ET-AOS: Damaged potable water service door hinge, ET-AOT: Nose radome unable to close, ET-ANR: Line blockage remark etc. and thorough research and collaboration with co-workers, I identified the root causes of these issues and contributed to their resolution.
- Assisted in preparing numerous Maintenance Orders (MOs) to identify and rectify faults, ensuring aircraft safety and compliance.
- Contributed to the preparation of multiple Summary Reports for the renewal of Certificates of Airworthiness, ensuring aircraft compliance with civil aviation regulations.

Lessons Learned

The most important lessons I've learned from this experience include:

- The critical importance of safety and following safety procedures, as they are essential in the aviation industry.
- The value of effective communication and teamwork in a fast-paced environment.
- The importance of seeking guidance from seniors; without their help, I wouldn't have excelled in my role.
- The benefit of taking detailed notes during communications with different people to avoid misunderstandings and ensure clarity.
- The necessity of strong time management and task prioritization skills to efficiently handle multiple tasks.
- Recognizing problems as opportunities to improve workflows and make processes more efficient.

Recommendations

To enhance the effectiveness of the College Trainee Development Program, I would suggest incorporating more practical sessions focused on learning different aircraft systems. While theoretical knowledge is valuable, hands-on experience with real-world systems would significantly improve our understanding and preparedness for technical roles. I recommend allotting at least one month for trainees to work alongside technicians before starting the On-the-Job Training (OJT). This initial period would allow us to gain familiarity with aircraft systems, maintenance procedures, and tools, making the OJT phase more productive and meaningful.

Additionally, providing trainees with learning materials such as computer-based training (CBT) modules and simulations would be highly beneficial. These tools would enable us to reinforce our learning at our own pace, practice troubleshooting in simulated environments, and further our knowledge from our computers. By integrating both practical and digital

learning methods, trainees would be better equipped with the skills and confidence necessary to excel in the aviation industry.

Conclusion

In conclusion, the College Trainee Development Program has been a highly rewarding experience. It provided me with practical skills, enhanced my knowledge, and allowed me to contribute meaningfully to Ethiopian Airlines. The lessons learned and accomplishments achieved during this on-job-trainig will be instrumental in shaping my future career.