GOVERNMENT OF INDIA

OFFICE OF THE DIRECTOR GENERAL OF CIVIL AVIATION

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TRGML-AED-1/2013

Training Manual for Aircraft Engineering Directorate

November 2013

Training of AED Officers

1. Purpose:

Aircraft Engineering Directorate has two offices one in Headquarters and other at Bangalore. The Aircraft Engineering Directorate's office at Headquarters has the following divisions:

i. Aero Engineering Division (AED),
ii. Aero Laboratory Division (ALD),
iii. Aviation Environment Unit (AEU), and
iv. Air Transport Division (ATD).

AED officers are generally posted in any one of the divisions mentioned above after recruitment. All the divisions of the Directorate are engaged in the following day-to-day activities:

I. Issue of type certificate and Validation/acceptance of type certificate issued to the aircraft,
II. Issue of ITSO Authorization for aircraft articles,
III. Continued Aircraft Engineering, Service Bulletins and Aircraft Engineering Directive,
IV. Approval/renewal of design organizations,
V. Periodic surveillance and regulatory audits of design organizations,
VI. Approval of modifications/alterations and repair scheme,
VII. Protection of aviation environment,
VIII. Routine monitoring and investigation of CVR/FDR,
IX. Failure investigation of parts/components,
X. Material testing for various components/parts,
XI. Quality Control Monitoring & testing of Aviation Fuels and Lubricants, etc.

The training requirements have been framed keeping in view the duties and responsibilities of AED officers including responsibility sharing. It has been framed in the backdrop of standardising the procedures and practices to be followed by the officers in day to day work and to build up their competency. Following are the objectives of the training for the officers of AED:

I. To familiarise with rules, regulation, policy, procedures and practices under which various tasks are undertaken,
II. To enable the officers to focus in dedicated area of work and to provide them sufficient knowledge to enable them to take appropriate decisions,
III. To sensitize the officers towards best international practices being followed globally,
IV. To provide guidance for technical documentations, maintenance and record keeping,
V. To optimise resources and management of work,
VI. To apply theoretical knowledge in practices through on job training.

The objective of the training is to develop a professional, impartial and efficient officer that is responsive to the current needs. The training is used as a tool to ensure that officers have the requisite knowledge, skills and attitude to effectively perform the functions and can be monitored by actual improvement in the performance. All officers shall be provided with training to equip them with the competencies for their current jobs.

2. Training Programme:

In order to have a systematic and uniform training of newly recruited as well as existing officers of the Directorate, the trainings have been divided into following categories as mentioned below:

1. **Induction Training:** For new entrants to provide a background and familiarize with the tasks they will be handling in the Directorate,

2. **On-Job Training:** For new entrants after completion of induction training to enable them to handle their responsibilities independently,

3. **Recurrent Training:** For existing and new entrants to refresh their knowledge and to apprise them about latest developments in the respective areas, and

4. **Specialized Training:** For existing middle and senior level officers to upgrade their knowledge at par with international standards and for efficient functioning.

3. Induction Training Programme:

A newly recruited officer is provided with an induction training to familiarize him/her with DGCA set up and functioning of various Directorates. New entrants shall complete the various training modules within the stipulated time frame in order to start on-job training in their respective areas of posting. This will enable them to be more useful in providing assistance to the senior officers at the preparatory level of work. The training programme for new recruits comprises of class room training, structured on-job training and case study.

a) <u>Class Room Training</u>:

The training programme for newly recruited officers has been structured keeping in view that the new entrants are to be provided with an overall view of functioning of whole DGCA setup apart from detailed knowledge of the functions of their Directorate. This will enable them to be more useful in providing assistance to the senior officers at the preparatory level of work. Newly inducted AED officers are being given necessary guidance and advice by their senior colleagues in their day-to-day work. Depending upon their academic qualifications and experiences, they can be assigned work in different areas. The newly recruited officers have to undergo two modules as given below and need to be completed within the stipulated timeframe:

Module: 1 - DGCA Orientation Programme (02 days), and

Module: 2 - Aircraft Engineering Orientation Programme (02 days/01 day)

Module 1 provides an insight of DGCA organization, structure, responsibilities, etc where as Module 2 gives an overview of functions and responsibilities of various divisions/unit of Aircraft Engineering Directorate. The training schedule for new recruits is as follows:

Module: 1 - DGCA Orientation Programme (02 days)

Sl. No.	Field of Study	Days/Hours
1.	**Introduction to DGCA set up:** • Responsibilities and functions of DGCA • Organization Structure • Responsibilities and functions of each Directorate. • International Cooperation Programme	½ days
2.	**Regulatory Framework:** • Aircraft Act, Aircraft Rules & Civil Aviation Requirements • AIC, AIP, Circulars, Notices, Directives, Policies, Orders etc. • Introduction to International Regulations (ICAO/FAA/EASA etc.) • Rule Making procedures in DGCA	½ days
3.	**Aircraft Engineering:** • Overview of Functions of AED • Aircraft Type certification and validation procedures • Technical Standards (TSO, ITSO) • Analysis of CVR and FDR recordings • Testing of Aviation Fuels & Lubricants, etc • Aircraft modification and repair including STC • Material testing • Environmental issues in Aviation • Over view of Air Transport.	01 day

Module: 2A - Aero Engineering Division Orientation Programme (02 days)

Sl. No.	Field of Study	Days/Hours
1.	**Aircraft Acts and Aircraft Rules** • Overview of the Aircraft Act and Aircraft Rules • The Aircraft Rule - Overview of relevant Civil Aviation Requirements. • Overview of applicable ICAO requirements. • Familiarization with Type Certificate, TCDS, etc. • Certification and Aircraft Engineering requirements overview. • Familiarization with various Regulatory Authorities & their websites	01/2 day
2.	**An Overview of DGCA's Civil Aviation Regulations (CARs)** • Section 6- Design Standards and Type Certification • Series – A: CAR – 21 • Series – B: Approval of Design Organizations • Series – C: Certification Requirements for Noise and Emission	01/2 day

	• Brief introduction about relevant CARs & ICAO Annexes and Docs	
3.	**An Overview of Aircraft Engineering Requirements/ Design Standards (FAA & EASA)** • Overview of the Foreign Design Standards • Aircraft Engineering Codes of FAA • Aircraft Engineering Codes – 21, 23 , 25, 27, 29, etc • Certification Standards of EASA • CS – 21, 23, 25, 27, 29, etc	**01/2 day**
4.	**Aircraft Engineering Functions** • Familiarization with procedures for issue of Type Certificate, type acceptance/validation, Indian Technical Standard Order (ITSO) Authorization, etc • Familiarization with continued Aircraft Engineering requirements, ADs and SBs, etc • Familiarization with procedures for approval of modifications, alternations and repair scheme • Familiarization with DGCA Surveillance Program, Safety Management System (SMS) and Regulatory Audit Policy and Procedures • Familiarization with procedures followed in Flight Recorder, Material Testing, Failure Investigation and Fuel testing laboratories	**01/2 day**

Module: 2B - Aero Laboratory Division Orientation Programme (02 days)

Sl. No.	Field of Study	Days/Hours
1.	**Failure Investigation Laboratory** • Overview of Rules and Regulations in investigation • Concept of Failure Investigation in Aviation. • Investigation Techniques. • Investigation Equipment and Tools. • Analysis and finalization of reports.	**01/2 day**
2.	**Material Testing Laboratory** • Overview of welding sample – specifications and standards • Sample for upholstery material for aircraft cabins – specifications and standards • Testing techniques • Brief introduction about equipment used	**01/2 day**

3.	**Flight Data Recorder Laboratory** • Overview of CVR and FDR – Requirements and Rule Position • Downloading and processing of raw data • Analysis, preparation of transcript, tables and graphs • Report preparation	**01/2 day**
4.	**Fuel Testing Laboratory** • Familiarization with sample processing and testing techniques • Familiarization with fuel standards and specifications • Familiarization with testing equipments • Familiarization with physical and chemical properties of fuel and lubricants	**01/2 day**

Module: 2C - Air Transport Division Orientation Programme (01 day)

Sl. No.	Field of Study	Days/Hours
1.	**Aircraft Acts and Aircraft Rules** • Overview of the Aircraft Act and Aircraft Rules • Overview of relevant Civil Aviation Requirements. • Overview of relevant Air Transport Circulars. •	
2.	**Role of Air Transport in AED** • Familiarization with Slot Allocation Process. • Familiarization with Preparedness meeting for operation to International destination by Indian registered air carrier • Familiarization with Air Fare Monitoring • Familiarization with Air Traffic Data • Familiarization with Parliament Questions and VIP References • Familiarization with Air Transport related Grievances and RTI	**01 day**

Module: 2D – Aviation Environment Division Orientation Programme (01 day)

Sl. No.	Field of Study	Days/Hours
1.	**Aviation and its Impact on Environment** • Growth of Aviation Industry – National and Global Scenario • Impact on Environment – the basic concepts. • Climate Change, Local Air Quality, Community Noise.	
2.	**An Overview of International Negotiations and Rule Position** • United Nation Framework Convention on Climate Change (UNFCCCC) – an overview.	

	• Kyoto Protocol and ICAO's responsibility in reducing carbon emissions from international aviation • Committee on Aviation Environment Protection (CAEP) • Four Pillar strategy to reduce carbon emissions from aviation	**01 day**
3.	**Measures Adopted by DGCA on Environmental Protection** • Noise abatement measures • Noise Mapping and Monitoring Study for IGI airport – a case history • Carbon Footprint of Civil Aviation • Alternative Fuels and Biofuels – a substitute to conventional fossil fuel • Local Air Quality – Standards and circulars	

b) <u>On-Job Training:</u>

On-job training is one of the training which is imparted at the job site, where someone who knows how to do a task shows another how to perform it. In other words, OJT can be defined as employee training at their work place while he/she is performing the actual job under the guidance of a senior official. This type of training provides direct experience in the work environment in which the officer is performing or will be performing on the job.

As a part of the skill development process, officers are required to undergo on job training (OJT) before they are assigned with independent work. OJT is training to the officers which should take place where they are actually working so as to facilitate them to gain skill while carrying out their jobs. In this process officers will learn in the real work environment and gain experience while dealing with the task and challenges that they will meet during a normal working day.

After completion of the Induction Training, new entrants are put into on-job training depending upon their posting and are attached with a senior officers working in the same field. The objective is to familiarize the officer about the various tasks being handled in the respective division and the way it has to be accomplished. After successful completion of OJT and when the senior officer is satisfied to the extent that the officer can perform his/her tasks independently, a certificate confirming his/her ability to handle tasks independently is issued. The main objective of the OJT is to authorize them to start their designated functioning in the relevant areas after successful completion of induction training. Certificate issued in respect of OJT completion of each task should be kept in the training records of officer. More details about On-job Training is given at Annexure-II. The suggested on job training task is as follows:

1. AERO ENGINEERING DIVISION			
Aircraft Type Certification/Validation Process			
Task No.	**Task**	**Starting Date**	**Completion Date**
1.	Process of documents for acceptance of TC and TCDS issued by FAA or EASA		
2.	Process of documents for validation of TC and TCDS issued by CAA (other than FAA or EASA)		
Aircraft Supplement Type Certification Process			
1.	Process of documents for acceptance of STC issued by FAA or EASA		
2.	Process of documents for acceptance/validation of STC issued by CAA (other than FAA or EASA)		
Modification and Repair Process			
1.	Process of documents for approval of modification and repair for Indian Registered aircraft		
Approval of Design Organization CAR 21			
1.	Process of Approval of Design Organization – JA category		
2.	Process for Approval Design Organization – JB category		
3.	Process for carrying out Surveillance Audit of DOA		
4.	Process for carrying out Regulatory Audit of DOA		
5.	Process for issuing SB's and AD's for continued Aircraft Engineering		
Approval of ITSO Items			
1.	Process of Approval of indigenous developed ITSO items		
2.	Process for acceptance of TSOs items		
3.	Process of Software Certification/Validation		

2. AERO LABORATORY DIVISION			
A. Aircraft Accident/Incident Investigation Laboratory			
1.	Process of Collection of background Data and Selection of sample		
2.	Process of collection of visual and photographic evidences		
3.	Process of preparation of sample for mechanical testing		
4.	Process of cleaning of sample and collection of macroscopic, microscopic and metallographic examinations		
5.	Process of preparation of final report		
B. Material Testing Laboratory			
Approval of Upholstery Materials			
1.	Process of sample preparation		
2.	Process of drawing test results and comparison with applicable specifications and standards		
3.	Process of preparation of final reports		
Approval of Welding Sample			

1.	Process of sample preparation		
2.	Process of drawing test results and comparison with applicable specifications and standards		
3.	Process of preparation of final reports		

C. Physical and Chemical Laboratory			
Routine Monitoring of ATF Samples			
1.	Process of preparation of standard solution, applicable standards and specifications		
2.	Process of carrying out physical and chemical analysis as per applicable specification		
3.	Process of report preparation and maintenance of records		
Approval of Fuel Tank /Pipeline Commissioning			
1.	Process of evaluation of fresh proposal in respect of commissioning of fuel tank/pipeline		
2.	Process of carrying out physical and chemical analysis as per applicable specification		
3.	Process of report preparation and maintenance of records		
Analysis of ATF/Lubricating Oil for Accidents/Incidents			
1.	Process of evaluation of accidental samples in respect of accident/incident aircraft		
2.	Process of carrying out physical and chemical analysis as per applicable specification		
3.	Process of report preparation and maintenance of records		
Approval of VVIP Flight ATF Samples			
1.	Process of evaluation of fuel sample in respect of VVIP flight		
2.	Process of carrying out physical and chemical analysis as per applicable specification		
3.	Process of report preparation and maintenance of records		

D. Flight Recorder Laboratory			
Routine Monitoring of Flight Recorders			
1.	Process for routine monitoring of Cockpit Voice Recorder		
2.	Process for routine monitoring of Flight Data Recorder		
3.	Process of report preparation and maintenance of records		
Analysis of Flight Recorders for Accidents/Incidents			
1.	Process for downloading of CVR Raw Data		
2.	Process for conversion of raw data into audio files		
3.	Process of preparation of transcript		
4.	Process for downloading of FDR Raw Data		

5.	Process for conversion of raw data into engineering units		
6.	Process of preparation of tables and graphs		
7.	Process of correlation of CVR and FDR data		

3. Aircraft Transport Division			
Traffic Movement and Fare Monitoring			
1.	Process for collection of monthly air traffic data		
2.	Process for analyzing traffic data and preparation of report		
3.	Process of monitoring of airfare on daily basis		
4.	Process of analyzing air fare and preparation of report		
5.	Process for approving amendments to airline schedules and slot allocation		
6.	Process of handling VIP References and Public Grievances		
7.	Process of handling Parliament Questions and RTI on Air Transport related issues		

4. Aviation Environment Unit			
1.	Processing of documents with regard to carbon footprint of each stakeholders		
2.	Processing of documents with regard to Standards and Specifications for Air Quality		
3.	Processing of documents with regard to Standards and Specifications for Noise from aircraft operations		

c). Case Study:

After completion of On-job Training for one year initially, the newly recruited officers are also made to visit aviation industries to familiarize themselves with the facilities and infrastructures of the organizations engaged in design and development of aircraft, parts or appliances, fuel suppliers and testing facilities, etc. As and when required, the officer is also included in the team to carry out Surveillance/Regulatory Audit of such organizations. The objective is twofold viz the officer gets an opportunity to visit the facilities at those organizations and secondly he/she also gets a chance to participate in such audits.

4. Certificate of Competency (CoC) after On-job Training:

After completion of on-job training along with case study and industry visit, a certificate of Competency is issued by Deputy Director General/Director based on the feedback received from the officer he/she was attached during OJT. Once the senior officer is satisfied that the newly recruited officer can handle the task independently, the process of issuance of CoC can be initiated by the senior/mentor officer. If the competency level of the officer is not found up to the mark, he/she may be advised to undergo the OJT once again with new batch by the senior officer. The copy of the CoC shall be maintained in the dossier of the

newly recruited officer as well as earmarked dossier for maintaining CoC. The format of the CoC is given at Annexure-III.

5. Recurrent Training Programme:

Serving officers of AED are required to undergo in-house recurrent training as well as trainings at reputed R&D and academic organizations such as Hindustan Aeronautics Ltd., National Aerospace Laboratories, Indian Institute of Technology, etc. Duration of training is decided by the trainer based on course/training contents being offered. Main motto of such training will be updating the skills and knowledge with respect to recent developments in the field of aviation.

The recurrent training programmes for existing officers have been structured keeping in view that these officers are already having working knowledge and experience in relevant areas which need to be refreshed time to time. Further these trainings are aimed to improve officer's decision making capability, develop maturity in sharing more responsibilities and to provide exposures with international regulations and standards and globally adopted best practices.

The recurrent training is imparted in the areas in which the officers of AED are engaged in their day-to-day work. The participants for these recurrent training is selected based on the area of work and sometimes officers working in other areas are also included to provide them an exposure of other areas. An annual Recurrent Training Plan (RTP) is developed for the entire calendar/financial year and effort is made to adhere to the plan. The in-house recurrent training is organized broadly in the following areas:

1. Relevant Civil Aviation Requirements and Handbook of Procedures
2. Continued Aircraft Engineering Requirements, Aircraft Engineering Directives and Service Bulletins
3. Type Certificate and its validation/acceptance
4. Supplement Type Certificate and its validation/acceptance
5. Indian Technical Standard Order Authorization
6. Design Organization Approval (JA and JB)
7. Approval of modifications, alternations and repair scheme
8. Surveillance & Regulatory Audit Policy
9. Helicopter Certification
10. Airframe, Engine, Aircraft System & Propulsion
11. Design, Fabrication & Testing of Composites
12. Parts Manufacturing Approval and Component Certification Process
13. Overview of Aircraft Accident/Investigation techniques
14. Aviation Fuel and Lubricants
15. Flight Data Recorders, and
16. Aviation Environmental Protection

Note: The list of few identified courses are provided at Annexure-I.

6. Specialized Training:

Specialized trainings programs are developed by DGCA in association with international organizations under special training programs/schemes like EU-India Cooperation project, India-US ACP program, COSCAP, etc. Duration of training is established based on the course content and the hosting organization.

Officer of AED are deputed to the International Civil Aviation Authorities such as FAA, EASA and ICAO or training institute/academy of any other Civil Aviation Authority that conduct structured class-room training programmes. Specialized trainings can be also imparted by reputed organizations such as Air Bus, Boeing, Honeywell, Goodrich etc, on specialized subjects. However, nomination of officers in such trainings is beyond the purview of AED Training Division. Organizations providing **Structured Training Plans (STP)** on relevant areas are also approached to provide relevant STPs to AED/DGCA officers. The aim of the training is to gain subject specific knowledge on international practices and procedures being followed by the other international organizations. The titles of structured class-room training can be broadly in the areas as mentioned in para 4 of this manual.

7. Seminars, Conferences, Workshops and Lectures:

Apart from Specialized Trainings, AED officers are also encouraged to approach the Training Division about various Seminars, Conferences, Workshop, Lectures, etc (both domestic and abroad) in their respective field of interest in advance along with full details (Topic of the Seminar/Conference, Date and Venue, Registration Fees, No. of Days, etc). The Division in turn, after receiving such request, will process the case for seeking financial and administrative approval from Competent Authorities. The officer will be officially deputed to attend such seminars, workshop, conferences, lectures, etc if the approval is accorded for attending the same.

8. Training Records:

The responsibility of maintaining the training records lies with individual officers of AED. The training file records must be reviewed and updated at regular intervals by the officer. As and when the officer undergoes any training, he/she shall update his/her training folder.

Sd/
(Charan Dass)
Jt. Director General
for Director General of Civil Aviation

Date: 10-12-2013

Annexure-I

Sl. No.	Training areas
1.	Propeller maintenance
2.	Non-destructive testing
3.	Test equipment, selection, application and calibration
4.	Processing and analysis of flight data
5.	Aircraft accident prevention and investigation
6.	Aircraft manufacturing certification system
7.	Modern technologies applied for aviation fuel and lubricants
8.	Accident and Incident Investigation
9.	Airport Carbon Management
10.	Airport Environment Management
11.	Airport Environment Management
12.	Airport Strategic Human Resources Management
13.	Leadership and Management training
14.	Personal Development
15.	Software Fundamentals
16.	Software Job Functions
17.	Aircraft Certification Systems Evaluation Program
18.	Aircraft Certification Indoctrination
19.	Fatigue and Damage Tolerance Analysis
20.	Lightning Protection of Avionics
21.	Airborne Electronic Hardware Job Functions
22.	Non-destructive Inspection and Evaluation
23.	Introduction to Aircraft loads/Basic Loads
24.	NextGen Advanced Communications
25.	NextGen Advanced Navigations
26.	Aircraft Electromagnetic Compatibility
27.	Human Factors Certification Job Aid
28.	Type Validation Procedures
29.	Composite Structural Engineering Technology
30.	Introduction to Fatigue and Fatigue Management
31.	Structures: Fatigue Management of Small Airplane
32.	Structures: Composite Safety and Certification Initiatives
33.	Structures: Finite Element Modelling and Analysis Validation
34.	Aircraft Seat Dynamic Impact Test Procedure
35.	Electrical: System Aspects of Certification
36.	Electrical: Software and Airborne Electronic Hardware
37.	Electrical: Aircraft Systems Cyber Security Awareness
38.	Electrical: Certification of Aircraft for Flight in Icing Conditions
39.	Repairs and Alterations for Aircraft Certification
40	Aviation Safety Engineer/Systems Job Functions
41.	Aviation Safety Engineer/Airframe Job Functions
42.	Aviation Safety Engineer/Propulsion Job Functions
43.	Suspected unapproved Parts
44.	Structural Inspection Programs Evaluation
45.	Aircraft Certification Systems Evaluation

Structured OJT

Part I – Introduction

What is OJT?

"OJT is planned training conducted at a work site by an authorized Trainer. This type of training provides direct experience in the work environment in which the officer is performing or will be performing on the job."

Value of OJT

The OJT Program is an essential part of officer's training and adds value to the overall training effort.

1. Skills Application

By applying knowledge and skills learned, the trainee officer completes the learning process. At the same time, the Directorate gains confidence in the trainee's capabilities. With the completion of OJT the Directorate can certify the trainee as a qualified officer.

2. Flexibility

The officer's OJT Program is a process for implementation and management of a structured OJT system using DGCA guidelines. The program can be tailored to the tasks in which officer needs training and may also include training on tasks unique to an office.

3. Timeliness

OJT can be provided immediately when the need or opportunity arises.

4. Locally Managed

OJT empowers an officer to develop needed skills. When a training need exists, OJT can be provided. OJT has been identified as the best method for delivering the needed training, or if no other means to receive the training is available.

5. Career Broadening

Throughout the career, OJT remains a valuable tool for continually broadening technical skills and capabilities of an officer. Cross-training in tasks to be co-ordinated with other directorates may not be possible through other training means due to resource limitations but may be more easily attainable through a structured OJT Program.

Part II – OJT Basics

Definitions

Certification	Certification work activities validate the competency of an air operator, maintenance organization, or certifying personnel and their compliance with appropriate statutory and regulatory requirements prior to active performance in the aviation industry.
Level I OJT Training	Level I training is related to that body of knowledge associated with a specific job task. This knowledge is contained in orders, rules, guidance, and standards. Level I training typically involve a review of all reference materials applicable to the job tasks for which training has been identified**.** Level I training *may* be satisfied through classroom training or other delivery methods.
Level II OJT Training	Level II training involves observation of the performance of specific job tasks. This training typically involves the trainee observing and/or assisting the OJT trainer in the performance of those specific job tasks for which the trainee will be held accountable. Level II training may be satisfied through appropriate training that provides the opportunity for the trainee to observe and/or assist the trainer performing the task.
Level III OJT Training	Level III training involves the application of knowledge and skills to the performance of specific job tasks. Typically, the trainee performs the job task under the observation of a qualified OJT trainer. The trainer assesses the performance of the task and indicates on the trainee's OJT training plan when Level III performance is achieved.
Principal OJT Program Co-ordinator	The Principal OJT Program Co-ordinator is the in-charge of implementing the OJT Program in DGCA as a whole. He is responsible for approving the OJT Program prepared by OJT Program Co-ordinator of each Directorate of DGCA and reviewing the implementation and improvements in OJT Program based on feedback.
OJT Program Co-ordinator	The officer who is designated to establish and maintain the OJT Program for the entire Aircraft Engineering Directorate. This is a key role in establishing the OJT Program.
Training Coordinator	The officer who is designated to establish and implement the OJT program in Aircraft Engineering Directorate. This is a key role in the implementation of the OJT Program.
OJT Trainer	A trained officer designated to provide OJT instruction to trainees on specific tasks at Levels I, II, and III, in accordance with the procedures established in this document. OJT trainers should be designated in each Aircraft Engineering office.
OJT Record	A tool that is used to record the trainee's OJT plan, progress**,** and completion.
OJT Steering Committee	A group of officers from the headquarters who have oversight of the OJT Program.
OJT Task	A unit of work that contains logical and necessary steps in the performance of a job duty, typically with a defined beginning and ending. The task must produce a meaningful result and is one that can best being taught and learned on the job.
Surveillance	One of the most significant duties of the DGCA is to conduct surveillance in all areas of air transportation. The primary objective of surveillance activities is to provide the DGCA with accurate, real-time, comprehensive information for the evaluation of the safety status of the air transportation system.

Job Task Analysis

A Job Task is, "A single identifiable unit of work that is regularly accomplished by Aircraft Engineering officer in the course of a normal work year." Each Job Task is supported by a detailed Job Task Analysis. This analysis is a written summary that describes how to perform

the Job Task. More specifically a Job Task Analysis is, "A written description of the materials, procedures, and requirements that are used to accomplish a Job Task, including, supporting documentation, completion standards, narrative description of the task, and step by step listing of the required sub-tasks."

Trainee Officers must complete OJT for each Job Task that they will be asked to perform without assistance. OJT Program Co-coordinator is responsible for determining which tasks are required for each officer based on the trainee officer's work assignment. OJT must be completed for each of the required Job Tasks.

Part III – Roles and Responsibilities

The OJT Steering Committee

An OJT Steering Committee may be established by DGCA to assist in the management of the OJT program of Aircraft Engineering Directorate. When so designated, the OJT Steering Committee should be composed of OJT Program Co-ordinators of each Directorate of DGCA and chaired by the Principal OJT Program Coordinator. The committee provides oversight and guidance for the implementation of the OJT Program of each Directorate. The Committee shall monitor and assess accomplishment of program objectives and shall recommend changes to the program. The committee shall meet at least annually to discuss training issues.

OJT Program Coordinator

An OJT Program Coordinator shall be of the rank of Deputy Director General of each Directorate. The OJT Program Coordinator is responsible for the implementation of the OJT program in the respective Directorate.

The OJT Program Coordinator is responsible for the items discussed below.

- Provide required information to the OJT Steering Committee,
- Implementing and managing the OJT Program in the Directorate,
- Educating and keeping office management and officers current on the OJT Program,
- Continually evaluating the effectiveness of the OJT program and recommending improvements. Improvements will be implemented by the Training Coordinator to ensure the office develops the skills and capabilities it needs,
- Facilitating the resolution of problems or issues that may impede the effective delivery of OJT,
- Participating in regular communications with Training Coordinator to discuss OJT best practices, suggested changes, and program issues,
- Interacting with the DGCA Training Directorate for smooth implementation of OJT policies, objectives and priorities,
- Assisting the Training Coordinator in identifying tasks performed for which OJT should be required,
- Facilitating and supporting in developing individual OJT training plans and schedules,
- Ensuring OJT instruction is provided to trainees in accordance with applicable directives,
- Conducting reviews of each trainee's OJT Training Record to ensure that all entries are maintained properly and correctly, and
- Ensuring through Training Coordinator that OJT is provided for officers as soon as they join.

Training Coordinator

The Director of Aircraft Engineering shall be designated as Training Coordinator. He is responsible for the implementation of the OJT program in his Directorate.

The Training Co-ordinator is responsible for the items discussed below.

- Ensuring that this OJT Program is implemented efficiently and effectively,
- Ensuring the designation of OJT Trainers who meet the selection criteria outlined below,
- Planning and budgeting to ensure that the OJT Program continuously receives the resources necessary for the effective accomplishment of its goals,
- Specifying the particular Job Tasks that apply to trainee officers in the office,
- Establishing a standardized method to ensure that trainees are provided adequate time and resources required for completing OJT training on specific tasks,
- Obtaining assistance from an OJT Trainer located at another office when a training requirement cannot be fulfilled locally due to the lack of internal instructional expertise,
- Ensuring that trainees begin their OJT Program as soon as possible,
- Authorizing and signing the Training Record for OJT,
- Reviewing with each OJT Trainer, on a regular basis, the progress of assigned trainee officers and initiating any corrective action necessary to improve performance and/or training deficiencies,
- Final sign-off in the Training Record of an officer to certify completion of all OJT requirements for each Job Task. This sign-off is DGCA authorization for the officer to begin accomplishing that Job Task without further assistance,
- Evaluating OJT Trainer performance annually with a mid-year review based on
  - feedback from trainees
  - the Trainer's ability to meet training plans
  - the selection criteria
- Assuming the role of mediator and decision-maker when there are OJT problems and/or disagreements involving OJT Trainers and trainee officers,
- Acting upon feedback from trainees concerning the OJT Program,
- Assisting the OJT Program Coordinator in implementing program improvements,
- Verifying that, prior to conducting OJT, selected OJT Trainers have successfully completed required training courses,
- Monitoring OJT Trainer performance and guiding OJT Trainers on effective methods and techniques

OJT Trainers

- Completing a course of training in Instructional Techniques,
- Conducting OJT with trainees,
- Ensuring that OJT instruction is consistent with applicable DGCA regulations and practices,
- Updating general entries in OJT trainee records,
- Entering data in a trainee's training record after instruction when necessary to certify completion of individual Job Tasks,
- Exhibiting objective, constructive, empathetic, and other behaviors conducive to supporting all OJT trainees,
- Conducting OJT according to the trainee's individual training plan as developed by the OJT Program Coordinator/Training Coordinator.

- Assessing the trainee level of knowledge and skill on specific tasks,
- Providing structured, well-planned, and documented OJT training with stated objectives and expected levels of performance,
- Communicating with the OJT Program Coordinator about trainee progress, and
- Ensuring that the trainee has accomplished all elements of OJT instruction associated with a particular task in an acceptable manner before notifying the OJT Program Coordinator that the trainee is able to perform the task without assistance and is ready for final sign-off.

Trainee

- Fulfilling their OJT requirements as established within the office,
- Participating in the feedback process to help ensure continual improvement including feedback on the performance of the Trainer, and
- Participating, in a constructive manner, in their own training progress reviews and checking the accuracy of completed tasks during the review meetings.

Part IV – OJT System Implementation

This part of the OJT policy discusses the implementation of the OJT system process. This process consists of three phases:

Phase 1- Planning

Phase 2- Delivery

Phase 3- Evaluation

Phase 1 – Planning

Designation of the OJT Program Coordinator

DDG (Headquarters) is designated as the OJT Program Coordinator.

Designation of Training Coordinator.

Director of AED is designated as Training Coordinator. The Training Coordinator is very important to the success of the OJT program and has the responsibility to see that the program is implemented according to DGCA policy. The Training Coordinator shall report to the OJT Program Coordinator.

The following should be ensured by the Training Coordinator.

- Should communicate with people at all levels
- Should make presentations to groups
- Should set up a program and to oversee its implementation
- Should have Knowledge of OJT instruction
- Should track OJT for each officer in the Region.
- Should complete a course of training on instructional techniques

Selection of OJT Trainer

The OJT Program Co-ordinator and the Training Coordinator should estimate trainer requirements while planning the OJT program. At a minimum, there should be one trainer for each represented occupational specialty in the office. As a maximum, not more than 25% of all officers in the office should be OJT trainer. When selecting OJT trainer following should be considered:

- How many officers, including new recruits, are expected to need OJT for the planning period?
- What knowledge and skills will the OJT trainer require? What specialties are represented in the needed training? This should come from the profiles developed earlier.
- How can trainer resources be best utilized?

The following criteria should be used to identify OJT trainers:

- Qualification in the job specialty and job tasks they are intended to teach
- Advanced knowledge, skill, and experience that match the identified training needs along with the necessary skills to support and enhance training and create a learning environment
- Ability to demonstrate a task in a clear and logical order
- Willingness to prepare training, instruct and coach trainees on performance of tasks being trained
- Ability to communicate technical information, concepts, and procedures clearly, concisely, and positively in a variety of ways
- Desire to be an trainer
- Compliance with the standards and definitions of professionalism

It is important for all the trainers to attend a course of training on instructional techniques to ensure consistency in delivering OJT and in evaluating trainee progress. The Training Coordinator will work with the trainer to reinforce training concepts and the value of a structured, planned training activity for each trainee.

Once individuals are appropriately trained to be OJT trainer, the Training Coordinator will prepare and sign a letter stating that the individual meets the criteria to be a trainer, that he has completed the formal training course on instructional techniques, and is authorized as an OJT trainer. The letter will list the specific roles and responsibilities assigned to the OJT trainer if different from those roles and responsibilities listed for OJT trainer in this policy. Only those OJT trainers who are so authorised are considered to be OJT trainers under the Aircraft Engineering Officers OJT Program.

Development of Individual OJT Plans

Development of the trainee's Individual OJT Plan

The Training Coordinator shall review training program expectations and responsibilities to be sure that the trainee understands the process. The following points should be discussed:

- Review of the importance and goals of OJT
- Review of the roles of the trainee, OJT trainer, Training Coordinator, and the OJT Program Coordinator

- Review of the OJT process
- Informing the trainee that OJT is a means of receiving individualised training but does not substitute for required formal classroom training.

The Training Coordinator shall consider the proposed work assignment for the trainee. He may decide that the trainee should become proficient in all the job functions performed in the office.

Phase 2 – Delivery

Scheduling of OJT

The Training coordinator and OJT trainers will jointly develop a proposed schedule for providing training according to the trainee's individual OJT training plan developed.

The Training Coordinator shall ensure that sufficient time is allotted to allow the OJT to take place. When practical, the trainee's work program should be adjusted to accommodate the trainer's schedule. When allocating work time to accomplish OJT, consideration should be given to the specific level of the OJT training to be accomplished (Level I, II, or III) and the complexity of the task. The following should be considered for the different levels of training:

- Level I training is typically a self study effort on the part of the trainee with guided discussion and validation conducted by the OJT trainer afterwards. The time allowed for this should be appropriate to the complexity of the task and the amount of material to be studied.
- Levels II and III involve the actual performance of the task. A good general guideline is to take the normal amount of time to conduct the task and add an additional 50% of that time to allow for instruction and questions. For example, a task that normally takes 1.0 hour should be allowed 1.5 hours for OJT.

As the process of scheduling OJT is continuous in nature, the schedule for delivering OJT should be updated as opportunities for OJT arise.

Preparation to Deliver OJT

When preparing for the delivery of OJT, trainer should review the Job Task Analysis, associated technical guidance materials, and OJT Training Guidance

Job Task Analysis

- To review the Job Task Analysis for the task to be presented.
- To gather all needed equipment, hardware, and software (as applicable).
- To determine if any assistance from other sources is needed regarding the task and how it should be performed. If personnel other than an authorized OJT trainer are used as informational resources, the training should be observed by an authorized OJT trainer to ensure compliance with the training plan and other objectives contained in this policy.
- To create a specific lesson plan for the training event when necessary to properly organize the training.
- To finalize logistical arrangements for training in the office or off-site as appropriate to the training event.

2. Guidance Materials

To review all technical guidance material to ensure that the training will be conducted in accordance with current approved procedures. These guidance materials may include such things as orders, Aircraft Engineering Procedure Manual, regulations, ICAO publications and other documents that are relevant to the task.

Teaching of the Task

The content of each training session must be appropriate to the task and to the level of training that is being presented. A typical OJT training event will include some or all of the following activities:

- Establishment of a training environment
- Development of a rapport with the trainee
- State of learning objectives and expected performance outcomes
- Review of technical requirements
- Assessment of the trainee's existing knowledge and skill in performing the task
- Demonstration of tasks
- Motivation to the trainee
- Observation of the trainee performing the task
- Allowing sufficient time for the trainee to practice task
- Asking questions to check for understanding
- Providing explanations
- Reviewing and summarizing information
- Providing feedback to evaluate the trainee's performance
- To Provide additional training when necessary

Updating of OJT Records

Permanent training records must be maintained for each officer. This shall be accomplished using a hard-copy paper system, and also through computerized record keeping system.

The Training Coordinator is responsible to maintain and update Training Records. This responsibility may be delegated to the OJT trainers when necessary. Entries should be updated as training is delivered. The OJT Program Coordinator, Training Coordinator, and OJT trainers have write access to the training records. Trainees have read-only access to their own records

When a training event is successfully completed the OJT trainer should notify the Training Coordinator. This can be done via e-mail or another locally implemented procedure that will provide a record that a trainee has completed training on a task. The notification should include:

- The task trained
- The level of training completed
- The date that training was completed
- Confirmation that the trainee successfully achieved the objectives

On receipt of report from OJT trainer about completion of a OJT task, the Training Co-ordinator shall issue a certificate to the trainee intimating such completion and authorizing him to carry out the tasks without any further assistance. With the Training Coordinator approval the OJT trainer will then update the trainee's records with the new information.

Conducting Review

A simple review of the trainee's OJT performance should be conducted at the end of each OJT training session. More in-depth reviews of the trainee's progress in the OJT training program should be conducted quarterly, or as needed. The frequency of these reviews will depend on various factors such as the amount of OJT assigned, problems encountered, and the changing needs of the office. This meeting should be attended by the Training Coordinator, OJT trainer and the trainee.

The Training Coordinator shall schedule a meeting with the trainee and the OJT trainer. The following areas should be discussed:

- Review of OJT since the last meeting
- Present training status
- Accuracy of completed tasks
- Trainee feedback on the OJT process
- Problems encountered
- Modification of trainee's OJT plan as needed
- Identification of next tasks to be presented
- Identification of opportunities for OJT

If problems are encountered between the trainee and his trainer the Training Coordinator should meet with the trainer to discuss the issues and provide coaching as needed.

Phase 3 – Evaluation

Evaluate the OJT Program

The program shall be evaluated by the Training Coordinator with the input of OJT trainers, trainees. This evaluation shall be done at least twice a year. The Training Coordinator will evaluate the OJT program through meetings and observation. The review is one way of determining if the OJT program is working properly. The feedback should be analyzed and suggested changes discussed with the OJT Program Coordinator. These evaluations should be conducted even if there are no new recruits in the office. On-site visits may be conducted on an as-needed basis.

Communicate Findings

The Training Coordinator is responsible for communicating program suggestions and changes for his Directorate. This can include any recommendations arising from the evaluation. A meeting shall be scheduled to discuss the OJT program. The meeting should be attended by the OJT Program Coordinator, Training Coordinator and OJT Trainers to discuss the status of the program, problems encountered, and suggestions for improvement. The results of these meetings shall be implemented to improve the OJT Program in the Directorate.

Implementation of Improvements

The OJT Program Coordinator is critical in implementing changes as needed to ensure the officers develop the skills and capabilities. The OJT Program Coordinator shall develop an implementation plan for needed improvements, answering the following types of questions:

- What improvements are needed to the OJT Program?
- What are the benefits of these improvements?
- What are the competing needs?
- Do these improvements affect DGCA standards and policies?
- What approvals are required?
- What budgetary support is required?
- What is the plan for implementing improvements?
- Who is responsible for carrying out the improvements?
- What is the estimated timeline?

Conclusion:

Structured OJT is a critical component of the Aircraft Engineering officer's training system. It is a core training process that is required in the training program. An effective OJT Program contributes to the vision and goals of DGCA and fulfils the international obligations required of ICAO member States.

Annexure- III

AIRCRAFT ENGINEERING DIRECTORATE
OFFICE OF DIRECTORATE GENERAL OF CIVIL AVIATION
TECHNICAL CENTRE, NEW DELHI - 110003

CERTIFICATE OF COMPETENCY

This is to certify that Mr./Mrs/Ms. ..... who joined this Directorate as..... has successfully completed Induction Training and On-job Training. He/she was deputed to ..... a Design Organization from..... to ..... to familiarize himself/herself with the various facilities available there. He/she has taken part in the..... Audit of the same organization also.

The Directorate is now satisfied that sufficient training has been provided to him/her to enable him/her to handle day-to-day work of this Directorate independently. It is further certified that he/she will be provided with recurrent in-house as well as out-station training from time to time.

Name & Signature

Deputy Director General/
(~~Director~~)

Date:.....