Aircraft Airworthiness Department of CAAC

ADVISORY

CIRCULAR

NO: AC-00-AA-2012-02R2

Issue Date: Dec.31, 2012

CAAC Airworthiness Training Catalogue

Contents

CAAC Airworthiness Training Catalogue

1. Purpose

This advisory circular is formulated as the complement of *Training Management Procedure for Airworthiness Certification Personnel(AP-00-01)*,

which provides qualified airworthiness training course Catalogue for Airworthiness Inspectors, Engineers, Flight Test Pilot, Airworthiness Designated Representative, Designated Organization Representative (DOR) and DOR management personnel, and relevant professional people who take part in the activity of aircraft airworthiness certification, It also can be recommended as training courses for people who work in aviation industry unit.

2. Applicability

This advisory circular provides all the training courses which had been reviewed by the Airworthiness Training Review Committee before December 27th, 2012. Starting from January 1st, 2013. The training organization which add or revise training courses should obey the rules of this advisory circular.

3. Background

In order to improve airworthiness certification personnel's professional competence and understanding of airworthiness regulation, procedures and technology, the Aircraft Airworthiness Certification Department of CAAC (short for AAD) offers a series of training and seminars by organizing universities of aerospace at domestic and abroad ,airworthiness authorities and aerospace industry experts.

In order to standardize manage training courses, AAD issues a series of airworthiness management procedure for training, and provides policy guidance for training course build and management .Include "*Training Management Procedure for Airworthiness Certification Personnel* " (AP-00-01) provides principles and requirements for building and managing training courses. *"Training Plan For Aerospace Engineers, Flight Test Pilots and Program Support Specialists" (AP-21-35)* describes a training profile for each specialty function identifying training courses that are essential for personnel assuming a position in the functional specialty". CAAC Airworthiness Training Catalogue" (AC-00-02) provides a list of qualified airworthiness training courses for airworthiness certification personnel.

Since the second revision of "CAAC Airworthiness Training Catalogue" (AC-00-02R1) was issued on May 27th, 2009. The management of airworthiness training had been deeply development, standardized, and some unit had been adjusting the responsibility. In addition, "*Training Management Procedure for Airworthiness Certification Personnel*" (AP-00-01) and *"Training Plan For Aerospace Engineers, Flight Test Pilots and Program Support Specialists" (AP-21-35)* have been amended, so this advisory circular should been revision to meet the airworthiness training development.

In principle, this advisory circular is revised once a year, adding or cancelling courses according to the review reports of courses and revising contents of the procedure of airworthiness training management.

4. Cancellation

The Advisory Circular "CAAC Airworthiness Training Catalogue" (AC-00-AA-2009-02R1 dated on May 27th ,2009)is cancelled since the December 31, 2012.

5. Management of Training Courses

5.1 Category of Training

Two categories of training for airworthiness certification personals: Initial training and on the job training. Both of them contain the requirements of Airworthiness Basic Courses and Professional Courses

5.2 Airworthiness Basic Courses

Civil Aviation Management Institute of China (CAMIC) is responsible for Airworthiness Basic Courses. The courses are reviewed by AAD and listed in the appendix 5 "Airworthiness Regulations Basic Training Courses".

5.3 Airworthiness Professional Courses

The units of airworthiness certification system and universities of aerospace could provide professional training. Applications from those parties or universities should be reviewed according to this advisory circular process, and the Airworthiness Review Committee office (CAST AAI) is responsible for organizing evaluation.

Meanwhile, the divisions of AAD, Airworthiness Review Committee office and authorized training organization should promote the development of professional courses, focus on personnel and training date, and strengthen the

development of professional training courses.

5.4 Training course ID

Training course ID contains three parts: course code, organization code and serial number of courses, forming an ID with five letters. Taking XYZZZ as an example, X means course code, Y means organization code(1 means CAMIC, 2 means CAUC, 3 means BUAA, 4 means CAFUC, Subsequent code postpone for other training agencies) , ZZZ means serial number of courses

Form 1—Course Code

Category of Training	Category of Training	Course code
Basic training	Basic training	1Y
Regulation Subject	professional training − Airworthiness summary	2Y
	professional training − Airworthiness regulations	
	professional training − Airworthiness procedure	
Technical Subject	professional training − performance and flight-test	3Y
	professional training − structure and airframe	
	professional training − power plant	
	professional training − mechanical system	
	professional training − electrical and electronic system	
	professional training − engine	
	professional training − propeller	
	professional training − manufacturing	
	professional training − continuous airworthiness	
Refreshment training	Basic training and professional training	4Y

6. Course Review Process

6.1 Principles

The course review is qualified by Training Evaluate Committee, and then added into this AC appendix 6 “Catalogue of Airworthiness Professional Training

Courses”

6.2 Application

6.2.1 Training organization should submit application to Training Evaluate Committee when it want to add new courses capacity, include course program, course materials, the approved Training Course Evaluation Form (appendix 1) and other supportive materials.

6.2.2 Application teaching the course which listed in the appendix 6, the organization should complete course program as original approved. Or communicate with the approved organization to coordinate the program of course, the unifying program of course should be submitted to Training Evaluate Committee as well as course program and material, the approved Training Course Evaluation Form (appendix 1) and other supportive materials.

6.2.3 If the approved organization wants to amend of authorized courses, it should submit new course program, course materials, the approved program and material, other supportive materials to Training Evaluate Committee. The committee will determine whether it needs to review.

6.2.4 Training Evaluate Committee office (CAST AAI) is authorized by the Committee, and organizes an initial review meeting for the courses once a year. It will determine whether it needs to be reviewed, to be initial evaluated by experts before The Committee review. The evaluating work plan should also be carried out during this meeting.

6.3 Course Evaluation Expert Group

6.3.1 Course evaluation work is been developed by The CAST AAI according to the working plan, The Course Evaluation Expert Group is appointed by CAAC AAD.

6.3.2 Course Evaluation Expert Group includes the followings:

a) CAAC AAD, AAD of Regional Administration, Airworthiness Certification Center;

b) CAST, CAMIC, CAUC, BUAA, and CAFUC;

c) Universities of Aerospace.

6.3.3 If the applying course requires expert evaluation, Division in CAAC AAD choose expert from the group to carry out preliminary evaluation. The expert gives his review comments to CAST AAI in accordance with Appendix 2 “Preliminary Evaluation Report of Professional Courses”.

6.4 Course Evaluation

6.4.1 The course evaluation meeting is organized by CAST AAI according to the working plan. Trainer gives a teaching in the meeting and is reviewed by the committee on site.

6.4.2 Review on the basis of: course program, course materials, PPT and teaching skills, the committee and the trainer would have a question and answer activities. If it has expert evaluation report and refer the report. Taking overall factors into consideration, the committee member will give the course a score and fill the appendix 3 “Training Course Evaluation Form”.

6.4.3 After discussion, the committee provides assessment conclusions and fills Appendix 4 “Training Course Evaluation Report”

6.5 Evaluation Outcomes

6.5.1 Course marked as qualified in the “Training Course Evaluation Report”, the CAST AAI will add this course in the appendix 6 with information about Course ID and course subject. Training organization will provide training service to airworthiness certification personnel with qualified course program and materials

6.5.2 Course marked with suggestions and issues in the “Training Course Evaluation Report”, the training organization should make corrective action based on the report. The committee office will follow up and inspect those issue, After qualified, The course and its ID and subject description will be add into “Catalogue Of Airworthiness Training Courses”. Training organization will provide training service to airworthiness certification personnel with revised program and materials.

6.5.3 If the course marked with unqualified, training organization should revise the program and materials, and reapply evaluation.

7. Courses Evaluate Records

Training Evaluate Committee office (CAST AAI) is responsible for the management of courses evaluate records. It should be completed within 10 working days after evaluation. Records should be saved and filed via both electrical data and paper documents for easy reference.

Details are as follows:

(1) Training Course Application Form

(2) Preliminary Evaluation Report of Professional Courses(if necessary);

(3) Training Course Evaluation Form

(4) Training Course Evaluation Report

8. Supplementary Provision

8.1 This advisory circular shall be interpreted by the Aircraft Airworthiness Certification Department of CAAC.

8.2 The airworthiness training courses catalogue in this advisory circular are updated dynamically based on evaluate result.

Appendix 1 Training Course Application Form

<table>
<tr><td>Name</td><td colspan="3"></td></tr>
<tr><td>Course Title</td><td colspan="3"></td></tr>
<tr><td>Trainer</td><td></td><td>Training hours</td><td></td></tr>
<tr><td>Contactor</td><td></td><td>Phone</td><td></td></tr>
<tr><td rowspan="2">Types of evaluate:</td><td colspan="3">☐ new course, initial application</td></tr>
<tr><td colspan="3">☐ amendment on contents , reapplication</td></tr>
<tr><td colspan="4">Description of course:</td></tr>
<tr><td colspan="4">Submitted materials
1.☐ Course Program 2.☐ Course materials
3.☐ others</td></tr>
<tr><td colspan="4">Statement :
Hereby we certify that all the information in this form is true and take full responsibility of the filled contexts.

Applicant :
Position :
Date :</td></tr>
</table>

Appendix 2 Preliminary Evaluation Report of Professional Courses

Name		Course Title	
Trainer		Training hours	
1、Review comments			
2、Recommendations for improvement			
Reviewer		Review date	
Phone		E-Mail	

Appendix 3 Training Course Evaluation Form

Name		Course Title		
Trainer		Training hours		
Index	Marking criterion		Scores	Marks
Course Program	1. Standard ,meet the requirements of training goals , conform with contents		20	
	2. Contents, training hours ,case and practical process meet *the Training Management Procedure for Airworthiness Certification Personnel*		15	
Course materials	1. cover the requirements of trainees		15	
	2. practical and combined with job function		10	
	3. support airworthiness certification		10	
PPT	1. structure format and contents		5	
	2. Words and figures		5	
Trainer Teaching skills	1. Articulate and easy understanding		5	
	2. Two-way communication		5	
	3. Overall control ability of class		5	
	4. Logical and systematic		5	
Guide of marking	program and materials	conform with related regulations ; PPT presentation;		
	Teaching skill	Clear mind; Subject, purpose and contents can be easy understood through presentation. Related information conform with PPT		
	Experience sharing	Experience is scientific, instructive and available for learning		
	Overall evaluation	Overall evaluation of the course		

	Q&A	Performance of answering questions
	Total scores	100
comments and suggestions		

Appendix 4 Training Course Evaluation Report

Training Course Evaluation Report

Training Organization:

Course Title:

Leader of evaluate:

Course Title		Training hours	
Review place		Review date	
Main contents of evaluation:			

Evaluate Group	Name	Duty	Unit
Leader			
Member			

1、Main problems and improvement suggestions

Main problems	improvement suggestions

2、Result of evaluate:

Group Leader : (signature)

Month Date Year

Appendix 5 Airworthiness Regulations Basic Training Courses

ID	Course Title	Description	Hours	Organization
11001	Airworthiness Regulations Basic Training Courses	a) International Civil Aviation Organizations, Conventions , Annexes and Organization; b) Foreign Civil Aviation Authority Organizations, Airworthiness Regulations and Bilateral Airworthiness Agreement; c) Administrative System of CAAC; d) Regulations system of CAAC; e) Regulations and standard documents on airworthiness certification activities. This course will be mainly face to freshmen, aims to provide the necessary basic airworthiness knowledge.	72	CAMIC[1]

[1] CAMIC is Civil Aviation Management Institute of China

Appendix 6 Catalogue of Airworthiness Professional Training Courses

ID	Course Title	Description	Hours	Organization
22001	Airworthiness Concept and Principles	Origin and Development of Airworthiness; General of Airworthiness Standards; Responsibility and Obligation of the Applicant, Holder and Authority; Airworthiness Regulation System; Development Trend of Airworthiness, etc.	4	CAUC[2]
22002	Supplier Surveillance	AC-21-04, include: Supplier, Surveillance of Supplier and Airworthiness management, PAH requirements and cooperation.	16	CAUC
22003	Airworthiness Standards of US. Military aircraft	MIL-HDBK-516, Military Aircraft airworthiness certification technology and methods	4	CAUC
22004	Civil Aircraft Customer Service System	Continuous Airworthiness Responsibility, Customer Service System; Importance, Characteristics and covers category; International Advanced Aviation Manufacturers Customer Service System.	8	CAUC
22005	Airworthiness Certification Process and Factors	Airworthiness Certification Process; Airworthiness Certification Factors;	8	CAUC
22006	Airworthiness Inspectors Competence Requirement and Certification Skill	Counseling Technique. Interpersonal Behavior Problem Solving. Employee Development. Group Behavior. Interactive Skills in Communication and Attitude.	8	CAUC
22007	Production Certification and Surveillance Procedures	AP-21-04, Application, Certification and Issuance of Production Certificate (PC) for manufacturing civil aviation products; Aircraft Certification System Evaluation Program(ACSEP); Quality control system;	8	CAUC
21008	Airworthiness Standards(General)	CCAR-25,CCAR-26, Concept, Content, Object and Means;	24	CAMIC

[2] CAUC is Civil Aviation University of China

		Items and Acceptable Means of Compliance.		
21009	Certification Procedures for Civil Aviation Products and Parts	CCAR-21 “Certification Procedures for Civil Aviation Products and Parts ”	24	CAMIC CAUC
2YZZZ	Engine	CCAR-33 “Airworthiness Standards: Aircraft Engines ”	16	Vacant
23010	Noise	CCAR-36 “ Noise Standards: Aircraft Type and Airworthiness Certification ”	21	BUAA[3]
21011	Aircraft TC procedure	Indoctrination Training for all Certification Engineering and Test Pilot Disciplines: TC and TC system and Process, Design Assurance System. Airframe, Propulsion, Systems and Flight Test.	24	CAMIC
21012	Production Certification and Surveillance Procedures	AP-21-04, Application, Certification and Issuance of Production Certificate (PC) for manufacturing civil aviation products; Aircraft Certification System Evaluation Program(ACSEP); Quality control system;	24	CAMIC
21013	Airworthiness Certification of Aircraft and Related Products	Airworthiness Certificate, AP-21-05, AP-21-07, AP-21-10.	20	CAMIC
21014	Validation Procedures for Import and Export Civil Aviation Products and Parts	AP-21-01, Validation Procedures of Type Certificate. Airworthiness Inspection Process; Bilateral Airworthiness Agreement; Export Airworthiness Certificate.	24	CAMIC
21015	Airworthiness management of Part and Appliances	CCAR-21, CCAR-37, AP-21-04, AP-21-06, AP-21-01; Basic Certification Requirement; Procedure and Process;	24	CAMIC
21016	Nationality Registration Certificate	CCAR-21, CCAR-45, AP-45-02, AP-21-05; Application Guide of Nationality Registration Certificate;	24	CAMIC

[3] BUAA is Beijing University of Aeronautics and Astronautics

	and AMIS System	AMIS system instructions;		
21017	Airworthiness Directives	CCAR-21、CCAR-39、AP-39-01,AP-21-02; AD Case; Implementation and Control of AD; FAA and EASA AD Procedure and Orders;	24	CAMIC
3?001	Flight Test	Basic Content of AC25-7A	8	Vacant
33002	Aircraft Flight Dynamics	Equations of Motion. Aerodynamic Concepts. Longitudinal-Lateral-Directional Stability Derivatives. Stick Fixed, Stick Force/Speed/Load Factor Gradient. Stick Free. Perturbation Equations. Frequency Response and Feedback Systems. Autopilot /Modes. Coupling and Non-coupling Problems. Aero elastic effects. Performance. Lift / Drag and High Lift Devices. Pressure Distribution.	35	BUAA
33003	Human Factors in Cockpit Standardization	Cockpit Design. Crew Workload Assessment. Visibility. Lighting and Controls.	28	BUAA
33004	Aircraft Structure Fatigue Evaluation	Definition and Recognition. Theories of Failures. Fatigue damage and fatigue design. Airworthiness Certification Requirements; Fatigue Load Spectrum and the full-scale Fatigue Test, Security Life Assessment, Damaged Safety Design and Evaluation, Damage Tolerance Assessment,Structure Maintenance Program..	24	BUAA
32005	Transport Aircraft Structure Fatigue Evaluation	Airworthiness Certification Requirement of Structure Fatigue; Certification Process and Compliance Methods; FAA Aircraft Structure Fatigue Certification Technology.	24	CAUC
33006	Aircraft Loads Assessment —Basic Loads	Basic Aerodynamics. Methods of Loads Analysis. Design Data. Critical Loading Conditions. Airfoil Characteristics. Airplane Balancing. Empennage and Wing Loads. Landing Loads. In flight Measurements of Loads. Evaluation of Typical Loads Report.	28	BUAA
33007	Aircraft Vibrations	Review of Mathematics and Physics, Definitions and Terms, Basic Linear and Torsional Frequency Equation. Single and Multi-Degrees of Freedom.	35	BUAA

		Free and Forced Damped Systems. Unbalance and Balancing Equipment. Absorbers and Dampers. Vibration Equipment and Use. Analysis of Continuous and Variable Cross-section Beams. Coupled Modes. Ground Vibration Survey.		
33008	Damage Tolerance Assessment	Fracture Mechanics Concepts. Stress Intensity Factor. Residual Strength of Damaged Elements. Surface-Corner-Embedded Flaws. Fastener Flexibility. Energy Release Rate and Pseudo Closed Form Solutions. Critical Crack Length. Crack Arrestors. Crack Growth Assessment. Retardation Models.	35	BUAA
33009	Flutter Analysis and Flight Flutter Testing	Structural Flexibility and Stiffness. Natural Frequencies and Mode Shapes. Excitation Techniques. Ground Vibration Testing. Nature of Flutter. Two and Three Dimensional Incompressible and Compressible Flow. Flutter with Two or Three Degrees of Freedom. Aero elastic Effects. Flutter Testing. Data Acguisition and Instrumentation. Data Reduction.	35	BUAA
33010	Composite Materials	Heterogeneous Materials. Characteristics of Fibers and Matrix Materials. Unidirectional Composites and Structural Laminates. Laminate Theory and Behavior. Interlaminar Stresses. Fracture. Fatigue. Analysis of Structural Elements. Design and Evaluation. Test Methods. Fabrication. Processing. Repair. Design Applications.	21	BUAA
3YZZZ	Power Plant Certification	Power Plant Airworthiness Certification Requirements and Policy	8	Vacant
33011	Fuel Systems and Design	Design Criteria. Crashworthiness Considerations. Ignition Sources. Fire Suppression/Prevention. Frangible Attachments. Self-Sealing Breakaway Couplings.	35	BUAA

33012	Engine Air induction systems	Design Techniques. Inlet Distortion, Icing Considerations. Inlet Losses. Stalls and Surge Characteristics. Environmental Considerations.	28	BUAA
33013	Turbine Engine Principles	Turbine Engine Fundamentals. Components. Compressible Flow. Turbo Jet. Turbo Fan. Turbo Shaft. Performance. Dynamics. Air system, Failure Mode Analysis.	35	BUAA
33014	Reciprocating Engine	Reciprocating Engine Principles,Components. Performance, Dynamics.	35	BUAA
33015	Electronic transmission of Flight Control Systems	CCAR-25 §25.143、25.181、25.671、25.672、25.1309 articles;Flight Control Systems, Airworthiness Regulation and Procedure, Certification Factors and Compliance Methods, System Safety Assessment.	21	BUAA
33016	Oxygen and Protective Breathing Systems	System Design, Installation and Maintenance. Methods for Calculating the Flow and Quantity Requirements. Test and Analysis Methods. Industry Specifications.	21	BUAA
33017	Automatic Control Principle	Control System Theory, Stability, Linear and nonlinear Systems	35	BUAA
33018	Transmission Systems	Gears. Bearings. Shafting. Seals. Lubrication. Cooling. Oil Pumps / Filters. Case Design.	28	BUAA
33019	Environmental Systems	Air Conditioning. Bleed Air Cooling. Ozone. Pressurization. Ventilation. Purpose and Function of Systems. Failure Effects. Testing and Analysis Methods.	28	BUAA
33020	Aircraft Anti-Ice/Deice Systems	Physics for Ice Collection. Technical Report AD-4. Icing Data statistics for Design Criteria. Protection Methods. AC20-73. Testing and Analysis Methods with and without Ice Shapes	35	BUAA
32021	System Safety Assessment	Introduces background and development of the system safety assessment theory and process, Related Regulation, Procedure and Advisory Circular, Requirement and Goal, SAE standards ,manual and guidelines, Future Development Trends and Strategies, Standard Process and Methods.	24	CAUC

32022	Certification Considerations for Highly-Integrated or Complex Aircraft Systems	SAE ARP-4754, Certification Process and Coordination Development Assurance Level (DAL) and allocation strategy.	24	CAUC
32023	Certification Considerations for Airborne Electronic Hardware	DO-254 Means of Compliance, Hardware Life Cycle, Security Considerations, Verification and Certification Process, Development Processes, Configuration Management Process, Tool Qualification. Commercial off-the-shelf (COTS)Hardware, Planning Process.	24	CAUC
32024	Software Considerations In Airborne Systems and Equipment Certification	DO-178B(Purpose, Content, History, Develop Trend), Software Life Cycle, Planning Process, Development Processes, Verification Process, Configuration Management Process, Quality Assurance Process, Tool Qualification.	24	CAUC
32025	Environmental Conditions and Test Procedures for Airborne Equipment	DO-160,Backgound, 23 Items of DO-160F Airborne Equipment Environmental Test Purpose and Process; Gaps in DO-160D、E、F DO-160 instructions.	24	CAUC
33026	Computer Technology	Survey of Current Computer Operating Systems and System Programs. Computer System Organization and Logic Design. Computer Structure. Artificial Intelligence. Programming. System Usage. Resent Developments in Computers and Programs. Hardware and Software as Applied to Real Time Systems. Language. Computer Aided Design and Manufacturing.	35	BUAA
3YZZZ	Manufacturing Compliance Check in Test Products	Introduce the basic concepts and process of Manufacturing Compliance Check	8	Vacant
32027	Certification Maintenance Requirement(CMR)	Continuous Airworthiness Management; Invisible Fault; AC25-19; Definition, History, Propose and develop of CMR; The Relationship and connector between CMR and MSG-3 process	16	CAUC

31028	Continuous Airworthiness Document Management	Origin, Significance and the main Types of Continued Airworthiness Document; Compile, Approval, Issuance and revision in the process of certification and service of aviation products ,etc	24	CAMIC
32029	Airworthiness Certification Technology in Composite Materials	Airworthiness Certification Items, Advisory Circular and Authority accepted Standards; Means of Compliance;	24	CAUC
32030	Certification Technology in Airframe Crashworthiness	Airworthiness Certification Items, Advisory Circular and Authority accepted Standards; Means of Compliance.	24	CAUC
33031	Engine Control System	Connotation and Means of Compliance in CCAR-33§ 33.28(Engine Control System). The basic theory and analysis method in §33.75(Safety Analysis)related to Engine Control System	21	BUAA
33032	Engine Time Limited Parts	Basic Concept and Airworthiness Requirement; Define a closed-loop system in Time Limited Parts;Engineering plan, manufacturing plan and In-Service management plan.	21	BUAA
33033	Certification Technology in Flight Control Systems	Airworthiness Certification Items and Advisory Circular in Classic and modern electronic transmission Flight Control Systems; Airworthiness Key Requirement in design, implementation and verification.	24	CAUC
33034	Certification Technology in Human Factors	Airworthiness Certification Items, Advisory Circular and Authority accepted Standards; Acceptable Means of Compliance(AMCs) and Guidance Materials(GM); Interpretation of EASA CS-25 §1302 item; general principles of Human Factors design, methods and compliance, evaluation tools and Certification Test Analysis.	24	CAUC
41001	Airworthiness Designated Engineering Representative	CCAR-183” Rules for Designation of Civil Aircraft Airworthiness Representative Individuals and Organization” ; AP-183-01, AP-183-02, AP-183-07.	24	CAMIC