



Guidance Material for Instructor and Evaluator Training

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Executive Letter

It is our pleasure to introduce the first edition of the co-branded IATA-IFALPA *Guidance Material for Instructor and Evaluator Training*.

Given the essential contribution of the instructors and evaluators to flight safety, it was important to look into the existing training curricula and propose solutions to enhance globally the level of competency of the instructors and the evaluators. Hence, this manual is dedicated to their training, and its content can be used by operators and by training organizations. We are committed to provide updates to this manual as the work at ICAO on the competency-based training framework, definitions of competencies and definitions of performance standards, continues to mature.

Part of the manual provides information about the major regulatory systems governing the instructor-evaluator initial and continuous qualification. Hence, communalities, differences and best practices from EASA and FAA standards are presented in order to facilitate the understanding of these two regulatory frameworks.

However, the key element of the manual resides in its innovative proposal of a consistent competency-based training and assessment approach for instructor and evaluator. The manual reinforces the benefits of using competencies, and provides a specific competency model for instructor and evaluator. It introduces a competency-based methodology for their training, and supports the industry's movement toward competency-based training and assessment to ensure the quality and efficiency of its training programs.

It is our belief that the shared efforts put into the development of this new approach to instructor and evaluator training will contribute to achieving our common goal of improving aviation safety worldwide.

We want to acknowledge the work and valuable support provided by the members of the IATA Pilot Training Task Force in the development of this manual. Without their support the publication of this manual would not have been possible.

Best regards,



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Publications

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ICAO Annex 1, Personnel Licensing	Eleventh Edition, 2011
ICAO Annex 6, Operation of an Aircraft, Part I, International Commercial Air Transport – Aeroplanes	Tenth Edition, 2016
ICAO DOC 9868, Procedures for Air Navigation Services – Training (PANS-TRG)	Second Edition, 2016, Rev.1–4
ICAO DOC 9995, Manual of Evidence-based Training	First Edition, 2013
EASA PART-FCL, Flight Crew Licensing	Revision state of October 2017
EASA PART-ORO, Organisation Requirements for Air Operations	Revision state of October 2017
FAA 14CFR PART 121	Revision state of September 2017
FAA Order 8900.1, Volume 3 Chapters 19 and 20	08/0315, CHG 415

Abbreviations and Acronyms

AMC	Acceptable means of compliance
AOC	Air operator certificate / Air operator certificate holder
AQP	Advanced qualification program
ATO	Approved training organization
ATQP	Alternative training and qualification program
CBT	Computer-based training
CBTA	Competency-based training and assessment
CCQ	Cross crew qualification
CFR	Code of federal regulations
CPT	Captain/Commander
CRE	Class rating examiner (EASA)
CRI	Class rating instructor (EASA)
CRM	Crew resource management
DOC	Document
EASA	European Aviation Safety Agency
EBT	Evidence-based training
FAA	Federal Aviation Administration
FCL	Flight crew licensing
FE	Flight examiner (EASA)
FI	Flight instructor
FIE	Flight instructor examiner (EASA)
FO	First officer
FSTD	Flight simulation training device
FTI	Flight test instructor (EASA)
GM	Guidance material
ICAO	International Civil Aviation Organization



IE	Instructor and evaluator
IEC	Instructor and evaluator competency
IRE	Instrument rating examiner (EASA)
IRI	Instrument rating instructor
IOS	Instructor operating station
LIFUS	Line flying under supervision
LTC	Suitably qualified commander, "Line training captain"
MCCI	Multi-crew cooperation instructor (EASA)
MI	Mountain rating instructor (EASA)
OB	Observable behavior
OCC	Operator conversion course
OM	Operations manual
ORO	Organization requirements for air operations
PANS-TRG	Procedures for air navigation services, training
PIC	Pilot in command
PF	Pilot flying
PM	Pilot monitoring
RHS	Right-hand seat
SFI	Synthetic flight instructor (EASA)
STI	Synthetic training instructor (EASA)
TRI	Type rating instructor
UPRT	Upset prevention and recovery training
ZTFF	Zero flight time training

Definitions Related to Instructors and Evaluators

Note: For a better understanding, the definitions below are logically grouped and not listed in an alphabetical order.

ICAO competency framework. A competency framework, developed by ICAO, is a selected group of competencies for a given aviation discipline. Each competency has an associated description and observable behaviors.

Adapted competency model. A group of competencies with their associated description and performance criteria adapted from an ICAO competency framework that an organization uses to develop competency-based training and assessment for a given role.

Competency. A dimension of human performance that is used to reliably predict successful performance on the job. A competency is manifested and observed through behaviors that mobilize the relevant knowledge, skills and attitudes to carry out activities or tasks under specified conditions.

Note: ICAO describes knowledge, skills and attitude as:

- **Knowledge** is specific information required to enable a learner to develop and apply the skills and attitudes to recall facts, identify concepts, apply rules or principles, solve problems, and think creatively in the context of work.
- A **skill** is an ability to perform an activity or action. It is often divided into three types: motor, cognitive and metacognitive skills.
- **Attitude** is a persistent internal mental state or disposition that influences an individual's choice of personal action toward some object, person or event and that can be learned. Attitudes have affective components, cognitive aspects and behavioral consequences. To demonstrate the "right" attitude, a learner needs to "know how to be" in a given context.

This manual distinguishes between "*Pilot competencies*" and "*Instructor and Evaluator competencies*".

Pilot competencies. An ICAO competency framework for aeroplane pilots.

Instructor and Evaluator competencies. A competency framework for instructors and evaluators as described in this manual.



Performance criteria. Statements used to assess whether the required levels of performance have been achieved for a competency. A performance criterion consists of an observable behavior, condition(s) and a competency standard.

Observable behavior (OB). A single role-related behavior that can be observed and may or may not be measurable.

Conditions. Anything that may qualify a specific environment in which performance will be demonstrated.

Competency standard. A level of performance that is defined as acceptable when assessing whether or not competency has been achieved.

Assessment. The determination by an instructor or evaluator as to whether a candidate meets a required competency standard under given conditions, by collecting evidence from observable behaviors. Assessment takes place during instruction and evaluation.

Formative Assessment. Formative assessments are a part of the learning process. Instructors provide feedback to the trainees on how they are progressing toward the interim or final competency standard. This type of assessment enables the trainee to progressively build on competencies already acquired and should aid learning by identifying gaps as learning opportunities.

Summative Assessment. Summative assessments provide a method that enables the instructor and evaluator to work with a trainee to collect evidence of the competencies and performance criteria to be demonstrated with respect to the interim or final competency standard(s). Summative assessments are carried out at defined points during the training and/or at the end of the training. During summative assessments, the decision is either "competent" or "not competent" with respect to the interim or final competency standard(s). However, this can be further developed into a more refined grading system with a scale of judgements to improve feedback for the trainee and training personnel.

Evaluation. For the purpose of this document, evaluation means the formal, summative assessment of an individual's performance or the evaluation of the training system.

Evaluator. A person authorized to provide evaluations.

Instructor. A person authorized to provide instruction.

Note: For the purpose of this document, "Validation", as used under the FAA, is equivalent to a summative assessment.

Section 1—Standards and Regulations for Instructor and Evaluator

1.1 ICAO Standards

1.1.1 ICAO Annex 1

Annex 1, Personnel Licensing, Chapter 2 – *Flight instructor rating appropriate to aeroplanes, airships, helicopters and powered-lifts*, provides the foundation for the development of national regulations regarding instructor ratings.

1.1.2 ICAO DOC 9868 – PANS-TRG

PANS-TRG describes the implementation of the training required for the pilot licenses and ratings found in Annex 1.

1.1.3 ICAO Annex 6

Annex 6, Operation of Aircraft, Chapter 9 – *Aeroplane Flight Crew*, mandates, that an operator establishes and maintains a ground and flight training program, approved by the State of the operator, which ensures that all flight crew members are adequately trained to perform their assigned duties.

Note: Amendments to Annex 1, Annex 6, and PANS-TRG are scheduled for November 2020.

1.2 EASA Regulations

EASA distinguishes between licensing training (PART-FCL) and operator training (PART-ORO).

1.2.1 PART-FCL – Flight Crew Licensing

EASA has published the requirements for Instructors in Subpart J to PART-FCL, and for Examiners in Subpart K to PART-FCL.



1.2.2 PART-ORO (Organization Requirements for Air Operations)

PART-ORO describes:

- operator conversion training and checking (when joining an operator or when changing aircraft type), and
- annual operator recurrent training and checking

1.3 FAA Regulations

1.3.1 14 CFR Part 61 – Certification: Pilots, Flight Instructors and Ground Instructors

Part 61-Subpart H prescribes the requirements for the issuance of flight instructor certificates and ratings (except for flight instructor certificates with a sport pilot rating), the conditions under which those certificates and ratings are necessary, and the limitations on those certificates and ratings.

1.3.2 14 CFR Part 121 – Operating Requirements: Domestic, Flag, and Supplemental Operations

Subpart N – Training Program, requires the certificate holder (operator) to provide properly qualified ground instructors and flight instructors, simulator instructors, and approved check airmen to conduct required flight training, flight checks, and simulator training courses. Instructors are qualified directly by the certificate holder (operator) and do not need to hold instructor certificates as per Part 61.

Subpart Y – Provides for approval of an alternative method known as “Advanced Qualification Program” or “AQP” for qualifying, training, certifying, and otherwise ensuring competency of crew members, aircraft dispatchers, other operations personnel, instructors, and evaluators who are required to be trained under parts 121 and 135.

1.3.3 14 CFR Part 142 – Training Centers

Part 142 prescribes the requirements governing the certification and operation of training centers for the purpose of third party training. For training of their own employees, including training for AQP, operators approved under Part 121 do not need certification under Part 142. Requirements for instructors are the same as for Part 121.

1.3.4 FAA Order 8900.1 Volume 3

Chapter 20, Section 1, contains guidance concerning *Check Pilot and Check Flight Engineer (FE) programs*.

Chapter 20, Section 2, describes procedures for the approval and surveillance of check pilots and check Flight Engineers (FEs), and it includes procedures for evaluation.

Chapter 20, Section 4, provides guidance concerning the training requirements for check pilots, check Flight Engineers (FEs), and air transportation flight instructors.

Further details on instructor, examiner and evaluator related to EASA and the FAA regulations can be found in Appendix 1 to this manual.

Section 2—The Benefits of Using Competencies

Mastering a defined set of *pilot* competencies should enable a pilot to perform his routine duties and manage unforeseen situations, which cannot be trained in advance.

Similarly, mastering a set of *instructor and evaluator competencies* (IECs) should enable an instructor and evaluator (IE) to perform instruction and evaluation duties and manage the full spectrum of assignments, from ground instruction to evaluations in dynamic flight situations. Therefore, it is beneficial to define a set of universal competencies that can be consistently applied throughout the entire career of an IE.

The competencies for instructors and evaluators developed in this manual are based on the latest ICAO standards, EASA and FAA regulations, and guidance material and best practices from IATA member airlines.

2.1 Using Pilot Competencies in AQP, ATQP and EBT

Alternative training programs, such as AQP, ATQP and EBT stress the importance of pilot behaviors beyond technical skills, in order to better prepare them for unforeseen events. In AQP and ATQP these behaviors are referred to as “CRM Skills”; in EBT they are included in the pilot competencies.

Note: As an example, most airlines use technical criteria and CRM skills to describe pilot performance. A comparison between three major airlines in the USA and Europe showed that one airline used three technical and seven CRM skills, another used one itemized technical and seven CRM skills, and the third airline used nine pilot competencies (four technical and five CRM related).

2.2 Using Instructor and Evaluator Competencies

Existing regulations for IEs generally list tasks, duties and procedures to be performed. However, to reliably predict successful performance on the job, an overarching framework of IE competencies is needed.

This manual defines the IE competencies, their descriptions and their observable behaviors. They should be used by selection teams and by course developers for initial, recurrent and standardization programs.

2.3 Using Competencies to Globally Harmonize and Enhance Training

The defined set of pilot and IE competencies should be applied across all types of training, from licensing to operator recurrent training, and by both operators and approved training organizations (AOC/ATOs). Developing both, pilots and instructors, through globally harmonized systems of competencies, will contribute to improved quality of training, enhanced safety and will also increase training efficiency.

Section 3—Instructor and Evaluator Competencies

Based on existing documentation and the latest ICAO publications, the IATA Pilot Training Task Force (PTTF) has developed a standardized competency model that includes five competencies for instructor and evaluator.

3.1 The Structure of the New ADAPTED ICAO Competency Model

The table below shows the structure of the competency model in accordance with Amendment 5 to ICAO DOC 9868, PANS-TRG.

Name of the competency	Description	Performance Criteria		
		Observable behavior (OB)	Competency Assessment	
			Final competency standard	Conditions
Competency 1	OB 1 OB 2 OB
Competency 2
Competency x

3.2 The Competency Model for Instructor and Evaluator

The table below shows an overview of the IATA competency model for instructor and evaluator.

Competencies for Instructor and Evaluator				
Name of the competency	Description	Performance Criteria		
		Observable behavior (OB)	Competency Assessment	
			Final competency standard	Conditions
Pilot competencies¹	See ICAO Aeroplane Pilot Competency Framework and EASA documents (including "Knowledge")	See the observable behaviors in the tables below	Operators and ATOs define in their OMs the level of performance to be achieved by the instructor and evaluator.	Ground training (incl. CRM) and Flight training in aircraft and in FSTDs: - licensing - type rating - conversion - line training - recurrent
Management of the learning environment	See descriptions in the tables below for the individual competencies			
Instruction				
Interaction with the trainees				
Assessment and Evaluation				

The following 5 tables separately show the individual Instructor and Evaluator Competencies (IEC1 – IEC5).

¹ For ground instructors some pilot competencies may not apply.

3.2.1 IEC1 - Pilot Competencies

Instructor and Evaluator Competency 1 - Pilot competencies				
Name of the competency	Description	Performance Criteria		
		Observable Behavior (OB)	Competency Assessment	
			Final competency standard	Conditions
IEC1: Pilot competencies²	See ICAO Aeroplane Pilot Competency Framework and EASA documents (including "Knowledge")	See ICAO Aeroplane Pilot Competency Framework and EASA documents (including "Knowledge")	Operators and ATOs define in their OMs the level of performance to be achieved by the instructor and evaluator in each pilot competency.	Ground training (incl. CRM) and Flight training in aircraft and in FSTDs: - licensing - type rating - conversion - line training - recurrent

² For ground instructors some competencies may not apply.

Therefore, the operators and ATOs have to identify which pilot competencies and associated observable behaviors are applicable depending on their ground instructors and evaluators activities. As an example the pilot competency "communication" must be demonstrated by instructors and evaluators whilst the pilot competency "flight path management, manual control" may not be mandatory.

3.2.2 IEC2 – Management of the Learning Environment

Instructor and Evaluator Competency 2 - Management of the learning environment				
Name of the competency	Description	Performance Criteria		
		Observable behavior (OB)	Competency Assessment	
			Final competency standard	Conditions
IEC2: Management of the learning environment	Ensures that the instruction, assessment and evaluation are conducted in a suitable and safe environment	<ul style="list-style-type: none"> • Applies TEM in the context of instruction/evaluation • Briefs on safety procedures for situations that are likely to develop during instruction/evaluation • Intervenes appropriately, at the correct time and level (e.g., progresses from verbal assistance to taking over control) • Resumes instruction/evaluation as practicable after any intervention • Plans and prepares training media, equipment and resources • Briefs on training devices or aircraft limitations that may influence training, when applicable • Creates and manages conditions (e.g., airspace, ATC, weather, time, etc.) to be suitable for the training objectives • Adapts to changes in the environment whilst minimizing training disruptions • Manages time, training media and equipment to ensure that training objectives are met 	Operators and ATOs define in their OMs the level of performance to be achieved by the instructor and evaluator.	<p>Ground training (incl. CRM) and</p> <p>Flight training in aircraft and in FSTDs:</p> <ul style="list-style-type: none"> - licensing - type rating - conversion - line training - recurrent

3.2.3 IEC3 – Instruction

Instructor and Evaluator Competency 3 - Instruction				
Name of the competency	Description	Performance Criteria		
		Observable behavior (OB)	Competency Assessment	
			Final competency standard	Conditions
IEC3: Instruction	Conducts training to develop the trainee's competencies	<ul style="list-style-type: none"> ● References approved sources (operations, technical, and training manuals, standards and regulations) ● States clearly the objectives and clarifies roles for the training ● Follows the approved training program ● Applies instructional methods as appropriate (e.g., explanation, demonstration, learning by discovery, facilitation, in-seat instruction) ● Sustains operational relevance and realism ● Adapts the amount of instructor inputs to ensure that the training objectives are met ● Adapts to situations that might disrupt a planned sequence of events ● Continuously assesses trainee's competencies ● Encourages the trainee to self-assess ● Allows trainee to self-correct in a timely manner ● Applies trainee-centered feedback techniques (e.g., facilitation, etc.) ● Provides positive reinforcement 	Operators and ATOs define in their OMs the level of performance to be achieved by the instructor and evaluator.	Ground training (incl. CRM) and Flight training in aircraft and in FSTDs: - licensing - type rating - conversion - line training - recurrent

3.2.4 IEC4 - Interaction with the Trainees

Instructor and Evaluator Competency 4 - Interaction with the trainees				
Name of the competency	Description	Performance Criteria		
		Observable behavior (OB)	Competency Assessment	
			Final competency standard	Conditions
IEC4: Interaction with the trainees	<p>Supports the trainees' learning and development</p> <p>Demonstrates exemplary behavior (role model)</p>	<ul style="list-style-type: none"> Shows respect for the trainees (e.g., for culture, language, experience) Shows patience and empathy (e.g., by actively listening, reading non-verbal messages and encouraging dialogue) Manages trainees' barriers to learning Encourages engagement and mutual support Coaches the trainees Supports the goal and training policies of the Operator/ATO and Authority Shows integrity (e.g., honesty and professional principles) Demonstrates acceptable personal conduct, acceptable social practices, content expertise, a model for professional and interpersonal behavior Actively seeks and accepts feedback to improve own performance 	Operators and ATOs define in their OMs the level of performance to be achieved by the instructor and evaluator.	<p>Ground training (incl. CRM) and</p> <p>Flight training in aircraft and in FSTDs:</p> <ul style="list-style-type: none"> - licensing - type rating - conversion - line training - recurrent

Section 4—Competency-Based Training and Assessment for Instructors and Evaluators

This manual describes a competency-based approach to IE training using the five instructor and evaluator competencies (IECs).

A development program for IEs should use a building block approach. The aim is to progress in a structured way, step-by-step, from the initial assignment through the complete spectrum of IE duties.

For any IE assignment, an IE needs to be trained and assessed in all competencies to a solid foundational level of performance. However, specific assignments require **special emphasis on specific competencies** during training; the final competency standard for these competencies should be higher than foundational.

As an example, training for IEs assigned to base training should provide special emphasis on the competencies “Pilot competencies” and “Management of the learning environment”; evaluator training should provide special emphasis on the competency “Assessment and Evaluation”.

Training objectives for IE courses will consequently refer to the descriptions of the relevant IECs and their OBs.

4.1 Training Focus for IE Assignments

The tables below show a simplified matrix to train and assess (“TA”) IEs. Depending on the IE’s assignment, the competencies requiring **special emphasis** during training are additionally identified with “SE”.

4.1.1 Ground Instructors

EASA: Ground Instructor, Theoretical Knowledge Instructor, CRM Instructor

FAA: Air Transportation Ground Instructor, CRM Instructor

IE Competencies				
IEC1	IEC2	IEC3	IEC4	IEC5
Pilot competencies	Management of the learning environment	Instruction	Interaction with the trainees	Assessment and Evaluation
TA	TA	TA-SE	TA-SE	TA

Note: TA: Means competencies **trained and assessed**

SE: Means competencies requiring **special emphasis** during training

Ground training is usually conducted in a well-established learning environment. Many of the conventional instructor duties today are taken over by modern media. In computer-based ground training systems, “Management of the learning environment” and “Assessment and Evaluation” are largely covered by learning management systems supporting the training departments of AOCs/ATOs; in the case of CBT, “Instruction” is also automated.

However, human interaction with instructors is preferred when:

- Addressing the “human element” in training; CRM courses are an example. Ground instructors not only address “Knowledge” but also other pilot competencies such as “Communication”, “Workload management”, “Problem solving and decision making”.
- Providing orientation in the complex learning environment.
- Connecting theory with operational relevance; i.e., when ground instructors explain aircraft systems and components they also link them to the pilot competencies e.g., “application of procedures”, “situation awareness”, “workload management”, etc.

Therefore, training for IEs assigned to ground instruction should provide special emphasis on the competencies “Instruction” and “Interaction with the trainees”.

4.1.2 Instructors in FSTDs

EASA: SFI

FAA: Proficiency Check Pilot-Simulator, Air Transportation Flight Instructor-Simulator

IE Competencies				
IEC1	IEC2	IEC3	IEC4	IEC5
Pilot competencies	Management of the learning environment	Instruction	Interaction with the trainees	Assessment and Evaluation
TA	TA-SE	TA-SE	TA-SE	TA-SE

Note: **TA:** Means competencies **trained and assessed**

SE: Means competencies requiring **special emphasis** during training

Today’s FSTDs can provide AOCs/ATOs with a very close to reality learning platform. IEs can train and assess pilots in all pilot competencies to such a level of performance, that for initial, transition and recurrent training a seamless transfer to actual aircraft flight operation is possible. With a few exceptions, such as limitations of the motion system, limited ATC environment and limited crew interaction, FSTDs provide a valid training envelope to support all training. Often IEs do not need to differentiate between the FSTD’s virtual world and reality.

Therefore, training for IEs assigned to FSTD instruction should provide special emphasis on the competencies “Management of the learning environment”, “Instruction”, “Interaction with the trainees” and “Assessment and Evaluation”.

While specific focused instruction is normally not required, FSTD instructors should have demonstrated competency in IEC1 “Pilot competencies”.

4.1.3 Instructors for Line Training

EASA: TRI, LTC

FAA: Proficiency Check Pilot-Aircraft, Proficiency Check Pilot-All Checks, Air Transportation Flight Instructor-Aircraft

IE Competencies				
IEC1	IEC2	IEC3	IEC4	IEC5
Pilot competencies	Management of the learning environment	Instruction	Interaction with the trainees	Assessment and Evaluation
TA-SE	TA-SE	TA	TA-SE	TA-SE

Note: **TA:** Means competencies **trained and assessed**

SE: Means competencies requiring **special emphasis** during training

Prior to entering line training, all pilot competencies are trained and assessed to the final competency standard in the FSTD. During line training IEs focus mainly on the adaption of the trainee to the new conditions. The conditions change from the FSTD environment to the less predictable real operational environment. Some conditions are more demanding in the real environment (e.g., ATC, crew and staff interactions, workflows, passenger and security, fatigue, etc.) and some are less demanding (i.e., frequency of non-normal/abnormal situations, etc.).

During line training, the IE will also act as a flight crew member, as PF and PM. This means that the IE applies his own “Pilot competencies” under the demanding condition of line training, which creates additional workload for the IE. The competency “Management of the training environment” gains importance, as successful management of threats, errors and possible undesired aircraft states related to training is key to maintain margins of safety.

Therefore, training for IEs assigned to line training should provide special emphasis on the competencies “Pilot competencies”, “Management of the learning environment”, “Interaction with the trainees” and “Assessment and Evaluation”.

4.1.4 Instructors for Base Training

EASA: TRI

FAA: Air Transportation Flight Instructor-Aircraft

IE Competencies				
IEC1	IEC2	IEC3	IEC4	IEC5
Pilot competencies	Management of the learning environment	Instruction	Interaction with the trainees	Assessment and Evaluation
TA-SE	TA-SE	TA	TA	TA-SE

Note: **TA:** Means competencies **trained and assessed**

SE: Means competencies requiring **special emphasis** during training

During base training IEs provide trainees with the possibility to perform defined maneuvers under real conditions, such as real ground and air environment, real aircraft, in real time and real threats. The scope of maneuvers to be flown is limited.

A special SOP for Touch and Go needs to be introduced and the differences to go-arounds during line operations must be highlighted. Communication is normally taken over by the instructor. The main pilot competencies addressed are "Aircraft flight path management – manual control", "Situation awareness", "Workload management" and "Application of procedures".

Base training should be preceded by FSTD preparation. Therefore, during base training, "Instruction" itself is limited. However, IEs may need focused training on specific instructional methods.

Hence, training for IEs assigned to base training should provide special emphasis on the competencies "Pilot competencies", and "Management of the learning environment" to maintain the safety margins, and "Assessment and Evaluation".

4.1.5 Evaluators

EASA: SFE, TRE, LTC

FAA: Proficiency Check Pilot–Aircraft, Proficiency Check Pilot–Simulator, Line Check Pilot–All Seats, Line Check Pilot–Observer’s Seat Only, Check Pilot–All Checks, Evaluator.

IE Competencies				
IEC1	IEC2	IEC3	IEC4	IEC5
Pilot competencies	Management of the learning environment	Instruction	Interaction with the trainees	Assessment and Evaluation
TA	TA-SE	TA	TA	TA-SE

Note: **TA:** Means competencies **trained and assessed**

SE: Means competencies requiring **special emphasis** during training

The primary role of evaluators is to confirm that flight crew members have met the interim or final competency standards before being released for succeeding training or for the duties they have been trained for.

Their primary functions are to evaluate performance of the trainee, evaluate the training system and report outcome. Therefore, training for IEs assigned to Evaluation should provide special emphasis on the competencies "Assessment and Evaluation" and "Management of the learning environment" to ensure that the environment is safe and suitable for assessment.

4.1.6 All Instructors - Role Model

Training focus IEC4, "Interaction with the trainees".

It is internationally recognized that the flight crew members' professional behavior is one important contributing factor to safety. Future increases in the demand for pilots could lead to an intake of younger, less experienced and culturally more diverse personnel, requiring more focus on behavioral aspects.

As IEs form a leading group within the organization, all actions and inactions of IEs will be attentively observed by their fellow pilots; even when not directly engaged in training. IEs act as role models and their behavior in the professional working environment should be exemplary.

During training, the function of role model is to support the trainee's learning and personal development.

IE selection should confirm that the individual has achieved, maintained and is likely to retain a favorable record as a flight crew member. Their professional reputation should always reflect positively upon the AOC/ATO and the Authority.

Therefore, training for every IE assignment should include OBs related to the Role Model under IEC4.

4.2 IE Training Program Matrix

The table below is an example of an IE training program matrix applying the competency-based training and assessment principles.

IE training programs matrix example						
IE competency		IE assignments				
		Ground instructors	Instructors in FSTDs	Instructors for line training	Instructors for base training ³	Evaluators
IEC1	Pilot competencies⁴ (all 9 pilot competencies)	TA	TA	TA-SE	TA-SE	TA
IEC2	Management of the learning environment <ul style="list-style-type: none"> Ensures that the instruction, assessment and evaluation are conducted in a suitable and safe environment 	TA	TA-SE	TA-SE	TA-SE	TA-SE
IEC3	Instruction <ul style="list-style-type: none"> Conducts training to develop the trainee's competencies 	TA-SE	TA-SE	TA	TA	TA
IEC4	Interaction with the trainees <ul style="list-style-type: none"> Supports the trainees' learning and development Demonstrates exemplary behavior (role model) 	TA-SE	TA-SE	TA-SE	TA	TA
IEC5	Assessment and Evaluation <ul style="list-style-type: none"> Assesses the competencies of the trainee Contributes to continuous training system improvement 	TA	TA-SE	TA-SE	TA-SE	TA-SE

Note: TA: Means competencies **trained and assessed**

SE: Means competencies requiring **special emphasis** during training

³ Base training means practicing landings, patterns and go-arounds in the actual aircraft as a part of type rating training.

⁴ For ground instructors some pilot competencies may not always apply. Depending on the IEs assignments, AOCs/ATOs identify which pilot competencies and associated observable behaviors are applicable. As an example, for a certain assignment, the pilot competency "Communication" must be demonstrated by the IE, whilst the pilot competency "Flight Path Management, manual control" may not apply.

Section 5—Industry Best Practices for Instructor and Evaluator Training

5.1 Aptitude Testing

Aptitude testing includes screening and selection of potential candidates for future instructor and evaluator positions. The aim of aptitude testing is to predict future performance on the job.

Research has shown that the job requirements for instructor pilots in certain fields are the same as for airline pilots, but in some fields they are higher; this is particularly true for “social/interactive” and “cognitive”⁵ requirements.

The principles shown in the IATA manual “Guidance Material and Best Practices for Pilot Aptitude Testing” can also be used to establish effective testing systems for instructors. Aptitude testing should be a formalized process, embedded in the quality management system.

5.1.1 Screening

Biographical data (i.e., professional experience, language proficiency, education, interests, etc.) and data from the professional records of the candidates, showing flight experience (license, ratings, professional career, logbook data, etc.) as well as background checks with actual and former fleets, may be used to screen the pool of applicants.

5.1.2 Selection

Structured multi-stage selection systems, starting with interviews, technical tests and psychological testing, followed by testing in operational environments, such as classroom and FSTDs, may be used to assess and predict future performance as an IE.

The selection procedure should assess in particular:

- the level of performance as a pilot
- the potential to support the trainee’s learning and personal development
- the potential to become a role model
- the potential to successfully pass instructor and evaluator training

⁵ Oubaid, Viktor und Graefe zu Baringdorf, Joachim (2014) *Job Requirements of Instructor pilots*.

5.1.3 Initial Training and Selection

After the selection, the AOCs/ATOs begin the IE indoctrination and initial training program. During each phase the candidate will be continuously assessed under realistic conditions, with scenarios comparable to situations arising during real life training. Typically these phases are:

- Teaching and learning course
- Right-hand seat training
 - FSTD, or
 - Right-hand seat line flying, or
 - Right-hand seat base training
- FSTD IOS training

At the end of the selection and training process the final decision to employ the candidate as an IE is based on the consolidated summary of the selection and initial training records.

5.1.4 The Aptitude Testing Team

Testing systems should be facilitated in close cooperation among departments and resources involved, such as flight operations, training, human resources and testing agency/consultants. Hiring decisions should be made by a dedicated testing team and should be based solely on the test results of all stages of the aptitude testing process.

Ideally, a selection team consists of a combination of psychological, methodical, statistical and flight training/operation expertise. In the interest of safety and fairness and, assuming that the aptitude testing system has been professionally developed, implemented and validated, the hiring decision should be based solely on test results.

The selection should be based on recorded observation and grading in reference to pre-defined evaluation criteria. Selection in FSTDs is ideally performed by at least two independent evaluators. Evaluators in the selection team should be nominated by the AOC/ATO and belong to the group of Senior IEs.

5.1.5 Using the IE Competencies for Aptitude Testing

The selection of applicants includes measuring aptitude for all defined IE competencies. It is important to familiarize the entire selection team with the defined IE competencies because it is consequential to use for the selection process the same competencies that will be used in initial and subsequent training. This will ensure that the organization benefits from a consistent application of the competencies throughout the entire professional career of an IE.

The defined IE competencies are:

Instructor and Evaluator Competencies	
1	Pilot competencies
2	Management of the learning environment
3	Instruction
4	Interaction with the trainees
5	Assessment and Evaluation

Note: A sample set of pilot competencies is shown in ICAO DOC 9995.

5.1.6 Reapplications after Failures

Depending on the stage at which the aptitude testing was failed (screening, selection or initial training) some AOCs/ATOs will limit the number of possible reapplications.

5.2 Sample Development Programs for IEs

Despite the fact that EASA and FAA regulations are both based on common ICAO standards, the typical IEs career paths, under these two systems, differ significantly. The following development programs are samples from AOCs/ATOs in the EASA and FAA environments, but are not the only options.

5.2.1 Sample Development Programs under EASA Regulations

Under EASA regulations the most frequently used instructor streams are:

- Synthetic Flight Instructor (SFI) and restricted Type Rating Instructor (TRI)
- Type Rating Instructor (TRI)
- Suitably qualified commander for line training and checking (Line training captain, LTC)

SFI and TRI can both be combined with an examiner certificate. Synthetic Flight Examiners (SFE) can only conduct type rating skill tests and operator proficiency checks in the FSTD.

Type Rating Examiners (TRE) additionally hold the privileges to conduct type rating skill tests and operator proficiency checks in the FSTD and in the aircraft.

The role of LTCs is to supervise flight crew members during line flying under supervision (LIFUS), except for the first four landings in case of ZFTT, and to conduct line checks.

With the exception of LIFUS, all conversion training and recurrent training is performed by SFIs and TRIs. TRIs usually conduct FSTD lessons at the end of the conversion course to ensure maximum operational realism.

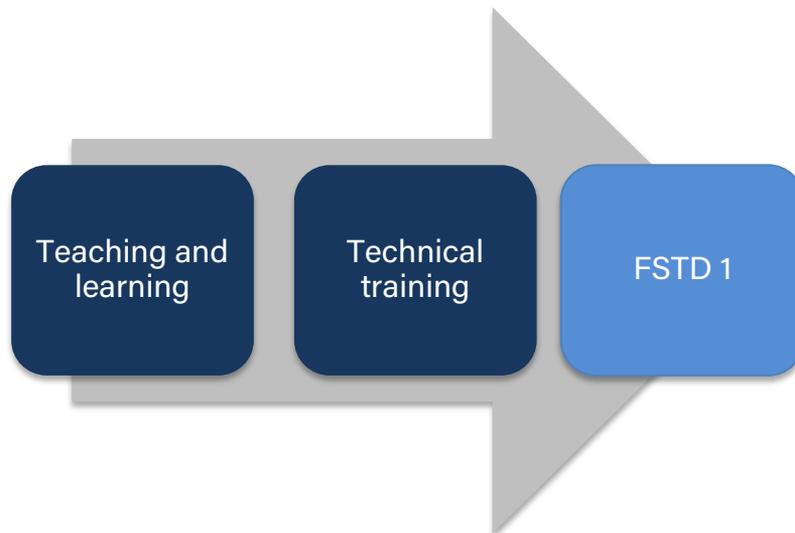
There are no additional instructor ratings or examiner certificates required for ATQP and EBT programs. However, EASA requires that the operators provide additional training to IEs delivering these programs. This is described in more detail in Section 6 of this manual.

Note: Instructors engaged in MPL programs are required to additionally complete an MPL instructor training course.

The following illustrations show sample programs to develop IEs under EASA regulations.

5.2.1.1 Development Program for SFI and “Restricted” TRI

Note: “SFI” means Synthetic Flight Instructor, “TRI” means Type Rating Instructor with restricted privileges, “Restricted” means that the privileges of the TRI are restricted to training in the FFS.



Teaching and learning

This part of the IE training course is dedicated to teaching and learning. AOCs/ATOs using competency-based training and assessment introduce the pilot competencies and the instructor competencies in this first part of the training course.

Additional training time is necessary for IEs to become familiar with the pilot and instructor competencies, beyond the regulatory requirements.

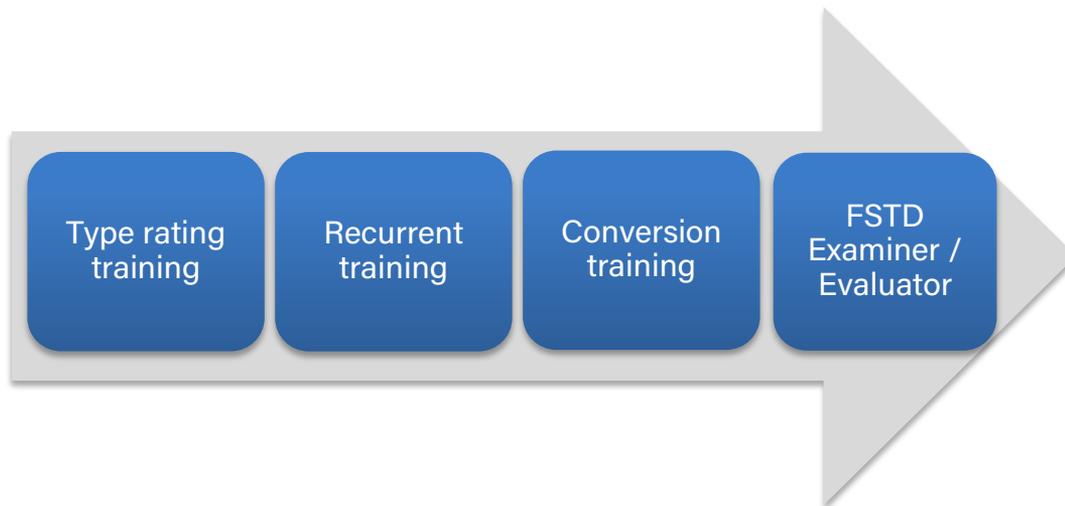
Technical training

This part of the instructor training course is dedicated to theoretical knowledge instruction. It may be partially combined with the FSTD training; briefings and debriefings can be used to practically apply the technical theoretical knowledge.

FSTD 1

This module is dedicated to flight instruction in the FSTD. It focuses on practical instructor training, developing the full scope of IECs. The IE applicant will act, under the supervision of a senior instructor, from the Instructor Operating Station (IOS), and will also demonstrate his ability to instruct specific exercises, such as UPRT, etc., from either pilots' seat.

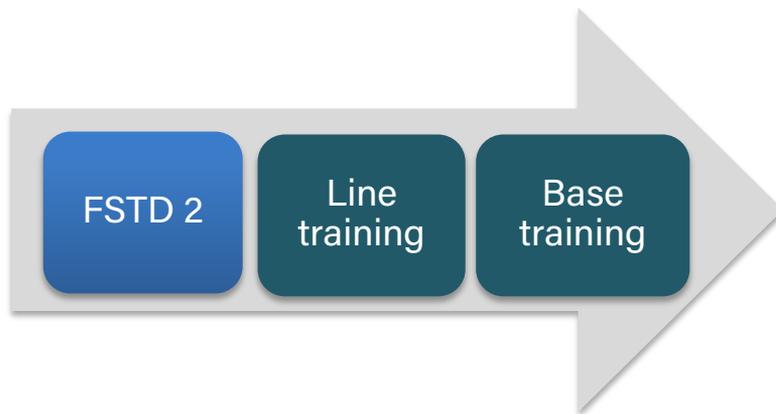
Duties of SFI and "restricted" TRI



5.2.1.2 Development Program for TRI

The typical career path of a TRI is to first instruct in an FSTD (as restricted TRI or SFI) and later instruct in an aircraft. Thus, the TRI course starts with the course described in 5.2.1.1 followed by the additional module below.

Note: The privileges of a TRI include supervision of the first four take-offs and landings during LIFUS of a pilot who has received zero flight-time training, and to conduct training in an aircraft.



FSTD 2:

In this FSTD part the IE applicant is trained to instruct from all operating positions, including demonstrating handling exercises related to line flying under supervision and base training instruction. FSTD 1 (5.2.1.1) and FSTD 2 may be combined.

Line training:

This module aims at developing the instructor's competencies under the condition of line flying under supervision. It consists of a number of sectors where the IE applicant:

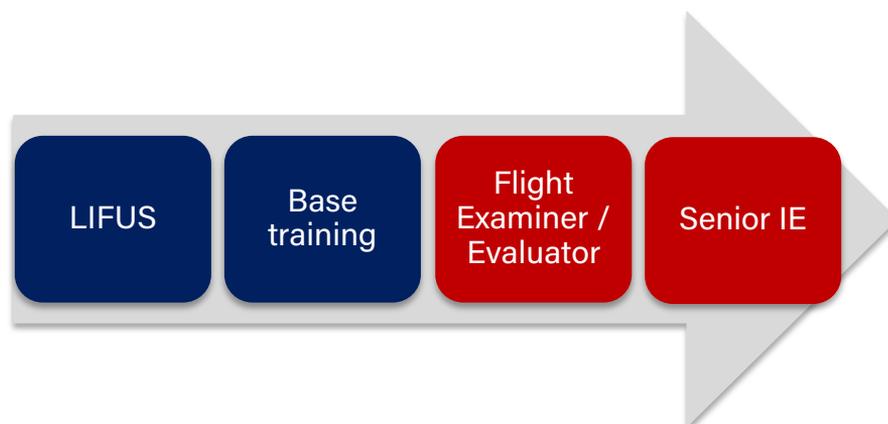
- Observes a TRI conduct actual line flying under supervision
- Conducts line flying under the supervision of a qualified TRI

Base training:

This module aims at developing the IECs under the special condition of base training. It consists of take-offs, traffic patterns, go-arounds and landings where the IE applicant:

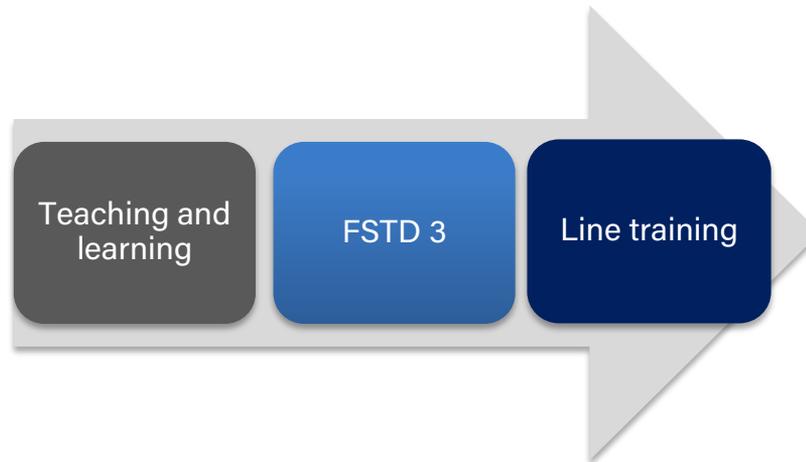
- Observes a TRI conduct actual base training
- Conducts base training under the supervision of a qualified TRI

Duties of a TRI



5.2.1.3 Development Program for LTC

Note: LTC means “suitably qualified commander for line training and checking”; suitably qualified commander for line training and checking are commonly known as Line Training Captains (LTC).



Teaching and learning:

Even if regulatory requirements are different for LTC and TRI, feedback from operators shows that LTC should generally complete the same teaching and learning module as the TRI (5.2.1.1). This is especially relevant to ensure inter-rater reliability for AOCs/ATOs using or moving to competency-based training and assessment.

FSTD 3:

Beyond the regulatory requirement mandating that the LTC be qualified to operate in either pilots' seat, operators generally demand from the LTC to also be competent in instruction in either pilots' seat, including the demonstration of appropriate handling exercises related to line flying under supervision.

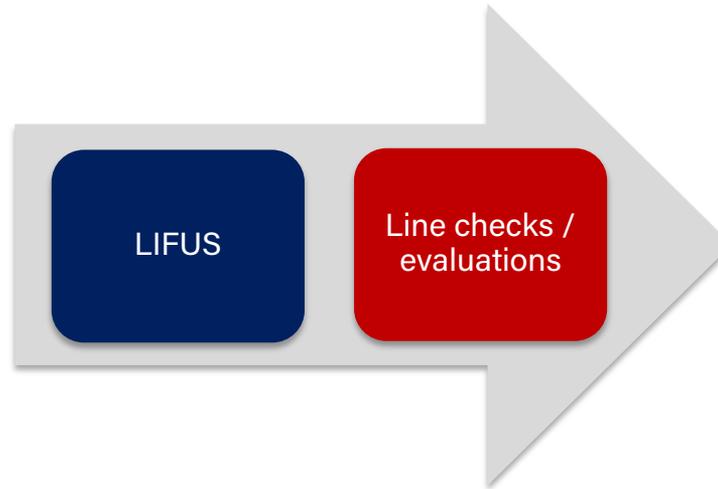
Line training:

This module enables the LTC to develop instructor and evaluator competencies under the condition of line flying. It consists of a number of sectors where the LTC:

- Observes a LTC conduct line training and checking under supervision
- Conducts line flying and line checks under the supervision of a nominated LTC

Note: Operators that chose to combine LTC and TRI activities will use the program described for TRI.

Duties of a LTC



5.2.2 Sample Development Programs under FAA Regulations

The following instructor streams exist under FAA regulations (non-AQP):

- Flight Instructor (airplane)
- Flight Instructor (simulator)
- Proficiency Check Pilot – Aircraft
- Proficiency Check Pilot – Simulator
- Line Check Pilot – All Seats (left, right, and observer’s)
- Line Check Pilot – Observer’s Seat Only
- Check Pilot – All Checks

As the majority of FAA operators follow AQP, this chapter describes IE development programs and duties under AQP.

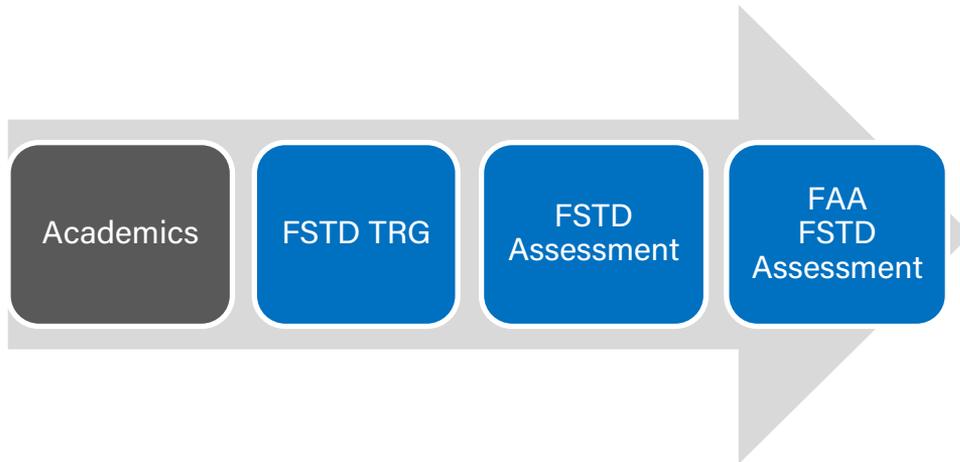
Under AQP the following terms apply:

- Instructor
- Evaluator, and
- Aircrew Program Designee (APD)

Instructor is synonymous to Flight Instructor. Evaluator is synonymous to Proficiency Check Pilot, and APD is an evaluator designated by the FAA to administer LOEs for qualification and certification. For special airport and theater qualifications some operators employ additionally Line Validation Pilots (LVP).

The following illustrations show sample programs to develop IEs under FAA regulations.

5.2.2.1 Development Program for IE (Simulator)



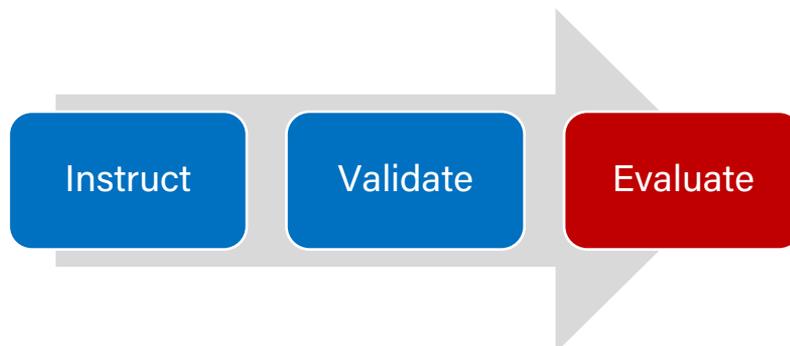
Academic training is performed through classroom and computer-based training.

During **FSTD training (TRG)** the IE applicant acts under the supervision of a designated instructor. The training is related to different stages of qualification and recurrent training, i.e., System-Procedures (SYST-PRO) training, Maneuvers (MAN) training and Line Oriented Simulation (LOS) training.

During **FSTD Assessment** the IE applicant is assessed by a designated instructor/evaluator. The assessment is related to the different stages of qualification and recurrent training: SYST-PRO, MAN and LOS. IE privileges will be granted accordingly.

During an **FAA FSTD Assessment** the IE applicant is assessed by an FAA inspector during a Maneuver Validation (MV) or Line Oriented Evaluation (LOE). Normally the first FAA FSTD assessment is conducted during continuing qualification; succeeding assessments may be conducted during initial qualification. Evaluator or APD privileges will be granted accordingly.

Duties of an IE (simulator)

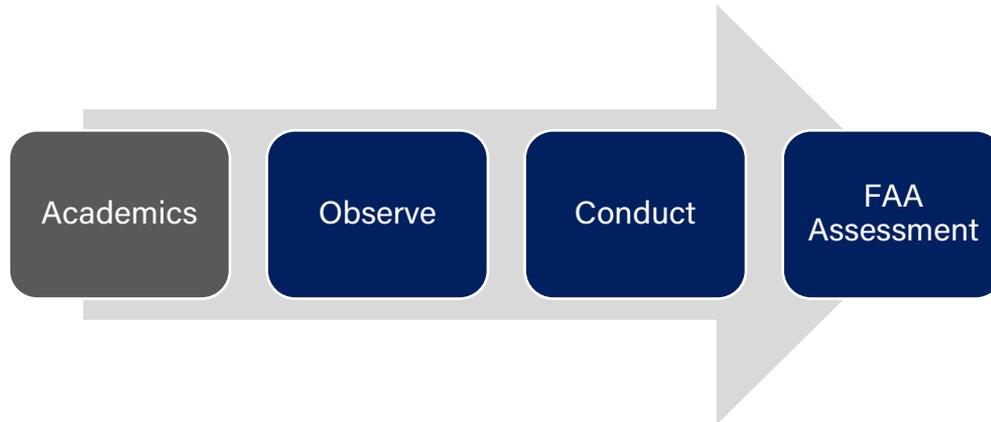


Instruct means instruction at all stages of the training.

Validate means Procedures (PRO) and Maneuvers (MAN) validations.

Evaluate means Line Operational Evaluation (LOE).

5.2.2.2 Development Program for IE (Line Training and Checks)



Academics training is performed through classroom and computer-based training. To ensure inter-rater reliability, academic training for IE (line training and checks) and for IE (simulator) should be identical in content.

Observe, means training where the IE applicant observes a designated instructor during role-playing or real line training or checking.

Conduct, means training where the IE applicant acts as line trainer or checker during role-playing or real line training or checking under the supervision and to the satisfaction of a designated IE.

FAA Assessment is an assessment where the IE applicant acts as line checker during role-playing or real line checking under the supervision and to the satisfaction of an FAA inspector.

Figure 5-1 illustrates the level of authorization needed for an individual to either train, validate, or evaluate an AQP event.

**Figure 5-1. Authorized Evaluation Personnel by AQP Curriculum
Flight Crew Qualification Curriculum**

Event	Instructor	Evaluator	Designee	FAA Inspector
Knowledge validation	Yes	Yes	Yes	Yes
Procedures validation	Yes	Yes	Yes	Yes
Maneuvers validation	No	Yes	Yes	Yes
LOE for Qualification	No	No	Yes	Yes
LOE for Certification	No	No	Yes	Yes
Operational Experience	No	Yes	Yes	If qualified*
Line Check	No	Yes	Yes	If qualified*

*Title 14 CFR part 135 operations only

Flight Crew Continuing Qualification Curriculum

Event	Instructor	Evaluator	Designee	FAA Inspector
LOFT/Maneuvers Training	Yes	Yes	Yes	Yes
Maneuvers validation	No	Yes	Yes	Yes
LOE	No	Yes	Yes	Yes
Line Check	No	Yes	Yes	If qualified*

*Title 14 CFR part 135 operations only

Source: FAA AC 120-54A

5.3 Operator and ATO Specific Categories for IEs

In addition to the IEs categories existing in the regulations, AOCs/ATOs introduce their own “trainer levels” to ensure that the most suitable IEs are assigned to the specific cases that typically exist in flight crew training. However, a high number of “trainer levels” may increase the overall complexity of scheduling and administration; hence, there is a trend in the industry to minimize the number of AOC/ATO specific categories for IEs.

The benefits of having additional IE categories are:

- Safety, due to higher experience requirements and due to higher levels of proficiency and recency of specialized IE groups for certain fields of instruction, e.g., line training and base training
- Training efficiency, due to specialized IE training and a lower number of IEs needed
- Training effectiveness, due to specialization and accurate standardization

AOC/ATO specific IE categories are based on the structure of the individual training programs, the operational needs and risk management. Common categories are:

- IEs for FSTD training only
 - IEs for type rating courses only
 - IEs for recurrent training only
- IEs for line training and checking
- IEs for CPT upgrading training, in FSTDs or A/C
- IEs for remediation after failed training or checks
- IEs for base training
- IEs for instructor and examiner/evaluator qualification

Based on the needs of the AOC/ATO and the experience, motivation, commitment and performance results of the IE, the AOC/ATO will assign the individual level to an IE.

IEs for instructor and evaluator training should be the most experienced, as this training involves simultaneously managing the new instructor and pilots under training.

5.4 Operator and ATO Specific Requirements for IEs

EASA: In addition to licensing, training and checking, EASA requires recency as PIC for the TRI. For the SFI and TRI, it requires a minimum experience of 1500 hours flight time as a pilot (either pilot in command or copilot) on multi-pilot airplanes.

FAA: In addition to training and checking, the FAA requires that the Flight Instructor–Airplane or Flight Instructor-Simulator and Check Pilot-Aircraft or Simulator hold the airman certificates and rating (for Check Pilots-Simulator except medical certificate) required to serve as a PIC.

In addition to the regulations, AOCs/ATOs may impose their own requirements for IEs; these may be in conjunction with the workers union agreements.

Here are some examples:

- Minimum hours on type
- Currency/recency requirements
- Minimum and maximum durations for IE contracts
- Special requirements for IEs performing base training

Some major EASA operators qualify all their TRI for line training and checking and do not use LTCs.

5.5 Recency Requirements for IEs

EASA and the FAA require the same recency for instructors in the aircraft as for regular pilots. Management systems of AOCs/ATOs may add specific recency requirements for IEs in order to ensure safety and quality of instruction.

Examples of specific recency requirements include:

- Participation in a certain number of standardization events
- Recency in right-hand seat (RHS) in the aircraft
- For FSTD instruction, a certain amount of lessons within a designated time period
- For Line training, a certain amount of sectors within a designated time period
- For Base training:
 - a preparation lesson in the FSTD with a senior instructor, or
 - base training preparation in the FSTD with the trainees

5.6 Standardization and Continuing Qualification of IEs

IE competencies can be used to design standardization and continuing qualification programs.

Focus:

IEC2	Management of the learning environment
IEC3	Instruction
IEC4	Interaction with the trainees
IEC5	Assessment and Evaluation

Standardization events are typically scheduled at a minimum once a year, or if new topics are introduced, such as:

- introduction of the new pilot recurrent/continuing qualification program
- relevant changes to regulations and SOPs, e.g., UPRT
- flight safety, incident and accident prevention including those specific to the ATO
- significant changes in the content of the relevant part of the aviation system

Standardization may:

- be conducted in combination with recurrent training, e.g., standardization by senior IEs using a recurrent or check lesson of the IE in the FSTD

- be conducted among IEs, using a standardization lesson in the FSTD with 3 IEs rotating through all 3 seats during the lesson, covering PF, PM and IE aspects
- include grading calibration exercises to increase inter-rater reliability

In certain cases an individual refresher program is determined on a case-by-case basis, following an assessment of the candidate and taking into account the following factors:

- the instructor competencies in which the applicant needs more training
- the experience of the applicant
- the amount of time elapsed since expiry
- missed recurrent or standardization events

Note: Some AOCs/ATOs use contracted IEs, who are not involved in line flying and have no previous experience from the operator's line. This group requires the highest standardization efforts. During their hiring process all IECs should be assessed, also IEC1 "Pilot competencies" under the condition of instruction.

5.7 IE Training for AQP, ATQP and EBT

Focus:

IEC3	Instruction
IEC4	Interaction with the trainees
IEC5	Assessment and Evaluation

All state-of-the-art training programs follow three principles:

1. The philosophy of **Train → Validate → Evaluate**
2. Training system design and its maintenance is based on data collection during instruction, validations and evaluations
3. Special emphasis is put on Threat and Error Management (TEM)

Competency-based training and assessment evolved after AQP and ATQP. MPL was the first program to require competency-based training and assessment for licensing training. EBT was the first program to require competency-based training and assessment for recurrent training.

Although the term "competency-based" training was not yet used during the implementation of AQP and ATQP, these programs target similar principles as competency-based training and assessment; they aim at increasing the amount of training and decreasing checking by installing a data-based validation and evaluation mechanism and by strengthening TEM/CRM.

Therefore, it was a consequential step from AQP/ATQP to EBT; this step included the definition of the pilot competencies and their integration in the TEM model.

Note: The pilot competencies encompass CRM skills (and previously termed technical- and non-technical skills) and provide the human related countermeasures against threats, errors and undesired aircraft states.

For IEs this evolution requires a major realignment. While previously task completion and CRM were treated separately, competency-based training and assessment merges them into one system.

Note: Competency-based training and assessment builds on the assumption that flight crews will be better prepared for the unforeseen if their training focuses on a defined set of pilot competencies compared to replicating retrogressive, accident- and incident-based, inventories of tasks and events.

Competency-based systems train and assess pilot competencies in a wide variety of work contexts. Known tasks and events remain, but serve as interchangeable vehicles to train the competencies.

For many IEs this might initially feel like a reversal of their teaching habits. Consequently IEs should receive special training in IECs 1, 4, and 5 to become competent in applying appropriate methods of instruction (including adapted briefing and debriefing), of assessment and grading of observed performance, and of interaction with the trainee. Associated training may involve theoretical knowledge instruction using classroom and computer-based training, and practical demonstrations in an FTSD.

Because all state-of-the-art training programs highlight the importance of CRM (in the EBT system CRM skills are already included in the pilot competencies) the Role Model function of IEs, as part of IEC4, "Interaction with the trainees", gains importance. The objective of an IE acting as a role model is to support the trainee's learning and personal development. IEC4, as detailed in Section 3, contains a set of OBs defining the role model. AOCs/ATOs should include appropriate training on the role model function for IEs in their programs.

5.7.1 Training for IEs under AQP and ATQP

Personnel who perform training, validation and evaluation of flight crew in AQP/ATQP should receive training on:

- AQP/ATQP principles and goals:
 - the functions of training, validation and evaluation
 - the relation between the safety management system and the training program development
 - the function of training data collection and analysis
 - the processes that the operator has implemented to validate the training and qualification standards and the instructors' part in the quality control; and

- Understanding of Assessment and Evaluation:
 - line-oriented evaluation (LOE / LOFT)
 - evaluations during line flights to assess the quality of the training (LOQE)
 - qualification/competency standards
 - assessment of pilot competencies, including CRM, through observable behaviors
 - grading scales and their calibration
 - familiarization with evaluation protocols
 - introduction to guidance resources available

Some operators require a certain amount of instructional experience from IEs, e.g., one year, before being employed in AQP/ATQP programs.

5.7.2 Training for IEs under EBT

EBT builds on the philosophy of AQP/ATQP, but moves from task-based training to competency-based training and assessment. It introduces the full set of pilot competencies and the aspect of “evidence”.

EASA regulations refer to ICAO DOC 9995, PART1, Chapter 6, which contains the guidance for training and assessment of IEs involved in the conduct of EBT:

“Training programmes for the instructor role should focus on development of competence in the following specific areas:

- the competencies contained in Appendix 1 to Part II, in particular the measuring of behaviors observed according to the defined grading system used by the operator or ATO;
- in accordance with the assessment and grading system of the operator or training organization, making assessments by observing behaviors; gathering objective evidence regarding the behavioral indicators in Appendix 1 to Part II;
- correlating between observed behavior and potential outcome in training situations;
- recognizing and highlighting good performance;
- determining root causes for deviations below the standards of performance; and
- identifying situations that could result in unacceptable reductions in safety margins.”

Further guidance by EASA (AMCs and GMs) are in a rulemaking process and are expected to come into effect in 2018 in Europe. ICAO has installed a taskforce currently addressing further guidance on competency-based training and assessment.

5.8 State-of-the-Art Grading

Focus:

- IEC3 Instruction, and
- ICE5 Assessment and Evaluation

State-of-the-art grading means assessment and grading of competencies; in the case of pilot training the pilot competencies apply, in the case of IE training, the instructor and evaluator competencies apply.

The assessment should be based on multiple observations of behavior across multiple work contexts. Observed behavior is compared to a competency standard, taking into account the conditions under which performance is demonstrated.

Grading means to relate results of the assessment to a defined scale.

The AOC/ATO will define the minimum acceptable level of performance. Industry practice has shown that a minimum of 3 grades should be used; 5 grades are deemed to deliver the optimum granularity, with grades 1 and 2 considered unsatisfactory and grades 3 to 5 as variants of acceptable performance. The minimum grade must be achieved in each competency to reach an overall PASS.

The following table shows a sample grading scale to grade pilot or IE competencies. This scale uses 5 grades; they are defined by how well, how often and how many OBs of the assessed competency were applied, and by the amount of instructor intervention.

Sample grading scale to grade competencies					
Pilot- or instructor competency X	Grade	Observable behaviors (OBs) of the competency, were applied			Amount of instructor intervention ⁶
		How well	How often	How many	More or less than planned
	1				
2					
3					
4					
5					

⁶ **Note:** During evaluations “instructor intervention” is not applicable

5.9 Instruction Methods

Focus:

IEC3 Instruction

In order to develop the trainee’s competencies effectively, IEs use a variety of instructional methods. Curricula should contain guidance to match the training objectives with the optimum method of instruction.

As an example, ab-initio training programs like MPL consist of several phases with increasing levels of difficulty. These phases focus on different pilot competencies (i.e., first, airplane flightpath management - manual control, then automation, then workload management, problem solving and decision making, etc.), requiring a progression of instructional methods.

IEs should master all available methods and should have the flexibility to select the most appropriate one to achieve the training objectives.

This table shows an example set of instructional methods:

Instructional method	Description
Explain (Tell)	The instructor, or the training media, provides information verbally to the trainees or (whenever facilitation seems not suitable in particular circumstances) recalls/reminds them of key points already acquired during the course. Questions are used to either establish current knowledge or to check understanding. Trainees will demonstrate the acquisition of their competencies.
Demonstrate (Show)	The instructor or the training media performs or directs the execution of a task, procedure, or maneuver to the trainees. In addition, facilitation is used to verify knowledge and to check understanding. Trainees will demonstrate the acquisition of competencies.
Facilitate	The instructor asks questions to the trainees in order to enable them to acquire and develop competencies. Trainees will demonstrate the acquisition or development of competencies.
Discover with assistance	The instructor, or the training media, provides trainees with objectives and conditions. Using their existing competencies, trainees “figure out” appropriate solutions and means to achieve the objectives. The instructor intervenes only when necessary to ensure achievement of the objectives and to minimize inefficiency.
Discover without assistance	The instructor or the training media provides trainees with objectives and conditions. Using their existing competencies, trainees “figure out” appropriate solutions and means to achieve the objectives. The instructor or training media verifies the outcomes.

Note: Items that have been acquired by the trainees through “Discover without assistance” will always be verified in a subsequent phase of the curriculum to verify the achievement of objectives.

5.9.1 Facilitation

Focus:

- IEC3 Instruction, and
- IEC5 Assessment and Evaluation

With the implementation of CRM and Line Oriented Simulation the debriefing style moved from lecturing to more facilitation. Further guidance is available in:

- FAA AC No: 120-35D of 3/13/15, Flight Crew Member Line Operational Simulations: Line-Oriented Flight Training, Special Purpose Operational Training, Line Operational Evaluation, which is based on the:
- NASA Technical Memorandum 112192, DOT/FAA/AR-97/6, dated March 1997, Facilitating LOS Debriefings: A Training Manual

Building on these references, AOCs/ATOs have developed debriefing guidelines, visualizations for briefing rooms, pocket guides, etc., for their IEs. Many of these documents are based on the C – A – L model (**C**RM – **A**nalysis and Evaluation of LOS performance – **L**ine Operations).

Note: Similar schemes have been developed in the medicine domain for medical IEs. “Evidence-Informed Facilitated Feedback”⁷ uses the R2C2 scheme (abbreviated: Build **R**apport and relationship – Explore **R**eactions to and perceptions of the data – Explore understanding of the **C**ontent of the data – **C**oach for performance change).

When progressing from AQP/ATQP to EBT and competency-based training and assessment, facilitation remains the preferred debriefing methodology.

Facilitation is “crew-centered”. It requires active participation. Crews need to analyze their performance on their own; this draws on the crews’ motivation and experience. Facilitation improves learning and enables crews to better inherit messages, thus taking more experience back to their working environment.

In competency-based training and assessment the focus during debriefings changes from analyzing tasks/events to competencies. Hence, IEs will need to adapt their facilitation approach to focus on questions related to the competencies, such as:

- “How good was your manual flying (Aircraft Flight Path Management, manual control)?”, “How good was your Situation awareness?” Which would be followed for example by “How did this affect your XYZ-recovery?”
- “How well did you apply your procedures (Application of Procedures)?” – “Which non-normal maneuver was especially difficult?” – “Why?” – “What could you have done to make it less difficult?”
- “How effective was your Workload Management?” – “Which event was most challenging?”

⁷ MedEdPORTAL Publications , Association of American Medical Colleges, 2016

TEM provides the operational context for the application of the pilot competencies, and flight crews use their competencies as countermeasures against threats, errors and undesired aircraft states.

For IEs, including TEM will enhance the quality of the briefing and debriefing. During the briefing, IEs may ask flight crews which threats and errors they would expect, which undesired aircraft states could arise and, most important, which competencies they plan to apply/use, in order to maintain the margins of safety in the given scenario. In the facilitated debriefing, flight crews will reflect on how successful the applied countermeasures were and explore possibilities for optimization in future scenarios.

Section 6—Assessment of IE Performance

6.1 Assessing the Performance of the IE

The performance of the IE is assessed in two stages, during IE training and during the phase of active IE duty. The AOC/ATO should provide assessment processes and tools for gathering valid and reliable evidence for both stages:

- on the individual performance of the IE, and
- on the IE training courses and assessment plans, in order to evaluate the training system

To gather evidence, feedback data are used from:

- audit results
- course results
- trainee feedback
- instructor and evaluator feedback

In order to build a consistent system, any formalized feedback, i.e., from trainees to the IE or from other instructors and evaluators to the IE, should be based on the IECs and their OBs.

Many AOCs/ATOs collect feedback data in an electronic and usually de-identified format, often developed with the participation of pilot unions' representatives. Analysis of the data can be automated and reports should enable the training management to improve the training system.

The nature of competency-based training and assessment is to continuously assess performance, during every IE training, tutoring or standardization lesson. Continuous assessment, and appropriate corrective actions, will contribute to fairness and make IE checking obsolete.

6.1.1 Feedback from Trainees to the IE

Trainee feedback forms should be user-friendly; they should only ask for feedback about those IE competencies and behaviors that can be reliably observed and rated by the trainees. Questions should be phrased accordingly and the rating scale may be simplified. AOCs/ATOs should insist on receiving feedback from the trainees; the forms may be fully or partially de-identified.

6.1.2 Feedback from Senior IEs to the IE

As IEs are familiar with both, the instructional system design and the methodologies used to assess performance and report outcome, feedback forms must directly refer to the IECs and their OBs.

6.1.3 Sample Format to Assess IEs

The table below provides a sample format to assess IE performance. It contains the defined IECs and sample questions quoted from the list of OBs. Adapted forms may be constructed for the various users, e.g., trainees, evaluators, course designers, etc.

Sample format to assess IEs					
Administrative data	Training	FSTD			
	Check	Aircraft			
	Etc.	Type etc.			
Assessment / Feedback					
IE competency	Description	Observations (Examples are quotes from OBs)⁸	Grade⁹		
IE1-Pilot Competencies	Applies the pilot competencies	Situation awareness	1	2	3
		AFM-manual			
		Etc.			
IE2-Management of the learning environment	Ensures that the instruction, assessment and evaluation are conducted in a suitable and safe environment	Briefs safety procedures...	1	2	3
		Intervenes appropriately...			
		Etc.			
IE3-Instruction	Conducts training to develop the trainee's competencies	States clear objectives...	1	2	3
		Applies trainee-centered feedback...			
		Etc.			
IE4-Interaction with the trainees	Supports the trainee's learning and development	Shows respect for the trainee's characteristics...	1	2	3
		Manages trainee's barriers...			
	Demonstrates exemplary behavior (role model)	Etc.			
IE5-Assessment and Evaluation	Assesses the competencies of the trainee	Applies the competency standards and conditions	1	2	3
		Suggests improvements for the training system			
	Contributes to continuous training system improvement	Etc.			
Suggestions for improvements					

⁸ The complete list of OBs is shown in Section 3. The AOC/ATO may adapt the actual questions, appropriate to the user, but should maintain reference to the OBs.

⁹ The grading scale may contain a minimum of 3 or an optimum of 5 grades. The competency standard and conditions must be known to the person who assesses IE performance.

Section 7—Training Effectiveness and Efficiency

Historically, many training concepts were developed as stand-alone products. The new global implementation of pilot and IE competencies will allow regulators and AOCs/ATOs to identify interconnections and mutual dependencies, standardize training and capitalize on synergies.

7.1 Enhancing Safety

The overarching aim of training is to enhance safety; increasing flight safety is the driving force for any improvement of the training system. The defined IECs will improve both, effectiveness and efficiency of the training system and thereby enhance safety.

7.2 Improving Training Effectiveness

Using the defined IE competencies allows course designers to get a clear idea of the scope of the training required to qualify IEs. This will enable them to:

- Create logically structured programs
- Define training objectives effectively
- Allocate devices, media and lesson briefings effectively
- Train IEs specifically for their assignments; additionally, when changing assignment or adding new assignments, the training needs can easily be identified

Improved training effectiveness will consequently raise performance of the individual IE and of the training system.

7.3 Optimizing Training Efficiency

Adopting a competency-based training approach for both pilots and IEs offers AOCs/ATOs the opportunity to optimize training. Efficiency can be improved by:

- Increasing effectiveness of instruction and evaluation
- Reducing the number of failures
- Identifying and avoiding duplications and overlaps in existing courses
- Merging content of different fleets courses
- Cooperating with other operators

- Introducing position/type optimized courses, e.g., for OCC, CCQ, requalification and bridge courses
- Standardizing formats of courses
- Optimizing scheduling and training time
- Using consistent data-driven feedback from students, instructors and evaluators for course evaluation

Section 8—Appendix 1 – Standards and Regulations for Instructors and Evaluators

8.1 ICAO Standards

8.1.1 ICAO Annex 1

Annex 1, Personnel Licensing, Chapter 2 – *Flight instructor rating appropriate to aeroplanes, airships, helicopters and powered-lifts*, provides the foundation for the development of national regulations regarding instructor ratings. An instructor rating provides the privilege to carry out flight instruction for the issuing of certain licenses and ratings, including the supervision of solo flights by student pilots.

8.1.2 ICAO DOC 9868 – PANS-TRG

PANS-TRG describes the implementation of the training required for the pilot licenses and ratings found in Annex 1. PANS-TRG, Attachment to Chapter 3, *Qualifications of course developers and instructors*, contains a detailed list of tasks and subtasks for instructors.

8.1.3 ICAO Annex 6

Annex 6, Operation of Aircraft, Chapter 9 – *Aeroplane Flight Crew*, mandates, that an operator shall establish and maintain a ground and flight training program, approved by the State of the operator, which ensures that all flight crew members are adequately trained to perform their assigned duties. The training program shall include ground and flight training facilities and properly qualified instructors as determined by the State of the operator.

Note: Amendments to Annex 1, Annex 6, and PANS-TRG are scheduled for November 2020.

8.2 EASA Regulations

EASA distinguishes between licensing training (PART-FCL) and operator training (PART – ORO).

8.2.1 PART-FCL – Flight Crew Licensing

EASA has published the requirements for:

a) *Instructors* in Subpart J to PART-FCL

There are nine *Instructor certificates* (FI, CRI, IRI, TRI, SFI, MCCI, STI, MI, FTI), available for licensing training.

FCL.920 and AMC1 to FCL.920 describe the competences instructors should be trained and assessed to.

b) *Examiners* in Subpart K to PART-FCL

There are six *Examiner certificates* (FE, FIE, CRE, IRE, TRE, SFE).

AMC1 to FCL.1020 describes the Examiners assessment of competence.

8.2.2 PART-ORO - Organization Requirements for Air Operations

PART-ORO describes:

- operator conversion training and checking (when joining an operator or when changing aircraft type), and
- annual operator recurrent training and checking

ORO.FC.145 mandates that for all flight and flight simulation training and checking, the personnel providing the training and conducting the checks shall be qualified in accordance with Part-FCL (see 8.2.1 above).

AM1 ORO.FC.230 specifies the personnel providing recurrent training and checking:

- for flight training FI, TRI or CRI or, in the case of the FSTD content SFI, provided that the FI, TRI, CRI or SFI satisfies the operator's experience and knowledge requirements
- for operator proficiency checks TRE or SFE
- Line flying under supervision (LIFUS), *following* completion of flight training and checking as part of the operator's conversion course, may be conducted by a flight crew member (not holding an instructor certificate as per PART-FCL) nominated by the operator; except in case of ZFTT, where the first four take-offs and landings must be performed under the supervision of a TRI.

8.3 FAA Regulations

8.3.1 14 CFR Part 61 - Certification: Pilots, Flight Instructors, and Ground Instructors

Part 61, Subpart H prescribes the requirements for the issuance of *flight instructor certificates and ratings* (except for flight instructor certificates with a sport pilot rating), the conditions under which those certificates and ratings are necessary, and the limitations on those certificates and ratings.



There are four instructor certificates:

1. A flight instructor certificate with an airplane category and single-engine class rating
2. A flight instructor certificate with an airplane category and multiengine class rating
3. A flight instructor certificate with a powered-lift rating
4. A flight instructor certificate with an instrument rating

Within the limitations of a person's flight instructor certificate and ratings, the privileges are to train and issue endorsements for:

1. A student pilot certificate
2. A pilot certificate
3. A flight instructor certificate
4. A ground instructor certificate
5. An aircraft rating
6. An instrument rating
7. A flight review, operating privilege, or recency of experience requirement of Part 61
8. A practical test
9. A knowledge test

8.3.2 14 CFR Part 121 - Operating Requirements: Domestic, Flag, and Supplemental Operations

Part 121, Subpart N – Training Program, requires the certificate holder (operator) to provide properly qualified *ground instructors* and *flight instructors, simulator instructors, and approved check airmen* to conduct required flight training, flight checks, and simulator training courses.

Subpart N distinguishes between *Check Airmen* (airplane and simulator) and *Flight Instructors* (airplane or simulator) and details requirements for initial, transition and recurrent instructor and check airmen training and checking.

Instructors are qualified directly by the certificate holder (operator) and do not need to hold instructor certificates as per Part 61.

The initial training program for Part 121 Flight instructors (airplane or simulator), provides credit for holders of a flight instructor certificate regarding:

- The fundamental principles of the teaching-learning process
- Teaching methods and procedures, and
- The instructor-student relationship



Part 121, Subpart Y – Advanced Qualification Program, provides for approval of an alternative method known as “Advanced Qualification Program” or “AQP” for qualifying, training, certifying, and otherwise ensuring competency of crew members, aircraft dispatchers, other operations personnel, instructors, and evaluators who are required to be trained under parts 121 and 135. (Detailed guidance for approval of an Advanced Qualification Program is provided in AC 120-54A).

8.3.3 14 CFR Part 142 – Training Centers

Part 142 prescribes the requirements governing the certification and operation of training centers for the purpose of third party training. For training of own employees, including training for AQP, operators approved under Part 121 do not need certification under Part 142.

Requirements for instructors are the same as for Part 121.

8.3.4 FAA Order 8900.1 Volume 3

Chapter 20 addresses Check Airmen, Instructor, and Supervisor Programs for Part 121 and 135 certificate holders.

Section 1, contains guidance concerning Check Pilot and check Flight Engineer (FE) programs. It describes regulatory requirements, qualifications, and functional responsibilities. It also addresses the roles and purposes of check pilots.

There are six classifications, the terms “*check pilot*” and “*check FE*” are replacing the older term “*check airman*”:

1. Proficiency Check Pilot–Aircraft
2. Proficiency Check Pilot–Simulator
3. Line Check Pilot–All Seats (left, right, and observer’s)
4. Line Check Pilot–Observer’s Seat Only
5. Check Pilot–All Checks
6. Check FE

Section 2 describes procedures for approval and surveillance of check pilots and check FEs, and it includes procedures for evaluation.

Section 4 provides guidance concerning the training requirements for check pilots, check Flight Engineers (FE), and air transportation flight instructors.

Note: Chapter 19, Section 1, contains direction and guidance to be used by FAA personnel for the evaluation, approval, and surveillance of flight crew member training programs. It shows in which

areas the IEs are deployed. It describes the training program for flight crew, the six basic categories of training (each of which is specific to an aircraft type and duty position, i.e., PIC B-737), associated curricula, curricula segments and training modules.

The six basic categories are:

1. Qualification
 - i. Initial New-Hire Training
 - ii. Initial Equipment Training
 - iii. Transition Training
 - iv. Upgrade Training
 - v. Requalification Training
2. Recurrent Training



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