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Instructor and Evaluator Training

Edition 2

Guidance Material and Best Practices

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Executive Letter

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

As the work at ICAO on the competency-based training framework, definitions of competencies and definitions of performance standards, has continued to mature since the publication of the 1st Edition of this IATA guidance material, a revision of its content was deemed necessary. Additionally, it was important to integrate the experience gained by airlines that have been implementing CBTA programs, such as Evidence-Based Training (EBT), in the recent years.

Given the essential contribution of the instructors and evaluators to flight safety, and their predominant role to ensure training effectiveness and efficiency, it was important to share the latest international standards and best practices to maintain at its highest the level of competence of the instructors and the evaluators. Moreover, the timing of this publication is synchronous with several major regulators initiatives to introduce competency-based training and assessment (CBTA) requirements for pilots and instructors into their regulations.

The most significant changes in this new edition reside in the provision of practical solutions for operators, training organizations and National Aviation Authorities, first to identify with more accuracy the instructor competencies requiring special emphasis during training in regard to the instructor duties, and, second, to perform the instructor/evaluator competency assessment. These two major changes permit a better understanding of the benefits of implementing CBTA and support the global enhancement of the training system.

In the context of post COVID restart of operations and the CBTA expansion, 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

Publications	Date
ICAO Annex 1, Personnel Licensing	Thirteenth Edition, July 2020
ICAO Annex 6, Operation of an Aircraft, Part I, International Commercial Air Transport — Aeroplanes	Eleventh Edition, 2018
ICAO Doc 9868, Procedures for Air Navigation Services – Training (PANS-TRG)	Third Edition, 2020 (Amendment 7)
ICAO Doc 9995, Manual of Evidence-based Training	First Edition, 2013
EASA Aircrew regulation	Revision state of April 2021
EASA Air Operations regulation	Revision state of April 2021
FAA 14CFR PART 121	Revision state of January 2021
FAA Order 8900.1, Volume 3 Chapters 19 and 20	19/10/20, CHG 702

Abbreviations and Acronyms

ADDIE	Analyze, Design, Develop, Implement and Evaluate
AMC	Acceptable means of compliance
AOC	Air operator certificate / Air operator certificate holder
AQP	Advanced qualification program
ATO	Approved training organization
ATPL	Airline Transport Pilot License
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
COM	Competency Communication
CPL	Commercial Pilot License
CPT	Captain/Commander
CRE	Class rating examiner (EASA)
CRI	Class rating instructor (EASA)
CRM	Crew resource management
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)
FPA	Competency Flight Path management, Automation
FPM	Competency Flight Path management, manual control
FSTD	Flight simulation training device
FTI	Flight test instructor (EASA)
ICAO	International Civil Aviation Organization
IE	Instructor and evaluator
IEC	Instructor and evaluator competency



IOB	Instructor Observable Behavior
IOS	Instructor operating station
IRE	Instrument rating examiner (EASA)
IRI	Instrument rating instructor
KNO	Competency Application of Knowledge
LIFUS	Line flying under supervision
LOE	Line Operational Evaluation (FAA)
LOE	Line-Oriented Evaluation (EASA)
LTC	Suitably qualified commander, "Line training captain"
LTW	Competency Leadership and Teamwork
MCCI	Multi-crew cooperation instructor (EASA)
MI	Mountain rating instructor (EASA)
MPL	Multi-Crew Pilot License
OB	Observable behavior
OCC	Operator conversion course
ORCA	Observe, Record, Classify and Assess
ORO	Organization requirements for air operations
PANS-TRG	Procedures for air navigation services, training
PIC	Pilot in command
PF	Pilot flying
PM	Pilot monitoring
PPL	Private Pilot License
PRO	Competency Application of procedures and compliance with regulations
PSD	Competency Problem solving and Decision making
RHS	Right-hand seat
SAW	Competency Situation awareness and management of the information
SFI	Synthetic flight instructor (EASA)
STI	Synthetic training instructor (EASA)
TRI	Type rating instructor
UPRT	Upset prevention and recovery training
VENN	Competency assessment methodology (VENN model)
WLM	Competency workload management
ZTFF	Zero flight time training

Definitions

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.

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.

Note: ICAO describes formative and summative assessment as follow:

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.*

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, and a learner needs to “know how to be” in a given context.



Competency-based training and assessment. Training and assessment that are characterized by a performance orientation, emphasis on standards of performance and their measurement, and the development of training to the specified performance standards.

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

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

Error. An action or inaction by an operational person that leads to deviations from organizational or the operational person's intentions or expectations.

Error management. The process of detecting and responding to errors with countermeasures that reduce or eliminate the consequences of errors and mitigate the probability of further errors or undesired states.

Evaluation. For the purpose of this document, evaluation means the summative assessment of a trainee performance or the evaluation of the training system.

Note: "Validation", as used under the FAA, is equivalent to a summative assessment.

Evaluator. A person authorized to conduct the formal and final summative assessment of a trainee's performance

Event. A combination of a task or a sub-task and the conditions under which the task or sub-task is to be performed.

Facilitation technique. An active training method, which uses effective questioning, listening and a non-judgmental approach and is particularly effective in developing skills and attitudes, assisting trainees to develop insight and their own solutions and resulting in better understanding, retention and commitment.

Human performance. Human capabilities and limitations which have an impact on the safety and efficiency of aeronautical operations.

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.

Instructional systems design (ISD). A formal process for designing training which includes analysis, design and production, and evaluation.

Instructor. A person authorized to provide training and to conduct evaluations.

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

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.

Resilience. The ability of a flight crew member to recognize, absorb and adapt to disruptions.

Note: Resilience is the ability to prepare and plan for, absorb, recover from, and more successfully adapt to adverse events as defined by the US National Academies of science, engineering and medicine.

Scenario (event-set). Relatively independent segment of training made up of several events.

Threat. Events or errors that occur beyond the influence of an operational person, increase operational complexity, and must be managed to maintain the margin of safety.

Threat management. The process of detecting and responding to threats with countermeasures that reduce or eliminate the consequences of threats and mitigate the probability of errors or undesired states.

Trainee/ Trainer. For the purpose of this document, the following terminology is applied:

- "Trainee" means a pilot or an Instructor/Evaluator receiving training or evaluation
- "Trainer" means an Instructor/Evaluator conducting training or evaluation

Training objective. A clear statement that is comprised of three parts, i.e. the desired performance or what the trainee is expected to be able to do at the end of training (or at the end of particular stages of training), the performance standard that must be attained to confirm the trainee's level of competence, and the conditions under which the trainee will demonstrate competence.



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.

1.2 EASA regulations

EASA distinguishes between licensing training Aircrew regulation and operator training Air Operations regulation.

1.2.1 Aircrew regulation

EASA has published the requirements for Instructors and Examiners in Aircrew regulation, Annex 1 Subpart J (Instructors) and Subpart K (Examiners). Air Operations regulation

1.2.2 Air operations regulation

EASA has published the requirements for operator training in Air Operations regulation, Annex 3 that also provides the qualification of the Instructor/Evaluator conducting the following:

- Command course training
- Initial operator Crew Resources Management training



- Operator conversion training and checking (when joining an operator or when changing aircraft type), and
- Operator recurrent training that includes ATQP and EBT

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 CBTA

2.1 Background and context

In 2006, ICAO supported a performance-based approach to training with the publication of standards for the multi-crew pilot license (MPL) which is the first license Competency-based Training and Assessment (CBTA) compliant.

In 2013, CBTA principles were extended to operator recurrent training with the publication of ICAO, Doc 9995, Manual for Evidence-based Training (EBT).

In 2016, ICAO published Amendment 5 to PANS-TRG, General provisions for competency-based training and assessment. This defined the role of the pilot competencies in the context of Threat and Error Management (TEM) and provided a basis for further development of CBTA.

In 2020, ICAO published Amendment 7 to PANS-TRG, which formalized the global expansion and applicability of CBTA principles to all licensing training (ICAO Annex 1) and operator training (ICAO Annex 6).

CBTA is defined by ICAO as training and assessment that are characterized by a performance orientation, emphasis on standards of performance and their measurement, and the development of training to the specified performance standards.

The goal of competency-based training and assessment is to provide a competent workforce for the provision of a safe and efficient air transportation system.

CBTA is a training methodology sustained by robust course design, instructor qualification and data collection to continuously enhance the training efficiency and effectiveness.

As experience with CBTA has grown, the aviation industry has realized that CBTA is a better way to develop a competent workforce when compared to the traditional task- or hours-based training and checking.

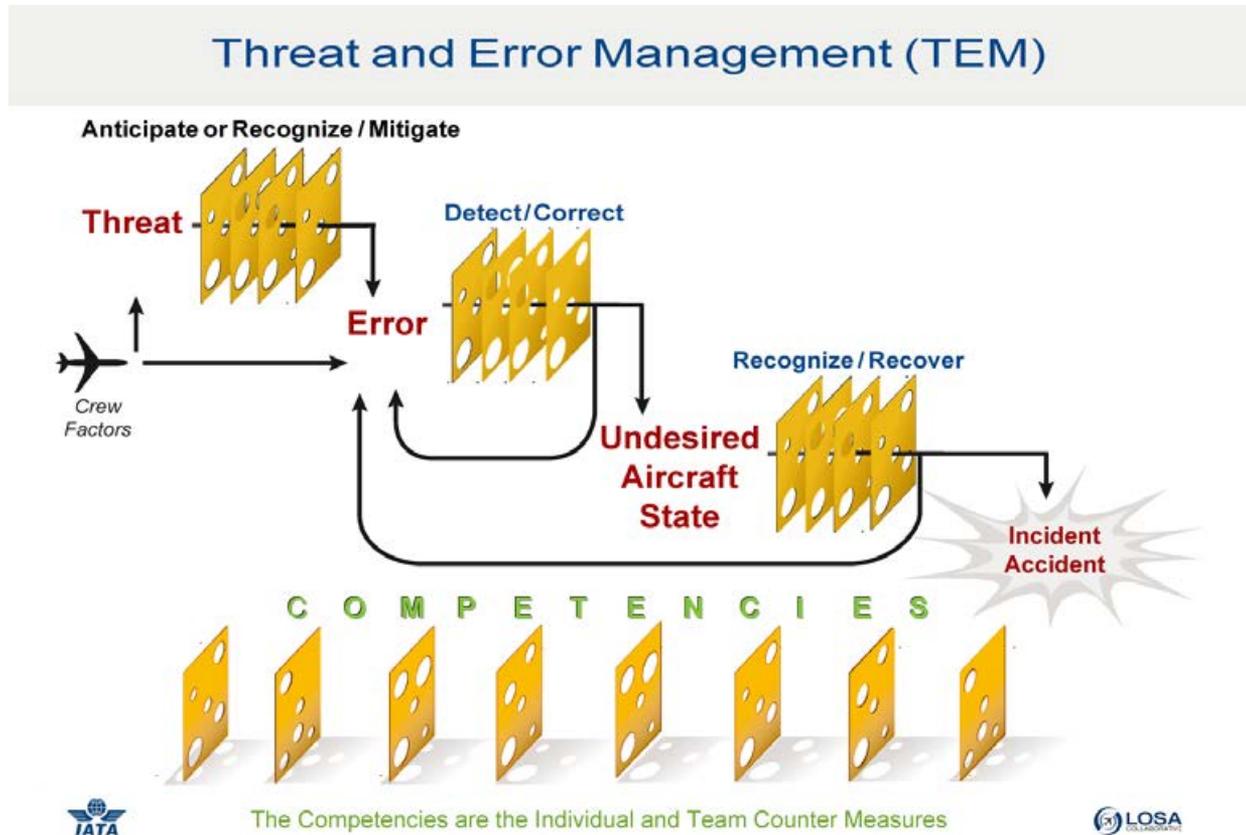
These ICAO CBTA standards support the IATA Total Systems Approach (TSA), which stands for the application of CBTA across all aviation disciplines in general, and to all modules and roles of a pilot's entire career. Hence, the defined competencies for pilots, instructors and evaluators should consistently be applied throughout pilot aptitude testing, initial (ab-initio) training, type rating training and testing, command upgrade, recurrent and evidence-based training and instructor and examiner selection and training.

2.2 Competencies and Threat and Error Management (TEM)

The role of the competencies within the Threat and Error Management model has been formalized at the international level.

First, ICAO Doc 9868 (PANS-TRG) Amendment 7 states that: *“From a competency-based training and assessment perspective, the competencies of the approved adapted competency model provide individual and team countermeasures to threats and errors and undesired aircraft states. CRM skills are embedded in the approved adapted competency model. Therefore, the CRM training supports the development of the competencies as countermeasures in the TEM concept.”*

The schematic below is used as a pedagogical tool to illustrate the above-mentioned concept



From a practical perspective, the competencies being the countermeasures in the TEM model:

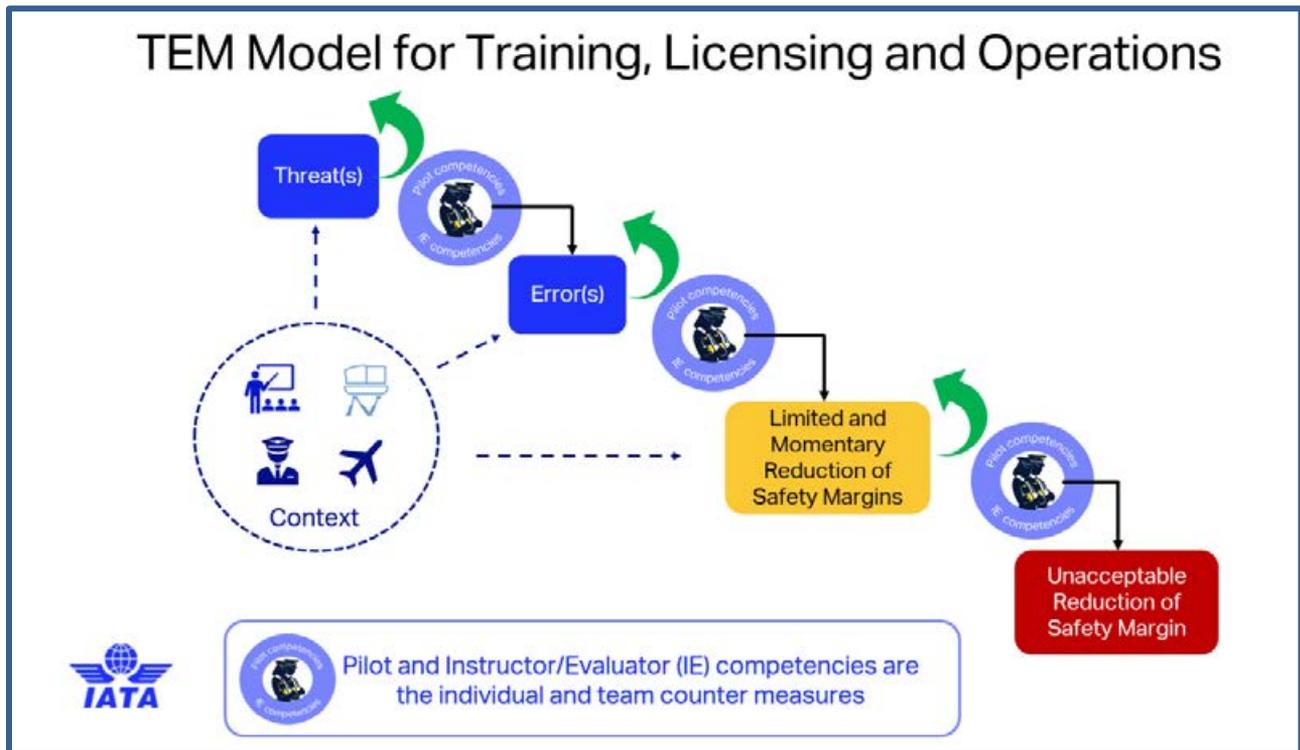
- The more Observable Behaviors are timely demonstrated, the better the threat and error management should be. This should lead to the maintenance of the safety margins.
- Per opposition, the Observable Behaviors that have not been demonstrated when they were required could result in the mismanagement of the threats and errors. This could lead to a reduction of the safety margins.

Second, ICAO Doc 9868 (PANS-TRG) Amendment 7 also states that: *“Originally developed for flight deck operations, the TEM model can nonetheless be used at different levels and in different sectors within an organization, and across different organizations and activities within the aviation industry. It is therefore important, when applying TEM, to keep the user’s perspective in the forefront. Depending on “who” is using TEM (front-line personnel, intermediate*

management, senior management; flight operations, maintenance, air traffic control), slight adjustments to related definitions may be required.”

The above statement illustrates the fact that the TEM model usage has historically expanded from the pure area of operations and safety to the training and licensing domain. This development has been synchronous with the expansion of the CBTA principles and is fully consistent, as the competencies permit (per definition) to reliably predict successful performance on the job as they represent the individual and team countermeasures in the TEM model.

The schematic below is an example of a more holistic TEM model that can be used as a tool in operations (e.g., LOSA), but also in training and licensing (e.g., assessment of competence).



Note the wording adjustments:

“Limited and Momentary Reduction of Safety Margin” describes an outcome of TEM where the pilot or the instructor/evaluator demonstrated Observable Behaviors that did not allow, on few occasions, a timely management of the threats or errors. This led to a limited and momentary reduction of the safety margin.

“Unacceptable Reduction of Safety Margin” describes an outcome of TEM where the pilot or the instructor/evaluator demonstrated Observable Behaviors that did not allow a timely management of the threats or errors. This led to an unacceptable reduction of the safety margin.

For example, involuntary Undesired Aircraft State (UAS) during flight training, due to mismanagement of a stall exercise, that is recognized late or recovered late by the instructor.

Refer to Section 6 for instructor/evaluator performance assessment.

2.3 CBTA training system performance

CBTA is a performance-based training program that integrates per design a continuous monitoring and evaluation of the course.

Under CBTA, the training system performance is measured and evaluated through a feedback process in order to validate and refine the program and ascertain that the organization program develops pilot competencies and meets the training objectives.

The feedback process should be included in the AOC or ATO safety and compliance management system.

The typical CBTA feedback process should use defined training metrics to collect data in order to:

- identify trends and ensure corrective action where necessary;
- identify collective training needs;
- review, adjust and continuously improve the training program;
- further develop the training system; and
- standardize the instructors.

Typical metrics include but are not limited to:

- differences in success rates between training topics
- grading metrics
- trainee's and instructor's feedback, which provides individual perspective as to the quality and effectiveness of the training
- differences in success rates between different trainee cohorts
- distribution of errors for various training topics, scenarios and aircraft class or types
- distribution of level of performance within the range of competencies and outcomes
- instructor inter-rater reliability data
- audit and course results

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.

Continuous assessment of IE performance together with the evaluation and improvement of the IE training and standardization system will contribute to fairness and make IE checking obsolete.

Feedback from trainees to the IE

Trainee feedback forms should be user-friendly and focus on a trainee-centered selection of competencies and associated OBs. 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. See example of a feedback form in Appendix 2.

2.4 Expected benefits of CBTA

2.4.1 Safety

The shift in term of safety benefit from traditional prescriptive task-based training to CBTA is mainly due to the extension of the scope and nature of the training and the enhancement of the measurement of the performance.

The traditional pilot training, which is hour driven and task based, focuses on training mainly three technical elements: handling skills, automation management and application of procedures. The content of the traditional pilot skill test or proficiency check are based on the restitution of exercises where the measurement of pilot performance is mainly based on a set of fixed predetermined criteria represented by the flight path deviation numeric tolerances.

Existing regulations for Instructor/Evaluator generally list tasks, duties and procedures to be performed, which permit to, only partially, predict successful performance on the job as an instructor.

In contrast, CBTA targets to assessing, developing and enhancing the pilot and instructor competencies. These pilot competencies include situation awareness, communication, workload management, leadership and decision making which are crucial for safety in operations. The instructor competencies include management of the learning environment, instruction, interaction with the trainee and assessment and evaluation, which are critical for safe and efficient training but also to ensure further safe operations.

CBTA also uses a progressive approach to introduce more and more demanding realistic scenarios under the supervision of a CBTA instructor that handles a set of instructional technics including facilitation. Pilots and instructors trained this way enhance their competence and increase their confidence.

Moreover, under CBTA the performance of the pilots and instructors is determined with more accuracy by using objective, observable performance criteria that state whether (or not) the desired level of performance has been achieved.

As a summary, CBTA should permit for pilots and instructors to be more resilient when they must manage unexpected situations in everyday operations.

2.4.2 Effectiveness and efficiency

CBTA implicitly provides dynamic, effective and efficient programs because it respects the instructional system design concept.

In particular, the ADDIE principles (analyze, design, develop, implement and evaluate) ensure that the training program is adapted to the organization and pilot needs while making best usage of training media and devices.

Practically, 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 consistent training programs
- Define training objectives effectively
- Allocate instructor resources and training media effectively
- Train IEs specifically for their assignments; additionally, when changing assignment or adding new assignments, the training needs can easily be identified

CBTA's effectiveness and efficiency is also based on the consistent use of the same set of competencies during the entire career path of the pilot, from aptitude testing, to PPL, CPL, MPL, ATPL, through operator training and for pilot Instructor/Evaluator as well.

This consistent use of pilot and instructor competencies facilitates training data exchange, the benchmark of training metrics and the training data analysis to enhance individual courses, a company's training pathway and the performance of the global training system.

Additionally, CBTA drives and enables pilots and instructors to reach their highest level of performance during all their training and potentially beyond the training, during their operational duties.

Practically, 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 AOC/ATOs
- 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 3—Instructor and Evaluator Competencies

In 2017, the IATA Pilot Training Task Force (PTTF) developed an instructor/evaluator competency framework that includes five competencies for instructor and evaluator. In 2018, this IATA instructor competency framework was reviewed by the group of experts of the ICAO CBTA Task Force and was endorsed by ICAO under the name of the “ICAO pilot instructor and evaluator competency framework” (refer to ICAO Doc 9868 PANS-TRG, 3rd Edition).

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 7 to ICAO Doc 9868, PANS-TRG.

Elements of an Adapted Competency Model

Competency	Description	Performance criteria		
		Observable behavior (OB)	Competency Assessment	
Competency 1	Description 1	OB 1	Final Competency standard	Conditions: <ul style="list-style-type: none"> • Tool, system or equipment • Operational context • Level of support of the Instructor
		OB 2		
		OB n		
Competency 2	Description 2	OB 1		
		OB 2		
		OB n		
Competency n	Description n	OB 1		
		OB 2		
		OB n		

Note 1: Final competency standard is defined by the organization.

Note 2: There are different types of conditions to be considered.

- conditions related to context (nature and complexity of the operational and environmental context);
- conditions related to tools and systems/equipment; and
- conditions related to the amount of support or assistance a trainee can expect from the instructor/evaluator.

3.2 The IATA 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 additional pilot competency "Application of 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 and/or Flight training in aircraft and in FSTDs
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 five tables separately show the individual Instructor and Evaluator Competencies (IEC1 – IEC5).

¹ For ground instructors some pilot competencies may not apply. See Ground Instructors under 4.4.2 Matrix.

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 competencies ²	See ICAO Aeroplane Pilot Competency Framework and EASA additional pilot competency "Application of Knowledge"	See ICAO Aeroplane Pilot Competency Framework and EASA additional pilot competency "Application of 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 and/or Flight training in aircraft and in FSTDs

² For ground instructors some pilot competencies may not apply. See Ground Instructors under 4.4.2 Matrix .

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		
		Instructor Observable behavior (IOB)	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	<p>IOB 2.1 Applies TEM in the context of instruction/evaluation</p> <p>IOB 2.2 Briefs on safety procedures for situations that are likely to develop during instruction/evaluation</p> <p>IOB 2.3 Intervenes appropriately, at the correct time and level (e.g., progresses from verbal assistance to taking over control)</p> <p>IOB 2.4 Resumes instruction/evaluation as practicable after any intervention</p> <p>IOB 2.5 Plans and prepares training media, equipment and resources</p> <p>IOB 2.6 Briefs on training devices or aircraft limitations that may influence training, when applicable</p> <p>IOB 2.7 Creates and manages conditions (e.g., airspace, ATC, weather, time, etc.) to be suitable for the training objectives</p> <p>IOB 2.8 Adapts to changes in the environment whilst minimizing training disruptions</p> <p>IOB 2.9 Manages time, training media and equipment to ensure that training objectives are met</p>	Operators and ATOs define in their OMs the level of performance to be achieved by the instructor and evaluator.	<p>Ground Training</p> <p>and/or</p> <p>Flight training in aircraft and in FSTDs</p>

3.2.3 IEC3 – Instruction

Instructor and Evaluator Competency 3 – Instruction				
Name of the competency	Description	Performance Criteria		
		Instructor Observable behavior (IOB)	Competency Assessment	
			Final competency standard	Conditions
IEC3: Instruction	Conducts training to develop the trainee’s competencies	IOB 3.1 References approved sources (operations, technical, and training manuals, standards and regulations) IOB 3.2 States clearly the objectives and clarifies roles for the training IOB 3.3 Follows the approved training program IOB 3.4 Applies instructional methods as appropriate (e.g., explanation, demonstration, learning by discovery, facilitation) IOB 3.5 Sustains operational relevance and realism IOB 3.6 Adapts the amount of instructor inputs to ensure that the training objectives are met IOB 3.7 Adapts to situations that might disrupt a planned sequence of events IOB 3.8 Continuously assesses trainee’s competencies IOB 3.9 Encourages the trainee to self-assess IOB 3.10 Allows trainee to self-correct in a timely manner IOB 3.11 Applies trainee-centered feedback techniques (e.g., facilitation, etc.) IOB 3.12 Provides positive reinforcement	Operators and ATOs define in their OMs the level of performance to be achieved by the instructor and evaluator.	Ground training and/or Flight training in aircraft and in FSTD

3.2.4 IEC4 – Interaction with the Trainees

Instructor and Evaluator Competency 4 – Interaction with the trainees				
Name of the competency	Description	Performance Criteria		
		Instructor Observable behavior (IOB)	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>	<p>IOB 4.1 Shows respect for the trainees (e.g., for culture, language, experience)</p> <p>IOB 4.2 Shows patience and empathy (e.g., by actively listening, reading non-verbal messages and encouraging dialogue)</p> <p>IOB 4.3 Manages trainees' barriers to learning</p> <p>IOB 4.4 Encourages engagement and mutual support</p> <p>IOB 4.5 Coaches the trainees</p> <p>IOB 4.6 Supports the goal and training policies of the Operator/ATO and Authority</p> <p>IOB 4.7 Shows integrity (e.g., honesty and professional principles)</p> <p>IOB 4.8 Demonstrates acceptable personal conduct, acceptable social practices, content expertise, a model for professional and interpersonal behavior</p> <p>IOB 4.9 Actively seeks and accepts feedback to improve own performance</p>	<p>Operators and ATOs define in their OMs the level of performance to be achieved by the instructor and evaluator.</p>	<p>Ground training</p> <p>and/or</p> <p>Flight training in aircraft and in FSTDs</p>

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).

4.1 Concept

Following the ICAO ADDIE⁽¹⁾ model a training program for IE should include the five components and related outputs:

No.	Component	Output
1	Analysis of the training need	Training specification
2	Design of the competency model including performance criteria	2.1. Competency model 2.2. Training assessment plans
3	Development of the training and assessment materials	Training materials, assessments, examinations
4	Conduct of the course	Competent Instructors and Evaluators
5	Evaluation of the course including the assessment and training plans	Course report

The purpose of the training program is to train and assess all IE competencies in order to enable the IE to perform his duties as required and described in the documentation of the AOC/ATO.

(1) ADDIE = analyze, design, develop, implement and evaluate (ADDIE) principles.

4.2 Preparing the IE training program

The first step (No. 1 above) of the ADDIE model is to thoroughly analyze the training need resulting in a training specification. The resulting training specification should provide answers to questions regarding the purpose of the training, the tasks associated with the purpose, the operational environment, the technical, regulatory and organizational requirements.

For the IE training these questions can be answered by referring to the existing documentation of the AOC/ATO.

Output No. 2.1 requires the design of the competency model, including the performance criteria (the competency standards and conditions). For the IE training, it is assumed that the IATA competency framework (Section 3 of this manual), which has been endorsed by ICAO (ICAO Doc 9868 PANS-TRG Third Edition), will be used.

Standards: The final competency standard should be defined by the ATO/AOC in accordance with the recommendations provided in Section 6 of this manual.

Conditions: The conditions under which the competencies of the trainees will be assessed (nature and complexity of the operational and environmental context); tools and systems/equipment, comprise the given operating environment of the AOC/ATO.

Based on the training specification, the development of the assessment and training plans (No. 2.2) and the training materials (No. 3) will permit to identify the training objectives relating to the initial, additional and recurrent IE training programs.

4.3 Special emphasis

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 IE competencies with the goal to achieve the level of performance defined by the AOC or the ATO.

However, it is recommended that the training objectives that sustain the IE initial, additional, recurrent standardization and refresher programs, be adjusted according to the IE duties, and sought privileges within the organization. The consequence of this training objectives adjustment is to place "Special Emphasis" on specific IE competencies depending of the IE duties.

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 the different IE standardization programs will consequently refer to the descriptions of the relevant IE Competencies and their OBs.

4.4 Special emphasis depending of the IE duties

4.4.1 Methodology

The need for the IE training objectives **adjustment** is linked to the fact that the IE are delivering training and assessment under different conditions* of training.

Note: As per Section 3 of this manual, conditions* are related to context (nature and complexity of the operational and environmental context), to tools and systems/equipment, and to the amount of support or assistance a trainee can expect from the instructor/evaluator.

Consequently, the IE should be prepared to face and to mitigate specific threats, to recover certain type of errors in order to avoid the potential reduction of safety margins that could happen under the different conditions of training.

As the competencies are the countermeasures in the TEM model (refer to Section 2 of this manual), the methodology applied by the IATA experts has been to assess the predominant effect of each competency to manage the most common threats and errors, depending on the conditions of training. To achieve this goal, the IATA experts reviewed every single OB of each IE competency to determine if it was critical for the IE to demonstrate regularly the individual OB in order to ensure a safe and efficient training/assessment, depending on the training conditions that apply to each instructor category.

As a macroscopic result, when the IATA experts considered critical for the IE to demonstrate regularly many or most or all of the OBs (related to a specific competency), in order to ensure a safe and efficient training/assessment, this competency was identified as “requiring Special Emphasis” during training.

As a microscopic result, the OB identification permits to sustain and to adjust the training objectives of the different categories of Instructor/Evaluator for their initial, additional and recurrent standardization (or refresher) training. Practically, the course developer (or training designer) should ensure that the training and assessment plans contain sufficient (many) opportunities for the instructor to demonstrate, among others, the identified critical OBs.

This level of detail during the above-mentioned analysis has permitted:

- To confirm that each organization should conduct similar analysis to ensure that the IE training programs are tailored to the IE population’s needs within the organization
- To ensure accurate identification of the competencies “requiring special emphasis” during training

Example with the competency Assessment and Evaluation for Evaluators

The IATA experts considered critical for the IE to demonstrate regularly the OBs **in Bold** in order to ensure a safe and efficient training/assessment. As most of the OBs are critical (8/11), the competency Assessment and Evaluation “requires special emphasis” during training and is therefore identified as TA-SE in the global IE table.

IEC 5	Description	Instructor Observable behaviors (IOB)
Assessment and Evaluation	Assesses the competencies of the trainee and Contributes to continuous training system improvement	<p>IOB 5.1 Complies with Operator/ATOs and Authority requirements</p> <p>IOB 5.2 Ensures that the trainee understands the assessment process</p> <p>IOB 5.3 Applies the competency standards and conditions</p> <p>IOB 5.4 Assesses trainee’s competencies</p> <p>IOB 5.5 Performs grading</p> <p>IOB 5.6 Provides recommendations based on the outcome of the assessment</p> <p>IOB 5.7 Makes decisions based on the outcome of the summative assessment</p> <p>IOB 5.8 Provides clear feedback to the trainee</p> <p>IOB 5.9 Reports strengths and weaknesses of the training system (e.g., training environment, curriculum, assessment/evaluation) including feedback from trainees</p> <p>IOB 5.10 Suggests improvements for the training system</p> <p>IOB 5.11 Produces reports using appropriate forms and media</p>

Macroscopic result for Evaluators

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	TA	TA-SE

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

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

Example with the competency Instruction for the Flight Instructor (FI)

The IATA experts have considered critical for the IE to demonstrate regularly the OBs in Bold in order to ensure a safe and efficient training/assessment. As few OBs are critical (2/12) the competency Instruction is identified as TA (Trained and Assessed) in the IE Table.

Nevertheless, the course developer should ensure that the training and assessment plans contain sufficient (many) opportunities for the FI to demonstrate, among others, the identified critical OBs during training.

IEC 3	Description	Instructor Observable behaviors (IOB)
Instruction	Conducts training to develop the trainee's competencies	IOB 3.1 References approved sources (operations, technical, and training manuals, standards and regulations) IOB 3.2 States clearly the objectives and clarifies roles for the training IOB 3.3 Follows the approved training program IOB 3.4 Applies instructional methods as appropriate (e.g., explanation, demonstration, facilitation, discover with assistance, discover without assistance) IOB 3.5 Sustains operational relevance and realism IOB 3.6 Adapts the amount of instructor inputs to ensure that the training objectives are met IOB 3.7 Adapts to situations that might disrupt a planned sequence of events IOB 3.8 Continuously assesses trainee's competencies IOB 3.9 Encourages the trainee to self-assess IOB 3.10 Allows trainee to self-correct in a timely manner IOB 3.11 Applies trainee-centered feedback techniques (e.g., facilitation, etc.) IOB 3.12 Provides positive reinforcement

Macroscopic result for the FI

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

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

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

4.4.2 Matrix

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”.

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	TA	TA

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

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

*For ground instructors some pilot 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 apply.

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 automatically delivered by the media.

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 duties, e.g., when ground instructors explain aircraft systems and components, they also link them to the pilot competencies.

Flight Instructors (FI) for Licensing Courses

EASA: FI

FAA: CFI

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

FIs deliver initial training for future general aviation pilots and for future professional flight crews. Considering the “law of primacy” the foundations set by the FI are important because they may be long lasting; this applies to all pilot competencies, and particularly to FPM (airplane flight path management) – manual control.

To develop self-confidence, the student’s exposure to “reality” is crucial; this is achieved in licensing training by using real aircraft in the real environment, and by UPRT. The FIs behavior is crucial, as a role model, as a coach and as a facilitator, encouraging the development of the trainee’s self-confidence.

Exemplary TEM behavior of the FI will allow the student to internalize the safety culture; this can be achieved for example by conducting effective briefings (expected threats, common errors, common undesired aircraft states) and debriefings (actually encountered threats, errors, undesired aircraft states), and relating them to the countermeasures taken.

Instructors in FSTDs

EASA: SFI, or TRI restricted to FSTD

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	TA	TA	TA

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.

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	TA-SE	TA	TA	TA

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 or 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.

Instructors for Base Training³

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

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.

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



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	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”.

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.

During training, the function of the role model behavior is to support the trainee’s learning and personal development. Because IEs form a leading group within the organization, all actions and inactions of IEs will be attentively observed by their fellow pilots. Therefore, even when not directly engaged in training, IEs should act as role models and their behavior in the professional working environment should be exemplary.

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.

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 assignments						
IEC\duties	GI	FI	SFI	LTC	TRI Base training ⁴	Evaluators
Pilot competencies	TA	TA-SE	TA	TA	TA-SE	TA
Management of the learning environment	TA	TA-SE	TA	TA-SE	TA-SE	TA
Instruction	TA	TA	TA	TA	TA	TA
Interaction with the trainees	TA	TA	TA	TA	TA	TA
Assessment and Evaluation	TA	TA	TA	TA	TA	TA-SE

Note: TA: Means competencies **trained and assessed**
SE: Means competencies requiring **special emphasis** during training

⁴ Base training means practicing landings, patterns and go-arounds in the actual aircraft as a part of type rating training.

4.5 Instructor/Evaluator transitioning from traditional training to CBTA

This section proposes training solutions based on industry feedback and best practices gained during MPL and EBT implementation. As CBTA programs will expand during the next decade, it is expected that a large number of already qualified IE under the traditional training system will have to transition to CBTA delivery. Those IE should complete initial and recurrent standardization to ensure safe operations and effective application of the CBTA methodology.

4.5.1 CBTA Instructor/Evaluator – Initial Standardization

The CBTA IE initial standardization program comprises:

- CBTA IE training, and
- CBTA assessment of competence.

4.5.1.1 CBTA IE training

The CBTA IE training course should be delivered by a qualified CBTA IE and comprise both theoretical and practical training.

At the completion of CBTA IE training, the applicant CBTA IE should:

1. have knowledge of CBTA, including the following underlying principles:
 - threat and error management,
 - CBTA,
 - learning from positive performance,
 - building resilience, and
 - data-driven training.
2. demonstrate knowledge of Instructional System Design, the structure and the method of training delivery for each phase of the AOC/ATO CBTA program
3. demonstrate knowledge of the principles of adult learning and how they relate to CBTA
4. apply appropriate teaching styles during training to accommodate trainee learning needs
5. facilitate trainee learning, focusing on specific competency-based training needs
6. conduct objective observations based on a competency framework, and document evidence of observed performance
7. relate specific performance observations of competencies
8. analyze trainee performance to determine competency-based training needs and recognize strengths

9. evaluate performance using the competency-based grading system
10. conduct a debrief using facilitation techniques

An IE may be given credit for parts of the above if the IE has previously demonstrated competence in those topics.

4.5.1.2 CBTA Assessment of Competence

Prior to delivering CBTA, the IE should undergo an assessment of competence, conducted during a practical CBTA session by a person nominated by the AOC/ATO and acceptable to the Licensing Authority.

4.5.2 CBTA Instructor/Evaluator – Recurrent Standardization

The CBTA IE should complete annual (or at a specific interval approved by the authority) recurrent standardization comprising:

- refresher CBTA training to develop the IE's competence to conduct CBTA; and
- concordance training

Note: Under EASA inter-rater-reliability is called "concordance". It is the consistency or stability of scores between different CBTA IE; it gives a score (or scores) on how much homogeneity, or consensus, there is in the ratings given by IEs (raters).

Recurrent standardization should incorporate de-identified grading data to show where grading is consistent or where there is inconsistency. Use of example scenarios that demonstrate appropriate grading have proven to be helpful in calibrating the IE workforce. Providing individual IE grading data in comparison to the entire population of IE can also be a useful tool to help individual instructors see how they perform compared to their peers.

The standardization could also incorporate feedback received from pilots that received CBTA and a review of relevant inter-rater reliability data.

At regular intervals, not to exceed three years, the IE should undergo a CBTA assessment of competence, conducted during the delivery of a practical CBTA session.

4.5.3 Special emphasis

The IATA experts have applied the Instructional System Design methodology to design the CBTA (including EBT) IE initial standardization with the assumption that the candidates are already qualified IE under the traditional training system. According to the training need analysis, it has been identified that the training objectives of the CBTA IE initial standardization program, for IEs transitioning from traditional training to CBTA, are sustained by the OBs related to the competencies Instruction and Assessment and Evaluation.

"Special Emphasis" for Traditional IE moving to CBTA (including EBT)				
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	TA-SE
Note: TA: Means competencies trained and assessed SE: Means competencies requiring special emphasis during training				

The table below proposes, as a guidance for the course developers, the OBs in bold that permit to sustain and adjust the training objectives for the CBTA IE initial standardization. Refer to paragraph 4.4 for further details.

Name of the competency	Description	Instructor Observable Behaviors (IOB)
IEC3: Instruction	Conducts training to develop the trainee's competencies	OB 3.1 References approved sources (operations and technical sources, training manuals and regulations) OB 3.2 States clearly the objectives and clarifies roles for the training OB 3.3 Follows the approved training program OB 3.4 Applies instructional methods as appropriate, (e.g. explanation, demonstration, learning by discovery, facilitation, in-seat instruction) OB 3.5 Sustains operational relevance and realism OB 3.6 Adapts the amount of instructor inputs to ensure that the training objectives are met OB 3.7 Adapts to situations that might disrupt a planned sequence of events OB 3.8 Continuously assesses trainee's competencies OB 3.9 Encourages the trainee to self-assess OB 3.10 Allows trainee to self-correct in a timely manner OB 3.11 Applies trainee-centered feedback techniques (e.g.: facilitation, ...) OB 3.12 Provides positive reinforcement

Name of the competency	Description	Instructor Observable Behaviors (IOB)
<p>IEC5: Assessment and Evaluation</p>	<p>Assesses the competencies of the trainee</p> <p>Contributes to continuous training system improvement</p>	<p>OB 5.1 Complies with Operator / ATOs and authority requirements</p> <p>OB 5.2 Ensures that the trainee understands the assessment process</p> <p>OB 5.3 Applies the competency standards and conditions</p> <p>OB 5.4 Assesses trainee's competencies</p> <p>OB 5.5 Performs grading</p> <p>OB 5.6 Provides recommendations based on the outcome of the assessment</p> <p>OB 5.7 Makes decisions based on the outcome of the summative assessment</p> <p>OB 5.8 Provides clear feedback to the trainees</p> <p>OB 5.9 Reports strengths and weaknesses of the training system (training environment, curriculum, assessment/evaluation) including feedback from trainees</p> <p>OB 5.10 Suggests improvements for the training system</p> <p>OB 5.11 Produces reports using provided appropriate forms and media</p>

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

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 IE 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:

- Flight Instructor (FI)
- 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 be both 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 initial and recurrent standardization to IEs delivering these programs. This is described in more detail in Section 4 and Section 5 in 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 FI

FIs delivering on-aeroplane and FSTD licensing training set the foundation for subsequent type rating, operator conversion and recurrent training.

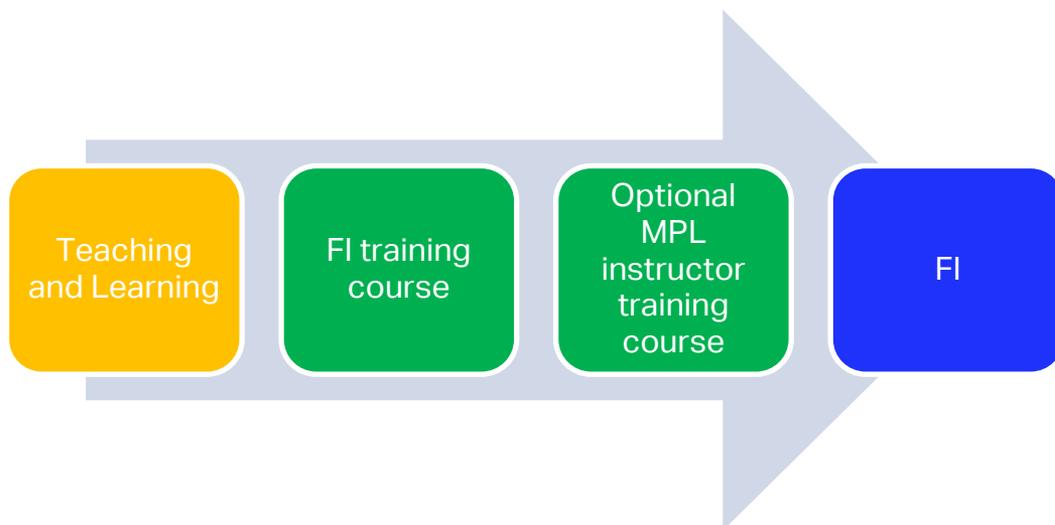
Teaching and learning

During this part of the IE training course, which is identical for all instructor courses, ATOs should thoroughly introduce CBTA principles and the IECs. Special emphasis is placed on IEC4 (Management of the trainees) which includes the OBs of the FI as a role model. The teaching and learning course is fully credited towards further instructor certificates.

FI training course

Applicants must pass a pre-entry flight test and the complete FI training course comprising theoretical and on-aircraft practical instruction. During their initial 100hrs of flight instruction delivery, FIs are restricted in their privileges.

After completing 200hrs of flight instruction (and 500hrs of flight time as a pilot) FIs may participate in an MPL instructor training course to extend their privileges to conduct MPL training.



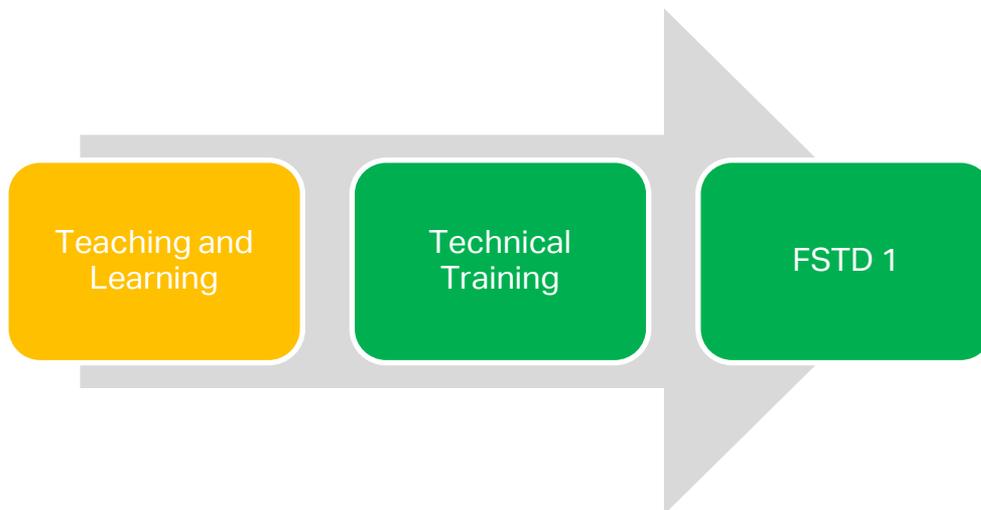
Duties of an FI

Besides training private pilots, FIs mainly deliver training for CPL and MPL courses. As many ATOs use young FIs who are building hours in preparation for an airline pilot career, it is important that ATOs intensify their initial and recurrent standardization. ATOs should ensure that airline experienced coaches are available.

This can ideally be achieved through arrangements with AOCs; especially for co-pilots beginning a career as an instructor, AOCs may add value by developing a career path for IEs, which includes a module to collect experience as an FI at an ATO.

5.2.1.2 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.

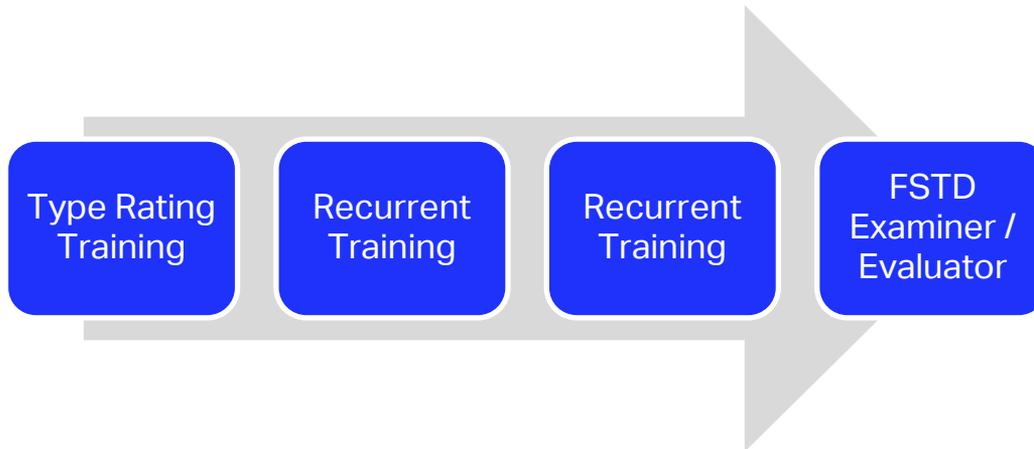
Technical training

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.

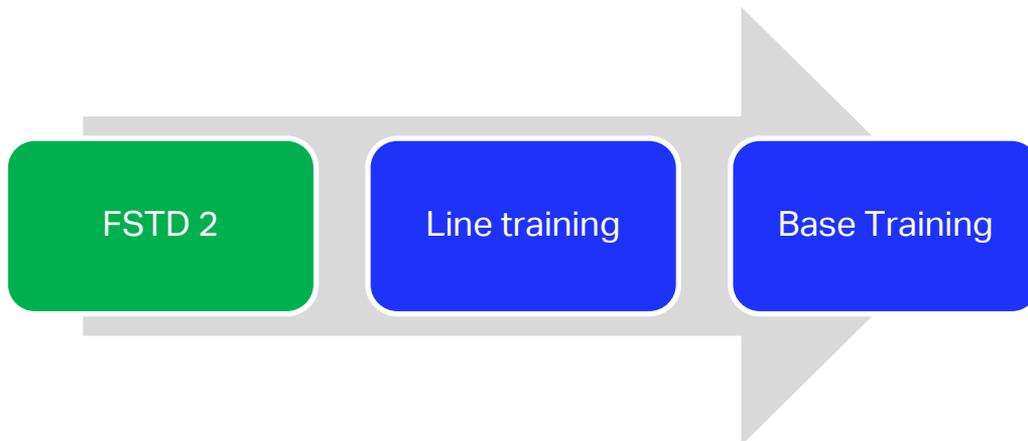
Duties of SFI and "restricted" TRI



5.2.1.3 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 5.2.1.2 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 (5.2.1.2) 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:

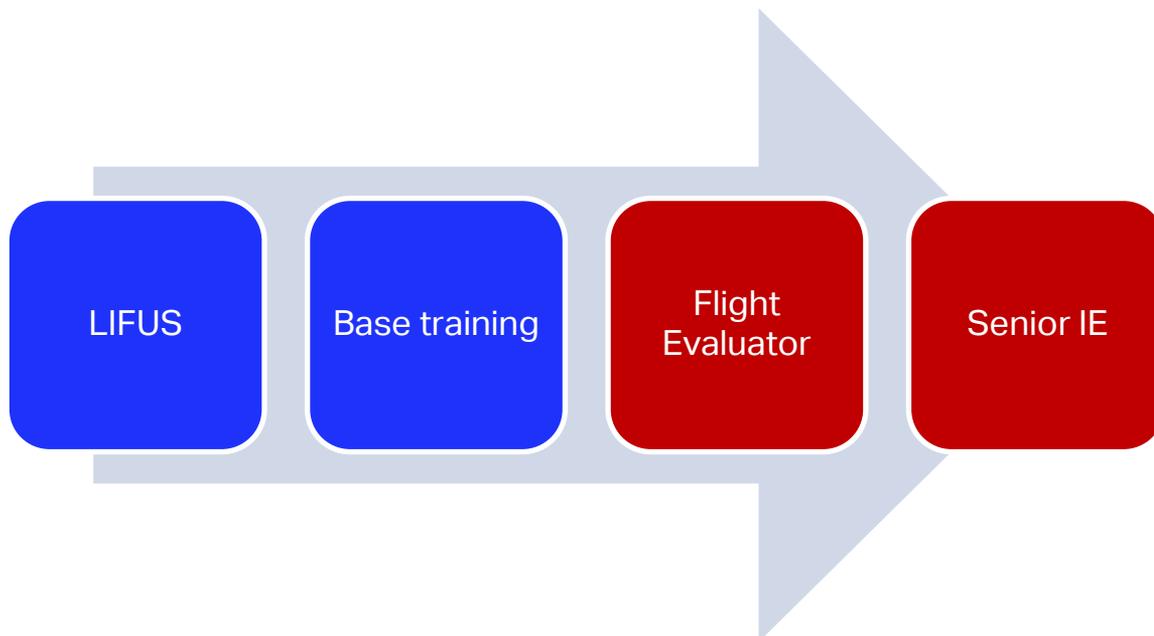
- Observes a TRI conduct actual line flying under supervision
- Conducts line flying under the supervision of a qualified TRI

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:

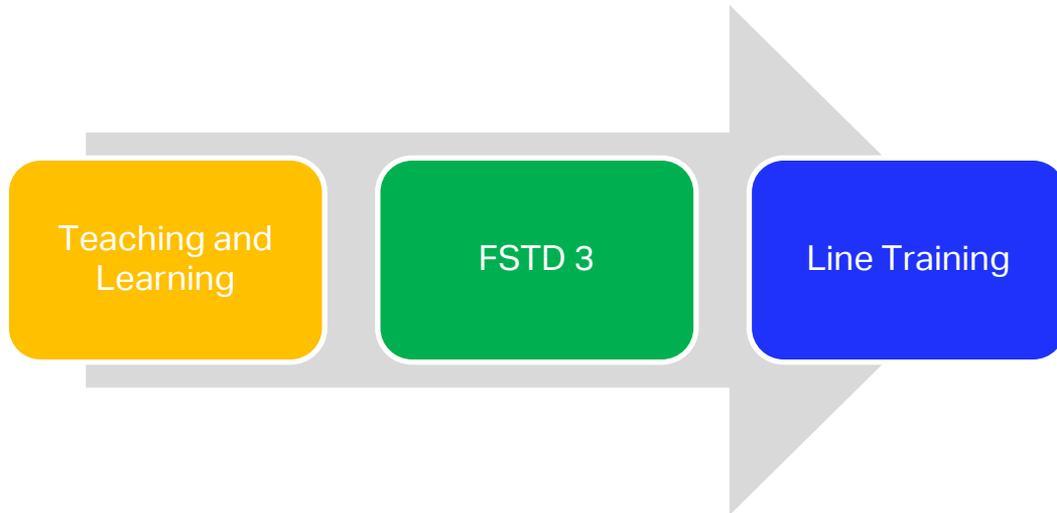
- Observes a TRI conduct actual base training
- Conducts base training under the supervision of a qualified TRI

Duties of a TRI



5.2.1.4 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 (5.2.1.2). 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.

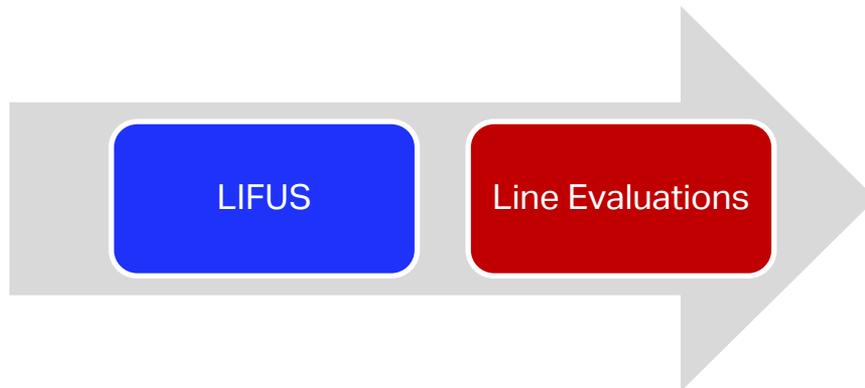
Line training:

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

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

Duties of an 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).

See Appendix 3 for examples of AQP operators instructor categories.

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 theatre 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)



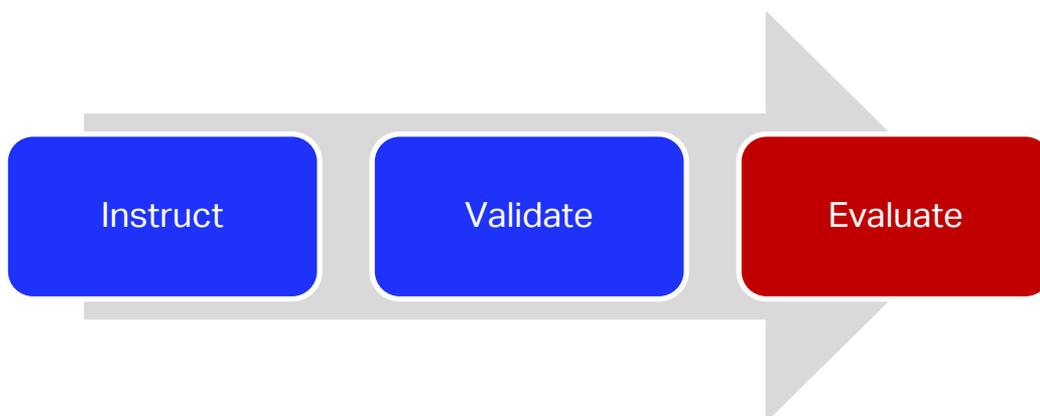
Academic training is performed through classroom and computer-based training.

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 Operational Simulations (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 Operational 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)

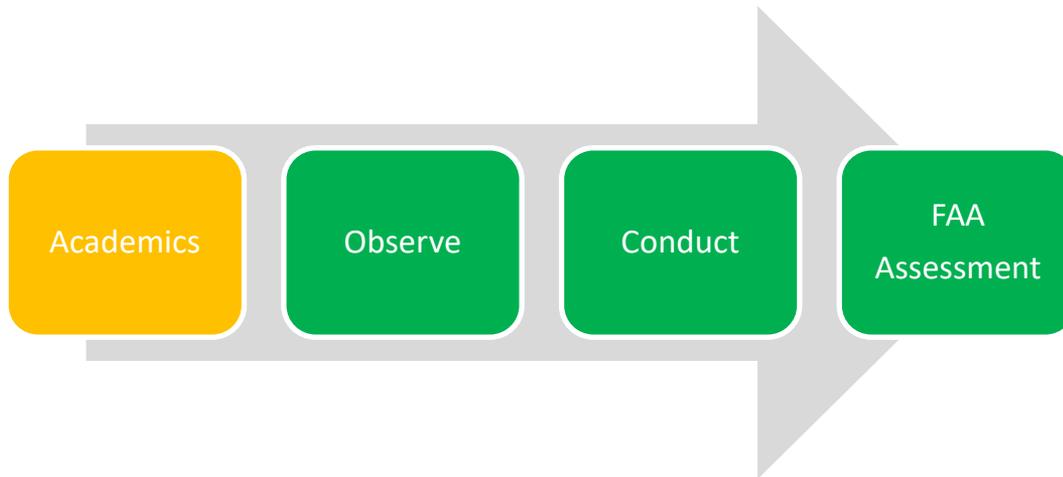


Instruct means instruction at all stages of the training.

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*

Source: FAA AC 120-54A

*Title 14 CFR part 135 operations only

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 enhanced 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–Airplane 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

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 number 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.

Standardization events are typically scheduled at a minimum once a year, or as required 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 From AQP or ATQP to EBT

CBTA evolved after AQP and ATQP. MPL was the first program to require CBTA for licensing training. EBT was the first program to require CBTA 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 CBTA; they aim at increasing the amount of training and decreasing checking by installing a data-based validation and evaluation mechanism and by strengthening TEM.

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.

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.

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 initial training with special emphasis on IECs 3 and 5 to become competent in applying appropriate methods of instruction (including adapted briefing and debriefing), and of assessment and grading of observed performance. Associated training may involve theoretical knowledge instruction using classroom and computer-based training, and practical demonstrations in an FTSD.

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 (ATQP) / line operational evaluation (AQP)
 - 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 CBTA. It introduces pilot competencies and the aspect of “evidence”.

ICAO Doc 9995, PART1, Chapter 6 contains guidance for training and assessment of IEs involved in the conduct of EBT.

Refer to 4.5 above for Instructor/Evaluator transitioning from traditional to CBTA (includes EBT).

5.8 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	Facilitation technique refers to an active training method, which uses effective questioning, listening and a nonjudgmental approach, and is particularly effective in developing skills and attitudes, assisting trainees in developing insight and their own solutions, resulting in better understanding, retention and commitment.
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 Facilitation

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 (CRM – Analysis and Evaluation of LOS performance – Line Operations).

Note: Similar schemes have been developed in the medicine domain for medical IEs. “Evidence-Informed Facilitated Feedback”⁶ uses the R2C2 feedback model (Build Rapport and relationship – Explore Reactions to and perceptions of the data – Explore understanding of the content of the data – Coach for performance change).

When transitioning 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?”

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.

⁶ MedEdPORTAL Publications, Association of American Medical Colleges, 2016

Section 6—Performance Assessment for IE

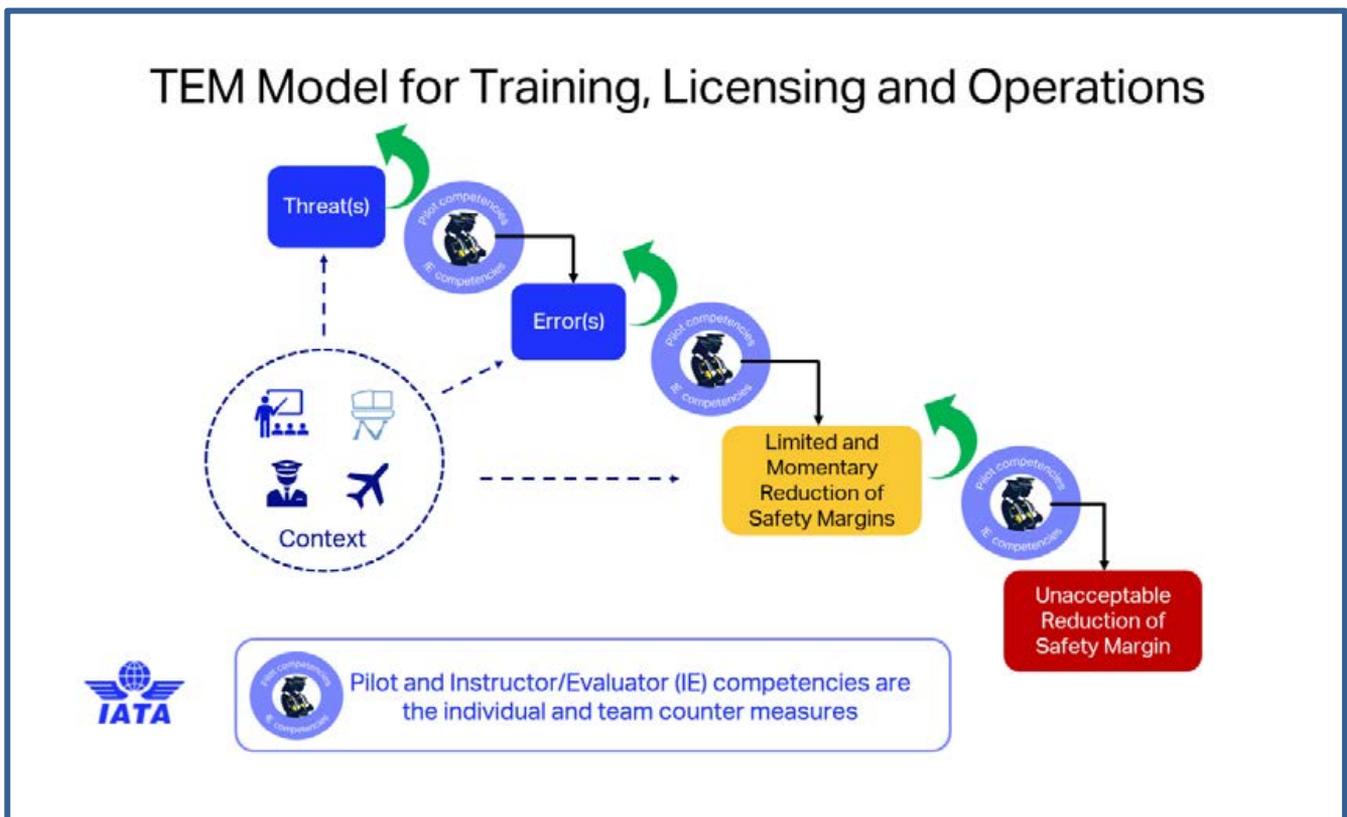
The following terminology is applied:

- “Trainee” means a pilot or an Instructor/Evaluator receiving training or evaluation
- “Trainer” means an Instructor/Evaluator conducting training or evaluation

The performance assessment process (ORCA) and methodology (VENN model) as described in the IATA Guidance Material for Competency Assessment and Evaluation for Pilots, Instructors and Evaluators are fully applicable to the IE competency assessment. Detailed content accessible [here](#).

This section provides complementary information related to the word pictures “OUTCOME of TEM” dimension in the training and licensing context to ensure consistent performance assessment for IE.

As a reminder (refer to Section 2) the role of the competency within the TEM has been formalized at the international level and IATA proposes the following schematic as a pedagogical tool to illustrate that, from a human performance perspective, the pilot and instructor/evaluator competencies provide the individual and team countermeasures to manage the threats, the errors and the potential reduction of safety margins that could happen during training, licensing and operations.



Note: “Limited and Momentary Reduction of Safety Margin” describes an outcome of TEM where the pilot or the instructor/evaluator demonstrated Observable Behaviors that did not allow, on few occasions, a timely management of the threats or errors. This led to a limited and momentary reduction of the safety margin. “Unacceptable Reduction of Safety Margin” describes an outcome of TEM where the pilot or the instructor/evaluator demonstrated Observable Behaviors that did not allow a timely management of the threats or errors. This led to an unacceptable reduction of the safety margin.

6.1 Process to Assess the Performance

It is to be noted that 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.

To assess the trainee’s performance, the trainer should apply the following process:

- Observe performance (behaviors) during the training or evaluation.
- Record details of effective and ineffective performance (behaviors) observed during the training or evaluation (“record” in this context refers to instructors taking notes).
- Classify observations against the Observable Behaviors (OBs) and allocate the OBs to each competency (or competencies).
- Assess the performance by determining the root cause(s) according to the competency framework. Low performance would normally indicate the area of performance to be remediated in subsequent training.

Remark: Depending on the training objective, the trainer guidance may indicate competencies which may be irrelevant to be assessed or recorded. In that case, the trainer will record “N/O” (NOT OBSERVABLE).

6.2 Competencies Assessment Method (VENN Model)

The VENN model is a methodology to ensure the maximum level of consistency and objectivity to assessments performed in a CBTA program.

To assess how well the trainee demonstrated the competency during training or evaluation, the trainer should assess the associated OBs of each competency against the following dimensions by determining:

- How many OBs the trainee demonstrated when they were required;
- How often the trainee demonstrated the OB(s) when they were required; and
- What was the outcome of the threat management and error management relating specifically to the competency being assessed?

The competency assessment (**HOW WELL**) is the combination of the number of OBs demonstrated and their frequency of demonstration and the consequential outcome of the Threat and Error Management relating specifically to the competency being assessed.

The "**HOW MANY**" dimension provides evidence related to the acquisition of the competency.

The "**HOW OFTEN**" dimension provides evidence related to the robustness of the competency.

The "**Outcome of TEM**" dimension provides evidence related to the effectiveness of the competency as individual and team countermeasures against the threats and errors.

6.2.1 Word Pictures of "HOW MANY" dimension

The following word pictures support the VENN model by providing a scale for the "**HOW MANY**" dimension regarding a number of OBs demonstrated when required:

HOW MANY
few, hardly any
some
many
most
all, almost all

6.2.2 Word Pictures of "HOW OFTEN" dimension

The following word pictures support the VENN model by providing a scale for the "**HOW OFTEN**" dimension regarding a frequency of OBs demonstrated when required:

HOW OFTEN
rarely
occasionally
regularly
regularly*
Always, almost always

regularly* This regularly* is interpreted as very often

6.2.3 Word Pictures of “OUTCOME of TEM” dimension

The following word pictures support the VENN model by providing a scale for the “Outcome of TEM” dimension relating specifically to the competency being assessed:

OUTCOME of TEM <small>relating specifically to the competency being assessed</small>	The demonstrated Observable Behaviors <small>relating specifically to the competency being assessed</small>
unsafe situation	<input type="checkbox"/> Did not allow a timely management of the threats or errors <input type="checkbox"/> This led to (or could have led to**) an unacceptable reduction of the safety margin.
not an unsafe situation	<input type="checkbox"/> Did not allow, on few occasions, a timely management of the threats or errors <input type="checkbox"/> This led to (or could have led to**) a limited and momentary reduction of the safety margin.
safe	<input type="checkbox"/> Allowed the anticipation and mitigation of many expected threats, the recognition and mitigation of the unexpected threats and the timely detection and correction of the errors. <input type="checkbox"/> This led to (or could have led to**) the maintenance of the safety margin.
safe*	<input type="checkbox"/> Allowed the anticipation and mitigation of most expected threats, the recognition and mitigation of the unexpected threats and the promptly detection and correction of the errors. <input type="checkbox"/> This led to (or could have led to**) an improvement of the safety margin.
enhance safety	<input type="checkbox"/> Allowed the anticipation and mitigation of all expected threats, the recognition and mitigation of the unexpected threats and the immediate detection and correction of the errors. <input type="checkbox"/> This led to (or could have led to**) an enhancement of the safety margin.

Safe*: This word picture (safe*) illustrates a more pro-active safety level.

or could have led to** must be used to:

- Integrate the outcome of TEM dimension when the conditions of training are significantly limited, e.g., classroom, part task trainer, ...
- Ensure that the OUTCOME of TEM dimension relates specifically to the competency being assessed.

During the competency assessment, the TEM model assists the instructor/evaluator in understanding the interrelation between safety and the trainee’s performance in dynamic and challenging operational contexts.

OUTCOMEE of TEM in the context of training and licensing

The OUTCOME of TEM dimension is applicable for IE performance assessment.

In the context of training and licensing, the OUTCOME of TEM dimension integrates the specific threats, errors and potential reductions of safety margins that could happen or result from the conduct of training or evaluation activities.

In the context of training and licensing, potential threats could be:

- Event requiring an evacuation of the facilities or of the device
- Facilities, training device or equipment not appropriate for the training objective (Actual Malfunctions, MEL, Device certification...)
- Training interruption or disruption (FFS down, ATC constraint, phone call, ...)
- Any disruption that generates time pressure (late arrival of the trainee, trainee does not show up, training time reduced...)
- Last minute change of training rostering (session content, trainees...)
- Inappropriate Official documentation (FCOM not up to date, training programs deficiencies ...)
- ...

In the context of training and licensing, potential errors could be:

The instructor/evaluator:

- Does not prepare sufficiently the training session (not familiar enough with the training facilities access, with the training device functionalities, with the IT procedures...)
- Has hobby horses
- Does not manage time appropriately
- Does not manage priorities appropriately (e.g., during flight instruction focuses on instruction instead of safety of the flight, ...)
- Omits safety briefings elements or training tool limitations
- Intervenes inappropriately (too early or too late)
- Refers to personal customized documentation
- Uses inappropriate teaching method (does not facilitate, ...)
- Generates unrealistic or inappropriate conditions for the training
- Demonstrates negative attitude towards trainees (is careless, is harsh, has bias, is lacking empathy, ...)
- Does not allocate enough time for trainee feedback
- Is not familiar with training policy and procedures
- Omits to provide necessary advice to improve performance
- Cuts corners with the training program
- Does not apply organizational performance standards
- ...

In the context of training and licensing, potential reduction of safety margins could be:

- Limited and momentary reduction of the safety margin
 - Temporarily involuntary reduction of safety margin during training (e.g., mismanagement of a stall exercise) recognized and timely recovered by the instructor
 - Temporarily Negative transfer of training, recognized and timely recovered by the instructor
 - Temporarily Negative training, recognized and timely recovered by the instructor,
 - ...
- Unacceptable reduction of safety margins
 - Involuntary reduction of safety margin during training (e.g., mismanagement of a stall exercise) not recognized or lately recovered by the instructor
 - Negative transfer of training not recognized or not recovered by the instructor
 - Negative training not recognized or not recovered by the instructor
 - Incident or accident during training
 - ...

Note: When the training and assessment is conducted during flight operations (example IE as a trainee delivering instruction in an aircraft as an FI), the IE as trainer observes, as well, the IE as trainee managing the threats, the errors, and the potential reductions of safety margins in the operational context.

Appendix 1 – Standards and Regulations for Instructors and Evaluators

ICAO Standards

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.

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, Part I – General Procedures,

Chapter 3 and its attachment contain the qualifications to be held, and the competencies to be demonstrated by instructors and course developers employed in a competency-based training and assessment programme. In competency-based programmes, instructor competencies are made explicit, and instructors have to demonstrate these competencies throughout the training process and in their knowledge of the subject matter and training course content.

PANS-TRG, Part II – Training and assessment for aircraft operational personnel,

Chapter 6 — Threat and error management

This chapter describes the threat and error management model and provides the procedures applicable to all pilots.

Chapter 7 — The ICAO pilot instructor and evaluator competency framework

This chapter provides the procedures for establishing a competency-based training and assessment programme for pilot instructors and evaluators, including an ICAO competency framework.

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.

EASA Regulations

EASA distinguishes between licensing training described in the AIRCREW regulation (PART-FCL) and operator training described in the Air Operations (PART – ORO).

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.

PART-ORO – Organization Requirements for Air Operations

PART-ORO describes:

- Command course training
- Initial operator Crew Resources Management training
- Operator conversion training and checking (when joining an operator or when changing aircraft type), and
- Operator recurrent training that includes ATQP and EBT

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).

AMC 1 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.



FAA Regulations

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

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).

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.

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*” replace 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

Appendix 2 – 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) ⁷	Grade ⁸				
IE1-Pilot Competencies	Applies the pilot competencies	Situation awareness	1	2	3	4	5
		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	4	5
		Intervenes appropriately...					
		Etc.					
IE3-Instruction	Conducts training to develop the trainee's competencies	States clear objectives...	1	2	3	4	5
		Applies trainee-centered feedback...					
		Etc.					
IE4-Interaction with the trainees	Supports the trainee's learning and development Demonstrates exemplary behavior (role model)	Shows respect for the trainee's characteristics...	1	2	3	4	5
		Manages trainee's barriers...					
		Etc.					
IE5-Assessment and Evaluation	Assesses the competencies of the trainee Contributes to continuous training system improvement	Applies the competency standards and conditions	1	2	3	4	5
		Suggests improvements for the training system					
		Etc.					
Suggestions for improvements							

⁷ 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.

⁸ 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.

Appendix 3 – Examples of AQP Operators IE Categories

Delta Air Lines

- Academic Instructor (Non-Pilot eligible)
- Flight Training Procedures Instructor (Non-Pilot eligible)
- Flight Training Instructor (current or former Pilot)
- Proficiency Check Pilot (current or former Delta Pilot)
- Line Check Pilot (current Delta Pilot)
- Aircrew Program Designee (current Delta Pilot)

United Airlines

- Fleet Technical Instructor (FTI)
- Emergency Procedures Instructor (EPI)
- Fleet Training Specialist (FTS)
- Emergency Procedures Specialist (EPS)
- General Subjects Instructor (GSI)
- Simulator Instructor (FIA-PS)
- Limited Simulator Check Airman (PCA-LS)
- Simulator Check Airman (PCA-S)
- Aircrew Program Designee – APD (PCA-XS)
- Line Check Airman (PCA-IL)
- Line Check Airman – Initial Captain Observation (PCA-ILI)