Safety and Airspace Regulation Group

Flight Operations

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Guidance on the requirements for the training and assessment of Human Factors for Flight Crew under UK Part ORO and UK Part FCL.

All amendments to this document will be completed electronically. The latest version of the document can be found at www.caa.co.uk/standardsdocument29

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AMENDMENT SUMMARY

Version 9.1 September 2025

Updated to fix broken links and include a missing portion of a table.

Version 9 March 2025

Extensive re-write of the document to incorporate the latest relevant information from UK Part FCL and Part ORO as of Jan 2024.
Short Guide to performance standards removed, replaced with more clarity on training design and evaluation of training effectiveness.
More clarity on differences between Part FCL and Part ORO. Emphasis on operator responsibilities for contracted CRM provision.
Updated to reflect Flight Crew Competencies development.

Version 8 May 2019

Extensive re-write of the document to incorporate the latest relevant information from EASA Part FCL and Part ORO as of May 2019. Updated terms of reference of the Flight Crew Human Factors Advisory Panel (Appendix 6).

Version 7 August 2016

Standards Document 29 includes an updated terms of reference of the Flight Crew Factors Advisory Panel (Appendix 7).

Version 6 June 2015

Standards Document 29 has been substantially re-written to provide guidance for individuals and Operators subject to the requirements of UK Part FCL and Part ORO with regard to the training and testing of CRM, including recognisable human factors and behavioural markers.

Glossary

AMC	Acceptable Means of Compliance
AltMoC	Alternative Means of Compliance
AoC	Assessment of Competence
ATPL	Airline Transport Pilot Licence
ATQP	Alternative Training Qualification Programme
CBTA	Competency Based Training and Assessment
CRE	Class Rating Examiner
CRI	Class Rating Instructor
CRM	Crew Resource Management
CRMT	Crew Resource Management Trainer
CRMT (E)	Crew Resource Management Trainer Examiner
EBT	Evidence Based Training
FSTD	Flight Synthetic Training Device
GM	Guidance Material
HF	Human Factors
HPL	Human Performance and Limitations
IR	Instrument Rating
LPC	Licence Proficiency Check
LST	Licence Skill Test
LIFUS	Line Flying under supervision
MCC	Multi-Crew Co-operation
NOTECHS	Non-Technical Skills
NTS	Non-Technical Skills
OPC	Operator Proficiency Check
SAR	Search and Rescue
SMART	Specific; Measurable; Achievable; Relevant; Time-Bound
TOR	Terms of Reference
TRE	Type Rating Examiner
TRI	Type Rating Instructor

2 Introduction

2.1 Origin

This document has been developed in conjunction with the UK Flight Operations Human Factors Advisory Panel (FOHFAP). The requirements and qualifications described relate to the regulations for commercial flight operations under UK Part ORO and UK Part FCL.

Safety research has shown human error to be the prime contributing factor in many aviation incidents and accidents. Recognition of this fact prompted the introduction of mandatory Crew Resource Management (CRM) and Multi-crew Cooperation (MCC) training for Flight Crew more than 20 years ago.

CRM training for Flight Crew has developed considerably since its introduction, and the requirements are now much more ‘operationally’ orientated. In addition, the principle that human error is ubiquitous and inevitable is more widely accepted. The development and training of effective threat and error management strategies now forms the core of many Operators’ CRM training programmes, and rightly so. Effective Threat and Error Management is the aim, and effective CRM training is how this is achieved.

The regulatory requirements also continue to be refined in support of these developments. This process is expected to continue as, for example, more evidence based and data driven training/assessment methodologies such as ATQP, CBTA, and EBT are developed, and adopted.

The intention is that this publication reflects current requirements; however, it can only ever reflect the legislation that existed at the time of writing so should a contradiction or omission occur, it should be assumed that the source material (including AMC, GM etc.) has superseded the requirements described here. Guidance should always be sought from the UK CAA should there be any doubt.

3 The Regulatory Framework

3.1 Introduction

The regulatory framework acknowledges that significant safety benefits accrue from an integrated approach to the training and testing of both technical and non-technical skills. The subjects that underpin the core elements of performance are defined in UK Regulations. At first glance these appear to have been developed and labelled somewhat differently under UK Part FCL and UK Part ORO, however the table below shows how the training requirements can be mapped against each other.

3.2 Part FCL and Part ORO:

MCC Knowledge Requirements (AMC1 FCL.735)	**CRM Knowledge Requirements (AMC1 ORO.FC.115)**
Human Factors, TEM & CRM Application of TEM and CRM principles to training	Human factors in aviation; General instructions on CRM principles and objectives; Human performance and limitations; Threat and error management.
	Personality awareness, human error and reliability, attitudes and behaviours, self-assessment and self-critique; Stress and stress management; Fatigue and vigilance; Assertiveness, situation awareness, information acquisition and processing; Human Performance and Limitations
Automation	Automation and philosophy on the use of automation
Aircraft systems	Specific type-related differences
Undesired aircraft states Understanding of aircraft performance and configuration	Monitoring and intervention
PF & PM roles	Shared situation awareness, shared information acquisition and processing; Workload management;
	Effective communication and coordination inside and outside the flight crew compartment; Leadership, cooperation, synergy, delegation, decision-making, actions; Resilience development; Surprise and startle effect; Cultural differences.
SOPs Checklist philosophy Interpretation of FMS data and in-flight documentation	Operator's safety culture and company culture, standard operating procedures (SOPs), organisational factors, factors linked to the type of operations; Effective communication and coordination with other operational personnel and ground services.

3.3 Training and Assessment of CRM

The training and assessment of MCC is required by Part FCL, and the training and assessment of CRM is required by Part ORO.

Part FCL and the accompanying AMC/GM describe the requirements for the initial issue and maintenance of validity of a Flight Crew licence and any associated type/class ratings. Human Performance and Limitations is a core theoretical syllabus item. The principles of threat and error management and crew resource management must be integrated throughout a type/class rating course. An individual wishing to extend the privileges of their licence to include a type or class operated in a multi-crew environment must additionally complete a Multi-crew Co-operation Course.

The licence holder's MCC skills are then tested during the Licence Skill Test (LST) for the initial issue of a multi crew rating, and retested during a Licence Proficiency Check (LPC)

Part ORO describes the requirements for the training and assessment of CRM skills for Flight Crew. They apply equally to both multi-crew and single-pilot operators. CRM is trained when joining an operator, during the type or class rating, during recurrent training and for a command course. CRM skills are assessed during Operator Proficiency Checks (OPC) and Line Checks.

4 CRM Training - General

AMC1 ORO.FC.115

4.1 General Requirements

Each operator is responsible for the standards of CRM training provision, and the performance standards of their CRM Trainers, in accordance with the UK CAA Air Ops regulations. Operators can expect UK CAA Inspectors to observe ground school/classroom training, and simulator training to verify compliance, but not competence.

4.2 Training Environment

CRM training is delivered in both the non-operational environment, and the operational environment.

The non-operational environment is considered to be classroom based, or, in certain circumstances, can be delivered via CBT (Computer Based Training). Operators should note the limitations of using CBT for CRM training, as described below.

The operational environment is considered to be the simulator (including the simulator briefing & debriefing), or during line training.

4.3 Classroom Training

Classroom training is required to be delivered in a group session, in an environment conducive to learning. Importantly, away from the pressures of the usual working environment. What this means, from a practical sense, is that operators should provide a sufficient opportunity for a number of flight crew members to attend CRM training, as a dedicated training session, in a dedicated training space, such as a training centre classroom, or other classroom style facility. This may be, for example, a hotel conference facility.

4.4 Computer Based Training (CBT)

CBT is not to be conducted as a stand-alone training method. It may however be used as a ‘complementary’ training method. This means, for example, crew could undertake some pre course learning via CBT, and consolidate this learning in the classroom.

4.5 Flight Simulation Training Devices (FSTD)

It is recommended, that wherever possible and practicable, parts of CRM training

should be conducted in a simulator that can reproduce a realistic operational environment. With the advent of NOTECHs, and the evolution to CBTA, it has become commonplace to discuss CRM topics during LOFT scenarios, or during debriefs of simulator details.
It should be noted however, this not the same as the training of CRM in the simulator. Instructors must demonstrate their ability to integrate, train, and if applicable, assess, or evaluate, CRM, as per AMC1 FCL.920.
It could be considered best practice to deliver the applied training in the simulator as a continuation of the classroom training objectives. This would require close liaison between the CRM trainers and the wider training department to ensure continuity.

4.6 Contracted CRM Training

It is accepted, and understood, that not all operators have the resources available for internal CRM Trainers. Therefore, it is permissible for operators to have CRM provided by CRMTs from another operator, a third party, or a CRM training organisation. Such contracted activities must be in accordance with ORO.GEN.205

Operators should note that there is no approval given from the UK CAA for CRM training providers. Operators are responsible for ensuring that the contracted CRMT is qualified in accordance with AMC3 ORO.FC.115, and that the training content delivered is applicable to the type of operations, the culture of the organisation, and references the associated procedures of that operator.

The operator should also ensure that the training content is developed in accordance with the requirements in AMC1 ORO.FC.115, in particular taking into account information from the operator's management system, and the results of the CRM assessment.

Those personnel delivering contracted CRM training, should ensure that the training content is in accordance with the training requirements for that particular operator. It would be expected that courses delivered by a contracted CRM trainer are bespoke to the organisation. In the case whereby crew members from different operators attend the same course, the content should be specific to the type of operation, and to the crew members concerned.

5 Training Content and Design

5.1 Training Content

The content to be covered in the Initial Operator's CRM training, Annual Recurrent CRM training, Operator Conversion Course and Command course is detailed in AMC1 ORO.FC.115 table 1 of (g).

The table only describes the topics that are to be covered, and not the specific learning objectives. It is expected that operators will define the detailed training requirements of each course topic, to be relevant to their operation. Specific training needs should be identified from the following sources:

- AMC1 ORO.FC.115 (a)(7)

CRM training should address hazards and risks identified by the operator's management system described in ORO.GEN.200.

- AMC1 ORO.FC.115 (d)(1)

Annual recurrent CRM training should be provided in such a way that all CRM training elements specified for the annual recurrent training in Table 1 of (g) are covered over a period not exceeding 3 years.

- AMC1 ORO.FC.115 (d)(2)

Operators should update their CRM recurrent training programme over a period not exceeding 3 years. The revision of the programme should take into account information from the operator's management system including the results of the CRM assessment.

5.2 Training Design

The fundamental component for delivering effective training, is the design of the training programme.

The model outlined within CRM training regulations is the ADDIE model (GM4 ORO.FC.115). Whilst listed within the CRM training domain, the ADDIE model is recognised internationally as a basis for any training programme design and has been academically validated.

The table is published in the regulations as guidance only. Operators may wish to adapt the specific elements of the model to suit their type and scale of operation.
An example of an adapted model is shown below.

Step No	Description	Element
1	Analysis	Identify the syllabus items required to be covered
		Analyse outputs from the management system
		Analyse outputs from training feedback
		Define CRM training aims
		Conduct gap analysis
2	Design	Identify available resources
		Identify structure and duration
		Define CRM learning objectives
		Decide on delivery methods
3	Development	Create training content
		Determine how training effectiveness will be measured
		Prepare resources
		Develop full-scale prototype of training
		Train the Trainer course
4	Implementation	Implement the CRM training programme
		Prepare trainees and environment
		Create a climate conducive to learning
		Monitor instructor standardisation
5	Evaluation	Evaluate CRM training effectiveness at multiple levels
		Revise the CRM training programme if required

5.3 Bloom's Taxonomy

It is recommended that training aims and objectives are set using a defined learning taxonomy, as is recommended in Part FCL. This will assist in ensuring that objectives follow the SMART methodology and will assist greatly in trainer standardisation.

Blooms Taxonomy is referred to within the regulations as Guidance Material in Part FCL, however it is an academically verified taxonomy that can be applied in all training course design and development. (GM1 FCL.310; FCL.515(b); FCL.615(b))

Aims are set at a broad, high level, however objectives are required to be set at a more specific level, and use the action verbs defined in the taxonomy columns. An example of Bloom's Taxonomy can be found in Appendix 2.

5.4 Explanation of the verbs used in the Benjamin Bloom Taxonomy

The depth or level of learning to be achieved during the training, and the corresponding level of attainment to be examined or assessed, is based on the following taxonomy. In each case, the level of knowledge or skill is signified by the learning objective (LO) verb.
An example of Bloom's Taxonomy can be found in Appendix 2

The majority of the LOs relate to the cognitive domain. The taxonomy described by B. Bloom (1956) and Anderson & Krathwohl (2001) has been used as the standard.

The six sequential increasing levels of required cognitive learning are identified by the LO verb. Hence the lowest level 'remember' is signified by verbs such as 'state', 'list', 'define' and 'recall' whilst the next higher level of 'understand' is signified by verbs such as 'describe' and 'explain'. The third level of 'apply' is signified by the verbs 'calculate', 'interpret', 'relate' and 'solve'.

- Classroom/Ground CRM Training

Within classroom training, the aims and objectives are limited primarily to levels 1, (Remember), and 2, (Understand). Whilst discussions or examples of level 3 (Apply) can be facilitated, level 3 is where the training moves from the classroom into the simulator or operational environment.

- Simulator Training

Within the simulator and operational environment, training objectives are best set at Level 3, Apply. It goes without saying however, that crews/trainees are unlikely to be able to apply their learning effectively, if foundational levels 1 and 2 are not secure. Instructors may be required to revisit some of the foundational CRM training objectives in order to train the application of CRM skills effectively.

- Instructors

The higher levels of Analyse (level 4), Evaluate (level 5) and Create (level 6) are not applicable in the level of training that is delivered to crew in either the classroom or simulator environment.

The general rule of thumb for instructor or trainer competence and proficiency, is to have a level of learning 1 level higher than the level that they are teaching.

Therefore, as a guide, it would be expected that CRMTs delivering training in the classroom environment should have the level of proficiency at least at Level 3 (Apply). Instructors delivering CRM training in the operational environment should therefore be required to demonstrate CRM proficiency at a minimum of Level 4 (Analyse).

5.5 Training Effectiveness

Measuring training effectiveness is a key component of the training design model. Whilst CRM training is only one component of the wider training system, human performance is integrated throughout the operation, and performance improvements can have notable efficiency and safety benefits to an organisation.
To quote Capt. Colin Budenburg, 'If CRM training doesn't reach the flight deck, then we are wasting our time'.

There are numerous models available for measurement of training effectiveness. The

most widely recognised and utilised in various forms, is the Kirkpatrick Model of Training Evaluation.
When designing and developing the CRM training programme, operators may find it useful to identify how training effectiveness will be measured.

5.6 Kirkpatrick Model of Training Evaluation

- Level 1 - Reaction
  - Reaction, or a course feedback form, measures what the participants thought of the course. Whilst an enjoyable or engaging session is not considered to be a direct measure of effectiveness, research has shown that if participants enjoy their course, there is a higher likelihood of training transfer occurring.
  - In CRM training, the operator may wish to consider a post course feedback form, specific to CRM, rather than a generic form for multiple refresher sessions.

- Level 2 - Learning
  - Learning measures the degree to which participants acquire the intended knowledge, skills, or behaviours, based on their participation in the training.
  - Traditionally, Level 2 is measured using exams, however CRM training rarely, if ever, has a knowledge check of the course content as is required in other training courses. The regulations only state that CRM skills should not be assessed during training in the non-operational environment. This does not prohibit a knowledge check being undertaken to measure the level of knowledge and/or understanding of the learning objectives.

- Level 3 - Behaviour
  - Behaviour measures the degree to which participants apply what they learned during the classroom training, and transfer this to the workplace.
  - With Flight Crew CRM training, measurement of the behaviours associated with the learning objectives would be evaluated in the real, or simulated, operational environment. This requires clear guidance material to be made available to line trainers, instructors and examiners. The behavioural expectations should be defined during the training design and development phase.

- Level 4: Results
  - Level 4 measures the degree to which targeted organisational outcomes occur as a result of the training.
  - In a CRM training context, the organisational results may take a

number of months, or even years to materialise. These results will be shown in the metric that was used to develop the training needs at the Analyse phase of the training design model. For example, if the training need was identified from the safety management system, then this is where we would look to see the results. Likewise, if the training need was identified from the results of the CRM assessment, then this is where the results would be measured.

6 CRM Trainers (CRMTs)

6.1 CRMT Appointments

AMC3 ORO.FC.115

The Flight crew CRM Trainers responsible for classroom CRM Training have a pivotal role to play within an Operator's safety system, and are an important means by which CRM performance standards are developed and maintained.

A CRM Trainer role is no longer an appointment, or certificate, issued by the CAA. When the UK joined EASA in 2014, the responsibility for trainer standards and competence fell to the individual operators. Whilst this gives more flexibility, and more tailored training and assessment processes to be developed, operators are therefore required to develop and publish procedures within Part D of their Operations Manual, that describe the selection, training and assessment of all personnel involved in CRM Training.

Whilst the UK has now left EASA, this requirement is still extant.

It is a requirement of Part ORO that all personnel who conduct CRM Training are suitably qualified. Operators are therefore required to define suitably qualified, in accordance with the regulations.
Operators may wish to nominate a person to act as a single point of contact responsible for managing CRM training, and compliance with the regulations.

6.2 Qualification of Flight Crew CRM Trainer

Note: the requirements described are not applicable to:

- Instructors, holding a certificate in accordance with Commission Regulation (EU) No 1178/2011, who conduct CRM training in the operational environment; and
- Trainers or Instructors conducting training other than CRM training, but integrating CRM elements into this training.

In summary, instructors holding a certificate as described above (defined in GM1 FCL.900) are not required to complete the defined CRM Trainer training as is required for ground instruction.
Albeit not described explicitly in the regulations, this is due to the requirement in the practical elements of an instructor training course to include the ***teaching*** and assessing of TEM and CRM. (AMC1 FCL.920).

Hereon therefore, the requirements for appointing CRMTs refers to classroom (ground) training.

6.3 Alternative acceptable qualifications & experience for a Flight Crew CRMT to be suitably qualified:

AMC3 ORO.FC.115 (b)

It is generally accepted, and maybe expected, that to be a Flight Crew CRMT, the requirement is to be a current pilot, either within the organization where the training is being delivered, or, for another operator. However, there are provisions in place for CRMTs to be appointed if they fulfil other requirements.

- Paragraph 2 (ii) (B), allows trainers who do not hold a commercial pilot licence, to become a Flight Crew CRMT so long as they have covered the ATPL syllabus for the Human Performance and Limitation (HP&L) examination as defined in AMC1 FCL.310.

- Paragraph (3) (i) allows former pilots to continue delivering CRM Training to flight crew upon cessation of flying duties.

- Paragraph (3) (ii) allows former pilots to become a Flight Crew CRM Trainer, if they were not appointed as one prior to cessation of flying duties.

- Whilst not explicitly stated, Paragraph (3) (iii), allows (for example) Cabin Crew CRM Trainers, or CRM Trainers appointed under different regulatory authorities to become Flight Crew CRM Trainers under the UK Regulations.

In all cases, it is the responsibility of the operator to determine and/or define their appointment requirements.

6.4 Training of flight crew CRM trainer

AMC3 ORO.FC.115 (c)

Flight Crew CRMTs are required to undertake training prior to delivering CRM sessions. The training elements are clearly defined in the regulations.

The theoretical training should cover the topics as listed in table 1 of AMC1 ORO.FC.115, in addition to the other requirement listed.
Whilst much of the theoretical training course could be considered generic, and may be delivered by an external company, there is still a requirement for the ‘operator’ specific training as described in (c)(2)(ii). Additionally, the practical training will be bespoke to each operator, and is required to be included and defined in the Operator’s Training Manual Part D.

6.5 Use of Third Party training providers

If an operator wishes to utilise an external training provider for the basic training of CRMTs, it should be noted that the organisation being used is required to be audited by the operator as a contracted activity, and follow the applicable process defined in ORO.GEN.205. Operators are required to evidence how this has been achieved.

- There is no approval process for CRM/CRMT providers from the UK CAA.

6.6 CRMT Refresher Training

Refresher training of CRMTs is to be completed triennially, and is a requirement for revalidation. Refresher training requirements as described in (c)(3), should expand beyond simply the overview of content of the next training cycle. Its purpose is to continue to evolve trainer knowledge and skills, and should be considered as developmental.

The recommended minimum training time for CRMT refresher training (excluding breaks) is 6 hours. GM3 ORO.FC.115

6.7 CRM Trainer Standards and Assessment

The standard for what constitutes acceptable levels of performance, capability, and competence to be a CRM Trainer is set, and managed by individual operators. Guidance material is published in the Air Ops regulation (GM7 ORO.FC.115) as to what a CMRT assessment could look like; however, the defined performance standards are the responsibility of the training department within each individual AOC.

Operators are required to establish a process whereby all CRM Trainers (CRMTs) are assessed and standardised. This assessment will be undertaken every three years and records maintained to confirm the activity.

Each AOC should ensure that the process for the assessment is included in the operations manual, describing methods for observing, recording, interpreting, and debriefing the flight crew CRM trainer. It is a regulatory requirement for the operator to demonstrate that the personnel involved in the CRMT assessment are credible and competent in their role (AMC3 ORO.FC.115(d)).

An Operator that does not have the resources for internal CRMT Assessments of Competence may employ a suitably qualified third-party to conduct the assessment. If a third party is utilised for this purpose, this is considered a contracted activity, and the operator is required to follow the process defined in ORO.GEN.205

The operator is required to assess the CRMT whilst the candidate is conducting a

CRM course. This therefore infers it should be with a live class, supported by a qualified CRMT as required (who may be the CRMT Examiner). It is not considered sufficient for CRMTs to be assessed solely during a CRMT training course, where the class consists mainly of trainee delegates.

6.8 Recency and Renewal of qualification as a Flight Crew CRMT

The Air Ops regulation refers to Recency and Renewal of qualification. The requirements for 'recency' are of the concept of what is considered a revalidation from a Part FCL perspective. AMC3 ORO.FC.115 (e)

It is requirement for recency (revalidation) that the CRMT has conducted a minimum of two CRM training events in any 12 month period.
The regulations do not define a training event. The operator may wish to consider including this in their operations manual.

It is requirement for both recency and renewal that the CRMT has completed CRM refresher training as described in 5.6 above during the three year validity period. Operators should maintain records of all refresher training completed, and may wish to include the training provider and course content.

If a third party is utilised for refresher training, the process for contracted activities should be followed as per ORO.GEN.205.

7 CRM Trainer Examiners (CRMTEs)

7.1 Assessment of CRM Trainer

The process for the assessment of a CRM Trainer is described in both AMC3 ORO.FC.115(d) and GM7 ORO.FC.115

There is no formal role of CRM Trainer Examiner (CRMTE) within the Air Operations Regulations. However, for clarity, operators may wish to use the term CRMTE for those nominated as being suitable to assess CRMTs.

An operator's Part D should include the processes by which a CRMTE is selected, trained and assessed in that role.

The regulations require that all personnel involved in the assessment are 'credible and competent in their role'. It would therefore be best practice that the definitions of competency and credibility for this role would be described in the operations manual, and should include how this is achieved and demonstrated. Guidance material recommends that personnel conducting an assessment of a CRMT, have

demonstrated continued compliance with the provisions for a CRMT for a period of at least 3 years.

To ensure standardisation of assessments, the operator may consider providing suitable CRMTE standardisation training every 3 years.

Operators using an external CRMTE for the assessment process, are required to follow the contracted activities process described in ORO.GEN.205.

7.2 Training of CRMT Examiners

There is no prescribed or recommended training programme for a CRMTE, as there is for other examiner roles within Air Operations/Air Crew regulations. Operators are required, as described above, to ensure that the process for the assessment of the CRMT is described in the operations manual, and that all personnel involved must be competent and credible in their role.

A prospective CRMTE who does not already hold an examiner certificate may undergo training designed to equip them with the relevant Examiner competencies prior to being appointed as a CRMTE. It should be noted that this is not a regulatory requirement, but an example of best practice.

A suggested methodology is as follows:

Phase 1: (1 day course)

- The Regulatory Framework
- Standards document 29
- The assessment process
    - Pre-test preparation
    - Briefing the Candidate
    - Observing the Candidate
    - Assessing the Candidate
    - Debriefing the Candidate
- Practice Video assessments
- Practice Debriefs
- Report Writing

Phase 2: (1 day)

- Observe a CRMT assessment, if required

Phase 3

- Assessment

7.3 Specimen CRMT Assessment Form

Appendix 4 of this document includes a specimen CRMT Assessment Form. This may be used by an Operator to help assess the competence of personnel involved in CRM training.

8 Part FCL Instructors and Examiners

8.1 Requirements for the teaching of CRM under Part FCL

Under the regulations, Part FCL instructors (FI, TRI, CRI etc) are not required to undertake a formalised CRMT training programme, as defined and required for classroom CRMTs, if the training they deliver is in the operational environment (simulator or line flying). Instructor training for teaching CRM is included in the practical element of the instructor training course. (AMC1 FCL.920)

If a Part FCL instructor or examiner wishes to progress to teaching CRM in the classroom environment, and become a Flight Crew CRMT, they will be required to follow the appointment process as defined in their operations manual; however, the duration of the course can be reduced by 18 hours, to take into account the more generic 'teaching and learning' elements already covered.

Part FCL requires all instructors to be able to demonstrate that they have the knowledge and skills to be able to teach and assess Threat and Error Management and CRM in all appropriate phases of type, recurrent, and command training.
Historically, personnel holding a Part FCL instructor certificate were automatically given a CRMI 'qualification' for use in the assessment and debriefing of NOTECHs in the operational environment. With CRM developing and evolving, it can no longer be assumed that instructors have the specific knowledge, skills, and attitudes required to teach CRM in the operational environment.

As such, AMC1 FCL.920 states the practical elements of instructor training require the specific development of the skills required to teach (and assess) TEM and CRM. As such, instructors may be assessed on their knowledge of, and ability to teach, the CRM syllabus at a level applicable to the operational environment during both their initial and recurrent Assessments of Competence (AoC).

It should be noted here as guidance to operators, that whilst AMC1 describes the requirement for instructor skills to include teaching and assessing CRM, there is no further expanded guidance as to when or how this is to be achieved. The performance standards refer to integrating TEM and CRM, however making TEM/CRM links with technical training does not necessarily demonstrate the same level of knowledge as would be required to teach the CRM subjects in isolation.

AMC1 FCL.930.TRI describes the requirement for advanced technical knowledge, and demonstration of training the technical aspects of the aircraft, and the technical operations. There is no guidance as to how, and when instructors are trained, and examined on their ability to teach TEM and CRM.

Operators should ensure that instructor courses cover the teaching of CRM to sufficient depth, as is required for their organisation and as described in Chapter 4 of this document. Operators may wish to utilise experienced current CRMTs for

guidance purposes.

Appendix 5 of this document includes a specimen Assessment Form. This may be used by an Operator to help assess the competence of personnel involved in FSTD training.

9 Operator Conversion Course, Line Flying Under Supervision, Line Checks, and Command Course

9.1 Operator Conversion Course (OCC)

ORO.FC.220 requires the relevant elements of the CRM training syllabus in Table 1 AMC1 ORO.FC.115 to be integrated into this phase of training.

This requirement is applicable when either a flight crew member undertakes a conversion course with a change of aircraft type, or, change of operator.

All personnel involved in Operator Conversion Training must be competent and able to deliver these elements to the required depth. An Operator should be able to show how this is achieved and how standards are maintained in Part D of their operations manual.

9.2 Line Flying Under Supervision

Line flying under supervision (LIFUS) takes place after completion of the flight/simulator training required for the issue of a type rating, and/or an Operator's Conversion Course. It provides the opportunity for a flight crew member to practice and consolidate the procedures and techniques he/she has been made familiar with during the conversion course. It may be conducted by a TRI, or a flight crew member specifically nominated for the task by the Operator, who may not hold an Instructor Certificate issued in accordance with the requirements of Part FCL.

The applicable elements of CRM as specified in Table 1 of AMC1 ORO.FC.115 (g) is required to be integrated into this phase of training, as described in AMC1 ORO.FC.220 (a)(5).

N.B. The term LIFUS in the sense of Part ORO is more commonly known as Line Training, undertaken under the supervision of an operator appointed Line Training Captain. LIFUS for ZFTT purposes under Part FCL, refers to the take offs and landings that are required to be demonstrated under the supervision of a TRI(A) on behalf of the ATO.

All personnel involved in integrating CRM into LIFUS training must be suitably qualified, and able to deliver these training elements to the required depth as described in AMC1 ORO.FC.220 (a)(5).
An Operator should show how this is achieved, and how standards are maintained in Part D of their operations manual.

Appendix 5 of this document includes a specimen Assessment Form. This may be used by an Operator to help assess the CRM training competence of personnel involved in LIFUS training.

9.3 Line Checks

Line checks on the aircraft enable each crew member to demonstrate competence in carrying out normal line operations as described in the operations manual. These should be conducted by a suitably qualified commander nominated by the operator. The flight crew member should be assessed on their CRM skills during line checks, as described in AMC1 ORO.FC.115 (h)(2). and as specified in the operations manual.

The nominated Commander should be trained in CRM concepts and the assessment of CRM skills, as defined in ORO.FC.230 (c)(b). The operator should ensure that all personnel conducting line checks are appropriately qualified in assessing CRM skills, and should be able to show how this is achieved in Part D of their operations manual, as per ORO.FC.146 (a).

9.4 Command Course

ORO.FC.205 (a)(6) states the requirement for CRM training to be included in a Command Course. This is further defined in AMC1 ORO.FC.115 (e), which requires that the specified elements of Table 1 of (g) are integrated into the command course.

How this is achieved is the responsibility of the operator to define. It should be noted however, that the training design model described in Chapter 4 of this document is required to be followed, with specific training objectives identified from the hazards and risks within the operator's management system, as stated in AMC1 ORO.FC.115 (a)(7).

Whilst CRM training that is integrated into other parts of crew training is not required to be delivered by Flight Crew CRM Trainers, it is recommended that the operator draws on the expertise of a CRMT, in order to ensure appropriate training outcomes are designed into the course materials.

10 Assessment of CRM Skills

10.1 Assessment of CRM Skills

The assessment CRM skills is required to be conducted in the operational environment, as defined in AMC1 ORO.FC.115 (h).

As mentioned in Chapter 2, this applies during the Line Check and Operator's Proficiency Check (OPC). Details of how this is to be achieved is detailed in CAA Standards Doc 24A, Paragraph A6.5.4 Non-Technical Skills (CRM) Assessment.

Operators should ensure that a detailed description of the CRM Skills assessment methodology, including the required standards is published in the operations manual.

10.2 The NOTECHs behavioural marker system

The training and assessment of both MCC and CRM is a requirement under Part FCL and Part ORO respectively. MCC competence is specifically assessed during the Licence Skill Test (LST) and the Licence Proficiency Check (LPC); whilst CRM skills are assessed during the Operator's Proficiency Check (OPC) and the Line Check.

Under ATQP and EBT, technical and non-technical competencies are assessed during the Line Orientated Evaluation (ATQP) or Evaluation Phase (EBT).

The same assessment criteria should be applied to all these events; however, when the requirement to assess CRM was first introduced there were no formal measurements of competence, potentially leading to a subjective and extremely variable application of assessment standards. Research into a means of assessment showed that non-technical skills are reflected in recognisable behaviours, whose characteristics are identifiable using behavioural marker systems. The NOTECHS behavioural marker system described in GM6 ORO.FC.115 is one such system. It was developed and validated specifically for the purpose of assessing flight crew CRM skills and it used by many Operators today.

Category	Element	Behavioural Marker (examples)
Cooperation	Team building and maintaining	Establishes atmosphere for open communication and participation
	Considering Others	Takes condition of other crew members into account

	Supporting Others	Helps other crew members in demanding situations
	Conflict Solving	Concentrates on what is right rather than who is right
Leadership and managerial skills	Use of authority and assertiveness	Takes initiative to ensure crew involvement and task completion
	Maintaining standards	Intervenes if task completion deviates from standards
	Planning and coordination	Clearly states intentions and goals
	Workload management	Allocates adequate time to complete tasks
Situation awareness	Awareness of aircraft systems	Monitors and reports changes in systems' states
	Awareness of external environment	Collects information about environment (position, weather and traffic)
	Anticipation	Identifies possible future problems
Decision-making	Problem definition and diagnosis	Reviews causal factors with other crew members
	Option generation	States alternative courses of action
		Asks other crew members for options
	Risk assessment and option selection	Considers and shares estimated risk of alternative courses of action
	Outcome review	Checks outcome against plan

10.3 Competency and Evidence Based Training Programs

In an EBT competency framework the core competencies are listed along with key behavioural performance indicators to aid assessment and the evaluation of competence.

A suggested version of the Pilot Competencies can be found in Appendix 1

Regardless of the methodology or competency framework used, robust Instructor training is essential to ensure inter-rater reliability, consistency and a standardised assessment process.

Operators must include the process by which their Instructors, Examiners and Assessors are trained, validated and then standardised on an on-going basis in Part D of their operations manual.

Care should be taken to remove as much of the subjectivity out of the evaluation as is reasonably practical, and that assessment criteria should not be modified based on the experience levels of the candidate, as this introduces a level of uncontrolled subjectivity.

The following has been taken from the IATA EBT Implementation Guide:

Background

Evidence-Based Training (EBT) is a major safety initiative that arose from an industry-wide consensus that, in order to reduce the airline accident rate, a strategic review of recurrent and type-rating training for airline pilots was necessary. A review of available data sources, their scope, and relative reliability was undertaken. This was followed by comprehensive analyses of the data sources chosen, with the objective of determining the relevance of existing pilot training and to identify the most critical areas of training focus.

The aim of EBT is to train and assess the competencies required to operate safely and efficiently in a commercial air transport environment, while addressing the most relevant threats according to evidence collected in accidents, incidents, flight operations and training. The EBT program seeks to drive pilots to master competencies, to enhance their confidence and to develop resilience managing unforeseen situations in stark contrast to traditional recurrent training and checking programs that train and evaluate “set piece” events, often found to lack relevance to modern aircraft.

Since the publication of ICAO Doc 9995, Manual of Evidence-based Training in 2013, many States and regulators have adopted EBT into their regulations and have encouraged their operators to implement EBT. As an example, as of 2015 EASA permitted the introduction of EBT provisions for operator flight crew training via the publication of a guidance material addressing the implementation of a mixed EBT program, in advance to the baseline EBT European regulation applicability in 2020.

The experience gained by operators having implemented EBT during the last decade combined with the work performed by IATA to review the EBT data report and produce its first amendment in 2021, led the IATA Training and Licensing, Flight and Technical Department, to regroup EBT training experts from different parts of the world to propose a second edition of the “Evidence-Based Training Implementation Guide”, which integrates the latest Competency-Based Training and Assessment (CBTA) best practices.

EBT paradigm shift

Recurrent training and assessment is a process of revalidation and affirmation that the pilot continues to demonstrate an adequate level of performance, in addition to presenting valuable opportunities for continuous improvement.

For many decades the industry has used the satisfactory completion of manoeuvres as performance measurements, such as rejected take-off, engine failure between V1 and V2, etc. A pilot able to demonstrate the ability to fly these often-repetitive manoeuvres within prescribed quantitative performance measurements indicating an acceptable level of deviation from ideal criteria was deemed to be “proficient”.

The paradigm shift developed by CBTA, including EBT, is that pilot performance should be determined across a wider range of competencies, and not simply by the achievement of a pre-determined outcome in a specific task or manoeuvre.

Tasks and manoeuvres remain important, as they are reflected in specific training topics which serve as vehicles to develop and maintain the pilot competencies in an EBT recurrent training program.

EBT emphasizes training versus checking and promotes learning from positive performance. Therefore, EBT recognizes the need that all pilots should be challenged with unrehearsed events that continually build resilience and confidence throughout a pilot’s career. An essential component of the EBT ethos is that pilots enrolled in an EBT program are more confident in their ability to perform their role

11 Appendix 1

11.1 Pilot Competencies

The following are a suggested set of Pilot Competencies that have been adopted by many of the UK airlines

Competency Description	Observable Behaviors
Application of knowledge Demonstrates knowledge and understanding of relevant information, operating instructions, aircraft systems and the operating environment	OB 0.1 Demonstrates practical and applicable knowledge of limitations and systems and their interaction OB 0.2 Demonstrates required knowledge of published operating instructions OB 0.3 Demonstrates knowledge of the physical environment, the air traffic environment including routings, weather, airports and the operational infrastructure OB 0.4 Demonstrates appropriate knowledge of applicable legislation OB 0.5 Knows where to source required information OB 0.6 Demonstrates a positive interest in acquiring knowledge OB 0.7 Is able to apply knowledge effectively
Application of procedures and compliance with regulations Identifies and applies appropriate procedures in accordance with published operating instructions and applicable regulations	OB 1.1 Identifies where to find procedures and regulations OB 1.2 Applies relevant operating instructions, procedures and techniques in a timely manner OB 1.3 Follows SOPs unless a higher degree of safety dictates an appropriate deviation OB 1.4 Operates aeroplane systems and associated equipment correctly OB 1.5 Monitors aircraft systems status OB 1.6 Complies with applicable regulations. OB 1.7 Applies relevant procedural knowledge
Communication Communicates through appropriate means in the operational environment, in both normal and non normal situations	OB 2.1 Determines that the recipient is ready and able to receive information OB 2.2 Selects appropriately what, when, how and with whom to communicate OB 2.3 Conveys messages clearly, accurately and concisely OB 2.4 Confirms that the recipient demonstrates understanding of important information OB 2.5 Listens actively and demonstrates understanding when receiving information OB 2.6 Asks relevant and effective questions OB 2.7 Uses appropriate escalation in communication to resolve identified deviations OB 2.8 Uses and interprets non-verbal communication in a manner appropriate to the organizational and social culture OB 2.9 Adheres to standard radiotelephone phraseology and procedures OB 2.10 Accurately reads, interprets, constructs and responds to datalink messages in English
Aeroplane Flight Path Management, automation Controls the flight path through automation	OB 3.1 Uses appropriate flight management, guidance systems and automation, as installed and applicable to the conditions OB 3.2 Monitors and detects deviations from the intended flight path and takes appropriate action OB 3.3 Manages the flight path safely to achieve optimum operational performance

	OB 3.4 Maintains the intended flight path during flight using automation while managing other tasks and distractions OB 3.5 Selects appropriate level and mode of automation in a timely manner considering phase of flight and workload OB 3.6 Effectively monitors automation, including engagement and automatic mode transitions
Aeroplane Flight Path Management, manual control Controls the flight path through manual control	OB 4.1 Controls the aircraft manually with accuracy and smoothness as appropriate to the situation OB 4.2 Monitors and detects deviations from the intended flight path and takes appropriate action OB 4.3 Manually controls the aeroplane using the relationship between aeroplane attitude, speed and thrust, and navigation signals or visual information OB 4.4 Manages the flight path safely to achieve optimum operational performance OB 4.5 Maintains the intended flight path during manual flight while managing other tasks and distractions OB 4.6 Uses appropriate flight management and guidance systems, as installed and applicable to the conditions OB 4.7 Effectively monitors flight guidance systems including engagement and automatic mode transitions
Leadership and Teamwork Influences others to contribute to a shared purpose Collaborates to accomplish the goals of the team	OB 5.1 Encourages team participation and open communication OB 5.2 Demonstrates initiative and provides direction when required OB 5.3 Engages others in planning OB 5.4 Considers inputs from others OB 5.5 Gives and receives feedback constructively OB 5.6 Addresses and resolves conflicts and disagreements in a constructive manner OB 5.7 Exercises decisive leadership when required OB 5.8 Accepts responsibility for decisions and actions OB 5.9 Carries out instructions when directed OB 5.10 Applies effective intervention strategies to resolve identified deviations OB 5.11 Manages cultural and language challenges, as applicable
Problem Solving and Decision Making Identifies precursors, mitigates problems; and makes decisions	OB 6.1 Identifies, assesses and manages threats and errors in a timely manner OB 6.2 Seeks accurate and adequate information from appropriate sources OB 6.3 Identifies and verifies what and why things have gone wrong, if appropriate OB 6.4 Perseveres in working through problems while prioritizing safety OB 6.5 Identifies and considers appropriate options OB 6.6 Applies appropriate and timely decision-making techniques OB 6.7 Monitors, reviews and adapts decisions as required OB 6.8 Adapts when faced with situations where no guidance or procedure exists OB 6.9 Demonstrates resilience when encountering an unexpected event
Situation awareness and management of information Perceives, comprehends and manages information and anticipates its effect on the operation	OB 7.1 Monitors and assesses the state of the aeroplane and its systems OB 7.2 Monitors and assesses the aeroplane's energy state, and its anticipated flight path. OB 7.3 Monitors and assesses the general environment as it may affect the operation OB 7.4 Validates the accuracy of information and checks for gross errors

	OB 7.5 Maintains awareness of the people involved in or affected by the operation and their capacity to perform as expected OB 7.6 Develops effective contingency plans based upon potential risks associated with threats and errors OB 7.7 Responds to indications of reduced situation awareness
Workload Management Maintain available workload capacity by prioritizing and distributing tasks using appropriate resources	OB 8.1 Exercises self-control in all situations OB 8.2 Plans, prioritizes and schedules appropriate tasks effectively OB 8.3 Manages time efficiently when carrying out tasks OB 8.4 Offers and gives assistance OB 8.5 Delegates tasks OB 8.6 Seeks and accepts assistance, when appropriate OB 8.7 Monitors, reviews and cross-checks actions conscientiously OB 8.8 Verifies that tasks are completed to the expected outcome OB 8.9 Manages and recovers from interruptions, distractions, variations and failures effectively while performing tasks

The following additional Pilot Competency of Professional Standards has also been adopted by some airlines:

Professional Standards	• Offers and accepts feedback • Aspires to high operational standards • Maintains high standards of discipline, conduct and appearance • Engages with passengers to ensure best customer experience • Exhibits a conscientious and enthusiastic attitude • Takes responsibility for duty of care to crew and passengers

12 Appendix 2

12.1 Blooms Taxonomy Action Verbs example

Revised Blooms Taxonomy Action Words					
Remember	Understand	Apply	Analyze	Evaluate	Create
copy	ask	act	advertise	appraise	adapt
define	associate	administer	analyze	argue	anticipate
describe	cite	apply	appraise	assess	arrange
discover	classify	articulate	break down	choose	assemble
duplicate	compare	calculate	calculate	compare	choose
enumerate	contrast	change	categorize	conclude	collaborate
examine	convert	chart	classify	consider	collect
identify	demonstrate	choose	compare	convince	combine
label	describe	collect	conclude	criticize	compile
list	differentiate	complete	connect	critique	compose
listen	discover	compute	contrast	debate	construct
locate	discuss	construct	correlate	decide	create
match	distinguish	demonstrate	criticize	defend	design
memorize	estimate	determine	deduce	discriminate	develop
name	explain	develop	devise	distinguish	devise
observe	express	discover	diagram	editorialize	express
omit	extend	dramatize	differentiate	estimate	facilitate
quote	generalize	employ	discriminate	evaluate	formulate
read	give examples	establish	dissect	find errors	generalize
recall	group	examine	distinguish	grade	hypothesize
recite	identify	experiment	divide	judge	imagine
recognize	illustrate	explain	estimate	justify	infer
record	indicate	illustrate	evaluate	measure	integrate
repeat	infer	interpret	experiment	order	intervene
reproduce	interpret	interview	explain	persuade	invent
retell	judge	judge	focus	predict	justify
select	observe	list	illustrate	rank	make
state	order	manipulate	infer	rate	manage
tabulate	paraphrase	modify	order	recommend	modify
tell	predict	operate	organize	reframe	negotiate
visualize	relate	paint	outline	score	organize
	report	practice	plan	select	originate
	represent	predict	point out	summarize	plan
	research	prepare	prioritize	support	prepare
	restate	produce	question	test	produce
	review	record	select	weigh	propose
	rewrite	relate	separate		rearrange
	select	report	subdivide		reorganize
	show	schedule	survey		report
	summarize	show	test		revise
	trace	sketch			rewrite
	transform	solve			role-play
	translate	stimulate			schematize
		teach			simulate
		transfer			solve
		use			speculate
		write			structure
					substitute
					support
					test
					validate
					write

13 Appendix 3

13.1 Guidance for a CRMT Examiner conducting an assessment

13.2 Introduction

This brief has been written to assist a CRMTE undertaking a CRMT assessment in the classroom environment, or a Senior Examiner undertaking an Assessment of Competence in the Operational Environment. It includes a checklist in the form of effective CRMT knowledge, skills and attitudes to help the Examiner decide if the candidate has demonstrated the required standard. It also includes a sample Examiner's assessment form.

The checklist and assessment form are designed to be practical tools that capture the key performance indicators in Part ORO and CAP 737. They are designed to help the CRMTE make and record an assessment of the CRMT's competence. The form is also a useful reference for the Trainer, as it helps him/her to understand the standards against which he/she is being assessed. Its use, however, is not mandatory and the Examiner may use his or her own company paperwork provided it accurately reflects the required proficiency.

Examiners should remember that the assessment is not just an opportunity for the Instructor to demonstrate proficiency. As most assessments will be deemed successful, best practice demands that all CRMTEs use this as an opportunity to give supportive feedback that helps develop and enhance the candidate's knowledge and skills.

13.3 Documents

In addition to any course material, Examiners should also be familiar with the general content of the following documents:

- Standards Document 29
- The relevant sections of UK Regulations No. 965/2012 Part ORO
- CAP 737 (available at www.caa.co.uk/cap737)
- Company behavioural marker system / pilot competencies (if applicable)

13.4 The Test

Pre-Test Preparation:

- Ensure the candidate has completed any relevant company paperwork

- Agree a date/time, allowing for extra opportunity for briefing/debriefing of the candidate.

It is vital that the candidate is aware of the standards against which they are being assessed.
They should be provided with a copy of the Company Examiner Checklist prior to undertaking an assessment. The Examiner will need to establish the type of course, review the syllabus/course material and establish the experience level and recency of the candidate and course trainees.

The CRMTE must confirm that the observation is to be carried out while the candidate conducts training with a class of “live” trainees and the training footprint will be of sufficient length to allow them sufficient opportunity to confirm the candidate’s depth of knowledge and their ability to facilitate learning. The Examiner should also ensure that the candidate knows that they can expect to be questioned on material not planned to be covered during the observation in order to assess their knowledge of other areas of the flight crew CRM syllabus and confirm their ability to translate that knowledge into a facilitated discussion covering related operational issues.

Briefing/Conducting the Assessment

The CRMTE needs to brief the candidate in plenty of time before the training starts – this ensures there is time to:

- set an open and professional tone;
- establish that the purpose of the test is for the candidate to demonstrate his/her competence;
- discuss the examiner’s role (including seating position and involvement with the class);
- discuss briefing the class about the examiner;
- establish what the training objectives are for the session;
- allow an opportunity for the candidate to ask questions;
- establish how many courses the candidate has run in the validity period;
- explain that the examiner will maintain an unobtrusive role during the training, leaving the candidate responsible for course conduct and timing;
- explain and emphasise that the needs of the trainees will take precedence over any other requirements; and
- explain that the CRMTE will also ask questions to ascertain the candidate’s depth of knowledge and understanding of topics not discussed as part of the course being observed prior to delivering the result.

The CRMT assessment is primarily based on observation, and it cannot be over-emphasised that the CRMTE **must have evidence** that supports their final assessment of the candidate’s competence.

13.5 Assessment Criteria

The required CRM Trainer competence standards are described in GM7 ORO.FC.115. The aim of the checklist in the following paragraph is to provide a summary of the key knowledge, skills and behaviours required to aid assessing the candidate's competence. Defining the behaviours that constitute a "good role model" is open to some degree of subjectivity; however, the term encapsulates one of the most important aspects of trainer competence and credibility, irrespective of the other skills required. The following list of behaviours is not exhaustive but is considered sufficient to convey an understanding of the concept and allow an informed assessment to be made.

A competent CRM Trainer:

- is overtly supportive of CRM principles in word and deed (actively role models good CRM);
- seeks feedback and responds appropriately;
- works hard to establish a rapport with trainees;
- is open and honest;
- creates an atmosphere of trust and respect;
- preserves confidentiality;
- is a good listener;
- openly strives to improve own performance;
- is supportive of fellow trainers; and
- is always patient, sensitive and respectful of others.

13.6 Examiner's Checklist for CRM Trainer Observations

There is space on the assessment form for the candidate to describe the key training objectives for each module and the training session overall. This gives the Examiner a clear insight into what the instructor is trying to achieve from the outset, and the Examiner should try to ensure that this is captured in as much detail as possible, as success or otherwise in achieving them forms one of the cornerstones of the assessment process.

The CRMTE may find using the simple nine-point checklist on the assessment form describing the key knowledge, skills and behaviours required to be an easy way to analyse and assess each performance element. An example is shown below.

Did the candidate support the achievement of the objectives, YES or NO? In deciding, consider the following:

- Did the candidate demonstrate the **knowledge** required for the role?
- Was the candidate **supportive of CRM concepts** and did the candidate **role model**

  best CRM practice?
- Did the candidate encourage trainees to participate, share their experiences and

  self-analyse?
- Did the candidate **identify** and **respond to the trainees' needs** relative to their expertise/experience?
- Did the candidate **integrate** practical CRM within technical training and line operations?
- Did the candidate incorporate **NOTECHS or Company CRM Standards** when appropriate?
- Did the candidate identify and discuss the **CRM reasons** for accidents/incidents/

  events?
- Did the candidate regularly check for understanding and resolve ambiguity?
- Did the candidate demonstrate effective **instruction and facilitation skills**?

The Examiner may find that casually checking the trainees' understanding of the material presented throughout the day can provide useful evidence to confirm their final assessment and improve the quality of feedback to the candidate. The Examiner should take care not to re-open CRM training topics, but just seek to gather evidence that confirms and supports their final assessment of the candidate's performance.

13.7 Unacceptable Performance Indicators

What constitutes a failure of the candidate to reach the required standard? In reaching a conclusion it is useful to first consider whether or not the desired training objectives described by the candidate at the outset have been met. If not, was it for reasons outside of the control of the candidate? Were the training objectives met in spite of, rather than because of the candidate? In all cases the Examiners must use their judgement and take into consideration any exceptional circumstances. However, if the CRMTE has evidence that confirms **repetition** of any of the following (paragraphs 7.4 to 7.14) this should normally result in the award of a failed assessment in that skill or knowledge area. A failure to reach the required standard in one or more areas will result in the candidate being assessed as unsatisfactory overall.

The following poor performance indicators may be used by the CRMTE when determining whether the candidate has displayed an acceptable level of proficiency. It must be emphasised that this list is not exhaustive and only includes the more common causes of failure. The CRMTE must still exercise his/her own judgement when assessing the candidate.

The use of the word “limited” in the following examples refers to a level of performance that the Examiner believes is unacceptable. The Examiner should be able to explain why it was unacceptable and what the candidate could do to rectify the issue.

Did the candidate support the achievement of the objectives?

The candidate:

- required multiple interventions and frequent assistance from the other facilitator(s) to support the achievement of the training objectives; or
- clearly showed that their own poor knowledge, skills or attitude failed to support the achievement of the training objectives.

Did the candidate support CRM concepts and did they role model best CRM practice?

The candidate:

- expressed the opinion that CRM training is of little value;
- was unfriendly, unwelcoming, impatient, insensitive, disrespectful or judgemental;
- demeaned the trainees;
- used humour inappropriately;
- let personal opinion deflect from the training objectives;
- rarely demonstrated empathy for the trainee’s position; or
- did not remain calm under stress or became overly emotional.

Did the candidate demonstrate the knowledge required for the role?

The candidate:

- was unable to describe the key training objectives, or could only describe them with difficulty;
- displayed limited knowledge of the material presented;
- either was unable to provide or could only provide limited elaboration or explanation of the material when asked to do so by the trainees;
- displayed limited knowledge of the company behavioural/non-technical standards;
- either was unable to explain or had great difficulty explaining the relationship between the company behavioural/non-technical standards and optimum performance in line operations;
- displayed limited knowledge of CRM subjects,
- displayed limited knowledge of the legislative requirements or publications pertaining to
- Human Factors training for flight crew, e.g. Part ORO, Part FCL, CAP 737 and this document.

Did the candidate encourage trainees to participate, share their experiences and self-analyse?

The candidate:

- made limited attempts to encourage trainees to participate, or share their experiences; or
- frequently either ignored or stifled trainee input.

Did the candidate identify and respond to the trainees' needs relative to their expertise and experience?

The candidate:

- did not attempt to establish the trainees' starting point, background or level of any relevant experience;
- either failed to respond, made limited attempts or made inappropriate responses to trainees' requests for further explanation or elaboration of training material; or
- made limited or no attempts, or was unable, to alter or adapt the training material or content when this was clearly required in order to meet the trainees' needs.

Did the candidate integrate practical CRM within technical training and line operations?

The candidate:

- failed to integrate practical CRM measures within technical training; or
- was unable to apply CRM to line operations.

Did the candidate incorporate NOTECHS / Competencies or Company CRM Standards when appropriate?

The candidate:

- made no, or limited, attempts to link the applicable non-technical marker system or CRM standards to effective crew behaviours during line operations; or
- made no, or limited, attempts to apply the applicable non-technical marker system or CRM standards when either describing or reinforcing effective behaviour.

Did the candidate identify and discuss the non-technical reasons for accidents, incidents, or events?

The candidate:

- focused on the technical causes and made few, if any, attempts to identify any ineffective non-technical skills; or
- made limited or inappropriate attempts to facilitate what would have been more effective behaviours when discussing incidents/accidents.

Did the candidate regularly check for understanding and resolve ambiguity?

The candidate:

- rarely attempted, or was unable, to ensure trainees' questions were adequately answered; or
- rarely attempted, or was unable, to resolve any ambiguities or misunderstandings.

Did the candidate demonstrate effective instructional skills?

The candidate:

- was clearly unprepared and demonstrated a clear lack of familiarity with the training materials;
- was often unclear, hesitant, confused, confusing or unstructured;
- presented too much information using jargon, terminology and language that was inappropriate for trainees;
- made few, if any, attempts to present the session in a relevant and motivating manner;
- consistently failed to deal with inappropriate trainee behaviour that detracted from the training objectives or stifled trainee participation;

- frequently glossed over key concepts or spent excessive time discussing irrelevant points;
- consistently delivered material in a monotone fashion;
- consistently delivered material with little or no eye contact; or
- lacked energy and appropriate enthusiasm. The trainees were bored and disengaged.

Did the candidate demonstrate effective facilitation skills?

The candidate:

- rarely asked open questions that probed or deepened the discussion;
- rarely reflected or deflected questions back to the trainees and consistently answered the trainees' questions directly without giving the rest of the group an opportunity to contribute;
- consistently presented personal views and opinions and little attempt was made to either summarise or synthesise the participants' own views;
- consistently interrupted the trainees or rarely gave them sufficient time to formulate a response; or
- either consistently ignored trainees' responses or rarely displayed effective listening skills such a paraphrasing.

14 Conducting the Debrief

14.1 Debriefing

The debrief should be conducted as follows:

- The CRMTE should adopt an appropriately relaxed but professional tone for the debrief and deliver the test result at the outset.
- The overall aim is to facilitate learning and for the CRMTE to role model an effective debriefing that ensures that the candidate makes the analysis of their own performance.
- The debriefing should focus on the candidate's development and include an appropriate balance of positive and negative feedback.
- In the event of a failure the examiner must indicate what re-training the candidate will need to undertake prior to a further assessment.
- The written report should reflect the content and key areas of performance debriefed.

Pass:

- State the result of the test and congratulate the candidate CRMT.

Fail:

- State the result, with the reasons and evidence in descending order of priority;
- state the effect on the CRMT's training position - "I have to advise you that you will be unable to continue training as a CRMT until your re-assessment is successful"; and
- state the areas where re-training is required.

Pass or Fail:

- Facilitate the main debrief points and agree any retraining requirements;
- the candidate CRMT must leave the debrief knowing what their strengths are; and
- the candidate CRMT must leave the debrief knowing what, if anything, needs to change and how to change it.

15 Appendix 4 – Specimen CRM Trainer Assessment Form - Classroom

NAME		Staff Number		Date	
Date of last assessment (if applicable):					

To be completed by the Candidate under Assessment

Session Description (Provide a brief overview of the training you will be delivering – type and purpose of training / number and description of trainees)

Training Objectives (Provide a list of the key training objectives or desired outcomes from the training)

To be completed by the Examiner

General Comments (refer to areas identified in the checklist on the reverse side of this form)

Result: PASS/FAIL

Examiner's Name and Signature	

Did the candidate support the achievement of the objectives? YES/NO (Provide reasons / give examples below)	
Did the Candidate demonstrate the **knowledge** required for the role?	
Did the Candidate **support CRM concepts** and did they **role model** best CRM practice?	
Did the Candidate encourage trainees to **participate, share their experiences** and **self-analyse?**	
Did the Candidate **identify** and respond to **the trainees' needs** relative to expertise/experience?	
Did the Candidate **integrate** practical CRM within technical training and line operations?	
Did the Candidate incorporate **NOTECHS or Company CRM Standards** when appropriate?	
Did the Candidate identify and discuss the **non-technical** reasons involved in accidents, incidents and events included in case studies?	
Did the Candidate regularly **check for understanding and resolve ambiguity**?	
Did the Candidate demonstrate effective **instruction and facilitation skills**?	

16 Appendix 5 - Specimen CRM Trainer Assessment Form - FSTD

Candidate Information		**Status**	**Line** **Sim**		
Rank + Name		**Staff Number**		**Company**	
Examiner Information					
Rank + Name			**CAA Number**		

To be completed by the candidate

Description of training/checking scenario (Provide a brief overview of the assessment scenario, e.g. type and purpose of training, testing or checking/description of flight crew involved.)

Training/Checking or Scenario Objectives (Provide a list of the key CRM objectives or desired outcomes.)

To be completed by the Examiner

General Comments (Refer to areas identified in the nine-point checklist on the reverse side of this form.)

The candidate has/has not met the requirements of the Assessment.

Candidate's Signature		**Date**	
Examiner's Signature		**Date**	

Nine-Point Checklist for CRMT Performance	
Written Observations	Assessment
Was the achievement of stated **objectives/desired outcomes** supported?	
Did the candidate **support CRM concepts** and did they **role model** best CRM practice?	
Did the candidate **integrate** practical CRM within the technical training?	
Did the candidate identify the **CRM behaviours** for both errors/good results?	
Did the candidate integrate the Company **CRM Standards** (e.g. NOTECHS)?	
Did the candidate use **facilitation** skills effectively to encourage flight crew to self-analyse?	
Did the candidate **assess flight crew non-technical performance accurately**?	
Did the CRMT demonstrate the **CRM subject knowledge** required for the role?	
Did the CRMT demonstrate the **instructional skills** required for the role?	

17 Appendix 6 – UK Part ORO Flight Crew CRM Training Syllabus

The table below specifies which CRM training elements should be covered in each type of training. The levels of training in Table 1 can be described as follows:

'Required' means training that should be instructional or interactive in style to meet the objectives specified in the CRM training programme or to refresh and strengthen knowledge gained in a previous training.

'In-depth' means training that should be instructional or interactive in style taking full advantage of group discussions, team task analysis, team task simulation, etc., for the acquisition or consolidation of knowledge, skills and attitudes. The CRM training elements should be tailored to the specific needs of the training phase being undertaken.

CRM training elements	**Initial operator's CRM training**	**Operator conversion course when changing aircraft type**	**Operator conversion course when changing operator**	**Annual recurrent training**	**Command course**
General principles					
Human factors in Aviation; General instructions on CRM principles and objectives; Human performance and limitations; Threat and error management.	In-depth	Required	Required	Required	Required
Relevant to the individual flight crew member					

Personality awareness, human error and reliability, attitudes and behaviours, self-assessment and self-critique; Stress and stress management; Fatigue and vigilance; Assertiveness, situation awareness, information acquisition and processing.	In-depth	Not required	Not required	Required	In-depth
Relevant to the flight crew					
Automation and philosophy on the use of automation	Required	In-depth	In-depth	In-depth	In-depth
Specific type-related differences	Required	In-depth	Not required	Required	Required
Monitoring and intervention	Required	In-depth	In-depth	Required	Required
Relevant to the entire aircraft crew					
Shared situation awareness, shared information acquisition and processing; Workload management; Effective communication and coordination inside and outside the flight crew compartment; Leadership, cooperation, synergy, delegation, decision-making, actions; Resilience development; Surprise and startle effect; Cultural differences.	In-depth	Required	Required	Required	In-depth

Relevant to the operator and the organisation					
Operator's safety culture and company culture, standard operating procedures (SOPs), organisational factors, factors linked to the type of operations; Effective communication and coordination with other operational personnel and ground services.	In-depth	Required	In-depth	Required	In-depth
Case studies	In-depth	In-depth	In-depth	In-depth	In-depth

18 Appendix 7 – Flight Operations Human Factors Advisory Panel: Terms of Reference

18.1 Mission Statement

The Flight Operations Human Factors Advisory Panel (the Panel), liaises with the UK Civil Aviation Authority (CAA) to identify HF issues. The Panel acts collaboratively in the interest of the aviation Industry by providing cost- effective, timely and high quality advice and assistance.

18.2 Purpose

a) To enhance safety by actively promoting high standards of Flight Crew CRM / HF performance.

b) To offer guidance, in order to address identified risks in Flight Crew CRM / HF performance.

c) To provide advice and proposals to the UK CAA, and the aviation industry about:

1) A common understanding of UK & EASA Flight Crew CRM / HF requirements and any proposed amendments.

2) Standards of Performance for:

i) CRM / HF Programmes.

ii) Operators and CRM Providers.

iii) The suitable qualification of Company CRM Trainers.

iv) Personnel involved in assessing or auditing CRM /HF programmes, Providers or Trainers.

3) Active promotion of Threat and Error management (TEM)

d) To advise and assist the UK CAA when requested:

1) To offer guidance on HF related issues.

2) To support UK CAA Pilot performance initiatives.

3) To independently assess CRM Trainers, or personnel involved in checking them.

4) To act as an arbitrator in the case of disputes over CRM training standards and provide the findings to interested parties.

18.3 Standards

e) The standards and framework required of CRM Trainers and Training Programmes are laid down in the UK Air Ops Regulations. Additional material can be sourced in CAP 737, Standards Document No. 29 and may

be supplemented by current Information Notices (IN's) or Training Notices.

f) The Panel's standards of operating and its procedures will be in direct support of the content of these documents

18.4 Responsibilities

g) The Panel will normally meet four times per year.

h) Members will be expected to attend at least 2 of these meetings per year.

i) The Panel Chairman will ensure a balanced quorum at each meeting to achieve the Panel's objectives.

j) In relation to CRM, in a cost effective, timely and effective manner:

1) Provide advice to the CAA on all matters relating to the oversight of CRM /HF Training, including the content of CAP 737 and Standards Document 29.

2) Continually review and recommend procedures to enable companies to suitably qualify CRM Trainers to a consistent and acceptable standard.

3) Be aware of, and respond to, all changes in CRM / HF Legislation.

4) Provide qualified Assessors to act if required as advisors/arbitrators should a dispute arise which relates to CRM training standards.

18.5 Resources

k) Meeting venues and a measure of administrative support will be provided by the UK CAA, where appropriate

l) Certain fee charging, where appropriate.

m) Industry support for initiatives, research and events.

18.6 Appointment to the Panel

a) Prospective members, whether invited or making direct application shall fill an appropriate vacancy, as indicated in Membership (Appendix 1 to Terms of Reference)

b) Membership applications shall follow the procedure indicated in Applications (Appendix 2 to Terms of Reference)

c) The Chairman and Vice-Chairman will be nominated by the members, and

will hold Office for three years, after which an election will be held. Nothing will stop those in Office offering themselves for re-election.

18.7 Membership Criteria

Any person acting as a member shall be:

d) Actively involved, or show a proven and credible track record, in the design, development, delivery, improvement or management of CRM / Human Factors training;
e) Demonstrably interested in the cost-effective application of Human Factors as a major contribution to flight safety; and
f) Motivated to serve regularly and effectively on the Panel.

19 Appendix 1 to Terms of Reference

19.1 Membership

a) Chaired by a person, nominated by the members, who has a recognised background in Human Factors in Aviation.

b) A deputy chairman, nominated by the members ,who has a recognised background in Human Factors in Aviation

c) A Secretary, nominated by the members.

d) Suitable Members will be selected as required to provide wide-ranging skills covering all aspects of flight crew training and to represent the industry:

e) Aircraft Manufacturers

f) ATQP or CBTA Specialist

g) Basic Pilot Training / Training Provider

h) Cabin Crew and Combined CRM Training

i) Company SMS / Auditor

j) Commercial and Corporate Operators

k) Crew Supply Chain

l) CRM /HF Specialist Expertise including training design and development

m) CRM /HF Material Design

n) Regulatory Policy

o) Ground CRM Training and Trainer Qualification

p) Links with:

- BALPA
- Global and EU Training
- RAeS and its Human Factors Group
- UK Flight Ops Liaison Group (FOLG) and the Training Sub-Group (TSG)- nominated posts.
- UK Flight Safety Committee (UKFSC)

q) On and Offshore Rotary Wing Operations

r) Oversight conducted by the Regulator

s) Research / Academic Expertise

t) Senior Examiners

u) Simulator and Aircraft Instructors and Examiners

v) Single Pilot Operations

w) Training Inspector Standardisation

x) Uncrewed Aerial systems

y) UK Guidance / Standards Documents and CAP 737

*nominated positions will be a HF specialist from each FOLG airline, this is an airline membership rather than an individual membership.

20 Appendix 2 to Terms of Reference

20.1 Applications

1) Applications for membership will be encouraged, welcomed and managed by a Membership Sub-Committee comprising of the Panel Chair, Panel Vice Chair and other members as required.

2) The Panel membership philosophy is to secure an active, appropriately knowledgeable, enthusiastic and independent group with numbers limited to achieve effective progress of the Panel business and skills diversity to ensure balanced advice.

3) Prospective new members of the Panel will be either invited, nominated* or make direct application. In every case applicants are requested to submit, in the first instance to the Panel Chair, a CV and briefly justify in writing their application, addressing the Terms of Reference (TOR) criteria.

4) Provided the Membership Sub-committee find the application acceptable, and a vacancy is identified within the TOR membership criteria. The application will be circulated to establish acceptance and suitability by the full Panel.

5) An invitation to attend a meeting as a Guest will follow a majority approval.

6) An opportunity for subsequent discussion of the application will be made during or after this meeting as necessary. A simple majority vote of those responding will determine the outcome of a contested decision.

7) A successful applicant will be offered full membership to fill the identified vacancy.

8) The Membership sub-committee will:

   a) periodically review all membership and individual contributions; and

   b) when necessary, using the above consultative mechanism, seek Panel approval for membership cancellation or replacement if suitable explanations for ineffective contribution are not forthcoming.