Alternative Means of Compliance

TRI Training Course General and Flight Instruction

AltMoC No. IT-LIC-2018-001

Regulatory reference:	
Regulation (EU) 1178/2011, Annex I	
Rule paragraph(s)	FCL.930.TRI AMC1

List of Effective Pages:		
Page number	**Revision number**	**Revision date**
1-14	*Rev.0*	*20th november 2018*

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1	***Full description of the AltMoC, which includes reasoning of the AltMoC***
There have been several cases in which the current AMC1 to IR FCL.930.TRI in relation to how to administer the flight instruction to candidates TRI has been implemented in a manner which may not have been consistent with the implementing rule aimed at developing instructor competencies. Although these cases have been proved to be rare, this inconsistency with the aim of the implementing rule seems to recur with a certain regularity. The AltMoC intends to provide an additional clarification on how the flight training is to be administered by adding some textual detailing to point (e) and (h) of the part General, a point (d) of part 2, and text to point (a) and (f) of part 3. The training for a candidate must be understood to develop the necessary competencies which are a blend of skill, knowledge and attitude. The flight training emphasizes the skills for the required competence, and as the skill must be taught, demonstrated and tried in order to achieve an acceptable level of training , an instructor cannot train more trainees simultaneously. However, the AltMoC is in line with the principle of competence training and recognizes that any job for which a competence is required can be detailed as tasks and subtasks and that the training for a few of these can be delivered using the “classroom” methodology, rather than the flight instruction method. For instance, the introduction to the features of the IOS in an FFS or the safety items of an FSTD could be accepted if delivered to more than one trainees simultaneously. It is responsibility of the ATO however to provide a detailed analyses of the tasks and subtasks of the TRI job.	

2	***Assessment demonstrating that the IR(s) are met***
This AltMoC is aimed at providing a more direct wording in order to meet the required 10hrs of flight instruction (or 5hrs incase a SP type rating) per candidate TRI. Introduces a more consistent approach to “competence training” which does not diminish the number of training required but maximize the training hours per candidate TRI.	

3	*Procedures for the use of the AltMoC*

AltMoC Procedures for the ATO

In the event of an ATO choosing to develop a more consistent competency approach to the training of a TRI detailed analysis of the syllabus should adopted. The ATO should establish a clear procedure on how to perform a "population analysis" in order to determine the need of the TRI candidate(s) with the objective to develop the "TRI competencies". The items of the syllabus should be identified as task(s) and subtask(s) and determine for each of them the action(s) of the instructor as well as that of the candidate(s). It is important to clearly identify how these actions are to be delivered, time allocated for each action, tools used, and skill, knowledge or attitude to be acquired by the candidate. The AT should then be able to demonstrate how much training can be delivered to more than one candidate simultaneously.

4	*Full AltMoC text*

TRI TRAINING COURSE: AEROPLANES
GENERAL

(a) The aim of the TRI(A) training course is to train aeroplane licence holders to the level of competence defined in FCL.920 and adequate for a TRI.

(b) The training course should develop safety awareness throughout by teaching the knowledge, skills and attitudes relevant to the TRI task, and should be designed to give adequate training to the applicant in theoretical knowledge instruction, flight instruction and FSTD instruction to instruct for an aeroplane type rating for which the applicant is qualified.

(c) The TRI(A) training course should give particular emphasis to the role of the individual in relation to the importance of human factors in the man-machine environment and the role of CRM.

(d) Special attention should be given to the applicant's maturity and judgment including an understanding of adults, their behavioural attitudes and variable levels of learning ability. During the training course the applicants should be made aware of their own attitudes to the importance of flight safety. It will be important during the training course to aim at giving the applicant the knowledge, skills and attitudes relevant to the role of the TRI.

(e) For a TRI(A) the amount of flight training will vary depending on the complexity of the aeroplane type and the experience of the applicant. A similar number of hours should be used for the instruction and practice of pre-flight and post flight briefing for each exercise. The flight instruction should aim to ensure that the applicant is able to teach the air exercises safely and efficiently and should be related to the type of aeroplane on which the applicant wishes to instruct. The content of the training programme should cover training exercises applicable to the aeroplane type as set out in the applicable type rating courses.

(f) A TRI(A) may instruct in a TRI(A) course once he or she has conducted a minimum of four type rating instruction courses.

(g) It is to be noted that airmanship is a vital ingredient of all flight operations. Therefore, in the following air exercises the relevant aspects of airmanship are to be stressed at the appropriate times during each flight.

(h) The student instructor should learn how to identify common errors and how to correct them properly, which should be emphasised at all times. The competence of detecting and correcting common errors should be demonstrated by the candidate TRI to the TRI instructor. To this purpose the training received by the candidate TRI has to be delivered individually by a TRI instructor and the attendance of two or more candidate TRI per TRI instructor should be avoided.

CONTENT

(i) The training course consists of three parts:

(1) Part 1: teaching and learning instruction that should comply with AMC1 FCL.920;

(2) Part 2: technical theoretical knowledge instruction (technical training);

(3) Part 3: flight instruction.

Part 1

The content of the teaching and learning part of the FI training course, as established in AMC1 FCL.930.FI, should be used as guidance to develop the course syllabus.

Part 2

TECHNICAL THEORETICAL KNOWLEDGE INSTRUCTION SYLLABUS

(a) The technical theoretical knowledge instruction should comprise of not less than 10 hours training to include the revision of technical knowledge, the preparation of lesson plans and the development of classroom instructional skills to enable the TRI(A) to instruct the technical theoretical knowledge syllabus.

(b) If a TRI(A) certificate for MP aeroplanes is sought, particular attention should be given to multi-crew cooperation. If a TRI(A) certificate for SP aeroplanes is sought, particular attention should be given to the duty in SP operations.

(c) The type rating theoretical syllabus should be used to develop the TRI(A)'s teaching skills in relation to the type technical course syllabus. The course instructor should deliver example lectures from the applicable type technical syllabus and the candidate instructor should prepare and deliver lectures on topics selected by the course instructor from the type rating course.

(d) The technical theoretical instruction should include enough time for the candidate TRI to deliver to a classroom sample of lesson plans related to the type technical course.

Part 3

FLIGHT INSTRUCTION SYLLABUS

(a) The course should be related to the type of aeroplane on which the applicant wishes to instruct.

The course should be designed to deliver training according to a methodology based on the principle of TRI instructor teaching/demonstrating to a single TRI candidate. In order to reach such objective the technique of a TRI instructor teaching/demonstrating to more than one TRI candidate at the same time should not be used. Candidates TRI of comparable experience can be present simultaneously in the FSTD, however the presence of one TRI instructor providing training to more TRI candidates should be avoided. The training organization in devising a syllabus to develop the instructor competences may provide a detailed analyses of the job, tasks and subtasks of a TRI and establish (by providing evidence that an equivalent level of competence can be achieved) that one or more item can be taught simultaneously to more than one TRI candidate by using classroom training technique.

(b) TEM, CRM and the appropriate use of behavioural markers should be integrated throughout.

(c) The content of the training programme should cover all the significant exercises applicable to the aeroplane type.

(d) The applicant for a TRI(A) certificate should be taught and made familiar with the device, its limitations, capabilities and safety features, and the instructor station, including emergency evacuation.

FSTD TRAINING

(e) The applicant for a TRI(A) certificate should be taught and made familiar with giving instruction from the instructor station. In addition, before being checked for base training instruction, the applicant for a TRI(A) should be taught and made familiar with giving instruction from all operating positions, including demonstrations of appropriate handling exercises.

(f) Training courses should be developed to give the applicant experience in training a variety of exercises, covering both normal and abnormal operations. The syllabus should be tailored appropriate to the aeroplane type and to the experience of the candidate TRI, using exercises considered more demanding for the student. This should include engine-out handling and engine-out operations in addition to representative exercises from the type transition course. The objective of the training is to provide each applicant with the minimum hours of training as per point (a)(3) of the requisite. The training should not be delivered cumulatively to more than one instructor candidate by one TRI instructor at any one time. The training organization may provide a detailed analysis of the tasks and subtasks of a TRI competence to be performed in an FSTD and determine that certain items can be trained with a classroom training technique.

(g) The training hours should be used by the candidate TRI also to demonstrate to the TRI instructor his/her competence to plan, brief, train and debrief sessions using all relevant training techniques.

AEROPLANE TRAINING

(h) The applicant for a TRI(A) certificate should receive instruction in an FFS to a satisfactory level in:

(1) right hand seat familiarisation, which should include at least the following as pilot flying:

(i) re-flight preparation and use of checklists;
(ii) taxiing;
(iii) take-off;
(iv) rejected take-off;
(v) engine failure during take-off, after v_1;
(vi) engine inoperative approach and go-around;
(vii) one engine (critical) simulated inoperative landing;
(viii) other emergency and abnormal operating procedures (as necessary).

(2) aeroplane training techniques:

(i) methods for giving appropriate commentary;
(ii) particularities of handling the aeroplane in touch and go manoeuvres;

(iii) intervention strategies developed from situations role-played by a TRI course instructor, taken from but not limited to:
(A) take-off configuration warning;
(B) over controlling;
(C) high flare: long float;
(D) long flare;
(E) baulked landing;
(F) immediate go-around from touch;
(G) too high on approach: no flare;

(H) incorrect configuration;
(I) TAWS warning;
(J) misuse of rudder;
(K) over control in roll axis during flare;
(L) incapacitation;
(M) actual abnormal or emergencies.

(i) Additionally, if the applicant is required to train emergency or abnormal procedures in an aeroplane, synthetic device training as follows:
(1) appropriate methods and minimum altitudes for simulating failures;
(2) incorrect rudder inputs;
(3) failure of a critical engine;
(4) approach and full-stop landing with simulated engine-out.
(j) In this case, the abnormal manoeuvres refer to engine-out handling as necessary for completion of type rating training. If the applicant is required to train other abnormal items in the transition course, additional training will be required.
(k) Upon successful completion of the training above, the applicant should receive training in an aeroplane in-flight under the supervision of a TRI(A). At the completion of training the applicant instructor should be required to conduct a training flight under the supervision and to the satisfaction of a TRI(A) nominated for this purpose by the training organisation.

TRAINING FOR ASYMMETRIC POWER FLIGHT ON SP MET AEROPLANES
(l) During this part of the training, special emphasis is to be placed on the:
(1) circumstances in which actual feathering and un-feathering practice will be done, for example safe altitude; compliance with regulations about minimum altitude or height for feathering practice, weather conditions, distance from nearest available aerodrome.
(2) procedure to use for instructor and student co-operation, for example the correct use of touch drills and the prevention of misunderstandings, especially during feathering and unfeathering practice and when zero thrust is being used for asymmetric circuits. This procedure is to include positive agreement as to which engine is being shut down or re-started or set at zero thrust and identifying each control and naming the engine it is going to affect.
(3) consideration to be given to avoid over-working the operating engine, and the

degraded performance when operating the aeroplane during asymmetric flight.
(4) need to use the specific checklist for the aeroplane type.

(m) Flight on asymmetric power
(1) introduction to asymmetric flight;
(2) feathering the propeller: method of operation;
(3) effects on aeroplane handling at cruising speed;

(4) introduction to effects upon aeroplane performance;
(5) note foot load to maintain a constant heading (no rudder trim);
(6) un-feathering the propeller: regain normal flight;
(7) finding the zero thrust setting: comparison of foot load when feathered and with zero thrust set.
(8) effects and recognition of engine failure in level flight;
(9) the forces and the effects of yaw;
(10) types of failure:
(i) sudden or gradual;
(ii) complete or partial.
(11) yaw, direction and further effects of yaw;
(12) flight instrument indications;
(13) identification of failed engine;
(14) the couples and residual out of balance forces: resultant flight attitude;
(15) use of rudder to counteract yaw;

(16) use of aileron: dangers of misuse;
(17) use of elevator to maintain level flight;
(18) use of power to maintain a safe air speed and altitude;
(19) supplementary recovery to straight and level flight: simultaneous increase of speed and reduction in power;
(20) identification of failed engine: = idle engine;
(21) use of engine instruments for identification:
(i) fuel pressure or flow;
(ii) RPM gauge response effect of CSU action at lower and higher air speed;
(iii) engine temperature gauges.
(22) confirmation of identification: close the throttle of identified failed engine;
(23) effects and recognition of engine failure in turns;
(24) identification and control;

(25) side forces and effects of yaw.

(n) During turning flight:
(1) effect of ‘inside’ engine failure: effect sudden and pronounced;
(2) effect of ‘outside’ engine failure: effect less sudden and pronounced;
(3) the possibility of confusion in identification (particularly at low power):
(i) correct use of rudder;
(ii) possible need to return to lateral level flight to confirm correct identification;

(4) visual and flight instrument indications;

(5) effect of varying speed and power;
(6) speed and thrust relationship;
(7) at normal cruising speed and cruising power: engine failure clearly recognised;
(8) at low safe speed and climb power: engine failure most positively recognised;
(9) high speed descent and low power: possible failure to notice asymmetry (engine failure);

(o) Minimum control speeds:
(1) ASI colour coding: red radial line
Note: this exercise is concerned with the ultimate boundaries of controllability in various conditions that a student can reach in a steady asymmetric power state, approached by a gradual speed reduction. Sudden and complete failure should not be given at the flight manual v_{mca}. The purpose of the exercise is to continue the gradual introduction of a student to control an aeroplane in asymmetric power flight during extreme or critical situations. It is not a demonstration of v_{mca}.
(2) techniques for assessing critical speeds with wings level and recovery – dangers involved when minimum control speed and the stalling speed are very close: use of v_{sse};
(3) establish a minimum control speed for each asymmetrically disposed engine: to establish critical engine (if applicable);

(4) effects on minimum control speeds of:
(i) bank;
(ii) zero thrust setting;
(iii) take-off configuration:
(A) landing gear down and take-off flap set;
(B) landing gear up and take-off flap set.
Note: it is important to appreciate that the use of 5 ° of bank towards the operating engine produces a lower v_{mca} and also a better performance than that obtained with the wings held level. It is now normal for manufacturers to use 5 ° of bank in this manner when determining the v_{mca} for the specific type. Thus the v_{mca} quoted in the aeroplane manual will have been obtained using the technique.

(p) Feathering and un-feathering:
(1) minimum heights for practising feathering or un-feathering drills;
(2) engine handling: precautions (overheating, icing conditions, priming, warm up and method of simulating engine failure: reference to aircraft engine manual and service instructions and bulletins).

(q) Engine failure procedure:
(1) once the maintenance of control has been achieved, the order in which the procedures are carried out will be determined by the phase of operation and the aircraft type;
(2) flight phase:

(i) in cruising flight;

(ii) critical phase such as immediately after take-off or during the approach to landing or during a go-around.

(r) Aircraft type
Variations will inevitably occur in the order of certain drills and checks due to differences between aeroplane types and perhaps between models of the same type. The flight manual or equivalent document (for example owner's manual or pilot's operating handbook) is to be consulted to establish the exact order of these procedures.
For example, one flight manual or equivalent document (for example owner's manual or pilot's operating handbook) may call for the raising of flaps and landing gear before feathering, whilst another may recommend feathering as a first step. The reason for this latter procedure could be due to the fact that some engines cannot be feathered if the rpm drops below a certain figure.
Again, in some aeroplanes, the raising of the landing gear may create more drag during retraction due to the transient position of the landing gear doors and as a result of this retraction would best be left until feathering has been accomplished and propeller drag reduced.

Therefore, the order in which the drills and checks are shown in this syllabus under immediate and subsequent actions are to be used as a general guide only and the exact order of precedence is determined by reference to the flight manual or equivalent document (for example owner's manual or pilot's operating handbook) for the specific aeroplane type being used on the course.

(s) In-flight engine failure in cruise or other flight phase not including take-off or landing:
(1) immediate actions:
(i) recognition of asymmetric condition;
(ii) identification and confirmation of failed engine:
(A) idle leg = idle engine;
(B) closing of throttle for confirmation.
(iii) cause and fire check:
(A) typical reasons for failure;
(B) methods of rectification.
(iv) feathering decision and procedure:
(A) reduction of other drag;
(B) need for speed but not haste;
(C) use of rudder trim.

(2) subsequent actions:
(i) live engine:
(A) temperature, pressures and power;
(B) remaining services;
(C) electrical load: assess and reduce as necessary;

(D) effect on power source for air driven instruments;

(E) landing gear;
(F) flaps and other services.
(ii) re-plan flight:
(A) ATC and weather;
(B) terrain clearance, SE cruise speed;
(C) decision to divert or continue.
(iii) fuel management: best use of remaining fuel;
(iv) dangers of re-starting damaged engine;
(v) action if unable to maintain altitude: effect of altitude on power available;
(vi) effects on performance;
(vii) effects on power available and power required;
(viii)effects on various airframe configuration and propeller settings;
(ix) use of flight or owner's manual:

(A) cruising;
(B) climbing: ASI colour coding (blue line);
(C) descending;
(D) turning.
(x) 'live' engine limitations and handling;
(xi) take-off and approach: control and performance;

(t) Significant factors:
(1) significance of take-off safety speed:
(i) effect of landing gear, flap, feathering, take-off, trim setting and systems for operating landing gear and flaps;
(ii) effect on mass, altitude and temperature (performance).
(2) significance of best SE climb speed (v_{yse}):
(i) acceleration to best engine climb speed and establishing a positive climb;
(ii) relationship of SE climb speed to normal climb speed;
(iii) action if unable to climb.
(3) significance of asymmetric committal height and speed: action if baulked below asymmetric committal height;

(u) Engine failure during take-off:
(1) below v_{mca} or unstick speed:
(i) accelerate or stop distance considerations;
(ii) prior use of flight manual data if available.
(2) above v_{mca} or unstick speed and below safety speed;
(3) immediate re-landing or use of remaining power to achieve forced landing;

(4) considerations:
(i) degree of engine failure;
(ii) speed at the time;
(iii) mass, altitude, temperature (performance);

(iv) configuration;
(v) length of runway remaining;
(vi) position of any obstacles ahead;

(v) Engine failure after take-off:
(1) simulated at a safe height and at or above take-off safety speed;
(2) considerations:
(i) need to maintain control;
(ii) use of bank towards operating engine;
(iii) use of available power achieving best SE climb speed;
(iv) mass, altitude, temperature (performance);
(v) effect of prevailing conditions and circumstances.
(3) Immediate actions:
(i) maintenance of control, including air speed and use of power;
(ii) recognition of asymmetric condition;
(iii) identification and confirmation of failed engine;
(iv) feathering and removal of drag (procedure for type);
(v) establishing best SE climb speed.

(4) Subsequent actions: whilst carrying out an asymmetric power climb to the downwind position at SE best rate of climb speed:
(i) cause and fire check;
(ii) live engine, handling considerations;
(iii) remaining services;
(iv) ATC liaison;
(v) fuel management.
Note: these procedures are applicable to aeroplane type and flight situation.

(w) Asymmetric committal height:
(1) Asymmetric committal height is the minimum height needed to establish a positive climb whilst maintaining adequate speed for control and removal of drag during an approach to a landing.
Because of the significantly reduced performance of many CS-23 aeroplanes when operating on one engine, consideration is to be given to a minimum height from which it would be safely possible to attempt a go-around procedure, during an approach when the flight path will have to be changed from a descent to a climb with the aeroplane in a high drag configuration.

Due to the height loss which will occur during the time that the operating engine is brought up to full power, landing gear and flap retracted, and the aeroplane established in a climb at v_{yse} a minimum height (often referred to as 'asymmetric committal height') is to be selected, below which the pilot should not attempt to take the aeroplane round again for another circuit. This height will be compatible with the aeroplane type, all up weight, altitude of the aerodrome being used, air temperature, wind, the height of obstructions along the climb out path, and pilot competence.

(2) Circuit approach and landing on asymmetric power:
(i) definition and use of asymmetric committal height;
(ii) use of standard pattern and normal procedures;
(iii) action if unable to maintain circuit height;
(iv) speed and power settings required;
(v) decision to land or go-around at asymmetric committal height: factors to be considered;

(3) Undershooting: importance of maintaining correct air speed, (not below v_{yse}).
(x) Speed and heading control:
(1) height, speed and power relationship: need for minimum possible drag;
(2) establishing positive climb at best SE rate of climb speed:
(i) effect of availability of systems, power for flap and landing gear;
(ii) operation and rapid clean up.
Note 1: The air speed at which the decision is made to commit the aeroplane to a landing or to go-around should normally be the best SE rate of climb speed and in any case not less than the safety speed.
Note 2: On no account should instrument approach 'decision height' and its associated procedures be confused with the selection of minimum height for initiating a go-around in asymmetric power flight.

Engine failure during an all engines approach or missed approach:
(1) use of asymmetric committal height and speed considerations;
(2) speed and heading control: decision to attempt a landing, go-around or force land as circumstances dictate.
Note: at least one demonstration and practice of engine failure in this situation should be performed during the course.

(z) Instrument flying on asymmetric power:
(1) considerations relating to aircraft performance during:
(i) straight and level flight;
(ii) climbing and descending;
(iii) standard rate turns;
(iv) level, climbing and descending turns including turns onto pre-selected headings.

(2) vacuum operated instruments: availability;
(3) electrical power source.

ADDITIONAL TRAINING FOR PRIVILEGES TO CONDUCT LINE FLYING UNDER SUPERVISION
(aa) In order to be able to conduct line flying under supervision, as provided in FCL.910.TRI(a), the

TRI should have received the additional training described in paragraph (k) of this AMC.

TRAINING WHERE NO FSTD EXISTS

(ab) Where no FSTD exists for the type for which the certificate is sought, a similar course of training should be conducted in the applicable aeroplane type. This includes all elements listed under this sub paragraph, the synthetic device elements being replaced with appropriate exercises in an aeroplane of the applicable type.