

The Assessment of Non-technical Skills in JAR-OPS and JAR-FCL

*Captain Paul Field
British Airways Plc*

Abstract

Safety research has shown that human error is a primal contributing factor in the majority of incidents and accidents in aviation. The benefits of dedicated CRM training programs as both a defence against human error and a method of enhancing flight-deck non-technical skills, were recognised almost twenty-five years ago. The majority of licensing authorities, including the JAA through JAR-OPS and JAR-FCL, now mandate CRM training.

JAR-OPS and JAR-FCL also insist on the assessment of Non-technical Skills proficiency, however, the JAR-OPS requirement that a crewmember's CRM is specifically assessed during their Line Check has generated considerable debate, and opposition from pilot's representatives in particular. The concerns expressed emanate from the belief that unscrupulous operators seeking to rid themselves of unwanted employees could use a poor CRM evaluation as grounds for dismissal.

The objectives of this short paper are therefore to compare the differing requirements under JAR-FCL and JAR-OPS, establish what safeguards are already in place, and establish whether or not the Line Check does in reality provide more opportunity than any other checking event for an operator to dismiss an unwanted employee on the grounds of poor CRM.

CRM Training and Testing in JAR-FCL

The training and assessment of CRM is an integral part of initial licensing and continued proficiency under JAR-FCL. JAR-FCL requires applicants to pass an examination in Human Performance and Limitations, and undertake a Multi Crew Co-operation course as part of the licensing and type rating process. The aim of the course is:

[AMC FCL1.261]

“The objectives of MCC training are optimum decision making, communication, division of tasks, use of checklists, mutual supervision, teamwork, and support throughout normal, abnormal and emergency conditions. The training emphasises the development of non-technical skills applicable to working in a multi-crew environment.....not simply as a collection of technically competent individuals”.

[Appendix 1 to JAR-FCL 1.261(d)]

The aim of the course is to ensure that as far as possible:

- a. The pilot-in-command fulfils his managing and decision-making functions irrespective of whether he is PF or PNF.
- b. The tasks of PF and PNF are clearly specified and distributed in such a manner that the PF can direct his full attention to the handling and control of the aircraft.
- c. Co-operation is effected in an orderly manner appropriate to the normal, abnormal or emergency situations encountered.

d. Mutual supervision, information and support is ensured at all times.

INSTRUCTORS

Instructors for MCC training shall be thoroughly familiar with human factors and Crew Resource Management (CRM). They should be current with the latest developments in human factors training and CRM techniques.

The principles and Non-technical Skills (NTS) acquired during the MCC course and type training (which must include MCC) are then checked (pass/fail) during the Skill test, and subsequent License Proficiency Checks (LPC) for the aeroplane type and ATPL as follows:

Appendix 1 to JAR–FCL 1.240 & 1.295

The test/check for a multi-pilot aeroplane shall be performed in a multi-crew environment. The following matters shall be specifically checked when testing/checking applicants for the ATPL(A) or a type rating for multi-pilot aeroplanes extending to the duties of a pilot-in-command, irrespective of whether the applicant acts as PF or PNF:

- (a) Management of crew co-operation (MCC);
- (b) Maintaining a general survey of the aeroplane operation by appropriate supervision; and
- (c) Setting priorities and making decisions in accordance with safety aspects and relevant rules and regulations appropriate to the operational situation, including emergencies.

FLIGHT TEST TOLERANCE

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- (a) Operate the aeroplane within its limitations;
- (b) Complete all manoeuvres with smoothness and accuracy;
- (c) Exercise good judgement and airmanship;
- (d) Apply aeronautical knowledge;
- (e) Maintain control of the aeroplane at all times in such a manner that the successful outcome of a procedure or manoeuvre is never in doubt;
- (f) Understand and apply crew co-ordination and incapacitation procedures, if applicable; and
- (g) Communicate effectively with the other crewmembers, if applicable.

CRM Training and Testing in JAR-OPS

[AMC OPS 1.943/1.945(a)(9)/1.955(b)(6)/1.965(e) Crew Resource Management (CRM)

1 General

1.1 Crew Resource Management (CRM) is the effective utilisation of all available resources (e.g. crewmembers, aeroplane systems, supporting facilities and persons) to achieve safe and efficient operation.

1.2 The objective of CRM is to enhance the communication and management skills of the flight crewmember concerned. The emphasis is placed on the non- technical aspects of flight crew performance.

JAR-OPS 1.943 New employees shall complete initial Operator's CRM Training within their first year of joining an operator. Initial CRM training is conducted in accordance with a detailed course syllabus included in the Operations Manual.

JAR-OPS 1.955 Nomination as commander

(a) An operator shall ensure that for upgrade to commander from co-pilot and for those joining as Commanders receive CRM training in accordance with AMC/IEM OPS 1.943 etc

JAR-OPS 1.945 Conversion training and checking

An operator shall ensure that:

- a). Elements of CRM training are integrated into the conversion course (*JAR-FCL MCC requirement*) and...
- b). Conversion training is conducted by suitably qualified personnel in accordance with a detailed course syllabus included in the Operations Manual and...
- C). The personnel integrating elements of CRM (*JAR-FCL MCC requirement*) into conversion training are suitably qualified

JAR-OPS 1.965 and appendix 1 to JAR-OPS 1.965

Recurrent Training

- (i) Elements of CRM shall be integrated into all appropriate phases of recurrent training;
- (ii) An Operator will establish a specific modular CRM training programme conducted by at least one CRM trainer acceptable to the Authority such that all major topics of CRM training are covered over a period not exceeding 3 years, including:

- (A) Human error and reliability, error chain, error prevention and detection;
- (B) Company safety culture, SOPs, organisational factors (C) Stress, stress management, fatigue and vigilance; (D) Information acquisition and processing, situation awareness, workload management; (E) Decision making; (F) Communication and co-ordination inside and outside the cockpit; behaviour, synergy; (H) Automation and philosophy of the use of Automation (if relevant to the type); (I) Specific type-related differences; (J) Case based studies;

Recurrent Checking

Recurrent checking shall comprise...

(1) *Operator proficiency checks*

8.4 If the operator proficiency check is combined with the Type Rating revalidation/renewal check, the assessment of CRM skills will satisfy the Multi Crew Co-operation requirements of the Type Rating revalidation/renewal. This assessment will not affect the validity of the Type Rating.

App. 1 to JAR-OPS 1.005(a)

Operator proficiency check may be conducted by a Type Rating Examiner (TRE), Class Rating Examiner (CRE) or by a suitably qualified Commander nominated by the operator and acceptable to the Authority, trained in CRM concepts and the assessment of CRM skills.

(2) *Line checks;*

(i) Line checks must establish the ability to perform satisfactorily a complete line operation including pre-flight and post-flight procedures and use of the equipment provided, as specified in the Operations Manual.

(ii) The flight crew must be assessed on their CRM skills in accordance with a methodology acceptable to the Authority and published in the Operations Manual. The purpose of such assessment is to:

(A) Provide feedback to the crew collectively and individually and serve to identify retraining;

(B) Be used to improve the CRM training system

The person conducting the line check, who is described in JAR-OPS 1.965(a)(4)(ii), shall be trained in CRM concepts and the assessment of CRM skills.

Discussion

JAR-FCL MCC concept	JAR-OPS CRM concept
AMC FCL 1.261	AMC OPS 1.943 etc
<p>“The objectives of MCC training are optimum decision making, communication, division of tasks, use of checklists, mutual supervision, teamwork, and support throughout normal, abnormal and emergency conditions. The training emphasises the development of non-technical skills applicable to working in a multi-crew environment.....not simply as a collection of technically competent individuals”.</p>	<p>“The objective of CRM is to enhance the communication and management skills of the flight crewmember concerned. The emphasis is placed on the non- technical aspects of flight crew performance. Crew Resource Management (CRM) is the effective utilisation of all available resources (e.g. crewmembers, aeroplane systems, supporting facilities and persons) to achieve safe and efficient operation.</p>

MCC Training Elements	CRM Training Elements
<p>Leadership / Followership and Authority; Managerial and Supervisory Skills; Team Responsibility; Teambuilding etc.</p>	<p>Leadership and Team behaviour. Synergy; Teambuilding, Conflict resolution. Decision-making; Information acquisition; Situation awareness; Workload Management etc (in depth). Stress and Stress Management.</p>
<p>Crew Co-ordination Procedures; Standard Phraseologies, checklist procedures; Checklist Discipline, mutual supervision. Communication – listening, feedback, participation etc.</p>	<p>Communication and co-ordination inside and outside the cockpit. Safety Culture, SOPs etc (in depth) Automation Philosophy</p>

The concepts of MCC and CRM defined in JAR-OPS and JAR-FCL may be slightly different, but the comparisons above show that in reality they are the same Non-technical competencies (skills), and that JAR-OPS and JAR-FCL seek to train and assess the same knowledge, skills and attitudes.

Assessment

There are four instances under which the assessment of Non-technical Skill (NTS) takes place, namely the License Skill Test (LST); License Proficiency Check (LPC); Operators Proficiency Check (OPC) and Line Check. Each carries the same implications i.e. an unacceptable NTS rating will provoke the withdrawal of the privileges of the individual’s type rating or operators certificate.

It was recognised by the JAA some years ago that the absence of unambiguous guidelines and a suitable assessment framework would inevitably lead to incorrect and biased pass/fail NTS judgements. This realisation led to the development of the NOTECHS assessment framework and its subsequent validation through the JARTEL project, although at this time (FEB 04), the JAA has not yet formally transformed the findings of the JARTEL project into relevant AMC and IEM. Never the less, in regard to JAR-OPS and the Line Check in particular, there is a requirement for the context, testing standards, and pass/fail criteria to be established prior to individual or crew NTS assessment.

IEM OPS 1.943/1.945(a)(9)/1.955(b)(6)/1.965(e)

Assessment of CRM Skills

4.1 Assessment is the process of observing, recording, interpreting and evaluating, where appropriate, pilot performance and knowledge against a required standard in the context of overall performance. It includes the concept of self-critique, and feedback which can be given continuously during training or in summary following a check.

4.2 CRM skills assessment should be included in an overall assessment of the flight crewmembers performance and be in accordance with approved standards. Suitable methods of assessment should be established, together with the selection criteria and training requirements of the assessors and their relevant qualifications, knowledge and skills.

4.3 Individual assessments are not appropriate until the crewmember has completed the initial CRM course and completed the first OPC.

For first CRM skills assessment, the following methodology is considered satisfactory:

- a. An operator should establish the CRM training programme including an agreed terminology. This should be evaluated with regard to methods, length of training, depth of subjects and effectiveness.
- b. A training and standardisation programme for training personnel should then be established.
- c. For a transition period, the evaluation system should be crew rather than individually based.

AMC OPS 1.943/1.945(a)(9)/1.955(b)(6)/1.965(e)

8.1 Assessment of CRM skills should:

- a. Provide feedback to the individual and serve to identify retraining; and
- b. Be used to improve the CRM training system.

8.2 Prior to the introduction of CRM skills assessment, a detailed description of the CRM methodology including terminology used, acceptable to the Authority, should be published in the Operations Manual.

8.3 Operators should establish procedures to be applied in the event that personnel do not achieve or maintain the required standards (Appendix 1 to 1.1045, Section D, paragraph 3.2 refers).

No such guidance exists as yet for the assessment of NTS under JAR-FCL, and the author believes the UK CAA may be unique among JAA regulatory authorities in having adopted many of the recommendations of the JARTEL project and applied the following NOTECHS guiding principle for NTS assessment to both JAR-OPS and JAR-FCL:

CAA CAP 737/Standards Doc 24

“A crewmember should not fail a licence or type rating revalidation check due to poor CRM unless this is associated with a technical failure. However, an Operator Proficiency Check should not be considered as being satisfactorily completed unless the CRM performance of the pilot meets with company requirements. This does not prevent instructors and examiners from giving feedback on CRM issues where appropriate even if there has not been an effect on the technical performance of the flight.”

Relating poor NTS to performance at the individual and Crew level is a crucial step in establishing the acceptance and validity of assessment. No longer can the assessment be made in isolation and out of context, and any deficiency in the individual's skills can then be established and appropriate training applied as required by the relevant codes (AMC/IEM OPS 1.943/1.945 etc). Indeed, the author would argue that in reality, the absence of this safeguard under JAR-FCL is much more of a threat to employees than the explicit requirement for NTS assessment under JAR-OPS, as a failure under FCL invalidates the employees' licence as well as jeopardising employment prospects.

Conclusions

The objectives of this paper were:

- i) To compare the NTS training and testing requirements under JAR-FCL and JAR-OPS;
- ii) To establish what safeguards against the misuse of an NTS assessment are already in place;
- iii) To establish whether or not the Line Check does in reality provide more opportunity than any other checking event for an operator to dismiss an unwanted employee on the grounds of poor CRM.

Despite semantic differences, it has been shown that requirements for the training and testing of NTS under JAR-FCL and JAR-OPS are entirely congruent - they aim to train and check the same competencies. There is, however, a lack of common language and detailed harmonisation between JAR-OPS and JAR-FCL, and this has led to the common misconception that assessment of NTS is only required during a Line Check. A unified approach to training and testing of NTS would provide industry with more clarity, and universal adoption of the implementation guidelines from the NOTECHS and JARTEL projects would provide the barriers to abuse that pilot's representative's demand.

It is difficult to conclude that the Line Check event provides more opportunity for an employer to dismiss an individual for poor CRM than any other checking event. On the contrary, there is more latitude for abuse under JAR-FCL than under JAR-OPS.

With the exception of the requirement to show the relationship between the technical consequence and inadequate Non-technical Skill(s), sufficient safeguards against misuse of NTS assessment are already in place in JAR-OPS. This guiding principle from the NOTECHS project has been adopted by the UK CAA as discussed above, however, it is not yet part of any AMC or IEM material. This should be remedied as a matter of urgency, and rather than petition for the removal or dilution of a process that is an essential part of the maintenance and enhancement of individual and crew proficiency (NTS assessment), pilot's representatives and national regulatory authorities must work together to ensure that the safeguards against abuse are assiduously applied and remain appropriate. This would be to the benefit of all.