

FLIGHT CREW LICENSING AND TRAINING PANEL (FCLTP)

SECOND MEETING

Montreal, 31 January to 11 February 2005

AGENDA ITEM 3

The attached constitutes the report on Agenda Item 3 and should be inserted at the appropriate place in the yellow report folder.

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- Agenda Item 3:**
- i) Develop recommendations for SARPs in Annex 1 for a multi-crew pilot licence (MPL), to include:**
 - a) competency-based licensing and training requirements;**
 - b) the optimum use of instructional devices (including synthetic training devices; and**
 - c) bridging requirements between the proposed multi-crew pilot licence (MPL) and the CPL and ATPL.**
 - ii) Review material for a *Procedures for Air Navigation Services - Training* (PANS-TRG) document.**
 - iii) Develop supporting guidance material**

3.1 INTRODUCTION

3.1.1 The Air Navigation Commission (ANC) requested the Flight Crew Licensing and Training Panel (FCLTP) to review the structure of licences and ratings to ensure that they provided an efficient path towards the future activities of the applicant and to determine:

- i) the core competencies required by the professional pilot;
- ii) the competency required for single-pilot and multi-crew operations; and
- iii) the optimum point at which to commence multi-crew training.

3.1.2 The ANC also requested the FCLTP to determine whether competency-based flight crew Standards could complement and/or replace existing Standards based upon knowledge, skill and experience and to assess the use of synthetic flight trainers (subsequently referred to as flight simulation training devices).

3.1.3 The ANC, at its first meeting of the 166th Session, approved the recommendation of FCLTP/1 and agreed, in principle, to the establishment of a multi-crew pilot licence (MPL) to be held by co-pilots of turbine-engine, commercial air transport aeroplanes (FCLTP/1-WP/27, Report on Agenda Item 3, paragraph 3.5, Recommendation 3/1 refers). The ANC requested that the proposal be supported by a safety rationale or analysis. It also agreed to include in the panel's work programme, an item on the development of material for a *Procedures for Air Navigation Services—Training* (PANS-TRG) document. Work continued through 2004 on developing the draft material for the MPL and the PANS-TRG document.

3.2 PROPOSALS FOR THE AMENDMENT OF ANNEX 1

3.2.1 Annex 1 requirements for the MPL

3.2.1.1 The proposal included the introduction in Chapter 2 of Annex 1 and in a new Appendix 3 of the Annex, of new provisions governing the issuance of the MPL. The new provisions contained an experience requirement of 240 hours of actual and simulated flight and made reference to more detailed experience requirements found in Chapter 3 of the PANS-TRG document. New definitions in relation to

competency-based training and threat and error management were proposed for Annex 1 (FCLTP/2-WP/11 refers).

3.2.1.2 A newly introduced Appendix 3 to Annex 1 contained the nine competency units established for the MPL that had to be satisfactorily demonstrated by the applicant in accordance to the assessment levels defined in a new Attachment 2. The application of threat and error management was established as one of the nine competency units to be demonstrated by the applicant. Reference was made to the further breakdown of the units into competency elements and performances criteria, to be found in the PANS-TRG document. Appendix 3 also contained training requirements and provisions governing the use of flight simulation training devices.

3.2.1.3 **FCLTP Review**

3.2.1.3.1 FCLTP/2-WP/15, containing the draft proposals for the multi-crew pilot licence (MPL), was introduced by the Rapporteur of Working Group C. He provided some background in relation to the work programme approved by the Air Navigation Commission and the work undergone by the working group in relation to the development of the draft proposal. As he pointed out, the broad principles underlining the MPL, included competency-based training and assessment; greater emphasis on flight simulation training devices (FSTDs); training based in a multi-crew environment; emphasis on cockpit resource management (CRM) and threat and error management (TEM) as essential components of training; the inclusion of mandatory upset recovery training in the core skills phase of training; and the fact that, at the current time, the MPL only related to the aeroplane category.

3.2.1.3.2 The Rapporteur also indicated that the MPL was able to take advantage of well-proven and modern, competency-based training methodologies; a selection process based on population analysis; emphasis on turbine-engine aircraft rather than light aircraft techniques; continuous assessment techniques and modern simulation technology that was versatile in allowing for environmental and meteorological effects. He listed and briefly outlined the main deliverables of the working group's work as being the Annex 1 draft provisions for the licence, including the competency units and the requirements included in a proposed new Appendix and Attachment to the Annex; the draft *Procedures for Air Navigation Services—Training* (PANS-TRG) that also contained procedures for determining experience requirements for the MPL; a safety/risk and benefit analysis of the MPL, as was requested by the Air Navigation Commission; and a proof of concept procedure for evaluating the in-service implementation of MPL training programmes. Working papers were introduced on each of these additional deliverables (FCLTP/2-WP/16, FCLTP/2-WP/18 and FCLTP/2-WP/19 refer respectively).

3.2.1.3.3 A member of the panel introduced FCLTP/2-WP/17 that suggested a number of amendments to the proposal of Working Group C (as contained in FCLTP-WP/15). She proposed that a step-by-step approach, based on current experience with ab initio training, be adopted in the implementation of MPL training programmes. Pointing to the background of development of existing ab initio pilot training programmes, notably in her State, she said that progressive elements included the increased use of flight simulation training devices and a reduction of actual flying hours, which would not have been possible without advances in training evaluation and monitoring techniques. At the same time, however, problems had risen, particularly in relation to aircraft handling capabilities and adaptation to actual flying conditions that could not be reproduced in a simulator.

3.2.1.3.4 This same member felt that the MPL proposal met the need for the whole training course, including the required flying and simulated hours, to be approved by the Licensing Authority. However, she felt that there was still a need to ensure that training be conducted alternately between actual flying in the aeroplane and flying the simulator; that, on the basis of experience with airline ab initio programmes, a reasonable basis for the number of actual flying hours was 115; that training volume adaptation be effected only on the basis of evaluation and feedback on the line performance of graduates from the course; that MPL training programmes be established only in close collaboration with the airlines, which will have to guarantee continued line training and evaluation; and that MPL training programmes only accept individual applicants with ties to an airline.

3.2.1.3.5 There was extensive discussion on the MPL proposal contained in FCLTP-WP/15. Amongst the responses to the proposal, however, was a concern that MPL training programmes would not be limited to applicants already tied to a specific airline. In the ensuing discussion, the meeting agreed that, although training for the MPL could be in accordance to the standard operating procedures (SOPs) of a particular airline, for several reasons, it would be impractical to tie the training to a specific airline.

3.2.1.3.6 In reviewing the contents of FCLTP/2-WP/15, the meeting agreed on a number of amendments (see paragraph 2.5 of the consolidated text of Annex 1 amendments at Appendix B). These included the deletion of any mention in the text of the terms *technical*, *procedural* and *interpersonal* in relation to skills, on the understanding that several taxonomies of skill were used in competency-based training frameworks, and a determination as to which one to use could best be left to the approved training organization. Further amendments to the skill requirements for the licence were made in line with the Secretariat's proposals in FCLTP/2-WP/21, to include the deletion of the proposed sub-paragraph 2.5.1.3 e) in view of the superfluous nature of the concepts, *good judgement*, *airmanship*, *structured decision making* and *situational awareness* in the context of competency-based training and assessment. The panel subsequently agreed to delete paragraph 2.5.1.3 e), and noted that the change would not be made to skill requirements of the other licences, since they were not competency-based. One panel member also suggested that it would be worthwhile to update the skill requirements for the airline transport pilot licence (ATPL) to reflect some of the interesting ideas contained in the MPL text.

3.2.1.3.7 In addition, the meeting took note of FCLTP/2-WP/20 that proposed the substitution of the term Pilot Monitoring (PM) for Pilot Non Flying (PNF). Although several participants expressed their support for the new terminology, other participants were unconvinced of the need to change existing terminology, and preferably would have liked to see the change achieved through education as opposed to regulation.

3.2.1.3.8 The meeting also deleted paragraph 2.5.3.2 in line with its decision not to allow for credit of flight time in other aircraft categories, and introduced a number of editorial changes to the entire text for the sake of improving clarity.

3.2.1.3.9 In concluding its discussion, the meeting reviewed the contents of FCLTP/2-WP/19 on the *proof of concept*, and agreed to recommend the approach proposed. This was on condition that Contracting States would be advised, at the time of the issuance of the Annex amendment, that data would be required to this end, including data for the validation of training. This matter was referred to Agenda Item 5 (see paragraph 5.3.4 in the Report on Agenda Item 5).

3.2.2 **The optimum use of flight simulation training devices**

3.2.2.1 The FCLTP Working Group B had considered the use of flight simulation training devices in acquiring or maintaining the competencies required for the various levels of licences and ratings, taking into account the type of device being used, and determining the credit given for the use of such devices. It agreed that there was a need to encourage the use of FSTDs, and expressed concern about arbitrarily determining the amount of credit to be awarded for the use of a device, in the absence of supporting data. It proposed that this matter be further considered by FCLTP/2.

3.2.2.2 **FCLTP review**

3.2.2.2.1 The panel noted that the best practices of several States allowed for deviations from the Annex 1 experience requirements for the issuance of licences and ratings, with respect also to the credits allowed for the use of FSTDs. Reference was made to the use by several States of a systematic analysis and approval process for determining an alternative means of compliance to the existing requirements of the Annex, and which provided a level of competency at least equal to traditional training programmes. The panel subsequently agreed to recommend to the ANC an amendment to Annex 1 (see Appendix 2 in the consolidated text of the Annex 1 amendments at Appendix B) that allowed for an alternative means of compliance with the experience requirements established for the PPL, CPL, and IR. In addition, the proposal also referred to the multi-crew pilot licence. It was agreed that in the case of the MPL, an approved training organization would have to demonstrate that the training provided a level of competency in multi-crew operations that was at least equal to that provided for the commercial pilot licence, instrument rating and type rating.

3.2.2.2.2 The panel amended paragraph 4.2 of the proposed Appendix 3 of the Annex, to include a more detailed description of Type 1 E-Training and part-tasking devices. It agreed that the Secretariat develop additional support guidance material, and that this matter be considered under Agenda Item 5.

3.2.3 **Bridging requirements between the MPL and the ATPL and CPL**

3.2.3.1 The proposal in FCLTP/2-WP/15 on the MPL also included bridging provisions that would enable a MPL holder to qualify for the commercial pilot licence (CPL). An amendment to the experience requirements of the airline transport pilot licence (ATPL) would also enable the holder of a MPL to meet the experience requirements of the ATPL when upgrading to pilot-in-command (see FCLTP/2-WP/18, Appendix C, paragraph 2.6.2.2).

3.2.3.2 **FCLTP Review**

3.2.3.2.1 In reviewing FCLTP/2-WP/15, the bridging requirement between the MPL and the CPL and the MPL and the ATPL were discussed by the meeting. Although one participant initially raised a concern that the ten hour bridging actual pilot-in-command (PIC) requirement that had to be met by MPL holders if making the transition to the CPL was inadequate, the meeting concluded in agreeing on the proposal (see paragraph 2.5.2.3 sub-paragraph a) and b) on page 3A-26 in Appendix B). The meeting also agreed to the proposal that enabled the holder of an MPL to meet the experience requirements of the ATPL as revised by its discussion (see paragraph 2.6.3.1.1.1 a) on page 3A-32 of Appendix B.) In addition, amendments were made to the ATPL privileges to clarify the need for an ATPL pilot who previously held only an MPL, to meet the single pilot requirements prior to exercising relevant privileges on the ATPL (see paragraph 2.6.2.2

of the consolidated text of the Annex 1 amendments at Appendix B). The proposed new structure for Chapter 2 of Annex 1 that includes the MPL, is at Appendix A.

3.2.4 **MPL risk and benefit analysis**

3.2.4.1 In response to the ANC's request for the panel to support the MPL proposal with a safety rationale, a risk and benefit analysis was presented that highlighted the benefits of the new licence as well as associated risks (FCLTP/2-WP/18 refers).

3.2.4.2 **FCLTP Review**

3.2.4.2.1 The panel reviewed FCLTP/2-WP/18 and recommended that the safety/risk and benefit analysis developed by Working Group C be presented to the Air Navigation Commission in support of the proposal on the MPL. The safety/risk and benefit analysis was reviewed and amended in light of recent discussion by the panel with regards to deleting the breakdown of the 240 hours total number of hours for the MPL. The panel agreed to recommend for consideration by the ANC the text found in Appendix D.

3.2.5 **Amendments to Annex 1**

3.2.5.1 The proposals to amend Annex 1 provide for a new multi-crew pilot licence that will enable the holder to act as co-pilot in commercial air transport operations, in a turbine-engine aeroplane certificated for operation with a minimum crew of at least two pilots or certificated for single-pilot operations but requiring the use of a co-pilot. The proposal also includes a new Appendix 3 that contains the competency units underlying the MPL and a new Attachment 2 in which are contained details of the four levels of competency. The proposals, in addition, provide for bridging between the MPL, the CPL and the ATPL, and for alternative means of compliance in relation to the experience requirements for the PPL, CPL, MPL and the IR, to include experience gained on FSTDs.

3.2.6 **RECOMMENDATIONS**

In view of the foregoing discussions, the meeting agreed to the following recommendation that consolidates all the amendments to Annex 1 discussed by the panel under Agenda Items 1, 2 and 3:

RSPP

**Recommendation 3/1 — AMENDMENT TO ANNEX 1 -
PERSONNEL LICENSING**

That Annex 1 be amended as indicated in Appendix B to the report on this agenda item.

3.3 **PROPOSAL FOR PROCEDURES FOR AIR NAVIGATION PROCEDURES—TRAINING (PANS-TRG)**

3.3.1 The draft PANS-TRG document (see FCLTP/2-WP/16, Appendix A) contained, in Chapter 2, general procedures for the design, development and implementation of competency-based

training and assessment. Chapter 2 also contained an attachment that described the Instructional Systems Design (ISD) methodology used by the ICAO TRAINAIR Programme.

3.3.2 Chapter 3 contained procedures specific to competency-based training and licensing for the multi-crew pilot licence (MPL). Located here were more-detailed experience requirements to those found in the Annex, including the 70 hours (or 60 hours, if reduced in accordance with the stipulated criteria) of actual flight time that had to be completed by the applicant. Also included, was the provision for twelve take-offs and landings that could also be reduced if the Licensing Authority was satisfied that stipulated criteria had been met. Appendix A of Chapter 3 contained the MPL training schedule and Appendix B contained the competency elements and performance criteria for the MPL. This chapter also had two attachments, one with guidance on the design and development of a MPL training programme and the other with examples of MPL training objectives.

3.3.3 Chapter 4 of the PANS contained the procedures on instructor and examiner competencies for the MPL. The competencies themselves were to be found in the Attachment to the chapter

3.3.4 **FCLTP Review**

3.3.4.1 In its review of FCLTP/2-WP/16, the panel made a number of editorial comments which included a clarification that evaluation of an MPL holder's initial operating experience (IOE) with an airline, would be conducted upon completion of the line training. With reference to FCLTP/2-DP/7 and its Appendix, the panel engaged in a lengthy discussion on the relationship between threat and error management (TEM) and crew resource management (CRM). The meeting requested that the text of the PANS-TRG document in the Appendix be amended in order to further clarify the relationship between TEM and CRM. In this respect, the Secretariat referred to other ICAO documents that would also contain material on TEM, namely the Circular on TEM for ATC. Elements of this would be included in a similar document related to flight crew.

3.3.4.2 The distribution of hours regarding the use of FSTDs and actual aeroplane was discussed in reference to paragraph 3.3.3 of Chapter 3 of the PANS-TRG. The meeting noted that given that MPL training is a competency-based programme, there would normally be no need to determine an experience requirement in flight hours. In addition, the proposal to include a requirement on the process of approval of a MPL training course, in the new Appendix 2 of the Annex made the procedures in paragraph 3.3.3 redundant (paragraph 3.2.2.2.1 refers). The panel therefore agreed to only maintain in the Annex, the 240 hours required for the MPL without stipulating any hours, or breakdown of hours between actual and simulated flight, in the PANS-TRG document, and accordingly amended paragraph 3.3.3. As a consequence, however, the panel developed guidelines for the implementation of the MPL, which it included as Attachment A to Chapter 3 of the PANS-TRG document. The draft PANS-TRG document, as agreed by the panel, is at Appendix C.

3.3.5 RECOMMENDATION

In view of the foregoing discussions, the meeting agreed to the following recommendation:

RSPP

**Recommendation 3/2 — PROCEDURES FOR AIR
NAVIGATION
SERVICES — TRAINING**

That the *Procedures for Air Navigation Services — Training* (PANS-TRG) at Appendix B to this agenda item be approved and published.

3.4 DEVELOPMENT OF GUIDANCE MATERIAL

3.4.1 Guidance material on the ICAO TRAINAIR instructional design methodology and on the design, development and implementation of a competency-based training programme for the MPL was included in the draft PANS-TRG document (see FCLTP/2-WP/16, Appendix A).

3.4.2 The working group of the whole meeting in October 2002 had agreed on the development of competency-based provisions for the current Annex 1 flight crew licences that would complement, and not replace, the current flight crew licensing provisions in Annex 1 and the training requirements of Annex 6. The ICAO Secretariat suggested that this need could be met by the competency-based framework established for the MPL, which could be used as a model for the PPL and the CPL (FCLTP/2-DP/6 refers). Although the use of the MPL competency framework for the PPL and the CPL was not prescriptive, it could provide an alternative framework for meeting the existing Annex 1 requirements for these licences. As stated in the PANS-TRG document, competency units, competency elements and performance criteria shall be derived from job and task analysis of flight crew and shall describe observable outcomes. Licensing Authorities wishing to develop competency-based frameworks for the PPL and the CPL would therefore need to apply a similar systematic approach to that used in the development of the MPL, and described in the PANS-TRG document.

3.4.3 FCLTP Review

3.4.3.1 The panel reviewed FCLTP/2-DP/6 and agreed that material already contained in the PANS-TRG document can be used to develop competency-based training for the current Annex 1 pilot licences.

3.4.3.1.1 In addition, the panel as a result of its discussion the use of FSTDs, determined that guidance material for inclusion in the *Manual on Approval of Flight Crew Training Organizations* be developed in support of its proposed provisions on alternative means of compliance. The guidance material would describe the approval process for training conducted using an alternative means of compliance with the experience requirements and for the approval of a MPL training course. The panel agreed to the outline proposed as a basis for the development of guidance material. The meeting also noted that the guidance

material would be made available on the ICAO Website prior to the distribution of the proposed Annex 1 amendment for consultation with States.

3.4.3.1.1.1 In view of the foregoing discussions, the meeting agreed to the following recommendation:

Recommendation 3/3 — DEVELOPMENT OF GUIDANCE MATERIAL

That guidance material on alternative means of compliance and for approval of a MPL training course be developed by the Secretariat and published in the *Manual on Approval of Flight Crew Training Organizations*.
