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WORKING PAPER

TENTH SESSION OF THE STATISTICS DIVISION

Montréal, 23 to 27 November 2009

Agenda Item 9: Civilian licensed personnel data

NEW DATA COLLECTION FOR AVIATION PERSONNEL LICENSES AND TRAINING

(Presented by the Secretariat)

SUMMARY

As air traffic grows, the demand for personnel licensed to perform civil air transport operations, including air traffic control (ATC), increases proportionally. Estimating current and future requirements for licensed aviation personnel on active duty and training capacity in each Contracting State is essential to lay the ground work for human resources planning, institutional capacity building and related funding and policy measures. Failure to quantify potential surplus or shortage of personnel and/or institutional capacities preclude adequate and timely measures from being taken to address these human resources and training imbalances. These shortcomings may adversely affect the safety of air transport operations.

An initial survey has been conducted in 2008 to assess licensed civil aviation personnel registered in Contracting States and corresponding training capacities. A new data collection is proposed on an annual basis.

Action by the division is in paragraph 4.

1. INTRODUCTION

1.1 Between 2004 and 2007, commercial air transport has shown a strong traffic growth pattern, leading to market-entry of several new air carriers and the highest peak in aircraft orders ever registered. Correlated to aircraft delivery plans over the next five years, is the demand for pilots, flight instructors, maintenance personnel (engineers, technicians and mechanics) and air traffic controllers, among other required personnel, which is likely to follow an exponential trend. Failure to train additional licensed aviation personnel in a timely manner could not only constrain air traffic growth but could also adversely affect the safety and efficiency of air transport operations. Before the air transport crisis in 2008, the threat of an opening gap between available and required licensed personnel was one of the potential traffic growth constraints in certain regions. According to the backlog of major aircraft manufacturers, 5 000 commercial aircraft have to be delivered over the next five years and 30 000 new pilots must be trained to operate them. Thus, the challenge for training institutions remains to have sufficient training capacity without compromising their standards to train and license pilots. The pressure

might be temporarily eased as the airline industry is still suffering from the decline in traffic growth due to recessionary demand contractions. However, the challenge would be when the additional demand, for instance for pilots, due to fleet expansion during the upswing to come, will coincide with retirement waves.

1.2 Human resources development and management must strive to continuously improve safety and to avoid skill gaps, taking into account interdependencies for supply and demand of civil licensed personnel at national, regional and global levels. Estimating current and future requirements for licensed personnel and training capacity in each Contracting State is essential to lay the ground work for human resources planning, institutional capacity building, and related funding and policy measures.

2. EXISTING ICAO DATA COLLECTIONS ON CIVILIAN LICENSED PERSONNEL

2.1 Form "D": Fleet and Personnel

2.1.1 On the existing Form D: Fleet and Personnel — Commercial Air Carriers, air carriers report, apart from fleet data, airline personnel and the corresponding airline expenditures. The reporting carriers covered more than 80 per cent of the global, scheduled traffic in terms of revenue tonnes kilometres (RTKs). They reported, among other staff categories, the number of pilots or co-pilots and licensed aircraft maintenance personnel.

2.1.2 Using the data on fleets and corresponding pilots or aircraft maintenance personnel, respectively, ratios of fleet/personnel were calculated, carrier by carrier, and consolidated at the national, regional and global levels. Estimates of pilots and aircraft maintenance personnel were performed by applying the respective regional fleet/personnel ratios to the latest available regional fleet data. In view of the representative reporting coverage of Form D, the application of fleet/personnel ratios produced significant results as will be shown in paragraph 3.1.3.

2.2 USOAP - Qualification and Training of Technical Personnel

2.2.1 ICAO is auditing Contracting States' civil aviation safety oversight system as part of the Universal Safety Oversight Audit Programme (USOAP)[1]. ICAO uses the State Aviation Activity Questionnaire (SAAQ) to assess the effectiveness of States' implementation of the critical elements of a safety oversight system. It contains questions on Technical Personnel Qualification and Training as well as Personnel Licensing in terms of the category and numbers of licenses and their validation issued by reporting State or another State as applicable.

2.2.2 Based on Assembly Resolution A35-6 — *Transition to a comprehensive systems approach for audits in the ICAO Universal Safety Oversight Audit Programme (USOAP)*, States are obliged to submit their completed SAAQ either prior to an initial audit or renewed audit cycle. Relevant information is contained in 209 SAAQs collected since 2005. As States are supposed to keep the information current, periodical data updates are done within a three to five year period. However, for comparative data analysis purposes, it is a handicap that the years of data origin are spread according to the audits conducted.

2.2.3 Audit results are confidential and findings cannot be reported. However, relevant audit information can be used internally by ICAO, if needed as long as the confidentiality clauses are respected.

[1] See http://www2.icao.int/en/ssa/soa/usoap/Pages/default.aspx for general information.

3. PROPOSED NEW DATABASE ON LICENSED AVIATION PERSONNEL AND TRAINING

3.1 ICAO 2008 Survey

3.1.1 The Secretariat launched an initial survey, under ICAO State letter EC 7/27-08/47 dated 25 June 2008, to assess the 2008 population of civilian license holders (employed by registered airlines, governmental or private entities), as well as the number of certified training institutions and their 2009-2012 planned projections. A copy of the questionnaire is provided in Appendix A.

3.1.2 Potential shortages or surpluses of licensed aviation personnel and training facilities as well as capacities are being assessed at regional and global levels in an on-going study, using the survey results, supplemented as appropriate with results from the other two databases discussed above. As a first step, the sample populations for pilots and licensed maintenance personnel of the 2008 survey reported by 82 States have been compared with estimates of the same groups stemming from fleet/personnel ratios based on Form D reports (see paragraph 2.1.2).

3.1.3 Figure 1 shows a survey population of around 421 000 pilots worldwide compared with an estimated 436 000 pilots based on the regional fleet/personnel ratios as explained. Although the traffic of the reporting States is equivalent to 85 per cent of RTKs, the lack of reporting is obvious in some regions. Figure 2 shows a survey population of around 500 000 aircraft maintenance personnel (engineers, technicians or mechanics) worldwide compared with an estimated 760 500 of that group, again based on the respective regional fleet/personnel ratios. Like for pilots, lack of reporting from States in all regions but North America precludes representative survey results. The discrepancy of about 355 000 aircraft maintenance personnel reported for North America in the 2008 survey compared to only 113 000 based on the applicable regional ratio is pointing out the air carriers´ trend to outsource maintenance/repair/overhaul functions to specialized, corporations, some of which are airline subsidiaries with multinational operations. The same discrepancy was also noticed for the European mechanics.

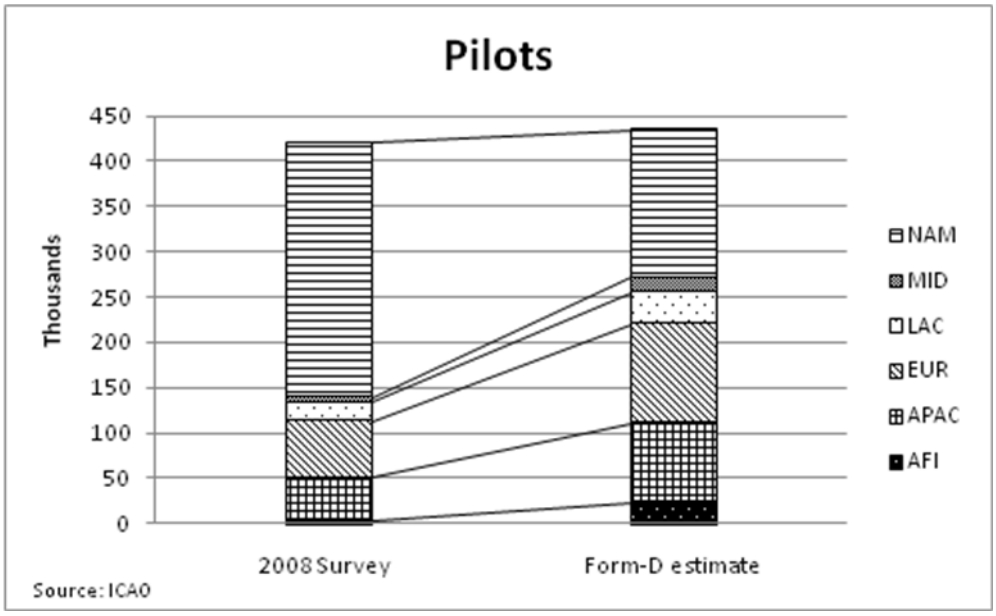

Figure 1: Pilots - World and Regions, 2008

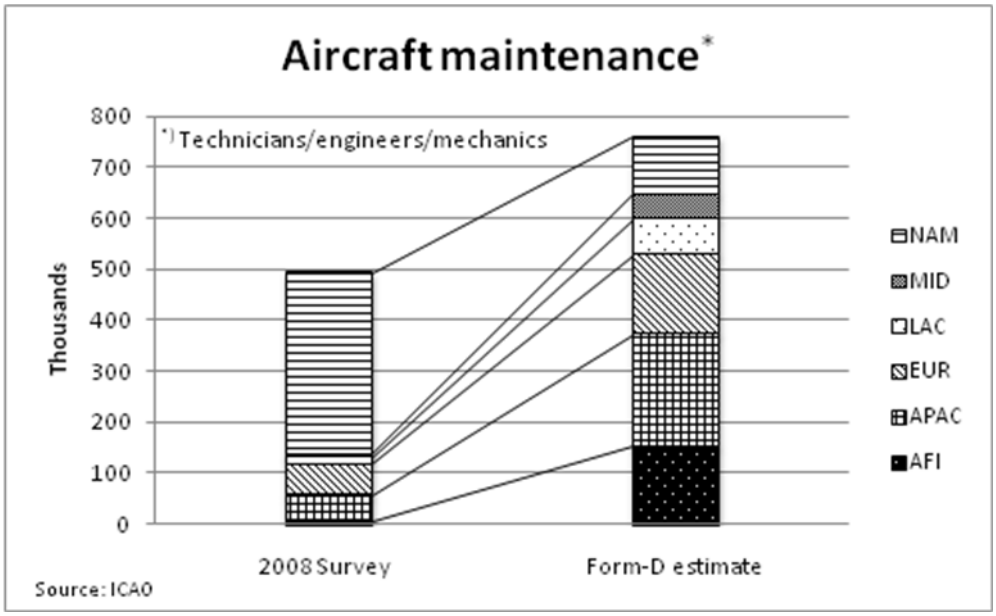

Figure 2: Aircraft maintenance personnel - World and Regions, 2008

3.1.4 Survey results for air traffic controllers are not considered as representative enough due to underreporting. According to an 2007 ICAO survey[2], 62 States reported that their ANSPs employed a total of around 150 000 staff out of which 64.2 per cent were active in air traffic management and communications, navigation and surveillance, 14.4 per cent were in meteorology, search and rescue or aeronautical information services while a remaining 20.4 per cent worked in other functions.

3.2 New Reporting Form

3.2.1 Governmental authorities, which issue or validate licenses for aviation personnel, can provide such data according to their current registers. Training institutions are involved in human resources planning and development and can indicate requirements for civilian licensed personnel and the corresponding training capacities over a 5-year horizon. Consequently, the proposed data collection adopts the method of asking for the number of specific licenses of a reporting State instead of the number of specific licenses holders. Furthermore, adopting the license categories will enable ICAO to create compatible databases, considering that airlines reported pilots and maintenance staff directly in Form D.

3.2.2 Appendix B shows a draft reporting form to which modifications will be made as required during the validation phase. In the interest of accurate and consistent data reporting from States, the accompanying reporting instructions will include definitions of the categories used based on ICAO Annex 1 — *Personnel Licensing* (see Appendix C).

4. ACTION BY THE DIVISION

4.1 The division is invited to endorse the recommendation STAP/14-14 of an annual data collection, using the draft form on licensed aviation personnel and training facilities as well as capacities provided in Appendix B to which modifications will be made as required during the validation phase.

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[2] See http://www.icao.int/icao/en/ATB/Studies/FinancialSituation_Ans_2007.pdf for the Report on the Financial Situation of Airports and Air Navigation Service Providers 2007.

APPENDIX A

ATTACHMENT to State letter EC 7/27-08/47
REPORTING FORM ON LICENSED PERSONNEL REQUIREMENTS AND TRAINING CAPACITY

State: _____ Contact Person: _____ Tel.: _____ E-mail: _____ Fax: _____

I. LICENSED PERSONNEL REQUIREMENTS

Category of personnel * (* Personnel employed by commercial air transport operators, air traffic service providers, maintenance and repair organizations, and training organizations, in the reporting State)		Mandatory retirement age	2007 Active on duty	2008 Projection of additional requirements** (**Must take into account the attrition rate and only the requirements due to fleet/traffic growth, for commercial air transport operations, maintenance and repair organizations, air traffic services provider of the reporting State)	2009	2010	2011	2012
Personnel holding licenses/ratings issued by the reporting State or holding equivalent qualifications	Airline transport pilot license (Captains employed by airlines)							
	Airline transport pilot license (Co-pilots employed by airlines)							
	Commercial pilot license (employed by an airline)							
	Commercial pilot license (not employed by an airline)							
	Flight Instructors Rating for the levels of PPL-CPL-IR-MPL***							
	Type Rating Instructor/Examiner							
	Licensed aircraft maintenance engineers/technicians							
	Air Traffic Controllers							
Personnel holding validated licenses issued by another State	Airline transport pilot license (Captains)							
	Airline transport pilot license (Co-pilots)							
	Flight Instructors Rating for the levels of PPL-CPL-IR-MPL***							
	Licensed aircraft maintenance engineers/technicians							
	Air Traffic Controllers							

*** PPL = Private Pilot License
*** CPL = Commercial Pilot License
*** IR = Instrument Rating
*** MPL = Multi-crew Pilot License

REPORTING FORM ON LICENSED PERSONNEL REQUIREMENTS AND TRAINING CAPACITY (Contd.)

II. TRAINING CAPACITY

Training Types in Approved Training Courses	2007 Training capacity		2008		2009		2010		2011		2012	
	Number of Training Organizations	Total training capacity (number/year)	Number of Training Organizations	Total training capacity (number/year)	Number of Training Organizations	Total training capacity (number/year)	Number of Training Organizations	Total training capacity (number/year)	Number of Training Organizations	Total training capacity (number/year)	Number of Training Organizations	Total training capacity (number/year)
Multi-Crew Pilot License												
Commercial Pilot License												
Licensed aircraft maintenance engineers/technicians												
Air Traffic Controllers												

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APPENDIX B

DRAFT
AIR TRANSPORT REPORTING FORM
AVIATION PERSONNEL LICENSES AND TRAINING

State:…….……. Contact person: ……...
Organization:……. E-mail:……
Tel.:…… Fax:……..…….

I. Aviation Personnel Licenses				
Personnel Licenses by Category		**Number of licenses**	**Mandatory retirement age**	
Licenses issued by the reporting State		**Current year**	**Current year**	**Planned changes**
1.	Pilot licenses			
1.1.	Airline Transport Licenses (ATPL)			
1.2.	Commercial Pilot Licenses (CPL)			
1.3.	Multi-Crew Pilot License (MPL)			
1.4.	Flight instructors and/or examiners (ATPL, CPL,MPL, Instrument Rating (IR))			
2.	Aircraft Maintenance Licenses (engineers/technicians/mechanics)			
3.	Air Traffic Controller Licenses			
Validated licenses issued by another State				
4.	Pilot licenses			
4.1.	ATPL			
4.2.	CPL			
4.3.	MPL			
4.4.	Flight instructors and/or examiners (ATPL, CPL, MPL, IR)			
5.	Aircraft Maintenance Licenses (engineers/technicians/mechanics)			
6.	Air Traffic Controller Licenses			

II. Training Institutions and Capacity				
Training Institutions		**Number of certified training institutions**		
Certified training institutions		**Current year**		**Planned changes***
1.	Pilot Licenses (rating for ATPL, CPL, MPL, IR)			
2.	Aircraft Maintenance Licenses (engineers/technicians/mechanics)			
3.	Air Traffic Controller Licenses			
Training Capacity		**Number of training population**		
		Current year		**Planned changes***
Training population		**Students**	**Graduates**	**Graduates**
4.	Pilots			
4.1.	ATPL			
4.2.	CPL			
4.3.	MPL			
5.	Aircraft maintenance personnel (engineers/technicians/mechanics)			
6.	Air Traffic Controllers			

*at the end of a 5-year period following the current year

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APPENDIX C

EXTRACT FROM ANNEX 1 — PERSONNEL LICENSING RELATED TO PRIVILEGES OF LICENSE HOLDERS

"CPL:

2.4.2.1 Subject to compliance with the requirements specified in 1.2.5, 1.2.6, 1.2.7.1, 1.2.9 and 2.1, the privileges of the holder of a commercial pilot licence shall be:

a) to exercise all the privileges of the holder of a private pilot licence in an aircraft within the appropriate aircraft category;

b) to act as pilot-in-command of an aircraft within the appropriate aircraft category engaged in operations other than commercial air transportation;

c) to act as pilot-in-command, in commercial air transportation, of an aircraft within the appropriate aircraft category and certificated for single-pilot operation;

d) to act as co-pilot of an aircraft within the appropriate aircraft category required to be operated with a co-pilot; and

e) for the airship category, to pilot an airship under IFR.

2.4.2.2 Before exercising the privileges at night, the licence holder shall have received dual instruction in aircraft within the appropriate category of aircraft in night flying, including take-off, landing and navigation.

ATPL:

2.6.2.1 Subject to compliance with the requirements specified in 1.2.5, 1.2.6, 1.2.7.1, 1.2.9 and 2.1, the privileges of the holder of an airline transport pilot licence shall be:

a) to exercise all the privileges of the holder of a private and commercial pilot licence in an aircraft within the appropriate aircraft category and, in the case of a licence for the aeroplane and powered-lift categories, of the instrument rating; and

b) to act as pilot-in-command, in commercial air transportation, of an aircraft within the appropriate category and certificated for operation with more than one pilot.

2.6.2.2 When the holder of an airline transport pilot licence in the aeroplane category has previously held only a multi-crew pilot licence, the privileges of the licence shall be limited to multi-crew operations unless the holder has met the requirements established in 2.5.2.1 a), 2.5.2.2 and 2.5.2.3 as appropriate. Any limitation of privileges shall be endorsed on the licence.

PPL:

2.3.2.1 Subject to compliance with the requirements specified in 1.2.5, 1.2.6, 1.2.7.1, 1.2.9 and 2.1, the privileges of the holder of a private pilot licence shall be to act, but not for remuneration, as pilot-in-command or co-pilot of aircraft within the appropriate aircraft category engaged in non-revenue flights.

2.3.2.2 Before exercising the privileges at night, the licence holder shall have received dual instruction in aircraft within the appropriate category of aircraft in night flying, including take-off, landing and navigation.

IR:
2.7.2.1 Subject to compliance with the requirements specified in 1.2.5, 1.2.6 and 2.1, the privileges of the holder of an instrument rating with a specific aircraft category shall be to pilot that category of aircraft under IFR.

2.7.2.2 Before exercising the privileges on multi-engined aircraft, the holder of the rating shall have complied with the requirements of 2.7.1.2.1.1.

Note.— Pilots may exercise joint category privileges of the instrument rating on more than one category of aircraft if they have completed the requirements in each category.

MPL
2.5.2.1 Subject to compliance with the requirements specified in 1.2.5, 1.2.6, 1.2.7.1, 1.2.9 and 2.1, the privileges of the holder of a multi-crew pilot licence shall be:

a) to exercise all the privileges of the holder of a private pilot licence in the aeroplane category provided the requirements of paragraph 2.3.3 have been met;

b) to exercise the privileges of the instrument rating in a multi-crew operation; and

c) to act as co-pilot of an aeroplane required to be operated with a co-pilot.

2.5.2.2 Before exercising the privileges of the instrument rating in a single-pilot operation in aeroplanes, the licence holder shall have demonstrated an ability to act as pilot-in-command in a single-pilot operation exercised by reference solely to instruments and shall have met the skill requirement specified in 2.7.1.2 appropriate to the aeroplane category.

2.5.2.3 Before exercising the privileges of a commercial pilot licence in a single-pilot operation in aeroplanes, the licence holder shall have:

a) completed in aeroplanes 70 hours, either as pilot-in-command, or made up of not less than 10 hours as pilot-in- command and the necessary additional flight time as pilot-in-command under supervision;

b) completed 20 hours of cross-country flight time as pilot-in-command, or made up of not less than 10 hours as pilot-in-command and 10 hours as pilot-in-command under supervision, including a cross-country flight totalling not less than 540 km (300 NM) in the course of which full-stop landings at two different aerodromes shall be made; and

c) met the requirements for the commercial pilot licence specified in 2.4.1.2, 2.4.1.3, 2.4.3.1.1 (with the exception of 2.4.3.1.1.1 a)) and 2.4.3.2 appropriate to the aeroplane category.

Note 1.— When a Contracting State grants single-pilot operation privileges to the holder of a multi-crew pilot licence, it can document the privileges through an endorsement of the multi-crew pilot licence or through the issuance of a commercial pilot licence in the aeroplane category.

Note 2.— Certain privileges of the licence are curtailed by 2.1.10 for licence holders when they attain their 65th birthday".

— END —