http://dx.doi.org/10.14311/MAD.2016.18.04 ISSN 1805-7578

French Approach to IFR Aerodromes

Comparison of Requirements for "Small" IFR Aerodromes in the European Union

Jakub Kraus
ATM Systems Laboratory,
Department of Air Transport, Faculty of Transportation Sciences, Czech Technical University in Prague
Horská 3, Praha 2, 128 03, Czech Republic
e-mail: kraus@fd.cvut.cz

Petra Burjánková
Department of Air Transport,
Department of Air Transport, Faculty of Transportation Sciences, Czech Technical University in Prague
Horská 3, Praha 2, 128 03, Czech Republic

***Abstract*— This article focuses on the comparison of equipment requirements for IFR aerodromes across Europe. The aim is to show to the reader that despite the single European, respectively global regulations it is still possible to find significant differences in the rules of individual states. The article describes an analysis executed at the Department of Air Transport.**

Keywords-IFR aerodrome; aerodrome requirements; France; IFR; Annex 14

I. INTRODUCTION

In this article, we focused on finding requirements and current state of aerodrome lighting equipment. The primary task was to examine whether airports in EASA (European Aviation Safety Agency) member states are equipped with lighting that is currently set as the minimum equipment for airports with IFR traffic (approach procedure) in the Czech Republic. Specifically, we searched for aerodromes, which have published straight-in instrument approach, but does not have the required lighting equipment (visual approach slope indicator system and approach lighting system). In the analysis, we also focused only on aerodromes where the longest runway does not exceed 1500 m in length.

II. DATA SOURCES

Data were gathered from the web portal ead.eurocontrol.int [1], which provides access to national AIPs (Aeronautical Information Publication) of individual states that belong under EUROCONTROL (European Organisation for the Safety of Air Navigation). For the purposes of this survey, we focused mainly on the part, which contains the ICAO Aerodrome Charts and on the part AD, specifically paragraph 2.14. From these sources, we were able to obtain data about the properties and equipment of all aerodromes in specific European state, which we needed for the survey.

III. REQUIRED EQUIPMENT

According Annex 14, Chapter 5: "Where physically practicable, a simple approach lighting system … shall be provided to serve a non-precision approach runway, except when the runway is used only in conditions of good visibility or sufficient guidance is provided by other visual aids. It is advisable to give consideration to the installation of a precision approach category I lighting system or to the addition of a runway lead-in lighting system." [6]

There is also recommendation for installing runway threshold identification lights at the threshold of a non-precision approach runway where it is not practicable to provide other approach lighting aids. [4]

In para. 5.3.10.1 is written: "Runway threshold lights shall be provided for a runway equipped with runway edge lights, except on non-precision approach runway where the threshold is displaced and wing bar lights are provided." [6]

In para. 5.3.5.1 is written: "A visual approach slope indicator system shall be provided to serve the approach to a runway whether or not the runway is served by other visual approach aids or by non-visual aids, where one or more of the following conditions exist:

a) the runway is used by turbojet or other aeroplanes with similar approach guidance requirements;

b) the pilot of any type of aeroplane may have difficulty in judging the approach due to:

   1) inadequate visual guidance such as is experienced during an approach over water or featureless terrain by day or in the absence of sufficient extraneous lights in the approach area by night; or

   2) misleading information such as is produced by deceptive surrounding terrain or runway slopes;

c) the presence of objects in the approach area may involve serious hazard if an aeroplane descends below the normal approach path, particularly if there are no non-visual or other visual aids to give warning of such objects;

d) physical conditions at either end of the runway present a serious hazard in the event of an aeroplane undershooting or overrunning the runway; and

e) terrain or prevalent meteorological conditions are such that the aeroplane may be subjected to unusual turbulence during approach." [6]

IV. EASA Member States

Although the total number of EASA Member States is currently 31, in Table I is a lower number of states. The reduction occurred during a search for aerodromes with maximum runway length of 1500 m; in some states, there is no aerodrome, which would meet this requirement. Further on the table only contains records about states and aerodromes where could be found difference of aerodrome lighting equipment and minimum requirements laid down in the Czech Republic. As a result, from all EASA member states remained in the table only Estonia, France, Hungary, Iceland, Ireland, Italy, Netherlands, Portugal, United Kingdom, Switzerland, Greece, Germany and Denmark.

TABLE I. Found European Aerodromes with Lighting Equipment Different from Czech Requirements

ICAO	APP	ATC	APP LGHT	RWY LGHT	GS LGHT
EEPU	NDB	AFIS	no	no	no
LFAB	NDB	AFIS	no	LIL	no
LFAY	LPV	AFIS	no	no	PAPI
LFAY	LNAV	AFIS	no	no	PAPI
LFAY	NDB	AFIS	no	no	PAPI
LFBR	NDB	TWR	no	LIL	PAPI
LFBR	LNAV	TWR	no	LIL	PAPI
LFBS	NDB	TWR	no	LIL	PAPI
LFCC	NDB	AFIS	no	LIL	APAPI
LFCY	LNAV	AFIS	no	LIL	no
LFCY	NDB	AFIS	no	LIL	no
LFDJ	NDB	AFIS	no	BI/LIL	no
LFEC	LPV	AFIS	no	LIL	PAPI
LFEC	NDB	AFIS	no	LIL	PAPI
LFEY	LNAV	AFIS	no	LIL	no
LFHY	VOR	AFIS	no	LIL	PAPI
LFHY	LPV	AFIS	no	LIL	PAPI
LFHY	LNAV	AFIS	no	LIL	PAPI
LFLH	NDB	AFIS	no	LIL	PAPI
LFLO	VOR	AFIS	no	LIL	PAPI
LFNB	LOC	AFIS	no	LIL	PAPI
LFNB	LPV	AFIS	no	LIL	PAPI
LFNB	LNAV	AFIS	no	LIL	PAPI
LFOQ	LNAV	AFIS	no	LIL	no
LFOQ	NDB	AFIS	no	LIL	no
LFOU	LNAV	AFIS	no	LIL	no
LFOU	NDB	AFIS	no	LIL	no
LFOZ	LPV	AFIS	no	LIH	PAPI
LFOZ	NDB	AFIS	no	LIH	PAPI
LFOZ	LNAV	AFIS	no	LIH	PAPI
LFPN	VOR/DME	TWR	no	LIH/LIL	PAPI
LFPN	VOR	TWR	no	LIH/LIL	PAPI
LFPN	LNAV	TWR	no	LIH/LIL	PAPI
LFQA	LNAV	AFIS	no	LIL	PAPI
LFQA	LPV	AFIS	no	LIL	PAPI
LFQM	NDB	AFIS	no	LIL	PAPI
LFQM	LPV (3,6 %)	AFIS	no	LIL	PAPI
LFRM	LPV	TWR	no	LIL	PAPI
LFRM	LNAV	TWR	no	LIL	PAPI
LFRM	LOC	TWR	no	LIL	PAPI
LFRM	NDB	TWR	no	LIL	PAPI
LFLO	LNAV	AFIS	no	LIL	PAPI
LHBC	GNSS	AFIS	no	LIH	no
LHBC	NDB	AFIS	no	LIH	no
BITN	NDB	AFIS	no	LIH	APAPI
BITN	LNAV	AFIS	no	LIH	APAPI
BIIS	LNAV	AFIS	no	yes	no
BIIS	NDB/DME (5,0 %)	AFIS	no	yes	no
BIVM	NDB	AFIS	no	yes	PAPI
BIVM	NDB	AFIS	no	yes	PAPI
EISG	NDB/DME	TWR	no	yes	PAPI
EISG	NDB	TWR	no	yes	PAPI
LIPU	NDB	AFIS	no	yes	PAPI
LIQS	VOR/DME	AFIS	no	yes	PAPI
EHLE	NDB/DME	AFIS	no	yes	PAPI
EHLE	NDB	AFIS	no	yes	PAPI
EHTE	LNAV	AFIS	no	yes	PAPI
EHTE	LPV	AFIS	no	yes	PAPI
LPCS	DVOR	TWR	no	yes	APAPI
LPCR	LNAV	AFIS	no	no	no
LPGR	NDB	AFIS	no	no	PAPI
LPVR	LNAV	AFIS	no	no	PAPI
EGHE	NDB	TWR	no	yes	PAPI
EGHG	NDB/DME	AFIS	no	yes	no
EGHG	SRA RTR	AFIS	no	yes	no
EGKA	LNAV 5,5	TWR	no	yes	PAPI
EGKA	NDB/DME	TWR	no	yes	PAPI
EGKA	LNAV	TWR	no	yes	PAPI
EGKA	NDB/DME	TWR	no	yes	PAPI
EGKA	VDF	TWR	no	yes	PAPI
EGPB	ILS Cat I	TWR	no	yes	PAPI
EGPB	LOC/DME	TWR	no	yes	PAPI
EGPB	LOC/DME	TWR	no	yes	PAPI
EGPB	VOR/DME	TWR	no	yes	PAPI
EGPB	VOR/DME	TWR	no	yes	PAPI
EGHG	LNAV	AFIS	no	yes	no
LSZA	IGS 6,65° 9,0	TWR	no	yes	PAPI
LSZA	LOC 5,4° 7,0	TWR	no	yes	PAPI
LSZG	LPV 6,8	TWR	no	yes	APAPI
LSZG	LNAV 6,4	TWR	no	yes	APAPI
LSZG	VOR/DME	TWR	no	yes	APAPI
LGKC	VOR/DME	AFIS	no	yes	APAPI
BIVO	LNAV 5,0	AFIS	no	LIM	PAPI
BIVO	NDB	AFIS	no	LIM	PAPI
ETHN	NDB	TWR	no	yes	PAPI

V. Survey Results

The table I shows that in EASA member states are many aerodromes that do not have the minimum required (in CZ) equipment. The main representative appears to be France, where is 21 aerodromes with published non-precision approaches (or approaches with vertical guidance) and no approach lighting system. Also we have found Amiens Glisy (LFAY) aerodrome, where merely precision approach path indicator (PAPI) is installed according Aerodrome Chart.

Because of the identified deviations, next analysis step was to examine national Aeronautical Information Publications, specifically part GEN 1.7, which should contain differences from ICAO standards, recommendations and procedures. This document shows that for French aerodromes, where is published instrument approach, is not necessary to install

approach lighting system and threshold identification lights under paragraph 5.3.8 are only recommended (see Table II).

France has thus decided to interpret the ICAO Annex 14 by own way and from the point of view of other countries, decreased the standards established by ICAO. An interesting fact is that no other state beside France has published deviations from ICAO standards in theirs AIP GEN 1.7.

TABLE II. FRENCH DIFFERENCES AGAINST ICAO ANNEX 14

Annex 14 reference	CAT	Differences
5.3.3.12	B	Alternate means of compliance: France intends to apply this Provision to new facilities; in France, some already installed identification beacons show flashing-white rather than flashing-green.
5.3.4.1.B	B	Alternate means of compliance: The French regulations do not require the regular provision of approach lighting systems for non-precision approach runways. The minimum operational conditions are adapted accordingly, in compliance with the European Regulations (JAR-OPS).
5.3.4.1.C	B	Alternate means of compliance: The French regulations do not require the regular provision of approach lighting systems for Category I precision approach runways. In the absence of approach systems, threshold identification lights are installed and operational restrictions are provided for runway use. The minimum operational conditions are adapted accordingly, in compliance with the European Regulations (JAR-OPS).
5.3.4.1.D	B	Alternate means of compliance: The French regulations do not require the regular provision of approach lighting systems for Category III precision approach runways if they are not also used for Category II precision approaches.
5.3.4.10	B	Alternate means of compliance: The French regulations do not require the regular provision of approach lighting systems for Category I precision approach runways. In the absence of approach systems, threshold identification lights shall be installed and operational restrictions are provided for runway use. The minimum operational conditions are adapted accordingly, in compliance with the European Regulations (JAR-OPS).
5.3.4.17* 5.3.4.18	B	Alternate means of compliance :The French regulations provide for the possible implementation of consecutive lines of flashing lights when the centre line is made up of the light sources provided for in 5.3.4.14 a) and 5.3.14 a) in cases where the signalling system need to be strengthened.
5.3.5.1 a)	B	Alternate means of compliance: The French regulations do not require the regular provision of visual approach slope indicators to serve a runway used by turbojet or other aircraft with similar approach guidance requirements.
5.3.9.8	B	Alternate means of compliance: The French regulations define the technical specifications specific to runways with night non-instrument runways. The equipment is approved by the State.
5.3.9.9	B	Alternate means of compliance: The French regulations define the technical specifications specific to runways with night non-instrument runways. The equipment is approved by the State
5.3.12.3	B	Alternate means of compliance : Runway centre line lights are mandatory for take-off in low visibility when the RVR is lower than 250 m for aircraft of Categories A, B and C, and 300 m for aircraft of Category D.

VI. CONCLUSION

The aim of this article was to report on performed analysis about requirements for "small" IFR aerodromes in the European Union. So to find the aerodromes in EASA member states that do not meet the minimum requirements set by the current regulations in the Czech Republic. The analysis finds that a total of thirteen European countries have at least one aerodrome, where some required lighting equipment is missing and twelve states lacking expression of deviation from the ICAO standard in their AIPs.

This approach to lighting equipment at IFR aerodromes, in time of harmonization of rules across Europe thanks to the European Union (EASA in aviation), is surprising.

ACKNOWLEDGMENT

This paper was supported by the Grant Agency of the Czech Technical University in Prague, grant No. SGS14/212/OHK2/3T/16.

REFERENCES

[1] European AIS Database - EAD. EUROCONTROL. 2013. [online] [cit. 18. 9. 2015] Dostupné z: <https://www.ead.eurocontrol.int/eadcms/eadsite/index.php.html>

[2] Procházka, J., Plos, V.: Aerodrome Flight Information Service. MAD - Magazine of Aviation Development. 2013, vol. 1, no. 1, art. no. 4, p. 15-18. ISSN 1805-7578.

[3] Vittek, P., Stojić, S., Lališ, A.: Definition of Contributory Factors Having Influence on Airport Safety. In GEO Spatial Visions. Žilina: EDIS - vydavatelstvo Žilinské univerzity, 2015, p. 59-60. ISBN 978-80-554-1113-2.

[4] Letecký předpis L 14. Ministerstvo dopravy České republiky. 641/2009-220-SP/4. [online] [cit. 18. 9. 2015] Dostupné z: <http://lis.rlp.cz/predpisy/predpisy/index.htm

[5] Vittek, P.: Approach Safety. MAD - Magazine of Aviation Development. 2015, vol. 3, no. 15, p. 9-12. ISSN 1805-7578.

[6] Annex 14 Volume I Aerodromes. ICAO. Sixth Edition, July 2013