55th CONFERENCE OF
DIRECTORS GENERAL OF CIVIL AVIATION
ASIA AND PACIFIC REGIONS

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AGENDA ITEM 3:　　　AVIATION SAFETY

INSPECTOR QUALIFICATIONS

Presented by European Aviation Safety Agency

SUMMARY

This paper describes the challenges and recent developments with regards to the competencies of aviation safety inspectors (ASI) and proposes measures to alleviate the burden of managing such scarce and expensive expertise and resources.

INSPECTOR QUALIFICATIONS

1.   INTRODUCTION

Competent Authorities (CAs) face difficulties to attract and retain suitably qualified inspectors who are able to cope with the challenges posed by the increased size, scope, complexity and rapid changes of the aviation industry. This is particularly true when highly specialized expertise is sought, such as the holding of a current airline transport pilot license (ATPL), of flight instructor certificates / qualifications or flight examiner certificates / qualifications. Consequently, the approach to competencies of inspectors need to evolve.

2.   DISCUSSION

2.1   ICAO Doc. 8335 states that CAs should ensure that ASIs are competent to carry out the tasks assigned to them. In the context of Doc. 8335, and other ICAO documents such as Doc. 9734, the approach to inspector competence is mainly prescriptive and rather focused on the technical skills and expertise. As a matter of fact 6.2.4 of Doc. 8335 specifies that "A flight operations inspector, for example, should have extensive operational experience — generally not less than 5 000 hours as a pilot-in-command of civil or military air transport aircraft."

In 2016[1] the ICAO Assembly was made aware of the challenges posed by the prescriptive provisions of Doc 8335 and the way they are interpreted in the context of the universal safety oversight audit program continuous monitoring approach (USOAP CMA).

Likewise EASA, through the monitoring[2] of the implementation of the EU regulation, noticed that the difficulties faced by the CAs to attract and retain suitably qualified inspectors are fairly frequent. However, in most cases, there is little evidence suggesting that such highly specialized expertise is actually needed to the extent that it would otherwise prevent the CA from discharging its responsibility to implement the EU regulation or the ICAO requirements on behalf of the Member State. This led the Agency to initiate a series of actions to respond to these challenges.

In recent years ICAO has also started to address the qualification of ASIs through the Manual on the Competencies of Civil Aviation Safety Inspectors (Doc 10070), which is available as advance unedited drafts since end of 2016. It is the first attempt to define the competencies needed in the different domains in a uniform way, through a single source.

2.2   **EASA INITIATIVES**

The general competency framework

In 2016 EASA established a working group in association with representation from the CAs to develop a competency framework for aviation inspectors. Such a framework sets the foundations for a mid to long term solution across all domains to meet the needs of the industry in defining the key competencies and skills required. The proposed competency model aims at enabling inspectors to act as an essential catalyst for the implementation of safety management and risk/performance-based oversight in the aviation system. The competency framework is a reference point which helps align the approaches on how people are managed e.g. hiring, training, evaluating, compensating, and promoting staff based on common grounds and similar attributes.

A job-specific competency framework for Civil Aviation Inspectors ensures the following added value:

-    Inspectors perform according to established standards;
-    Selection of new inspectors is targeted for the expected performance and behaviours;
-    Performance is evaluated effectively, comparatively and fairly;
-    Skills and competencies gaps are identified with a specific measurable focus on behaviours,

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1 ASSEMBLY — 39TH SESSION, TECHNICAL COMMISSION working paper A39-WP/197 - TE/78 on "State safety oversight system and the universal safety oversight audit programme (USOAP) – Inspector qualifications", presented by South Africa

2 Standardisation of EU National Authorities in the domains of aircraft maintenance, production, air operations, aircrew, aerodromes and air traffic management.

- Training and professional development are tailored to the identified behaviours, and
- Succession is planned with a focus on competency gaps.

As a result of this initiative a competency model has been developed and promoted3 by the Agency since early 2017. It includes a table identifying each competency and the related behavioral anchors which may be considered by CAs either to complement their existing frameworks or as a starting point to meet their specific organizational needs. The proposed framework is based on the implementation of the following KSA (knowledge, skills and attitude) model:
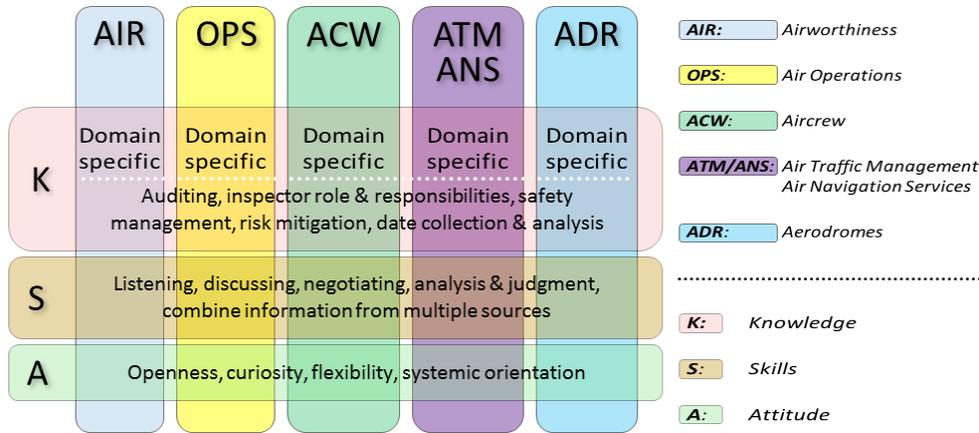
The EASA competency framework for ASIs can be portrayed as shown below:
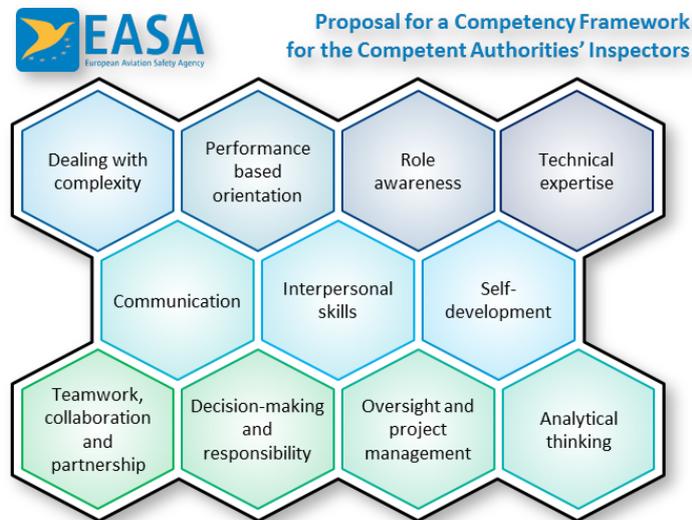
A practical case: Assigning pilots to oversight tasks

Following the development of the general competency framework, EASA took a second step towards resolving practical issues of particular importance i.e. how to optimize the management of scarce and expensive expertise and resources such holders of pilot licenses and certificates.

In Nov 2017, the Agency, with the contribution of the Member States, issued a practical guide4 on "Assigning pilots to oversight tasks" (here after referred to as the Guide) proposing common grounds for determining the needs and thereafter assigning pilots approval and oversight tasks. The guide describes the key principles for optimized management of pilot license holders and provides detailed guidance on how in can be practically implemented.

Four practical steps are proposed to develop procedures for oversight and approval tasks that require pilot competence.

3   EASA Aviation Inspector Competencies Report (Feb. 2017)
  https://www.easa.europa.eu/document-library/general-publications/easa-aviation-inspector-competencies-report
4   EASA website: https://www.easa.europa.eu/document-library/general-publications/practical-guide-assigning-pilots-oversight-tasks

Step #1   The task analysis according to applicable EU regulation, acceptable means of compliance (AMCs) and guidance material (GM) defines when pilot competence is needed for approval and oversight activities to be performed by a CA. A limited number of tasks require the competence of a qualified pilot[5]. The Guide provides for a common understanding of the task analysis and explains how to relate it to the applicable rules, AMCs, GM and to ICAO Doc 8335. This step aims to facilitate demonstration of compliance.

Step #2   When specific pilot competence is required, the CA is expected to identify the profile of an adequately qualified inspector pilot. To facilitate this step, the Guide proposes the concept of aircraft and competence clustering. This should enable the CAs to assign qualified pilots to a range of aircraft operations in a consistent manner. Aircraft clustering ensures maximum flexibility by grouping aircraft of similar characteristics so that a single inspector can perform oversight tasks for all aircraft in the same cluster.

Step #3   If clustering does not help, the next step is to consider team composition. This means that the CA may consider designating a competent pilot, who is not necessarily a qualified inspector, to support an inspection task. For example, a senior examiner may act as subject-matter expert reporting to the inspector who is in charge of the oversight. Team composition refers either to a single team conducting an on-site inspection or to a team whose subject-matter expert (the qualified pilot, in this case) will perform the technical tasks on-site and report to the CA inspector in charge who will then review the documents, off-site, and determine a course of action in relation to the oversight. This allows the CA to adapt the team size to the organization size for on-site inspections.

Step #4   Whenever all the above does not help, the Guide provides recommendations on the use of pool of experts and the related resource management issues.

It has to be emphasized that the Guide and the regulatory framework on which it is based, makes a clear distinction between approval and oversight tasks typically performed by ASIs and aircrew examiners who perform skill tests and license or proficiency checks. This distinction is actually part of the first step i.e. the task analysis which is based on the applicable regulations related to air operations and aircrew including the management and the use of flight simulators.

For example, in the context of airline approval and oversight, the concept of aircraft clustering proposed is as follows:

Certification basis for the clustering:

AIRCRAFT			
1	CS-22 Sailplanes	**3**	CS-27/-29 Rotorcraft
2	CS-23/-25 Airplanes	**4**	CS-31 Balloons

Example for airplanes:

For CS-23/-25 Airplanes

POWER PLANT		NUMBER OF ENGINES		MCTOM	
1	PISTON ENGINE	**1**	SINGLE ENGINE	**1**	< 2 000 (KG)
2	JET	**2**	TWIN ENGINE	**2**	2 000 – 5 700 (KG)
3	TURBOFAN	**3**	THREE or more ENGINES	**3**	5 700 – 45 360 (KG)
4	TURBOPROP			**4**	45 360 – 136 000 (KG)
				5	> 136 000 (KG)

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5   Example: tasks requiring qualified inspectors for air operations are contained in ED Decision 2017/006/R 'AMC and GM to Part-ARO — Issue 3, Amendment 6', available at *https://www.easa.europa.eu/document-library/agency-decisions/ed-decision-2017006r.*

COCKPIT LAYOUT		AUTOMATION		FMS		FLT CTRLs	
1	CLASSIC	1	NO AUTOMATION	1	NO	1	FLY-BY-WIRE
2	EFIS	2	AP	2	YES	2	NON-FLY-BY-WIRE
		3	AP/FD				
		4	AP/FD and A/THR				

Another layer of clustering is proposed to further simplify and establish common grounds for the categorisation of competence. It is a simple tool for the clustering of pilot experience. Four levels are proposed: None (N), Level A (A), Level B (B), and Level C (C). Practically, as an example for airline pilots, it could be as shown below:
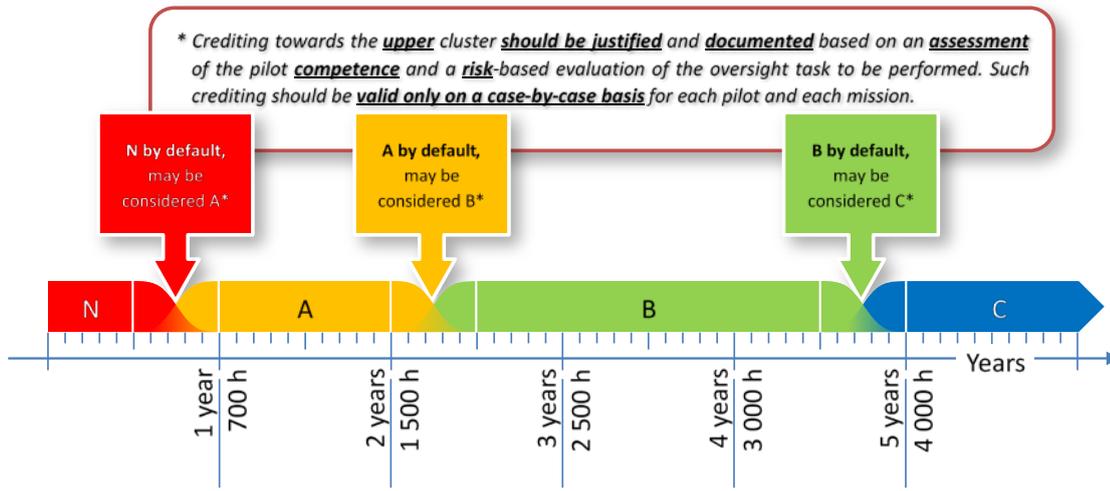
The Guide provides more details on how combined aircraft and experience clustering can be used to determine the minimum competence profile of an inspector, or a subject matter expert, enabling them to adequately perform given oversight tasks. The clustering of other specific pilot competencies is also discussed to provider a broader understanding of the concept.

An example of the benefits that the proposed approach brings is presented below:
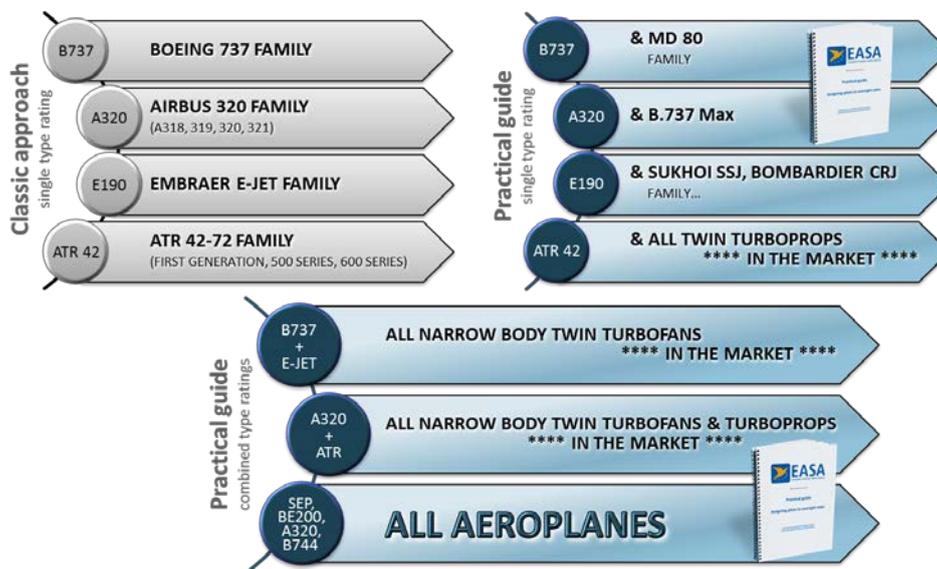
The classical approach is shown in grey where for example a pilot holding a B.737 type rating would only be able to perform oversight tasks where the B.737 airplane family is operated. Considering that oversight does not necessarily include assessment of pilot competence such as skill tests and proficiency checks, the Guide proposes to extend the range of oversight tasks to environments where the B.737 family and MD80 family is operated. The lower part of the graphic shows how holders of multiple type ratings may cover tasks of much wider scope.

2.3   CONCLUSION

The management of scarce and expensive expertise and resources can be quite challenging for many competent authorities. It is often exacerbated by overly prescriptive specifications or rigid interpretation of guidance material.

The disconnected between the prescriptive vision and the real needs dictated by the safety objectives, can be resolved by adopting a risk based approach centered on task analysis and modern distributed competence management such as team composition management, pooling of experts and joint expertise management.

EASA has already taken some practical steps in this direction. The proposals promoted by the Agency can be further explored and extended to other domains which have not been sufficiently addressed so far.

3.   ACTION BY THE CONFERENCE

The Conference is invited to consider the creation of a reflection group under ICAO coordination to review the current competences of inspectors which would report back at the next conference.

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