

LOW CAPACITY AND OTHER RESTRICTED ENDORSEMENT CONCEPTS

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SUMMARY

Today, efficiency and effective resource management are crucial in nearly all human activities, and Air Traffic Control (ATC) has not been overlooked.

In a bid to improve workforce management and take advantage of enhanced Air Traffic Control Systems with greater functionality, Air Navigation Service providers (ANSP) are exploring proposals regarding ATCO (Air Traffic Controllers) licensing and endorsement structure. They seek solutions for complex challenges generated by staff shortages, capacity management issues, flexible use of airspace, and airspace closures.

Proposed updates to ATC licensing and endorsements aim to increase ATC mobility and potentially provide cross border operations while introducing new endorsements tailored for sectors with decreased workload and complexity to enable service continuity or provide service to adjacent additional airspace.

This paper will analyse the implications and impact of Low Air Traffic or Low Capacity endorsements and discuss non-geographic, functional or generic endorsements and system based licensing concepts.

1. INTRODUCTION

- 1.1. Over the past decade, worldwide ATC staff shortages, capacity management issues, airspace closures, and contingency operations have all been significant causes of delays and flight disruptions. The financial impact on the aviation industry costs millions of dollars annually, and as traffic grows, the situation is expected to continue.
- 1.2. As ANSPs implement ATS with greater system functionality, they are looking at adapting endorsements to improve efficiency and optimise personnel resource allocation. The solution proposed by EUROCONTROL in Think Paper #19 ATC Mobility and Capacity Shortages discussed ATCO Mobility to mean physical relocation from one unit to another, remote operations or cross-border operations. SESAR (Single European Sky ATM Research) projects are proposing solutions that are working towards the concept of "Any controller -

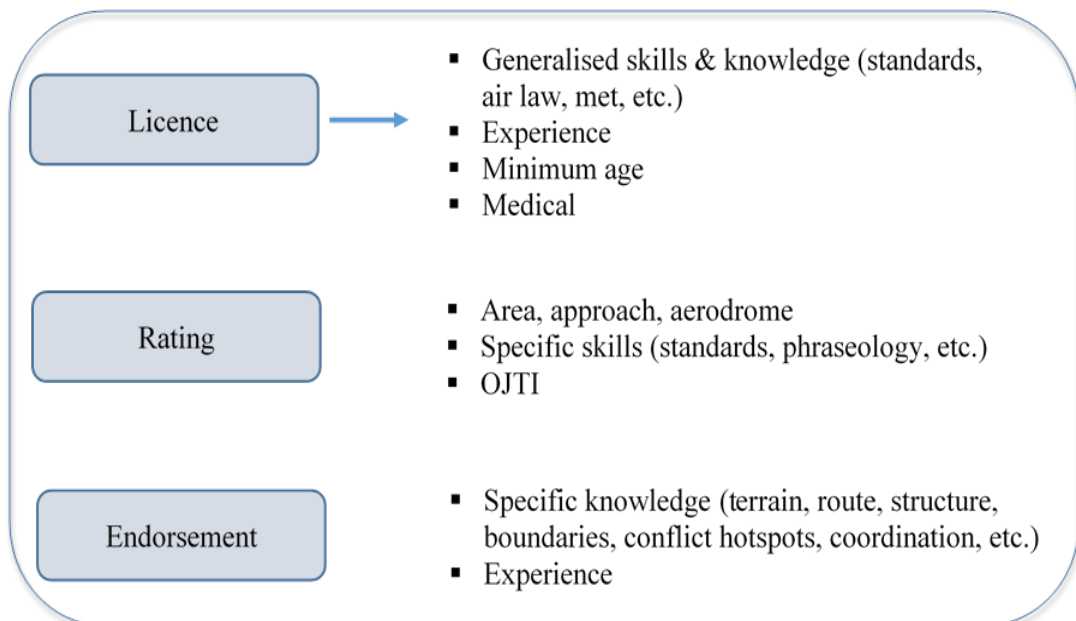
Any Airspace”. This is where ATCO validation is not dependent on geographic and local knowledge but the systems and sector type.

- 1.3. Restricted endorsements are used in Australia to improve service continuity and staff flexibility. They take advantage of periods of low density and complexity in specific sectors, which are most prevalent in cross-continent overnight operations.
- 1.4. When discussing Low Air Traffic or Low Capacity endorsements, the word “low” does not refer to the altitude of the traffic. It refers to the extent of the density and complexity of the traffic. It is suggested that the term Low Traffic or Low Air Traffic be replaced with Low Capacity and will be referred to as such for the remainder.
- 1.5. This paper highlights that the crux of the problem essentially lies with resource management and worldwide ATC staffing shortages. If the staff shortage problems could be addressed and fixed, these endorsement concepts would not be required.

2. DISCUSSION

ATC Licensing

- 2.1. Air Traffic Control licence systems and hierarchy include licences, ratings, endorsements and qualifications. ICAO Annex 1 (Personnel Licensing) defines the licence certification system but does not include definitions of all the terms used.



- 2.2. Many papers have been written and presented by IFATCA regarding ATCO licensing and its requirements. This paper will not go into specific details and assumes the reader has a sufficient understanding of this topic.

Definitions

- 2.3. ICAO Annex 1 defines a Rating as an authorisation entered on or associated with a licence and forming part thereof, stating special conditions, privileges or limitations pertaining to such licence. Of note, ICAO does not define or refer to Endorsements.

- 2.4. In addition, Regulation 2015/3402, European Union Aviation Safety Agency (EASA) has defined the terms as follows:

- a. 'Licence' means a document issued and endorsed in accordance with this Regulation and entitling its lawful holder to exercise the privileges of the ratings and endorsements contained therein;
- b. 'Rating endorsement' means the authorisation entered on and forming part of a licence, indicating the specific conditions, privileges or limitations pertaining to the relevant rating;
- c. 'Unit endorsement' means the authorisation entered on and forming part of a licence, indicating the ICAO location indicator and the sector, group of sectors or working positions where the licence holder is competent to work.

- 2.5. The definitions mentioned above do not specify the level of density or complexity of the traffic, sectorisation requirements, traffic mitigation procedures, pre-defined hours of operation or system limitations. This means that to obtain and keep a valid licence, a rating endorsement or a unit endorsement needs the appropriate competency-based training and evaluation under any conditions.

- 2.6. IFATCA TPM TRNG 9.4.4 states that

IFATCA supports competence assessment for all personnel engaged in operational duties, for every endorsement or validation. Theoretical knowledge and practical competence shall be assessed at least once a year, for every rating that a controller holds. The standards to be achieved and the checklist of items to be evaluated should be made available to all those concerned.

¹ IFATCA 58th Annual Conference, Costa Rica, 20 – 24 May 2019, WP No. 158 – Performance – based Endorsements

² COMMISSION REGULATION (EU) 2015/340 of 20 February 2015 - Article 4, Definitions

- 2.7. Today ANSPs are confronted with problems with conflicting priorities: on the one hand, they have to ensure safety and service continuity, which means having a sufficient number of well-trained licensed ATCOs regardless of the amount of traffic, and on the other hand, they have to cut costs and be efficient with staffing resources. Compounding the issue, nearly every ANSP faces a shortage of ATCOs globally.

Different approaches to the same problem: ATC shortages and subsequent lack of capacity

- 2.8. ANSPs can multiple-license ATCOs within a shorter term than the initial one, provided the person already holds one relevant license. The training organisation will develop a dedicated Unit Training Plan without general procedures already known and with a reduced period of OJT (on-the-Job Training).
- 2.9. Europe proposed a new concept: ATCO's mobility. Years before, mobility was linked to geographic relocation: intra-ANSP mobility and, after that, intra-European mobility. The development of technology allowed ATCO's mobility to include cross-border or even remote operations.
- 2.10. There are currently European ANSPs providing cross-border operations, such as Maastricht UAC (managing the upper airspace of Belgium, Luxembourg, The Netherlands, and the north-west of Germany), FINEST Project (merging Helsinki FIR and Tallinn FIR between FL 95 and FL 660) and Hungaro Control (providing ATS over the Kosovo upper airspace).
- 2.11. Another attempt to solve the ATC shortage would be the Skyguide Virtual Centre. This aims to 'virtually' merge the two Switzerland airspaces and Area Control Centres (ACCs) (Zurich and Geneva) so that any controller in either of the ACCs can control any portion of the Swiss airspace, ensuring that staff would be assigned to work the sectors with the greatest demand.
- 2.12. In December 2022, EUROCONTROL conducted a study that analysed the impact of ATC capacity and staff shortages on delays in Europe. The study looked into the level of capacity/staffing en-route delay and how much this costs. The question "How many ATCOs do we need?" revealed that the shortage has increased over the years while traffic has gone up as well.
- 2.13. The study came to some key conclusions³, out of which the two listed below are the most relevant:
- ATCO mobility could help either within/between ANSPs, or by one ANSP providing services outside its borders;
 - The European ATC Licence, with a common rating system and rules to mandate mutual recognition, is already in place. However, national

³ EUROCONTROL – ATC Mobility and Capacity Shortages - Think Paper #19 - 19 December 2022, page 1, Key Conclusions

requirements relating to language, education and citizenship make it difficult for ATCOs to move between countries.”

- 2.14. CANSO (Civil Air Navigation Services Organisation) press release [2024] identified five measures in answer to the question “How can we create more capacity?”⁴ : Better regulation, Airline Flight Plan adherence, Adverse weather, Accelerated standardisation, A new approach to ATCO training and licensing.
- 2.15. The last measure proposed by CANSO “calls for an alternative to the current licensing and training requirements for ATCOs to be more system-driven. In this regard, EASA (European Union Aviation Safety Agency) has identified ATCO system-based licensing as a strategic priority”⁵.
- 2.16. Endorsements that have restrictions or conditions placed on their use are known by many different names globally. These have been created within ANSPs Safety Management systems, with hazards defined and controls put in place, to ensure that the residual safety risks and hazards are managed to as low as reasonably practicable (ALARP).
- 2.17. Alternate endorsements and licensing concepts include:
 - a. Restricted Endorsement – used for periods or at locations with low workload or complexity (i.e. night operations)
 - b. Special Event Endorsement – infrequent events requiring special airspaces, rules or procedures (i.e. air shows, dignitary visits)
 - c. Non-Geographic – Functional, performance based endorsements or generic validations – use common system tools to be able to cover like-type sector operations with little local knowledge required
 - d. Contingency endorsements – allowing ATCO to perform limited, defined functions to provide service continuity

Restricted Endorsements

- 2.18. Australia began implementing restricted endorsements around 2009 to enable the management of larger sectors of airspace by fewer air traffic controllers. This approach was adopted as a resource management strategy. Currently, many restricted endorsements are used on a nightly basis across the continent. This strategy helps reduce staffing costs and ease shift schedules' pressure, requiring fewer personnel for overnight shifts.
- 2.19. These endorsements are held by controllers within the same group, generally in adjacent airspace. The training required for the restricted endorsement is markedly less than required, which results in cost savings. ATCO that hold restricted endorsements are proficient and experienced controllers that

⁴ CANSO Press Release [2024] – How to manage more traffic in less airspace

⁵ CANSO Press Release [2024] – How to manage more traffic in less airspace, page 3

currently hold ATC endorsements on similar sectors. They fulfil the competency based training requirements and remain current and recent on the restricted area endorsement.

- 2.20. A report from the Australian Transport Safety Bureau (ATSB) 2023 stated that:

Holding a restricted endorsement enables an air traffic controller to control additional airspace in which traffic levels or complexity are considered very light. There are limitations on when a Restricted Endorsement can be exercised, which means that its use is often limited to overnight operations only.

- 2.21. Mitigations were specified in local instructions, defining the conditions under which the endorsement may be used, including the time of day and traffic limitations.
- 2.22. Restricted endorsements that come with traffic limitations are much like other endorsements that carry restrictions; For example, the endorsement can only be exercised within certain geographic and/or vertical boundaries.

Non-geographic, Functional Endorsements

- 2.23. IFATCA WP158 discussed Performance-Based endorsements to be developed by Australia in 2019 to support dynamic sectorisation. This did not come to fruition. They are reworking the framework as part of an Endorsement Modernisation project to be implemented with a new ATMS (Air Traffic Management System). It states that functional endorsements will be introduced that extend beyond the traditional geographic sector boundary, enabling the management of airspace with similar characteristics. This concept is similar to other System Based Licensing concepts that are being discussed worldwide. These rely on the System to produce automated conflict detection, coordination and frequency prompting.

The Low Air Traffic or Low Capacity Endorsement Concept

- 2.24. Air traffic control is a highly specialised field that requires extensive training and experience. A way to describe Low Capacity Endorsements would be to say they are utilised during periods of defined times where there is less nominal traffic or when traffic mitigations can be put in place.
- 2.25. Regardless of the restrictions placed on an endorsement, a controller should be trained appropriately and meet the required competency standards as per ICAO licensing requirements.
- 2.26. Mitigating workload by adjusting terminal arrival rates, increasing departure spacing, rerouting or alternate flight paths to create conditions of low density and less complex operations can also increase the workload on adjacent units.

- 2.27. The creation of Low Capacity Endorsement could be eliminated if the problems of staffing shortages, effective resource management or issues with the training and recruiting systems were addressed.

When traffic conditions regarding low capacity, complexity or density are no longer met

- 2.28. ATC is a dynamic environment; traffic patterns can be unpredictable, and forecasted movements are not always reliable. When operating under an endorsement that uses traffic mitigations or relies on a period of time that usually has “less traffic”, there is a risk that the restricted conditions for the endorsement may not be met when there is an unexpected increase in density or complexity. This could be due to a weather event or an unforeseen situation requiring traffic rerouting, an inflight emergency or contingency operations on an adjoining sector.
- 2.29. Additional mitigation strategies must be implemented when the traffic levels or complexity exceed the level appropriate for the endorsement. These include strategies like traffic metering, increased departure spacing, reduced arrival rates, delaying or withholding clearances.
- 2.30. However, a further risk of utilising Low Capacity Endorsements in locations where they will operate under single person operations (SPO), additional mitigations may not be able to be implemented by the ATCO. This carries a high risk of the ATCO being unable to cope with abnormal situations or increased capacity complexity situations if they present.
- 2.31. ICAO defines ‘Sector capacity’⁶ expressed as maximum aircraft are handled per time unit, usually one hour (e.g. 40 aircraft per hour). This value takes into account various factors such as sector size and shape, applicable procedures, expected traffic flows, nearby aerodromes, seasonal variations, etc.
- 2.32. ICAO Annex 11 defines “declared capacity”⁷ as the measure of the ability of the ATC system or any of its subsystems or operating positions to provide service to aircraft during normal activities. It is expressed as the number of aircraft entering a specific portion of airspace in a given period. This takes into account weather, ATC unit configuration, available staff and equipment, and any other factors that may affect the workload of the controller responsible for that airspace. This data needs to be included when determining the mitigation for low and restricted endorsements.
- 2.33. To determine when there is too much traffic for an ATCO to work multiple endorsements concurrently, an ANSP should consider the declared capacity and sector capacity and then set a limit to capacity level for each defined endorsement.

⁶ ICAO Annex 11 - ...

⁷ ICAO Annex 11 - ...

- 2.34. It should be a condition of restricted endorsements that contingency procedures must be able to be put in place for situations when traffic/complexity levels will exceed the maximum threshold as determined.
- 2.35. Restricted endorsements have been created initially as contingency solutions to staffing shortages or to manage low capacity areas. However, when these restricted endorsements transition into standard practices, it becomes essential to establish contingency solutions to support them. This creates a scenario in which the original issue is effectively resolved by implementing a contingency solution, which is then further supplemented by another layer of contingency solutions. Essentially, this could lead to a chain of reliance on temporary measures rather than addressing the root causes of the staffing and capacity issues in the first place.
- 2.36. **Using Low Capacity Endorsements for contingency operations**
- 2.37. There is a risk that these endorsements we have discussed would be created for periods of less complex and reduced traffic levels, e.g. overnight, may be utilised by ANSP to provide service continuity to prevent contingency procedures from being implemented or serving as a basis for reducing staffing numbers.
- 2.38. ANSPs may focus on having ATCOs work endorsements with high levels of restrictions and traffic mitigations in place, which is preferable to having airspace closures and enacting contingency procedures like TIBA (Traffic Information Broadcasts by Aircraft).
- 2.39. Contingency situations are often needed because of staffing shortages or resource management. The focus should be on solving the cause of the problem rather than adjusting the endorsement parameters to facilitate staffing issues.
- 2.40. The most controversial endorsement concept to be introduced by Australia is an En-route conditional endorsement (ECE), described by the Australian Transport Safety Bureau which is proposed to be used in contingency situations where “unrated” controllers can operate numerous defined sectors with specific conditions applied to simplify the task.
- 2.41. It enables the activation of controllers who are not usually authorised to control the affected airspace during an ATS contingency event. The scope is to provide the highest possible service under those circumstances, when traditional options are not available.
- 2.42. Contingency endorsements in low staffing situations shall be avoided. Defining procedures for a “non rated” controller to operate a sector for which they do not hold a licence or has demonstrated the required competencies is akin to “Use of Unqualified Personnel” as described in the IFATCA TPM (Technical and Professional Manual).

2.43. TRNG 9.4.2 USE OF UNQUALIFIED PERSONNEL

To guarantee safety, controllers shall not be replaced by personnel who do not hold ATC licences in accordance with ICAO Annex 1, with the ratings, recency and competency appropriate to the duties that they are expected to undertake for the position and unit at which those duties are to be performed.

2.44. IFATCA has already identified that factors like staff shortages, night shifts, and introducing automation and technical tools to better predict conflicting traffic can lead to SPO. This needs to be a consideration for endorsements that have procedures, and traffic mitigations utilised in standalone sectors or units.

2.45. WC 10.1.6 SINGLE / LONE PERSON OPERATIONS (SPO)

Single or Lone Person Operations (SPO/LPO) shall be avoided. The use of SPO/LPO should be strongly discouraged by MAs, both through ANSP and their regulator.

If providers choose to operate SPO/LPO, they shall bear the responsibility for the resulting risk(s) to the system.

If SPO/LPO occurs, appropriate measures shall be taken to ensure that the SPO/LPO situation changes to another manning scenario. Until such time, measures shall be taken to mitigate all impacts of SPO/LPO, such as, but not limited to: traffic regulation, work break provisions, and informing neighbouring ATC units. Procedures shall be in place to implement such measures in an efficient way, without increasing the workload of the ATCO.

System Based Licensing concept

2.46. The system-based licence concept: WP No. 97 presented in Singapore 2024 differs from generic or non-geographic functional endorsements. It explains that if an ATC can operate a system consisting of hardware and software to a certain performance standard, they can utilise this licence on the same system regardless of their organisation's country or even region.⁸

2.47. The provisional policy was created regarding IFACTA's position below and further work is being researched by IFACTA TOC/PLC with a working paper to be delivered in Abu Dhabi 2025.

IFATCA Provisional Policy - AAS 1.23 SYSTEM-BASED AIR TRAFFIC CONTROL LICENCE CONCEPT

⁸ IFATCA 63rd Annual Conference, Singapore, 15-19 April 2024, WP No. 97 - System-Based air Traffic Controller Licence Concept

IFATCA does not support ATC licencing concepts under which ATCOs are authorised to provide an ATS function based solely on Automation, equipment and/or systems utilised, because the contribution of ATCO skills and knowledge of the safe provision of the ATC service in all possible situations is not sufficiently recognised.

- 2.48. System Based ATCO licensing solutions documented in CANSO discussion papers, SESAR projects and EUROCONTROL think papers aren't proposing true system based licence concepts. The term licence is, in fact, referring to an endorsement. These proposed system based licences are more in line with generic or non-geographic functional based endorsements as they would not be solely based on the system being used. They are progressing these concepts to take advantage of more advanced ATMS being delivered to ANSP.
- 2.49. CANSO Think Paper 2024 states that these endorsements would also include simplification of procedures, supporting tools, automation of system functionalities and automation tools that reduce the level of knowledge of local conditions and procedures. They go on to emphasise that

... high traffic complexity, high airspace complexity, lower airspace with terminal areas and airport interface non-nominal conditions and high traffic conditions have been identified as potential barriers to the concept.

Risk Assessment and Analysis

- 2.50. If a new endorsement is deemed necessary to cater to a particular set of circumstances, whether to be more efficient with staffing resources, increase staff mobility or flexibility, contingency operations, or controller competencies, the appropriate safety work must be done. Risk assessments and appropriate safety assessments must be conducted to identify hazards and analyse and evaluate the risks.
- 2.51. It must also be considered that ATCOs must be involved in determining the parameters of any low, restricted, or contingency endorsement to ensure that it meets the needs of both the ANSP and the ATCO.
- 2.52. Once created, these new endorsements must be constantly reviewed and monitored to ensure that the hazards remain within the parameters defined for the endorsement.

3. CONCLUSION

- 3.1. In conclusion, the evolution of Air Traffic Control licensing and endorsement concepts is seen as a step for ANSPs towards enhancing efficiency and minimising flight disruption in the aviation industry. Non-geographic functional or generic endorsement concepts are hoped to allow for better resource allocation and staff mobility to create a more resilient and adaptable ATC system for ANSPs with the introduction of more advanced ATMS.

- 3.2. Staff shortages and capacity management issues have led to the need for innovation by ANSPs. This has led to the research and development of new endorsements in an attempt to reduce contingency operations and prevent airspace closures.
- 3.3. Once these new endorsements would be implemented, they unfortunately become “the new normal” and an accepted practice within the ANSP. The original intent may have been a “stop gap measure” until staffing numbers increased, or staff could be adequately trained to resolve the issue. However, once in place and the problem is solved, what was meant to be a temporary fix becomes accepted practice.
- 3.4. Any new endorsements shall require an appropriate amount of competency based training and be subject to all applicable licensing regulations of the State relating to recency and currency.
- 3.5. As per IFATCA TPM Competence Assessment TRNG 9.4.4, IFACTA supports competence assessment for all personnel engaged in operational duties for every endorsement or validation.
- 3.6. ANSPs should concentrate their efforts towards solving these critical resource issues instead of mitigating staff shortages, capacity management issues, airspace closures and contingency operations through licensing workarounds and endorsement manipulation.

4. RECOMMENDATIONS

- 4.1. It is recommended that the following be accepted as policy and inserted into the TPM:

IFATCA TPM (2025) TRNG 9.4.2 USE OF UNQUALIFIED PERSONNEL

Proposal:

IFATCA policy is:

To guarantee safety, controllers shall not be replaced by personnel who do not hold ATC licences in accordance with ICAO Annex 1, with the ratings, recency and competency appropriate to the duties that they are expected to undertake for the position and unit at which those duties are to be performed.

IFATCA does not support the creation of Low Capacity or other Restricted Endorsements. This includes for managing contingencies or mitigation of insufficient staffing.

State Regulators shall recognise the advantages of implementing an ATCO licensing system to provide assurance to domestic and international stakeholders.

ANSPs shall recognise the advantages of an ATCO licensing system as an effective tool not only to harmonise ATCO standards, but to give an effective, transparent means of providing assurance that ATCO standards are being met and maintained.

The functions which are contained within ICAO Annex 1, as being ATC functions shall not be added to the work responsibilities for unlicensed personnel.

In the event of an incident, caused totally or in part by the use of unqualified personnel, responsibility shall lie with the person or authority responsible for allocating the unqualified staff to the task undertaken and any other person or authority who has materially supported or assisted to use unqualified personnel.

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