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DIRECTORATE GENERAL OF CIVIL AVIATION

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Subject: Guidelines for Air Navigation Service Provider for determining the capacity of the ATS system including airport acceptance rate, number of staff required.

1. Purpose and scope

- 1.1. This Circular is issued to provide guidance to Air Navigation Service Provider responsible for the air traffic service (ATS) to prepare policies and procedures to determine the capacity of the ATS system including airport acceptance rate, the number of ATS staff required for every ATS unit.

2. References

- 2.1 The Civil Aviation Requirements (Section 9 – Air Space and Air Traffic Management Series 'E', Part I)
- 2.2 ICAO Doc 4444 PANS ATM
- 2.3 ICAO Doc 9426 – ATS Planning Manual

3. Guidance and procedures

3.1 General

- 3.1.1 The Air Navigation Services Provider (ANSP) shall lay down the procedures for determining the capacity of the ATS system including airport acceptance rate, which will follow the number of staff required for every ATS unit.

3.1.2 The capacity of an ATS system depends on many factors, including the ATS route structure, the navigation accuracy of the aircraft using the airspace, weather-related factors, and controller workload. Every effort should be made to provide sufficient capacity to cater to both normal and peak traffic levels; however, in implementing any measures to increase capacity, the ANSP shall ensure that safety levels are not jeopardized.

3.1.3 The number of aircraft provided with an air traffic service shall not exceed that, which can be safely handled by the ATS unit concerned under the prevailing circumstances. In order to define the maximum number of flights which can be safely accommodated, the appropriate ANSP should assess and declare the ATS capacity for control areas, for control sectors within a control area and for aerodromes.

Note—The most appropriate measure of capacity is likely to be the sustainable hourly traffic flow. Such hourly capacities can, for example, be converted into daily, monthly or annual values.

3.1.4 Airspace capacity is not unlimited but it can be more or less optimised depending on many factors, such as airspace design and flexibility; ATS system capacity; number of sectors and their complexity; segregated airspace; availability, training, and response capability of personnel; available CNS infrastructure; degree of automation; and even the equipage and type of aircraft in the fleet.

Note—ANSP must take note that the proximity of airports to one another, the relationship of runway alignments, the taxiway system, size of aprons and the nature of operations (IFR or VFR) are the principal inter-airport considerations that affect the airspace capacity. If major or secondary airports are closely spaced, they will share a parcel of airspace and this may to some extent reduce the airspace capacity.

3.2 ATS Capacity assessment

The capacity of an ATS sector/unit can be defined as the maximum number of aircraft that can be provided Air Traffic Service in safe manner in a particular ATS sector/unit within a specified period, while still permitting an acceptable level of controller workload. To assess the capacity, the ANSP needs to define the controller workload and how it is measured and quantify the acceptable level of controller workload in terms of threshold value at full capacity.

In assessing capacity values, factors to be taken into account should include, inter alia:

- a) The level and type of ATS provided;
- b) The structural complexity of the airspace assigned to the sector/unit or the aerodrome concerned;
- c) Controller workload, including control and coordination tasks to be performed;
- d) The types of communications, navigation and surveillance systems in use, their degree of technical reliability and availability as well as the availability of backup systems and/or procedures;
- e) Availability of ATS systems providing controller support and alert functions; and
- f) Any other factor or element deemed relevant to controller workload.

Note—Summaries of techniques which may be used to estimate control sector/position capacities are contained in the Air Traffic Services Planning Manual (Doc 9426).

3.3 ATS capacity and traffic volumes management

3.3.1 Where traffic demand varies significantly on a daily or periodic basis, facilities and procedures should be implemented to vary the number of operational sectors or working positions to meet the prevailing and anticipated demand. Applicable procedures should be contained in local instructions.

3.3.2 In case of particular events which have a negative impact on the declared capacity of an airspace or aerodrome, the capacity of the airspace or aerodrome concerned shall be reduced accordingly for the required time period. Whenever possible, the capacity pertaining to such events should be predetermined.

3.3.3 To ensure that safety is not compromised whenever the traffic demand in an airspace or at an aerodrome is forecast to exceed the available ATS capacity, measures shall be implemented to regulate traffic volumes accordingly.

3.4 Enhancement of ATS capacity

3.4.1 In order to ensure provision of safe Air Traffic Services ANSP should:

- a) Periodically review ATS capacities in relation to traffic demand; and

- b) Provide for flexible use of airspace in order to improve the efficiency of operations and increase capacity.
- 3.4.2 In the event that traffic demand regularly exceeds ATS capacity, resulting in continuing and frequent traffic delays, or it becomes apparent that forecast traffic demand will exceed capacity values, the appropriate ANSP should, as far as practicable:
- a) Implement steps aimed at maximizing the use of the existing system capacity; and
 - b) Develop plans to increase capacity to meet the actual or forecast demand.
- 3.4.3 When the traffic demand exceeds occasionally, or is foreseen to exceed, the capacity of a particular sector or aerodrome, the responsible ATS unit shall advise the responsible ATFM unit, where such a unit is established, and other ATS units concerned. Flight crews of aircraft planned to fly in the affected area and operators should be advised, as soon as practicable, of the delays expected or the restrictions which will be applied.

4. Manpower requirement assessment

- 4.1 The ANSP shall assess the manpower requirement using Task and Resource Analysis for any ATS unit and prior to establishment of every unit.
- 4.2 Manpower planning and staffing is essential to ensure a properly balanced workload scheme that justifies the number of ATCOs employed and ensures the capacity of the system can be handled.
- 4.3 Each ATS unit is unique and its staffing requirements must be reviewed annually and adjusted whenever, traffic or other relevant factors demand so.

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