

APPENDIX B

STRATEGY FOR THE IMPLEMENTATION OF GNSS NAVIGATION CAPABILITY IN THE ASIA/PACIFIC REGION

Considering that:

- 1) Safety is the highest priority;
- 2) Elements of Global Air Navigation Plan for CNS/ATM system on GNSS and requirements for the GNSS implementation have been incorporated into the CNS part of FASID;
- 3) GNSS SARPs, PANS and guidance material for GNSS implementation are available;
- 4) The availability of avionics including limitations of some receiver designs; the ability of aircraft to achieve RNP requirements and the level of user equipage;
- 5) Development of GNSS systems including satellite constellations and improvement in system performance;
- 6) Airworthiness and operational approvals allowing the current GNSS to be used for en-route and non precision approach phases of flight without the need for augmentation services external to the aircraft;
- 7) Development status of aircraft-based augmentation systems;
- 8) Regional augmentation systems include both satellite-based (SBAS) and ground-based systems (GBAS);
- 9) Human, environmental and economic factors will affect the implementation of GNSS;
- 10) The regional navigation requirements are:
 - (a) RNP10/RNP4 for en-route;
 - (b) RNP4 for transition to terminal phase of flight;
 - (c) RNP1 for terminal phase of flight;
 - (d) NPA/APV for approaches and departures; and
 - (e) Precision approaches at selected airports.

The general strategy for the implementation of GNSS in the Asia/Pacific Region is detailed below:

- 1) There should be an examination of the extent to which the GNSS system accessible in the Region can meet the navigational requirements of ATM service providers and aircraft operators in the Region;
- 2) Evolutionary introduction of GNSS Navigation Capability should be consistent with the Global Air Navigation Plan for CNS/ATM Systems;
- 3) During transition to GNSS, sufficient ground infrastructure for current navigation systems must remain available. Before existing ground infrastructure is considered for removal, users should be given reasonable transition time to allow them to equip with GNSS to attain equivalent navigation service;
- 4) Implementation shall be in full compliance with ICAO SARPs and PANS;
- 5) Introduce the use of GNSS for en-route, terminal and approach navigation;
- 6) States are encouraged to implement future GNSS approvals based on TSO C145/146 receiver standards or equivalents;
- 7) To the extent possible, States should work co-operatively on a multinational basis to implement GNSS augmentation systems in order to facilitate seamless and inter-operable systems;
- 8) States consider segregating traffic according to navigation capability and granting preferred routes to aircraft with better navigation performance, taking due consideration of the need of State aircraft;
- 9) States undertake a co-coordinated R & D programme on GNSS implementation and operation;
- 10) ICAO and States should undertake education and training to provide necessary knowledge in GNSS theory and operational application, including RNP; and
- 11) States establish multidisciplinary GNSS implementation teams, using section 6.10.2 of ICAO Circular 267, *Guidelines for the Introduction and Operational Approval of the GNSS*, as a guide.

Note.— Identified SBAS systems are EGNOS, MSAS and WAAS. The MSAS is expected to be available for providing augmentation for the Asia/Pacific region.

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