CARC GNSS Strategy

Global Navigation Satellite System (GNSS) Strategy

Civil Aviation Regulatory Commission (CARC)

Prepared and Presented by:

Planning & Development Department

Strategy objective

To formulate a future GNSS *road map that* foster the implementation of advanced navigation systems in Jordan to improve *flight efficiency* and airports accessibility

Strategy framework and references

- GNSS Strategy is done in line with the regional and global aviation requirements, to maintain regional and global harmonization.

Strategy Purpose

Is to draw a clear path for deploying GNSS infrastructure to support the GNSS Operation implementation for future investment in Jordan airspace and aviation industry by all stakeholders

The Strategy will provide sufficient argument to justify the claim in resources in order to support the future operation requirements and needs to make sure that CARC is able to cope with the increasing demand on airspace resources

CARC position

CARC has identified GNSS Operation implementation as one of the main fundamental areas to improve navigation service performance in all phases of flight.

CARC will participate in GNSS activity to build its own capacity and to foster the implementation of GNSS in Jordan within the MID east region on an agreed timeframe

Collaboration is crucial, when considering that CARC not only wants to formulate meaningful GNSS strategy, but wants to execute the planed strategy.

CARC GNSS Strategy

CARC position

CARC is aiming to develop a leading team in coordination and collaborate with all stakeholders to foster the implementation and expedite the benefits gain.

CARC is the responsible body for aviation regulation in Jordan and will develop specific GNSS regulation to cover all types of airworthiness and operational approvals required to foster the implementation of GNSS navigation

The ANSP within CARC will make GNSS operation available for the airspace user in a efficient, safe, cost effective, harmonized approach

CARC is the responsible body for the satellite navigation in aviation implementation in JORDAN and its specific roles and responsibilities will be develop further as GNSS implementation progresses (ex. regulation development, operational approvals)

Current navigation situation

44 RNAV 1 departure route based on satellite navigation(GNSS) for the three airports

44 RNAV 1arrival route based on satellite navigation (GNSS) for the three airports

8 RNP0.3 GNSS Final approaches based on satellite navigation(GNSS) for the three airports

5 RNAV5 ATS en-route for the overflying air traffic

Airport	Number of RNAV 1 SIDs	Number of RNAV 1 STARs	Number of approaches Baro- VNAV
OJAI	24	24	4
OJAM	12	12	2
OJAQ	8	8	2
Total	44	44	8

Strategy principles

1. GNSS is not a goal by itself, but it is the supporting infrastructure for GNSS service operations

2. Any element of the GNSS (systems and applications) must be ICAO compliance within ICAO regional time frame

3. In selecting a specific augmentation system many elements are to be considered types of operation to be supported, technology maturity, cost, Aviation standard readiness, airlines fleet capabilities and their future plans the global and regional approach.

Strategy principles

4. Cooperation between all stakeholders on GNSS will achieve a strategy beneficial for all GNSS stakeholders as well as provide all parties with a solid baseline for future activities investment in the field of GNSS.

5. As GNSS is vulnerable from many aspects (sun cycle , jamming) and it will be used as the primary means of navigation within Jordan; proper Backup system must be kept in place to support a healthy aviation system and continuous services

Strategy principles

6. The transition period to GNSS represents a significant change for aviation; a successful transition requires a carful gradual comprehensive approach to elevate the risk associated with the changes required.

7. CARC through coordination with an appropriate body will record the GNSS signal as required

Future navigation specification

The Advanced RNP-1 navigation specification is expected to play an important role in the long term implementation in the region for en-route and terminal operations, Advanced RNP will be implemented in line with the ICAO Aviation System Block Upgrades and the Global Air Navigation Plan.

En-routes Operation

The replacement of RNAV 5 Advanced RNP-1 navigation specification routes will be implemented based on a Regional agreements and agreed transition plan.

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Terminal Operation

•Initial implementation of Advance RNP 1 navigation specification is expected in TMAs by 2018

•due to the very high level of complexity associated with the operation in Jordan, CDO and CCO will be implemented initially on a limited trails basis, following s successful outcomes of the trails a full implementation will be progressed realizing that CDO and CCO will not be efficiently implemented without a cooperation and agreement with all concern stake holders, a dedicated team will be form to pave the road to CCO and CDO implementation in Jordan.

Trial of CCO and CDO will start by the end of 2016

Continuous descent operations CDO/ Continuous climb operations CCO

Approach Operation

It is expected that that precision approach capability using GPS and its ground based augmentation systems will start by 2018 if the business case prove an operational and economic benefit for all concerned stakeholders

Table of Future Navigation specification

Medium Term (2016 and Beyond)			
Airspace	*Navigation Specification*	Implemented date	Note
En-route – Continental	RNAV 1 or Advance RNP 1	2018	Regional agreements
En-route - Local / Domestic	RNAV 1 or Advance RNP 1	2017	Local user capabilities
TMA – (Arrival, Departure)	Advance RNP 1	2018	Local user capabilities
Approach	GNSS/proper Augmentation	2018	operational and financial benefits
Trails of CCO and CDO implementation will start in 2016			

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THANK YOU