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GBAS SBAS Implementation Workshop

Summary and Outcomes



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5 June-2019



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Summary & Participants

Three days to cover :

- System development and certification
- Fleet readiness
- Implementation challenges for system (development/operation) and for operational procedures (APV, Cat I, II, III)
- Current implementation and planning of GBAS and SBAS operations in APAC

Participants :

- States (Australia, Brunei, China and HongKong SAR, France, India, Indonesia, Japan, Malaysia, Philippines, ROK, Singapore, Sri Lanka, Thailand, USA, Vietnam,) and
- Industry (Airbus, Boeing, Raytheon, TAS, ESSP, Honeywell, Collins,...)
- Singapore Airlines



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Outcomes

AIRSPACE
USERS

Fleet readiness

AFM

ANSP/AIRPORT

Procedure

Safety
Assessment

ATC
Interface

NOTAM

GNSS
CONSTELLATION

GBAS SBAS SYSTEM

Industry

Operator

Performance
compliance

REGULATOR

Approval

Certification



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Outcomes

GNSS
CONSTELLATION

So far GBAS and SBAS are only available on GPS L1

Dual Frequency Multi Constellation receivers are expected
but not before 5-10 years



Outcomes

GBAS SBAS SYSTEM

Industry

Operator

Performance
compliance

REGULATOR

Certification

GBAS / SBAS :

- Define clearly the target operations (APV I, Cat I, Cat II/III) and discuss with your airspace users
- Conduct test bed / **ionosphere data collection** / run simulation if interest in using neighboring SBAS
- Engage discussion with the regulator to agree on all the process for performance compliance demonstration



Outcomes

GBAS SBAS SYSTEM

Industry

Operator

Performance
compliance

REGULATOR

Certification

GBAS / SBAS :

- Which entity is going to operate the system ?
- Ensure that the regulator will recognize the entity as a CNS provider and approve the maintenance/upgrade of the system



Outcomes

ANSP/AIRPORT

Procedure

Safety
Assessment

REGULATOR

Approval

GBAS / SBAS :

- Update national regulation as necessary
- Procedure design (difference from with APV Baro and similar to ILS)
- Different strategies for ground/flight validation
- Management and validation of the FAS DB
- Management of SBAS/GBAS channel (ICAO summer 2019)
- Safety assessment of the LPV / GLS operations for the integration of this change into your ATM environment
- Submission of all the documents to the regulator for approval



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Outcomes

ANSP/AIRPORT

ATC
Interface

NOTAM

GBAS / SBAS :

- Which information to provide to ATC?
- NOTAM
- Legal recording



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Outcomes

AIRSPACE
USERS

Fleet readiness

AFM

GBAS / SBAS :

- Airbus is moving to GBAS and SBAS
- Boeing is mainly proposing GBAS today and will consider SBAS
- SBAS (LPV function) mandates in several regions
- SBAS/GBAS to complement ILS operations
- GBAS could help to maintain better capacity than with ILS in low visibility conditions
- SBAS could improve access to airports and allow reduction of ILS Cat I systems



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Outcomes

New GANP coming

New APAC Seamless ATM plan coming



Outcomes

PBN is a complex subject

- Appoint a project manager and create specific national group
- Conduct workshop to develop awareness with airspace users/ procedure designers/ATCO/engineers
- Get expertise from universities to support the validation/acceptance of the GBAS/SBAS system



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Reference

All material is available here

<https://www.icao.int/APAC/Meetings/Pages/2019-GBAS-SBAS-.aspx>



A big thank to all the speakers

**A big thank to all participants
for the very interactive sessions**

**A special thank to MOLIT/KOCA and ICAO RSO team for
the perfect preparation and management of the
workshop**



INTERNATIONAL CIVIL AVIATION ORGANIZATION

A United Nations Specialized Agency

Have a safe journey back home





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THANK YOU!