

IBAC Technical Report Summary

Subject: Global Navigation Satellite System

Meeting: ICAO GNSS Panel WG “A”, Delhi, October 2000

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Reported by: Heinz Lichius

Summary:

Reviewed timeline for publication of GNSS Manual. Draft Version 2 updated to Version 3.

Training issues relating to GNSS introduction will require particular attention by the Panel.

Development of GNSS related RT phraseologies – no consensus reached.

For operational reasons, WG”A” does not support encryption for Galileo.

No need seen to change existing NOTAM format to disseminate RAIM availability info.

Noted continuing problem with integrity and accuracy of GPS status messages; this is invalidating results of RAIM prediction systems in some States; WG “A” Member nominated by USA to raise with GPS service provider management.

Attached detailed report elaborates.

Implication for Business Aviation:

No immediate impact on current use of GNSS.

Decisions Required:

P.O.C. to note report.

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GLOBAL NAVIGATION SATELLITE SYSTEM PANEL (GNSS)

REPORT OF WORKING GROUP A MEETING

NEW DELHI, INDIA

OCTOBER 2000

Twenty-one experts attended the meeting, coming from 10 States and 3 International Organizations.

Mr. Ross Bowie from NAV CANADA, the Rapporteur of GNSSP WG-A chaired the meeting. Mr. Victor Iatsouk, GNSS Panel Secretary and Ed Hajek of NAV CANADA provided the Secretariat support.

The Rapporteur welcomed the attendees to the meeting, explaining the objectives of the working group. He thanked the GNSSP Member of the host country, Mr. K. Ramalingam, for the excellent hospitality and support provided to the group. Mr. Ramalingam then covered the administrative details.

The meeting was made aware of the GNSS Workshop held the previous days in New Delhi, supported by a few working group members (incl IBAC).

Then the members reviewed the action items of the last meeting held in London in April 2000.

Olivier Carel, from France GDAC proposed to coordinate with GNSSP WG-B regarding the new edition of DOC. 8071 Volume II for GNSS testing.

Eric Chartre, France, proposed that GRAS operational issues should be reviewed and discussed, in order to provide comments for WG B's review at their next meeting to be held in Yokohama.

All WG-Members: the application of continuity requirements needs to be addressed from an operational point of view.

Secretary: asked the WG members from Europe if there could be input from Eurocontrol's recent WG meeting. Mr. G. Del Duca (Italy) was requested to brief on the joint WAAS, EGNOS and MSAS NOTAM issue.

Eric Chartre: Encryption and other operational issues related to Galileo-an Ad Hoc group report from Brussels meeting on Galileo will be distributed for review.

Jeff Williams (US) and Ross Bowie: NOTAM status monitoring issue. WG A/B and IWG cooperation set out by this group to prevent discontinuity.

The Rapporteur then discussed the need to review the timeline of publishing the GNSS Manual, and to address the issue of making the interim version of the manual available on the ICAO web-site for easy access by member States:

The Secretary presented two options:

- a) It may be premature to publish the manual before States have experience with SBAS. Taking this into account, another consideration is that there can be no publication before the GNSS Panel approves the manual at its next meeting (GNSSP4) that is presently planned in the 2nd half of 2002. This would mean publication in late 2003.
- b) Another approach is to finalize the manual as soon as possible based on information and experience available to date. Have the final draft produced at the next meeting (Spring 2001). Co-ordinate the approval of the draft with the GNSS Panel by correspondence, and request authorization from the ANC for publication. It is believed that this option would save one year.

Advantages and disadvantages for both options were discussed. After some discussion the consensus was that the WG should proceed with Option B) – “try to finalize the document by the next WG-A meeting”. If, at some point during this process, it becomes evident that, because of unforeseen SBAS developments, then Option A) could be followed.

It was discussed a possibility of providing an interim (draft) manual on the ICAO Web-site. After some discussion regarding the benefits of making Manual available through the internet, the Secretary informed the group that present ICAO policy is such that saleable publications are not included in the web-site until the ICAO policy in this regard is changed. He further stated that draft documents could not appear on the web-site because nothing can be there that is not approved.

The Rapporteur, with the consensus of the group, recommended that States solicit ICAO to implement innovative methods for distributing documents like the Manual on the ICAO web-site. Panel members through their national representatives to raise this issue with ICAO and the Secretary to continue promoting publication of GNSS documentation on the ICAO web-site.

The meeting then reviewed Version 2 of the draft GNSS Manual as presented by the drafting group together with relevant working papers and flimsies. Multiple comments, additions and revisions were brought forward for inclusion in the next version. Additional assignments were agreed to members and requested for producing material to the drafting group by 15 December 2000.

The Rapporteur and Secretary informed the members that the final report including Version 3 of the manual will be distributed to the members two weeks after the meeting i.e. not later than 3 November 2000.

It was agreed that training issues associated with GNSS introduction require particular attention of the GNSS Panel.

Ed Hajek presented a paper on PANS RAC PART X Phraseologies. After some discussion it became evident that a consensus could not be reached in the allowable time for this topic on many of the direct examples of GNSS phraseology presented in this paper.

In regard to Co-ordination with other Panels Barry Billman (US) presented a paper on actions taken by the OCP WG meeting in Madrid in regard to contributions provided by GNSS WG A in response to questions asked by the OCP concerning GNSS. He informed the group that all items were successfully addressed, that GNSS contributions were well received, and that all action items were accomplished. Members were encouraged to continue to provide input to their OCP members.

Eric Chartre presented a paper dealing with information from the last WG B meeting held in Seattle, and the work that will take place at their next meeting in Yokohama; validation of GLONASS, part of SBAS and GBAS SARPs based on the information available to date. Signal quality monitoring against waveform distortion was one of the main outstanding issues for completion of validation of SBAS and GBAS SARPs. Second part dealt with future work program and established the following list in conformance with the list adopted at GNSSP 3:

Development of SARPs for GRAS, GALILEO, GPS L5 and GLONASS M.

It was noted that WG B completed validation of GNSS SARPs and that ICAO now proceeds with the adoption of amendment to Annex 10, Volume 1 to incorporate SARPs and guidance material for GNSS including modifications resulting from SARPs validation. Expected applicability date is 1 November 2001.

Eric Chartre then briefed the members on some of the issues discussed at the last WG B Galileo Ad hoc meeting held in Brussels. In particular Encryption of the Safety Access Signal (SAS) and the status of GNSS Performance Requirements. Eric advised WG A that it would be beneficial to receive some operational input on these items which could be presented and discussed at the next meeting of WG B in Yokohama. The members discussed the fact that encryption presents many problems for aviation and that encryption service raises difficult issues.

Note: GALILEO information is available at www.galileo-pgm.com

After considerable discussion WG A recommended the following to be passed to GALILEO management and WG B:

- a) From the aviation perspective, a very useful and viable level of global service would be APV 2 at 0.999 availability.
- b) based on currently available information, encryption appears undesirable for a range of operational reasons, and is therefore not generally supported by WG A.

Jochen Roeper (Germany) presented a paper on RAIM prediction via NOTAM and AFTN. The purpose of the paper is to inform the group about the RAIM prediction tool, and to state that there is no need to change the existing NOTAM format to disseminate the information of the RAIM availability.

Ian Mallett (Australia) briefed on Australian RPS that was based on the same Volpe software and was supplying RPS to Australia, New Zealand, Fiji and Canada. While not mandated, the RSP has served to raise pilot confidence in the GPS NPA's, reveal receiver RPS errors, as well as awareness of the criticality of maintaining the GPS constellation. If the GPS NPA approval is to be upgraded to primary means an RPS would be necessary to ensure system integrity.

WG A members noted that there was a continuing problem with the integrity and accuracy of GPS status messages and this was invalidating the results of the RAIM prediction systems in their States. This problem continues despite repeated inputs to the US CGIC.

The US WG A member to raise the system status errors with the GPS service provider management, and Ross Bowie to provide a paper for the next meeting to repeat on the project that will compare prediction results with observed receiver performance.

The meeting was made aware of the work in progress in India that involves studies and other activities related to satellite-based augmentation system in support of GNSS implementation. This meeting expressed great interest in receiving information on further developments in this area.

The location of the next WG A Meeting was discussed. Jeff Williams, the US member to the Panel, invited the group to hold the meeting in Philadelphia, USA. It was agreed that the meeting would be beginning the week of April 23, 2001. It was suggested that the then following meeting should be held in concert with the GNSS WG B and that perhaps two weeks should be reserved for this venue. It is tentatively planned that the meeting will take place in Europe in October, 2001.

Heinz Lichius

October 23, 2000