

Seminar on the Ionosphere and its Effects on GNSS Systems
(Project RLA/00/009 GNSS Augmentation Trials)
(Santiago, Chile, 14-16 April 2008)

AGENDA

Monday, 14 April 2008

REGISTRATION OF PARTICIPANTS AND SEMINAR OPENING

08:30 -08:45 Participants Registration
08:45-09:00 Seminar Opening

INTRODUCTION

09:00-09:30 Introduction to the seminar and summary of activities carried out in Project RLA/00/009 (*Eng. Onofrio Smarrelli*)

GNSS APPLICATIONS

09:30–10:00 Introduction to MITRE’s Work (*Dr. Bernard Lisker, MITRE*)

10:00–10:30 Overview of GNSS Navigation Sources, Augmentation Systems, and Applications (*Dr. Sebastian V. Massimini, MITRE*)

- System Descriptions

10:30–11:00 Coffee Break

11:00–13:00 Overview of GNSS Navigation Sources, Augmentation Systems, and Applications (*Dr. Sebastian V. Massimini, MITRE*)

- GNSS Service Levels for Aviation
- GNSS Role in Advanced Aviation Applications
- Future Capabilities for GNSS and Augmentations
 - Multiple Constellations and Frequencies
- GNSS Applications (RNAV, RNP, etc.)

Questions

13:00–14:00 Lunch

IONOSPHERIC AND TROPOSPHERIC EFFECTS ON GNSS SYSTEMS

14:00–15:00 Ionospheric Effects on GNSS (*Dr. M. Bakry El-Arini, MITRE and Eng. Roland O. Lejeune, MITRE*)

- Solar Cycles , Effects on GNSS in Low- Mid-, and High-Latitude Regions

- Range Delay Errors
- Geomagnetic Storms
- Ionosphere Scintillation
- Ionospheric Depletions

15:00–15:30 Description of a Real-Time Algorithm for Detecting Ionospheric Depletions for GNSS/SBAS and the Statistics of Depletions in South America during the Peak of the Current Solar Cycle (*Dr. M. Bakry El-Arini, MITRE*)

15:30–16:00 Tropospheric Effects on GNSS (*Eng. Roland O. Lejeune, MITRE*)

16:00–16:30 GNSS Network Observation of Ionospheric Structure and Disturbances (*Dr. Andrew J. Hansen, Volpe*)

16:30–17:00 Ionosphere Analysis (*Universidad de la Plata Argentina*)

17:00–17:30 Questions

Tuesday, 15 April 2008

CORRECTING FOR IONOSPHERIC AND TROPOSPHERIC EFFECTS ON GNSS

09:00–09:30 Ionospheric Corrections for GNSS (*Eng. Roland O. Lejeune, MITRE*)

- L1-single Frequency GPS (Single-frequency Ionospheric Correction Model)
- L1/L5 Dual-Frequency GNSS Receivers
- L1-Single Frequency SBAS Receivers
- L1 Single Frequency GBAS and GRAS Receivers
- Galileo Single and Dual Frequency Corrections

09:30–10:00 Tropospheric Corrections for GNSS (*Dr. M. Bakry El-Arini, MITRE*)

- RTCA DO-229D MOPS Tropospheric Correction Model for SBAS Receivers
- MOPS Corrections for GBAS Receivers

10:00–10:30 Ionospheric Observation Reference Network Noise and Bias Calibration Techniques (*Dr. Andrew J. Hansen, Volpe*)

10:30–10:45 Questions

10:45–11:00 Coffee Break

MODELING GNSS AND AUGMENTATION PERFORMANCE AND DATA REQUIREMENTS

11:00–13:00 Service Volume Models (*GPS/Galileo/SBAS/GBAS/GRAS*)(*Eng. Roland O. Lejeune, MITRE and Dr. Sebastian V. Massimini, MITRE*)

- General Description of MITRE's SVM Models
- Modeling Ionospheric Effect on GNSS/SBAS Availability
- Modeling Scintillation Effects on L1/L5 GNSS/SBAS Availability in North and South America
- Performance Estimates for Current and Future GNSS Systems and Augmented GNSS Systems (SBAS/GBAS/GRAS)

13:00–14:00 Lunch

14:30–15:00 Ionosphere Analysis in the CAR/SAM Region Modeling for an SBAS Configuration (*GMV AENA Spain - RLA/03/902 - SACCSA SBAS Type EGNOS Project*) Phd. *Marta Cueto Santamaría*

15:00–15:30 Development and Extension of GBAS Ionospheric Error Threat *Models* (*Dr. Andrew J. Hansen, Volpe*)

15:30–16:00 Questions

FUTURE CONCEPTS AND PLANNING

16:00–17:00 Short and Long-Term Planning Considerations (*Dr. Sebastian V. Massimini, MITRE*)

RECOMMENDATIONS ON IONOSPHERE ANALYSIS

17:00–18:00 Recommendations for GNSS Data Collection, Planning, and Implementation (*MITRE/ICAO/Volpe*)

18:00–18:30 Questions

Wednesday, 16 April 2008

GNSS IMPLEMENTATION

- 09:00–09:30 GNSS activities in the ICAO CAR/SAM Region (*Eng. Onofrio Smarrelli, ICAO*)
- 09:30–10:00 ICAO norms and references for GNSS development (*Eng. Julio Siu, ICAO*)
- 10:00–10:30 Results of the RLA/03/902 Project - GNSS/SBAS Transition in the CAR/SAM Regions, SACCSA (*Project Member*)
- 10:30–11:00 Coffee Break
- 11:00–11:30 Navigation Evolution Roadmap (*Eng. David Petersen, FAA*)
- 11:30–12:00 LAAS, WAAS Implementation (*Eng. David Petersen, FAA*)
- 12:00–12:30 GNSS Implementation in Brazil (*Eng. Andre Eduardo Jansem, Brazil*)
- 12:30–13:00 WAAS Operational Implementation: Facility Approval and Service Approval (*Eng. David Petersen, FAA*)
- 13:00–14:00 Lunch
- 14:00–14:30 LAAS Operational Implementation: Facility Approval and Service Approval (*Eng. David Petersen, FAA*)
- 14:30–15:00 LAAS System Development (*Eng. Carlos Rodríguez, FAA*)
- 15:00–15:30 GBAS Implementation Activity (*Eng. Carlos Rodríguez, FAA*)
- 15:30–16:00 Questions

FINAL CONCLUSIONS AND RECOMMENDATIONS

- 16:00–17:00 Final Conclusions and Recommendations

During this section, delegates and speakers will debate on the agenda of the seminar. It is expected that these discussions result in conclusions and recommendations.

RELEASE OF CERTIFICATE AND CLOSING

- 17:00–17:30 Release of Attendance Certificate and Seminar Closing