



International Civil Aviation Organization

**FIRST MEETING OF IONOSPHERIC STUDIES
TASK FORCE (ISTF/1)**

27 – 29 February 2012, Tokyo, Japan



- Agenda Item 4:** **Data collection and analysis strategy**
 - Task Force deliverables
- Agenda Item 8:** **Any other business**

**A PROPOSAL FOR THE ESTABLISHMENT OF TECHNICAL TASK EXECUTION GROUP
TO SUPPORT THE IONOSPHERIC STUDY TASK FORCE**

(Presented by Republic of Korea)

SUMMARY

In the CNS/MET SG/15 meeting, it was agreed to establish the Ionospheric Study Task Force for the sake of identifying the need for a Regional Ionospheric Threat Model for the GBAS and the SBAS and of creating it if required. In order to realize the adoption, this paper proposes the establishment of the Technical Task Execution Group, which is divided according to the different roles, such as GNSS data collection and distribution; TEC calculation; scintillation generation; ionosphere analysis; and ionosphere model development, for the development of an Asia-Pacific regional ionosphere model under the Ionospheric Study Task Force.

This paper relates to –

Strategic Objectives:

A: **Safety** – Enhance global civil aviation safety

C: **Environmental Protection and Sustainable Development of Air Transport**

Global Plan Initiatives:

GPI-5 RNAV and RNP (Performance-based navigation)

GPI-21 Navigation systems

1. INTRODUCTION

1.1 In the APANPIRG/20 meeting, characterizing ionosphere in the region was identified as an important, useful step towards the implementation of GNSS. To proceed with the characterization of the ionosphere, the APANPIRG/21 agreed upon the condition of a cooperative effort in developing a

standard ionospheric model for the region and invited Japan to provide technical leadership with the ICAO to provide support.

1.2 A two-day workshop under the theme of *Ionospheric Data Collection, Analysis and Sharing in Support of GNSS Implementation* was held on May 5 and 6, 2011 in Bangkok with 20 participants from 9 Administrations in attendance.

1.3 After deliberating on ionospheric issues such as ionospheric effects on GNSS performance and exchanging information/experience, the workshop developed the following recommendations for consideration of the CNS/MET SG/15 in which the establishment of the Ionospheric Study Task Force was adopted:

- a) States are urged to coordinate with their relevant national organizations about the sharing of the available collected GNSS data so that the characterization of the ionosphere can be facilitated to support the implementation of GNSS applications for aviation.
- b) a Task Force needs to be established with an objective of identifying the need for a Regional Ionospheric Threat Model for the GBAS and the SBAS and of creating it if required.
- c) the ICAO Regional Office will coordinate with the APEC GIT for the initiative being carried out which is related to ionospheric data collection, analysis and sharing.

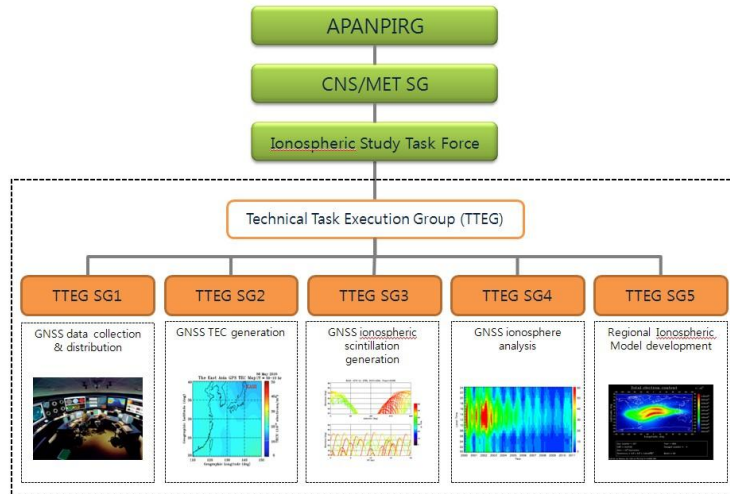
2. DISCUSSION

2.1 Extenuating circumstances notwithstanding, an essential prerequisite for promoting progress of the effort to develop a Regional Ionospheric Threat Model for the GBAS and the SBAS is the development of a Regional Ionospheric Model under normal condition.

2.2 Thus, this paper proposes the establishment of Technical Task Execution Group with the following objectives under the Ionospheric Study Task Force for the sake of developing a Regional Ionospheric Model:

- a) to collect, integrate, administrate and distribute GNSS data from all countries in the Asia-Pacific region;
- b) to standardize the algorithm and/or the format for GNSS TEC data as well as to generate ionospheric scintillation data and share thereof amongst the countries;
- c) to analyze the ionospheric properties in the Asia-Pacific region; and
- d) to develop a Regional Ionospheric Model in the Asia-Pacific region based on studies into ionospheric climatology and ionospheric storms

2.3 The following is a summary of the roles that are being proposed for each subgroup of the Technical Task Execution Group:



[Figure] Schematic of the Organization of the Technical Task Execution Group

[Table] Description of each TTEG subgroup

	Function	Description
TTEG SG1	GNSS data collection and distribution	<ul style="list-style-type: none"> Collection/integration/administration/distribution of GNSS data in the Asia-Pacific region Distribution of the processed data to TTEG SG2/3/4/5
TTEG SG2	GNSS TEC data generation	<ul style="list-style-type: none"> Generation of GNSS TEC data Standardization of algorithms as well as outcomes for/from GNSS TEC data generation
TTEG SG3	GNSS ionospheric scintillation data generation	<ul style="list-style-type: none"> Generation of GNSS ionospheric scintillation data Standardization of algorithms as well as outcomes for/from GNSS ionospheric scintillation data generation
TTEG SG4	GNSS ionosphere analysis	<ul style="list-style-type: none"> Formulation of ionosphere analysis methodologies Analysis of characteristics of the ionosphere and the provision of quantized information for TTEG SG5
TTEG SG5	Regional Ionospheric Model development	<ul style="list-style-type: none"> Development of Ionospheric empirical model Definition of I/O variables and analysis of the performance of the developed model

3. ACTIONS BY THE MEETING

3.1 The meeting is invited to review the proposal regarding the establishment of the Technical Task Execution Group to be adopted by the first meeting of the Task Force, which is scheduled to be held from 27 to 29 February 2012 in Japan, in order to invigorate the Ionospheric Study Task Force and to develop a model of the Asia-Pacific regional ionosphere.
