

réf. **WORKGNSS
ATM**

Code OACI 179
ENAC - SINA

GNSS for Surveillance and Navigation in ATM

FORMATION EN ANGLAIS

DURÉE

9 jours

PLACES OFFERTES

32

DATES ET LIEUX

No session in 2016, recast in progress.

CONDITIONS DE PARTICIPATION

CONTACT ADMINISTRATIF ENAC

formationcontinue@enac.fr

Bulletin d'inscription obligatoire :
voir en fin de catalogue

RESPONSABLE(S) DU STAGE

Christophe MACABIAU [Systèmes
Informatiques]

Objectifs

This course is designed to give a clear presentation of satellite constellations used for navigation, signal structures, system errors and a full explanation of the different types of augmentations that can be applied, including civil aviation view and necessary enhancements. This training allows to have an overview of the techniques of navigation that are deployed in Europe and around the world. At the introduction, we will develop the navigation generic requirement for systems (Conventional Nav Aids and GNSS), recommended by OACI, RTCA, Eurocae and by the operational requirements (RNAV, RNP, PBN, criteria). The course ends with a view of future GNSS developments including a discussion on GALILEO. Additionally, we will study how GNSS principle and technique can be exported towards the surveillance Domain. In these courses, Automatic Dependent Surveillance-Broadcast (ADS-B) and Multilateration (MLAT) will be presented as two emerging surveillance technologies identified as part of the European Surveillance Strategy.

Participants concernés

The course is designed for staff working in any area of CNS/ATM, to whom an overview of current and future development technique of the SUR-NAV/ATM system might be beneficial. It is aimed at people with a perception of the current Navigation and Surveillance domains, and wanting to take part in an in-depth analysis concerning the understanding of the way the GNSS can support Navigation and Surveillance. Globally this training targets engineers, involved in the planning of national "Nav/Surv" infrastructures of the local ANSP. This course is designed for operational, technical and managerial ATM staff interested in the developments of the field of Automatic Dependent Surveillance - Broadcast, Multilateration and Navigation, more especially with a view toward implementation in their own environment. It may also be of interest to ANSP staff involved in current or future ADS-B or Multilateration Deployment.

Contenu

GNSS : Concept, strategy and detection

GPS System Description

- Basic radio-navigation measurements and principles : distance, velocity, time . Principle of measurement of solution of navigation. Time and coordinates reference system.

GPS Architecture and Technique

- GPS : space, control and users segments . GPS Architecture.
- Signal structure : frequencies, multiple access technique, spread spectrum technique, Code C/A, P(Y), GPS Data Message.
- Transmission channel : ionosphere and troposphere propagation properties, interferences, multipath, localisation Indoors.
- Performances : D.O.P, Accuracy, Availability, Integrity, Continuity.

Differential techniques : DGPS

- Principles of correction of common bias systematic error : code differential and phase differential techniques.

Others Satellites Constellation for Navigation

- GLONASS, GALILEO, Modernized GPS.

Navigation Domain

General consideration on navigation, Operational requirements and strategy

- Navigation and different phase of flight (En-route, TMA, approach and landing), Notion of general Navigation errors Requirement Navigation performance overview and operation benefits.
- Introduction to the Policy of Augmentation of Accuracy, Availability, Integrity (ABAS, GBAS, SBAS, RAIM, EGNOS ...)

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- Landing phase (non-precision, precision).
- RNAV. PBN Concept.

Surveillance Domain

General consideration on Surveillance , Operational requirements and strategy

- Introduction to the general Surveillance Radar sensors and tracking processing
- Concept of Non-Dependant detection Mode S Radar and Multilateration.
- Concept of Dependant detection ADS-B
- How GNSS can help surveillance in positioning , accuracy and integrity ?

Demonstration and Simulations on the simulator or equipment device of ENAC

Demonstration in "Direction Technique de l'Innovation" of French DSNA or in French Industrial company

For information only : 52 hours

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