



## Main Outputs of the Working Session #6 October, 27<sup>th</sup> to 30<sup>th</sup> October 2014, Nairobi-Kenya

### Participants:

Cf. Annex 1 to have the list of the participants to the sixth SAFIR Working Session.

### 1 Goals of Working Session #6

The 4-days workshop was dedicated to JPO Missions - EGNOS V3 implementation for sub-Saharan Africa. The working session #6 addressed the following items:

- Shared understanding of the current and future missions, work programme and status of the EGNOS-Africa Joint Programme Office (JPO)
- EGNOS V3 Governance, Certification and Liability for Africa (taking to account the modular implementation)
- Identification of potential new modules that could be developed and deployed in Africa.

The following figure provides an overview of the agenda of the working session #6.



Cf. Annex 2 to have final agenda items for the sixth SAFIR Working Session.

## 2 Opening Ceremony

The Working Session #6 for the SAFIR project (Satellite navigation services for African Region) took place in Nairobi, Kenya, from 27<sup>th</sup> to 30<sup>th</sup> October 2014.

The Working Session, dedicated to “governance/Certification/Liability”, was opened by:

- Mr. Shadrack WESECHERE, Ag Director East African School of Aviation, representative of Kenya Civil Aviation Authority [KCAA] Ag. Director General Mr. Joseph K. CHEBUNGEI; In a speech read on his behalf, Ag. Director General welcomed the delegates and thanked the organizers for honoring Kenya in general and KCAA in particular as host for the sixth working session of SAFIR. He also assured the organizers of KCAA’s full support and cooperation in implementation of EGNOS SBAS.
- Mr. Olivier TURCAS, SAFIR Team Leader, from Egis Avia ; He thanked and welcomed all participants for participating in the meeting and in particular paid tribute to Mr. Nicholas O. Odwar and Mr. Walter Malanga from KCAA who managed to successfully coordinate VISA issues within very tight time span for some delegates to be able to be present in the working session.
- Mr. Cumbi H. AYINA AKILOTAN, SAFIR PIT member, SAFIR Delegate, on behalf of ASECNA general director Mr. Amadou Ousmane GUITTEYE, thanked and welcomed all participants. He thanked KCAA
- Mr. Ladislaus MATINDI, director of JPO welcomed and thanked all the participant

All participants to the working session, representing different Stakeholders, were present during the opening ceremony.

## 3 Introduction & Objectives of the Working Session #6

Mr. Olivier Turcas, the SAFIR Project Team leader, summarized the general scope and activities of SAFIR project. SAFIR is a two years project that started in 2013.

Mr. Turcas reminded two main activities of the SAFIR project:

### Activity 1: Set-up, staffing and Operation of an EGNOS-Africa Joint Programme Office (JPO)

- The JPO has now 10 members
- The team has a regional emphasis and covers other applications that aviation

### Activity 2: Set-up and support for GNSS/EGNOS Working Sessions comprising JPO staff and representatives of stakeholders concerned with GNSS/EGNOS.

- 8 working sessions are planned during the 2 years.

Olivier Turcas also presented the objectives of the Working session dedicated to EGNOS V3 implementation in sub-Saharan Africa (cf. section 1).

Mr. Roland KAMENI (ASECNA) recommended that EGNOS User Adoption should also be covered by a working session. Ms. Anne-Laure VOGEL (SAFIR PIT) responded that this issue will be fully covered in the development of EGNOS services implementation roadmap and also covered in the working session #6.

## 4 EGNOS Last information

Ms. Anne Laure Vogel (SAFIR PIT) presented a brief reminder of SBAS:

- GPS reminder (basis of GPS position computation)
- Satellite based positioning systems:
  - 4 SBAS currently operational (EGNOS, MSAS, WAAS, GAGAN)
    - ✓ Note: With the current version of EGNOS V2, it is not possible to cover the entire African continent with the same level of service/performance.
  - The future SBAS programmes: EGNOS over Africa, WAAS over South America, SDCM over Russia and the Chinese initiative SNAS.
  - In the future, if all SBAS systems are implemented, there will be a global coverage with a good level of performance (LPV 200 level of performance)
    - ✓ Thanks to the SBAS standards, SBAS systems are interoperable.

Several questions were raised following the first part of the presentation.

- Mr. Adiron Alberto (AUC) wondered if the vertical alert limits were impacted by the ionosphere conditions. Anne Laure Vogel (SAFIR PIT) answered that the vertical alert limits were defined regardless ionosphere conditions.
- Mr. Mari Mwangi (KCAA) wanted to know how the accuracy of ABAS and SBAS were compared. Ms. Anne Laure Vogel (SAFIR PIT) replied that the main difference between ABAS and SBAS is the level of performance that can be obtained. With ABAS, operation from Enroute to Non precision approaches can be performed. The ABAS improves only integrity. Vertical guidance is only achievable by SBAS and GBAS.  
Mr. Ernest Ilangikwa (ECCAS) mentioned that the GBAS is developed in USA and wanted to know the current developments of GBAS in Europe. Ms. Anne Laure Vogel (SAFIR PIT) answered that effectively the LAAS is well developed in USAs. In Europe, some GBAS stations are set up in Germany. The future of GBAS will rather be GBAS CAT II and III. Some standardisation activities are ongoing for CAT II/III level of performance. Ms. Anne Laure Vogel further said that GBAS CAT I did not emerge in Europe because of the SBAS and conventional instrument approaches.  
Mr. Roland Kameni (ASECNA) added that ASECNA will present the implementation of GBAS in one of the ASECNA country (on the last day of the working session #6). The GBAS CAT 1 can meet the needs of some countries. This issue falls within the AFI strategy. In Africa, the density of ILS is much less than that in Europe.
- Capt. Johannes Titahena (AMSSA) asked about the meaning of accuracy in the SBAS domain. He wondered if the accuracy would be better for slow vessels in the maritime domain. Ms. Anne Laure Vogel (SAFIR PIT) replied that the maritime needs could be considered in the next version of EGNOS System. When maritime evolutions will be mature, they will be included in the EGNOS System evolutions. She added that there could be a new broadcasted message for aviation/open services and another for maritime (that will be broadcasted by the same geo satellite). She added that, this is still under discussion and the first step is consolidation of the maritime requirements.
- Capt. Johannes Titahena (AMSSA) asked about the timeframe of maritime applications in EGNOS

project. Ms. Anne Laure Vogel (SAFIR PIT) answered that the first signal could be used for some maritime applications, but not for all. Mr. Ladislaus Matindi (JPO) added that the uses of EGNOS by maritime were discussed during the GSA /ESSP workshop. IMO is developing standards to include SBAS as a navigation system.

Ms. Anne Laure Vogel (SAFIR PIT) informed the Working Session that the maritime domain, especially the port activities, will have more stringent requirements

- Mr. Mari MWANGI (KCAA) asked which alternative were available today considering that SBAS cannot reach CAT I (strictly speaking from SARPs requirements). He wondered if the stakeholders should retain ILS. Ms. Anne Laure Vogel (SAFIR PIT) answered that from the system point of view, the CAT I cannot be reached. But from the operational point of view the pilots will perform an approach with a decision height of 200 ft. For the pilot, the way to flight ILS CAT I or SBAS is the same. The operational approaches are similar.

Mr. Nasser Sant'anna (JPO) added that the target of EGNOS is LPV200. This would enable CAT I like approaches. The main advantage is that it will be possible to provide LPV to quiet all airports including those that have not currently CAT I.

Mr. Ernest Ilangikwa (ECCAS) stated that the need in Africa is to have CAT I ILS. In the case of Africa, SBAS is more beneficial as a regional system; it will provide LPV 200 approaches without ILS. This would be an advantage for Africa.

Ms. Anne Laure Vogel (SAFIR PIT) mentioned that the question was very linked to the strategy of the African stakeholders. The choice today should be based on the future expectations:

- Today for CAT I, there are mainly two options: ILS or GBAS.
- In the middle term, a third system SBAS will be available:
  - First level of performance APV-I (SBAS Approach with 250 ft. minima).
  - No Navigation infrastructures needed, only development of the SBAS Approach procedure, safety cases and flight inspection.
- In the long term (full coverage) LPV-200 is expected.
  - LPV-200 has no navigation infrastructure costs.

Mr. David Labrosse (ICAO) added that installing ILS at an aerodrome/airport will not necessarily solve all of the problems related to instrument approaches. As an airport operator, you have to think about the aircraft /customers that will use the facility provided (type of aircraft, aircraft equipage, crew training on specific instrument and non-instrument approach and departure procedures, percentage of aircraft that will use the facility, etc.) .. This should be considered during the planning phase of the aerodrome, or when upgrading air navigation facilities to cater for more efficient and safe operation.

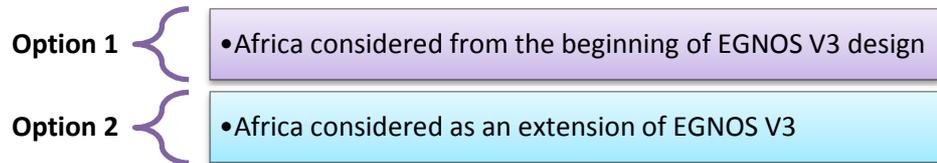
Ms. Anne Laure Vogel (SAFIR PIT) concluded that this issue was linked to User adoption. Users should be able to perform the SBAS operations and should be equipped. In Europe, at the beginning, the service was available but there were not many users.

In the second part of her presentation, Ms. Anne-Laure Vogel (SAFIR PIT) provided the **latest information on EGNOS:**

- Currently EGNOS V3 (new version of EGNOS that will cover Africa) is under definition.
- “Programmatic decision” (expected end of 2014):
  - There is no decision taken at this stage ( decision for EGNOS V3 to be extended over Africa or not)
    - ✓ Europe will not fund the Africa extension (communication network, RIMS, ...)
    - ✓ The decision has been delayed from March to December 2014.
    - ✓ It is difficult to have a consolidated funding at African Level.
    - ✓ The overall system shall not impact Europe. The African extension shall not

jeopardize the European system

- From the beginning, the focus was only option 1. But as the programmatic decision is delayed, the option 2 shall be considered.



The following questions were raised on the second part of the presentation:

- Dr. John Momoh (NASRDA) wanted to know the meaning of an African system (Autonomous system? RIMS in Africa?). Ms. Anne Laure Vogel (SAFIR PIT) answered that the target was the modular implementation whatever the decision will be. Mr. Ladislaus Matindi (JPO) added that this issue was a positive outcome of SAFIR and the JPO. It implies moving to a more realistic implementation of EGNOS in Africa.
- Mr. Fidelis C. Onyeyiri (AFCAC) reminded that the decision to extend EGNOS V3 over Africa is the basis of the SAFIR project and the working sessions. Ms. Anne Laure Vogel (SAFIR PIT) mentioned that the term extension was confusing. Extension is the extension of the system.
- Mr. Fidelis C. Onyeyiri (AFCAC) asked why the programmatic decision arrives at that this time. Mr. Nasser Sant'anna (JPO) answered that EGNOS V3 Phase B feasibility studies are undergoing and have taken into account Africa. The political decision shall be taken by Europe and by African countries. Mr. Ladislaus Matindi (JPO) clarified the confusion on the programmatic decision. He said the political decision to extend EGNOS V3 over Africa had been taken and the current question, which is related to the programmatic decision, is how EGNOS V3 can be extended to Africa.

Then, Ms. Anne Laure Vogel (SAFIR PIT) presented EGNOS V2 and V3 roadmaps:

- EGNOS V2 vs. V3
  - In Europe, today we are operating the version V2. Europe is preparing for V3
- EGNOS V2 roadmap in Europe
  - EGNOS V3 roadmap
  - There is a delay of three years from America side on GPS expended L5

The following questions were raised:

- Dr. John Momoh (NASRDA) asked about the meaning of “L5 FOC”. Ms. Anne Laure Vogel (SAFIR PIT) answered that it means the full operation capabilities: all the satellites to be L5.
- Mr. Cumbi Ayina Akilotan (SAFIR PIT) informed the Working Session that the ASECNA program has a projection to 2018. The final decision will depend on the Phase B study (to start in 2015). The study will allow identification of users, the costs, the level of service and the performance.

## 5 Africa Joint Programme Office (JPO)

### 5.1 JPO Background and Missions

Mr. Ladislaus Matindi (Director of JPO) presented:

- EGNOS Africa Joint Programme Office (JPO);
- SAFIR and TREGA Projects;
- The main objectives (missions) of JPO; and
- The JPO organization Chart and Functions.

The following questions were raised:

- Mr. Fidelis C. Onyeyiri (AFCAC) asked for more information on Capacity Building. Mr. Ladislaus Matindi (JPO) answered that Capacity building encompasses participation of JPO experts in conducting courses prepared by aviation schools to share their experience. The roadmap will describe other capacity building related activities.
- Mr. Fidelis C. Onyeyiri (AFCAC) asked what the sister applications were. Mr. Ladislaus Matindi (JPO) mentioned that sister applications are the same as other applications or sometimes are referred to as non-aviation applications.
- Mr. Mari Mwangi (KCAA) asked if JPO could provide some figures/estimations on funding (for JPO, for the different scenarios). Mr. Ladislaus Matindi (JPO) replied that the roadmap would provide the figures for JPO and the last day of the working session would provide rough estimations of EGNOS implementation.
- Mr. Cumbi Ayina Akilotan (SAFIR PIT) mentioned that ASECNA and its consortium replied to and won the international invitation to tender for the SAFIR project.
- Mr. Eric NTAGENGERWA (EAC) asked if there is any plan as a kind of basic plan for the users to move from their current situation (basic instrument landing system) to SBAS system and what the cost benefits are. He also asked if a survey analysis of the current landing system in Africa was conducted by the JPO. Mr. Nasser Sant'anna (JPO) answered that a survey is currently being undertaken by JPO and AFCAC (not completed yet). Mr. Ladislaus Matindi (JPO) added that these issues are under assessment by JPO.
- Mr. Fidelis C. Onyeyiri (AFCAC) wanted to know how JPO will work with the civil aviation authorities and how in the future JPO will work with the African countries. Mr. Ladislaus Matindi (JPO) replied that JPO will work with the CAAs through the REX, uplink, regional meetings and contacts with ANSPs. With the assistance of AFCAC and AUC, JPO will contact the African countries.  
Mr. Adiron Alberto (AUC) stated that AUC is concerned by how it could help JPO after the end of SAFIR. In the Steering Committee, the need for promoting the SAFIR project and the JPO had been discussed. A specific framework shall be put in place with AFCAC and AUC. EASA is developing a project on Aviation Safety in Africa. As JPO is also working on Safety matters, JPO should participate in those projects. There is a TREGA platform which is still in Europe. This

platform will be handed over by JPO. This platform provides good results (ionosphere conditions, scintillations). Nevertheless, the data was provided by European stakeholders. The issues for African data for the platform shall be investigated.

Mr. David Labrosse (ICAO) mentioned that ICAO fully supports the use of satellite technology by AFI States, as part of the GNSS implementation strategy for the Region. The implementation of Augmentation system will no doubt enhance the approaches to international airports and domestic aerodromes, resulting in enhanced safety, capacity and efficiency of air navigation. All involved parties have to work closely with users, primarily IATA and manufacturing industries.

## 5.2 JPO Work Programme 2014+

Mr. Semou Diouf (JPO) presented the JPO mission and functions and the JPO Work Programme 2014 + (overview, Operational Objectives, Actions, milestones).

The following questions were raised:

- Mr. Fidelis C. Onyeyiri (AFCAC) asked how much it costs for ASECNA to put in place the logistics requirements of the JPO. Mr. Cumbi Ayina Akilotan (SAFIR PIT) answered that when ASECNA responded to the invitation to tenders for the SAFIR project, ASECNA included a volunteer contribution and a financial contribution up to 500 000 euros in two years (there is a clear statement). When the limits fixed in the contract will be reached, these conditions would be negotiated again.
- Mr. Ernest Ilangikwa (ECCAS) asked what will be the relationship between JPO and TREGA at the end of the SAFIR project in 2015 (in the framework of reinforcement of knowledge). Mr. Olivier Turcas (SAFIR PIT) answered that discussions between SAFIR PIT, TREGA and JPO are on-going. A meeting had taken place with TREGA (JPO/TREGA/SAFIR PIT). This meeting had the following objectives:
  - To take note of the work conducted by the two African experts in TREGA
  - To get all information about the ending of TREGA and to prepare the arrivals of the two African experts and the TREGA platform in Dakar (September 2015)
  - To prepare the future: the future work of the African experts and the training plan of JPO.

Mr. Olivier Turcas (SAFIR PIT) stated that a white paper presenting the proposals of TREGA/JPO works is under development.

- Mr. Ernest Ilangikwa (ECCAS) added that the reinforcement of the communication on JPO is an important aspect. This will contribute to issues related to the funding of JPO. The concern of the African states on the maintenance and the funding of current navigation systems is a very crucial question. The delay in EGNOS planning will certainly impact the African states decisions. Therefore the communication of these types of information toward African States/CAAs/Stakeholders is essential in order to allow them to take the right decisions at the right time.

He further said that the Steering Committee asked the EC and ACP to consider setting the JPO funding which should be done during the preparation of the 11th European Development Fund.

- Mr. Gerson FUMBUKA (Lake Victoria Basin Com.) asked about the JPO plans to ensure that non-aviation applications are taken into consideration in the project. Mr. Semou Diouf (JPO) answered that JPO is trying to get all the needs for Maritime. Mr. Olivier Turcas (SAFIR PIT) added that the working session #5 had addressed the needs for non-aviation applications in the MRD.

### 5.3 Prospective view of the JPO

Dr. Aicha ALOU OUMAROU (JPO) presented the prospective view of the JPO. She addressed the following key topics:

- Foundation of JPO legal and institutional framework and the JPO Current status ;
- The Main Requirements to establish the JPO;
- JPO Legal status timeframe and the issues under investigation.

The following questions were raised during the presentation:

- Dr. John Momoh (NASRDA) asked about the legal status of JPO. Mr. Cumbi Ayina Akilotan (SAFIR PIT) answered that the JPO has no proper juridical status yet. The JPO exist and is covered by the contract signed by the consortium led by ASECNA and the European Commission. In this contractual framework, the JPO experts had been recruited. It is required urgently to think about the future of JPO after the SAFIR project. Mr. Ladislaus Matindi (JPO) added that the SAFIR mandate was to create JPO and define its legal status.
- Mr. Mari Mwangi (KCAA) wondered if there is an intention to provide services to other domains. Mr. Ladislaus Matindi (JPO) answered that other domains are fully covered by a dedicated expert (sister/brother applications expert).
- Dr. Momar Gueye (UEMOA) asked what should be done in the future in order to operate EGNOS in Africa when it will be implemented, and if there is any need to have a specific institution to operate the system? The project should clearly indicate what is needed to implement and what had been defined by the JPO. SAFIR should take into account the following key points:
- Safety of Aviation in African airspace
  - Sovereignty of the African States
  - Financial aspects (expenses).

Mr. Olivier Turcas (SAFIT PIT) answered that at the end of the SAFIR Project, the roadmap and the action plan will try to answer to all the issues raised. The SAFIR project falls within a Europe/Africa partnership. There was a political decision taken by AUC and EUC to work on EGNOS. There is a need to go further at the technical and financial level.

## 5.4 EGNOS Services implementation Roadmap

Mr. Nasser Sant'Anna presented the objectives, structure and the high level objectives of the roadmap and a progress status.

The following questions were raised:

- Mr. Amos Marawa (COMESA) advised that the high level objectives should be reformulated in the positive way. He also observed a need for a common agreement on the format of objectives/activities/actions (common framework).
- Mr. Fidelis C. Onyeyiri (AFCAC) requested JPO to review the specific objectives as they look like actions. Mr. Gerson FUMBUKA (Lake Victoria Basin Com.) added that attention should be paid on objectives/main objectives/Activities. Mr. Ladislaus Matindi and Mr. Nasser Sant'anna (JPO) assured the participants that all the comments will be taken into account.
- Mr. Eric Ntagengerwa (EAC) asked how EGNOS System performance can be demonstrated (Objective #2). Mr. Ernest Ilangikwa (ECCAS) mentioned the objectives are in fact actions. The objective is the System Development.  
Ms. Anne Laure VOGEL (SAFIR PIT) mentioned that all the objectives are not mandatory. She suggested having different levels of objectives. Some activities are optional.  
Mr. Roland Kameni (ASECNA) supported Anne Laure's proposal. He added that test bed and cost/benefits analysis should be include as actions. Dr. Aicha ALOU OUMAROU (JPO) answered that costs and benefits aspects will be addressed under the economic study topic in the Roadmap.
- Dr. John Momoh (NASRDA) wondered if the objectives were guidelines or process. Mr. Nasser (JPO) answered that these are guidelines.
- Mr. Cumbi Ayina Akilotan (SAFIR PIT) advised that it would have been interesting to include the airlines in the SAFIR Workshop regarding the users segments. Mr. Nasser (JPO) answered that the JPO is currently conducting analysis and collection of African airport's needs.
- Ms. Anne Laure Vogel (SAFIR PIT) proposed to rephrase Objective n°4: Motivate adoption by operators (replace operators by users).

## 6 EGNOS V3 Governance/Certification/Liability

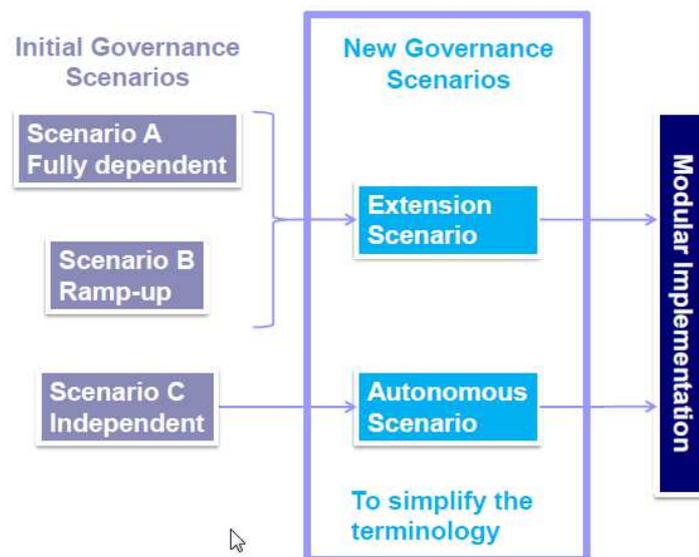
### 6.1 Reminder of the previous Working Session Achievements

Ms. Anne Laure Vogel (SAFIR PIT) presented a reminder of the previous Working sessions results (WS 1, 2, 3, 4 and 5).

- Dr. John Momoh (NASRDA) wondered if Africa is going to have services for GPS L1 –L5 before GPS + GALILEO. Ms. Anne Laure Vogel (SAFIR PIT) answered that for Africa GPS L1-L5, and GPS+GALILEO are targeted.
- Mr. Roland Kameni (ASECNA) asked why the different levels of service and performances were limited to CAT-I only. Ms. Anne Laure Vogel (SAFIR PIT) answered that the EGNOS technology (regional system) does not allow currently CAT –II approaches.

### 6.2 EGNOS V3 Governance Schemes

Mr. Ladislaus Matindi (JPO) presented the EGNOS V3 Governance scenarios/option. The scenarios had been simplified from 3 to 2 scenarios: Extension Scenario and Autonomous scenario.



The following questions were raised:

- Capt. Johannes Titahena (AMSSA) asked if EGNOS V3 extension over Africa could also degrade Africa service. Dr. John Momoh (NASRDA) said that on European side degradation could appear but from the African side as the service is new it is not applicable, we cannot talk of degradation.
- Mr. Amos Marawa (COMESA) mentioned that it would be better to include Africa extension in from the beginning as it would be costlier if it is done after. Ms. Anne Laure Vogel and Mr. Olivier Turcas (SAFIR PIT) answered that due to technical and financial issues, there is a risk. Mr. Cumbi Ayina Akilotan (SAFIR PIT) added that Africa has not been considered in the EGNOS V3. Africa has not shown clearly its intention and to request Europe to take Africa into

consideration in EGNOS V3.

Mr. Roland Kameni (ASECNA) mentioned that there is huge risk. At the level of decision makers, no strong actions had been conducted by Africa.

Mr. Fidelis C. Onyeyiri (AFCAC) stated that as a risk is identified, mitigations efforts shall be defined. Funding is an essential aspect to be considered.

Mr. Amos Marawa (COMESA) pointed out that there is a need of political decisions. But the role of these workshops is to raise those issues and to identify the risks for the decision makers. Mr. Adegorite Olumuyiwa (NAMA) concluded saying that the impact of that risk shall be deeply investigated. All possibilities should be envisaged in order to have inputs to make the right decisions.

- Dr. John Momoh (NASRDA) asked what "copy/paste" means. Ms. Anne Laure (SAFIR PIT) answered that the architecture is opened. The core system is in Africa.
- Dr. John Momoh (NASRDA) questioned the assumption that cost will be higher in option 2. Ms. Anne Laure Vogel (SAFIR PIT) answered that the cost will be higher if the extension is done in a second step. The cost of extension could be supported by Africa.

#### **Details on the governance Scenarios**

- Ms. Anne Laure Vogel (SAFIR PIT) mentioned the cases of RIMS that are part of the European reinforcement installed in Africa. Mr. Cumbi Ayina Akilotan (SAFIR PIT) said that ASECNA manage the maintenance of one « European » RIMS installed in Nouakchott. An African expertise exists.
- Dr. John Momoh (NASRDA) asked if the RIMS are owned by Europe. Ms. Anne Laure (SAFIR PIT) answered that depending on the purpose of the RIMS (for African or European performance); the RIMS will be owned by Europe or Africa.
- Dr. John Momoh (NASRDA) asked if one RIMS contributes to the performance of the SiS, why some RIMS should be owned by Europe or Africa. Dr. John Momoh suggested correcting the presentation: If the signal in space is one, there is no need to have a distinction between EU and Africa assets.
- Dr. John Momoh (NASRDA) asked who will decide and choose one of the scenarios presented by JPO/SAFIR. JPO/SAFIR answered that the scenarios provide an exhaustive view. Then the module will decide or not to apply one of the scenario. There are several options to get EGNOS at the end.
- Capt. Johannes Titahena (AMSSA) asked on which data are used for the performance assessment. JPO answered that the first step is to have a clear understanding of the environment, and then in a second step simulations are conducted to assess the performance.
- Mr. Mari Mwangi (KCAA) asked about the differences between EGNOS V2 and V3. Ms. Anne Laure (SAFIR PIT) answered that the availability of the system V2 is degraded in Africa (due to technical aspects - ionosphere). The difference between EGNOS V2 and V3 is a matter of

availability. EGNOS V3 will solve most of the problems of V2.

- Mr. Mari Mwangi (KCAA) said that if EGNOS V2 will be implemented in Africa, there will be a need for extra investment to implement EGNOS V3. Ms. Anne Laure (SAFIR PIT) responded that implementing V2 allows having signal usable for applications. This can be an opportunity to acquire experience. The final goal remains to move towards V3. But the initial investment is not lost. Some equipment could be V3 compatible.
- Mr. Cumbi Ayina Akilotan (SAFIR PIT) mentioned that the decision to start with V2 before V3 is more linked to the strategic objectives of the African stakeholder (or module). Implementing V2 over an African module, the performance will be limited (navigation) but it will allow gaining some experience on EGNOS. But it might bring constraints and additional costs. This option will allow having operational gain for the airports that have no instrument landing system.
- Mr. Atoumane Fall (AFCAC) asked who will be the owners of the equipment in Africa. He advised to clearly identify owners. Mr. Olivier Turcas (SAFIR PIT) answered that the owners will depend on the African module.
- Mr. Roland Kameni (ASECNA) suggested that the JPO proposed the types of the modules.

### 6.3 Certification Schemes

Presentation on the certification scheme was made by Mr. Moustapha Boukary (JPO). The following questions were raised:

- Mr. Fidelis C. Onyeyiri (AFCAC) mentioned that there is no ICAO Requirement for certification and advised not to be limited the certification scheme to Annex 19.
- Mr. Roland Kameni (ASECNA) asked whether the ANSPs or the Signal should be certified. Mr. Moustapha Boukary (JPO) answered that only the Signal was certified.
- Mr. Roland Kameni (ASECNA) wanted to know in which module the Certification process will be clarified (mainly for Aviation). Mr. Moustapha Boukary (JPO) answered that the reason that brings Europe to certify ESSP is the provision of Safety of life service. Ms. Anne Laure Vogel (SAFIR PIT) added that the certification was needed because of Safety of Life. At the African Level, for a module the regulations in the countries of the module shall be analyzed:
  - If one country requires certification , certification is needed
  - If no country requires certification of Safety of Life, there is no need for certification.
- Mr. Atoumane Fall (AFCAC) mentioned that one country can make the certification on behalf of all the countries of a module.  
Mr. Cumbi Ayina Akilotan (SAFIR PIT) gave the example of ASECNA. All the ASECNA member states are the owners of the system. ASECNA is involved in the SMS. There is a concrete case of the certification of the EAMAC (ASECNA training school): EAMAC was certified by Niger which was mandated by all the member states of ASECNA.
- Mr. Atoumane Fall asked on the link between the structure in charge of the supervision of safety

and the AAMAC is. Mr. Fidelis C. Onyeyiri (AFCAC) answered that there are different entities: AAMAC, COSCAPs, UEMOA and CEMAC. ICAO solves this issue with the African Plan. AAMAC is in charge of the regulation of air navigation.

➤ The roles of these entities shall not be redundant.

Moustapha Boukary (JPO) added that there are agreements between the AAMAC and the CEMAC and UEMOA COSCAPs):

- The AAMAC are in charge of technical tasks related to the certification supervise the ANSPs on behalf of the States, and supervise the CAAs. The certificate is delivered by a CAA. The COSCAPs /UEMOA/CEMAC are in charge of the airworthiness and the aerodromes.

## 7 Liability

### 7.1 Working session #2B Liability outcomes

Ms. Anne Laure Vogel (SAFIR PIT) presented a brief reminder of the outcomes of working session n°2 in December 2012. The presentation focused on the Liability issues and one governance scenario. The idea was to have the background for discussion during the brainstorming.

She mentioned that EWA (EGNOS Working Agreement) are required in Europe because of the single sky regulations. In Africa this has to be discussed (no single sky regulations).

In case of certification oversight, in Europe there is a need to conduct this activity with EASA. The proposed liability scheme developed during WS2 shall now be updated with the updated information (e.g. the decision to have a modular implementation).

The following questions were raised:

- Mr. Eric Ntagengerwa (EAC) asked about the modalities for the implementation of EWA. Ms. Anne Laure Vogel (SAFIR PIT) mentioned that EWA is required in Europe because of SES regulation and it is not applicable to Africa. The liability between ESSP and the African ANSP needs to be defined. It is not an obligation written in the regulation at African regulation.
- Mr. Roland Kameni (ASECNA) asked for more details about the liability link between the Africa Design Agent and ESA. Ms. Anne Laure Vogel (SAFIR PIT) answered that Africa is covered in the design of the system. In order to ensure that the performances are compliant with the African expectations, there is a need to have African Design Agent to discuss with ESA. Who is responsible of the Design requested by Africa? This link has to exist, but at this stage which type of liability link is not known.

Mr. Roland Kameni (ASECNA) added that for the ASECNA sub module, ESA will be designated as Design Agent for ASECNA. He wondered how it will work for the pan African vision. Dr. Aicha ALOU OUMAROU (JPO) answered that there will be relationship between different modules with different solutions and the relationship should differ depending on the solution and the nature of the entities involved. Mr. Olivier Turcas (SAFIR PIT) added the liability schemes will be different for each module. A same entity can have several roles.

- Mr. Gerson Fumbuka (LVBC) asked who in Africa will request a link with Europe. Ms. Anne Laure answered that a global coverage in Africa needs to have a link with Europe. In a modular scope, there is a need to have several links. The link will be an initiative of African stakeholder willing to implement/deploy EGNOS in a module (link between an African stakeholder and the European Commission).

Mr. Olivier Turcas reminded the definition of the module (agreed during the last WS 5). The definition shall be updated with regard to the autonomous scenario (A module is a subsystem of the core EGNOS V3 system). The plan is to have a unique definition of the module approved by the steering committee. A first draft of the definition will be discussed in the next steering committee.

## 7.2 Liability Schemes for a module

Dr. Aicha ALOU OUMAROU (JPO) presented potential issues that can arise in the liability scheme of the module. She pointed out that liability and governance scenarios are closely linked.

The following questions were raised:

- Capt. John Titahena (AMSSA) asked where the claims should be raised. He wondered if it was mentioned in the contracts and agreements between the different parties involved in the EGNOS implementation. Aicha ALOU OUMAROU (JPO) answered that there are two aspects to consider. There is no international convention solving jurisdiction issues for third party liability on GNSS however there are some principle of international law to refer to or some specific conventions. But as contractual liability is considered, the issue of litigation is addressed in the contract and parties can agree on the law to refer to in case of conflict. Dr. Aicha ALOU OUMAROU (JPO) answered that Mr. Ernest Ilangikwa (ECCAS) asked what the responsibilities are in case of multi satellite constellation. Dr. Aicha ALOU OUMAROU (JPO) answered that the contracts will set obligations and boundaries in the liabilities. Ms. Anne Laure Vogel (SAFIR PIT) added that there are many differences between the satellite systems. The integrity is ensured by the augmentation. Even if there is a failure of the GPS/GALILEO constellations, the augmentation system remains responsible to the users. She pointed that it was a very difficult question. If a “user “uses GPS only, integrity is not ensured. The augmentation systems provide integrity. The augmentation systems are designed taking into account certain mode of failures. If GPS is not in line with the specifications, augmentation system is no more responsible.
- Dr. John Momoh (NASRDA) asked who would be responsible in case of intentional jamming of the signal. Mr. Ladislaus Matindi (JPO) answered that this issue will be covered by risk management. The owner has the final responsibility over the system. Mr. Fidelis C. Onyeyiri (AFCAC) added that in liability, the contract always include the risks of sabotage including jamming. Mr. Nasser Sant’anna (JPO) mentioned that the jamming is taken into account in the design of the future version of EGNOS.
- Dr. John Momoh (NASDRA) asked why the African System Design agent undertakes the role of procurement agent. Mr. Olivier Turcas answered that it can be the role of the Africa

System Design.

Mr. Amos Marawa (COMESA) mentioned that the owner of the system remains responsible for the system. The owner could be assisted by the African System Design Agent. The African system Design Agent works on behalf of the Owner of the system.

- Dr. John Momoh (NASDRA) asked who install the system when it is designed. Mr. Moustapha Boukary (JPO) answered that after the design and the procurement, the industries will install the system (the subcontractors).  
Mr. Adegorite Olumuyiwa (NAMA) mentioned that the owners of the project will commission the design agent. The owner of the projects would organize rules of the procurements. The owner will appoint a consult to follow the whole process.  
Mr. Ladislaus Matindi (JPO) concluded saying that there are delegation agreement to design, to procure and to install. But all goes to the infrastructure Owner.
- Mr. Gerson Fumbuka (LVBC) asked whether there are plans for JPO to assist actors in defining the liability schemes. Dr. Aicha ALOU OUMAROU (JPO) answered that this will be the assignment of JPO. JPO will analyze case by case.  
Mr. Fidelis C. Onyeyiri (AFCAC) mentioned that there are so many protocols t. The JPO could assist stakeholders in this mission.

### 7.3 Brainstorming on Liability in a module

Ms. Anne Laure Vogel (SAFIR PIT) presented open questions to be addressed to implement EGNOS in a module. Ms. Anne Laure also provided a proposed check list. This list will be refined for each module when potential modules will be defined. Some of the questions may not be applicable

- Dr. John Momoh (NASRDA) wondered what “Assurance that the system is Safe” means. Ms. Anne Laure answered that this is covered by the Safety analysis made by the industrials. Mr. Moustapha Boukary (JPO) added that at this stage, the ANSP shall verify the assurance that the system is safe before it is put in service.

Ms. Anne Laure Vogel (SAFIR PIT) mentioned that to have seamless operations within Africa, there is a need to have overlap between the service areas.

- Mr. Olivier Turcas (SAFIR PIT) asked if there are SBAS that overlaps at this time. Ms. Anne Laure Vogel answered that it was such problem at the beginning even before overlapping. So this has been implemented in the SBAS to deal with this issue.

Mr. Nasser Sant'anna (JPO) added that there is a concern on the problem of liability (not addressed currently) when a service provider is broadcasting a signal beyond the airspace under his responsibility. This situation is the case in the north part of Africa where SBAS receivers might use the EGNOS navigation message due to its availability from En-route to the Terminal. It's also the case with MSAS whose signal is received in Australia airspace and which brought some issues few months ago following a problem on MSAS PRN. The situation is going to increase in the near future since multiple new SBAS systems will be in operation in the world. Africa is very concerned by this issue, especially in the context of implementation of different SBAS modules.

Various solutions are under discussions:

- A manual selection of the SBAS by the pilot,
- Addition of the constellation and the SABS system to use on the waypoints in the route coding (database) as is the case for Approach.

There is an important Institutional aspect to investigate, especially in this context of many new SBAS systems in development. This issue had been submitted to ICAO Navigation Systems panel (NSP).

- Mr. Ernest Ilangikwa (ECCAS) asked if ASECNA had already thought about the liability schemes. The objective is to learn from the ASECNA experience. Mr. Roland Kameni (ASECNA) answered that discussions are ongoing within ASECNA.
- Mr. David Labrosse (ICAO) mentioned that ICAO wishes implementation is made in a harmonized manner. This will alleviate the need for receivers to have multiple codes if implementation is done by different groups of States or ANSPs and that a common scheme for all the modules involving all the stakeholders would be better. The implementation strategy should always take into consideration user requirements and equipage. Mr. Cumbi Ayina Akilotan (SAFIR PIT) added that ASECNA ensures that the technical solutions will converge with pan African vision.
- Mr. Richard Ruhesi (UCAA) asked if there is a need to conduct business case in addition to the safety case before the EGNOS implementation. Ms. Anne Laure answered that business case is very important. This issue shall be address at the module level. There are critical aspects to be address: Why implement EGNOS? How much will it cost? What are the benefits? Are the users equipped?

## 8 Potential New Modules in Africa

### 8.1 Status of GNSS RNAV implementation in terminal areas of AFI States (David Labrosse)

Mr. David Labrosse (ICAO) provided an updated of Status of GNSS RNAV implementation in terminal areas of AFI States:

- the medium term implementation targets (2013-2016)
- what are the expected achievement in each region and what has been done so far in term of implementation
- updated information (RNAV GSSS approaches, SIDs and STARs) on what is available /implemented at each international aerodrome in each AFI State. (ESAF and WACAF).

ICAO urged other States to increase their efforts to implement GNSS RNAV (mainly for international aerodromes). States have to ensure that all the pre-requisites are in place (regulations, WGS-84 survey, etc.) before finalizing the procedure design which should be then flight checked, validated and published in their respective AIPs.

- Ms. Anne Laure Vogel (SAFIR) asked if ICAO will update the targets based on the data collection with the information available now. Mr. David Labrosse answered that the slides will be continuously updated with information received on implementation progress. .
- Mr. Ernest Ilangikwa (ECCAS) mentioned that before designing GNSS procedures, the first step is to perform WGS84 data collection/measurements. This procedure is really expensive. Mr. Ernest Ilangikwa (ECCAS) asked how ICAO could help those countries which have not enough funding. Mr. David Labrosse (ICAO) answered that ICAO is committed to working with States and donor organizations to support implementation of its Strategic Objectives at Regional and global level and that it will consider areas where it can assist (donor, sharing of regional expertise, etc.). There is also a possibility for those countries with capacity to assist their neighbors.
- Mr. Moustapha Boukary (JPO) added that the implementation of GNSS RNAV procedures in Niamey, provided benefits on the runway occupancy and runway capacity (difference of 5 to 7minutes of flight by aircraft).
- Mr. Atoumane Fall (AFCAC) asked if the states provide some reports on the use of the GNSS RNAV procedures to ICAO. Mr. David Labrosse (ICAO) answered that this kind of information has not been collected yet, but is not difficult to obtain, as ATC is fully aware of which operator uses GNSS RNAV approaches at any airport. Statistics can be easily compiled (weekly. Monthly, etc.)
- Mr. Nasser Sant'anna (JPO) wondered if ICAO has noticed the difficulties encountered by the some states while developing and implementing GNSS RNAV procedures. Mr. David Labrosse (ICAO) answered that in order to reduce such and impact, the African Flight Information Programme (AFPP) has been created to assist all AFI States lacking the capacity to develop and produce their own procedures. The AFPP Office is based in Dakar, Senegal. Mr. Ernest Ilangikwa (ECCAS) added that the GNSS procedures will bring benefits to African states. Mr. David Labrosse (ICAO) stated that the cost of using satellite technology should be considered favorably (minimum maintenance cost) against buying conventional navigational aids to facilitate instrument and non-instrument approaches at airports.

## 8.2 Potential module in ASECNA (Roland Kameni)

Mr. Roland Kameni (ASECNA) presented the ASECNA sub module, GNSS R&D projects in which ASECNA is involved, and GBAS experimentation. An ASECNA initiative fits into the scope of pan African SBAS implementation.

Mr. Roland Kameni (ASECNA) mentioned that the AAMAC will play a technical role. The certification will be issued by a state (state may be mandated by other countries).

- Mr. Ernest Ilangikwa (EAC) said that the AAMAC are the agencies overseeing the safety of air navigation.
- Dr. Aicha Alou Oumarou (JPO) asked which entity will manage the continuous safety cases. Mr. Moustapha Boukary (JPO) answered that the AAMAC can oversee the civil aviation authority and the ANSPs also (by delegation).
- Mr. Amos Marawa (COMESA) asked about the relations between AAMAC and CAA
  - Who has the responsibility of Safety oversight?
    - It is CAA and AAMAC is a service provider
  - It will be the same for EGNOS in the ASECNA Sub module.
    - Which CAA is responsible to certify what in the regional module?
    - Who is certifying on behalf of whom?

Mr. Roland Kameni (ASECNA) answered that the AAMAC are not competent for certification. AAMAC will strengthen their expertise to help the certification to be made by the states.

- Mr. Amos Marawa (COMESA) wondered if there is a direct link between SAFIR and the ASECNA initiatives. SAFIR can benefit from the ASECNA sub module: this can be a practical exercise. It should have a direct link between SAFIR and the ASECNA.

Mr. Roland Kameni (ASECNA) answered that the role of SAFIR and JPO should be highlighted in the ASECNA initiative. ASECNA's initiative is in line with the SBAS over all Africa. The development scheme of the ASECNA sub module fits into the logic of JPO. ASECNA will use the technical assistance of the JPO in the development of the sub module. JPO will ensure the interoperability of all the modules.

- Mr. Atoumane Fall (AFCAC): asked why ASECNA has opted for an Autonomous scenario rather than the extension scenario. What has guided this choice?  
Mr. Roland Kameni (ASECNA) answered that ASECNA had first chosen an extension scenario, and then ASECNA switched to an independent approach. The reasons were the risk of the EGNOS V3 planning, and the fact that ASECNA wants to provide a SiS.  
Ms. Anne Laure Vogel (SAFIR PIT) mentioned that there are many factors that will help to choose between the two scenarios. Mr. Nasser Sant'Anna (JPO) added that the EGNOS V2 technology has a limitation. The extension was not possible.
- Dr. John Momoh (NASDRA) asked what the ASECNA choice implies to international agreement. Mr. Roland Kameni (ASECNA) answered that there is a current agreement with the European Union. With ESA, there is an agreement under study.

- Dr. John Momoh (NASDRA) wondered if ASECNA is implementing EGNOS V2 and why ASECNA is moving to EGNOS V3. Mr. Nasser Sant'anna (JPO) answered that the extension is not possible with EGNOS V2.

### 8.3 EAC CNS/ATM Study and its relationship to EGNOS

Mr. Eric Ntagengerwa (EAC) and Mr. Ronny Barongo (UCCA) presented the proposed ANS Navigation Architecture for the EAC UFIR follow on study and its relationship with EGNOS.

Mr. Nasser Sant'anna (JPO) asked if the study only focused on the upper airspace (not on the approaches of the states). Mr. Ronny Barongo (UCAA) replied that the main objective is the upper airspace. But safety issues on the lower airspace are also assessed.

Mr. Eric Ntagengerwa (EAC) wondered if ASECNA would like to share the information of CAPEX and OPEX of ASECNA sub module with EAC.

Mr. Richard Ruhesi (UCAA) mentioned that at the moment, East Africa needs to take on more advanced EGNOS activities with JPO and SAFIR PiT. SAFIR and JPO responded that they are ready to support EAC and Uganda.

### 8.4 Key issues for new modules

Ms. Anne Laure Vogel (SAFIR PIT) presented the key issues for new modules: Decision-making elements for module (benefits, cost, Timeframe, user readiness, Scenario selection (extension or autonomous)).

She also provided rough estimates of European costs for EGNOS V2 experience.

- The network is the main cost of the system. So audit of the existing infrastructures can help to decide on reuse.
  - OPEX: Europe uses a subcontractor for the geo satellites (linked to liability issues).
- Mr. Richard Ruhesi (UCAA) asked why the “copy/paste” term was used in the presentation. “Adapt” seems to be a better word. Ms. Anne Laure Vogel (SAFIR PIT) replied that “copy/paste” of EGNOS V3 in Africa is the term used by the industry.
  - Dr. John Momoh (NASDRA) wondered why they are additional 26 RIMS for EGNOS V3. He also wondered why 3 geo satellites were needed. He stated that 2 geo satellites are needed for operations. Ms. Anne Laure Vogel (SAFIR PIT) replied that Phase B studies are conducted. These studies are confidential.
  - Mr. Roland Kameni (ASECNA) mentioned that there are annual taxes to be paid in the scope of OPEX. Ms. Anne Laure Vogel answered that she will investigate this point.
  - Mr. Nasser Sant'anna (JPO) asked if the ~15 million are only for the major evolution. Ms. Anne Laure Vogel (SAFIR PIT) answered that it is an average of minor and major operations.
  - Dr. John Momoh (NASDRA) asked why evolution of processing centers from V2 and V3 are

foreseen. Ms. Anne Laure answered that there are ongoing studies to develop V3 RIMS compatible to V2.

- Dr. John Momoh (NASDRA) wondered what would be the additional evolutions/costs if Africa need to integrate GLONASS in EGNOS. Anne Laure answered that at this stage EGNOS V3 will concern only GPS+GALILEO. There are a lot of political discussions on the use of GPS/GALILEO, and GLONASS. If you need to use a new constellation in the EGNOS design, you need to have new receivers, standardization. Mr. Nasser Sant'anna (JPO) mentioned that for airborne receivers, there are ensuring that the airborne receivers for all types of constellation.
- Mr. Mari Mwangi (KCAA) wondered why 43 RIMS are needed in Europe and only 15 RIMS are indicated in the price given. Ms. Anne Laure Vogel (SAFIR PIT) answered that with 15 RIMS CAT I operations area possible within a more limited area. Mr. Nasser: there are 40 RIMS in Europe because of Legacy service. Anne Laure also added that with EGNOS V3, fewer RIMS are needed than in V2.
- Mr. Roland Kameni (ASECNA) wondered if the extension from an African module to another African region should also be assessed by SAFIR and JPO. Anne-Laure and Olivier (SAFIR PIT) answered that this case is included in the sub scenario of the autonomous scenario.
- Mr. Roland Kameni (ASECNA) asked if mitigation to intentional jamming shall be included in the CAPEX. Mr. Nasser Sant'anna (JPO) replied that this mitigation will not be operational in the first versions of EGNOS V3.

## 9 Closure working session

The closing ceremony was chaired by Mr. Reuben LUBANGA ANS Director (KCAA), Mr. Olivier TURCAS as SAFIR Team Leader, Mr. Cumbi Ayina Akilotan (ASECNA & SAFIR PIT) and Mr. Ladislaus Matindi (JPO manager).

Mr. Olivier Turcas thanked Kenya CAA for hosting the working session and for the great hospitality provided to all delegates during their stay in Kenya. Olivier Turcas also thanked all those who had contributed to the success of this sixth Working Session (ICAO, Secretaries, protocol, interpreters, the members of staff of the hotel, etc.) and congratulation to the participants, in particular, the members of the PIT, the Shorts Term Experts (ESSP, Pildo Labs, Egis Avia), and the participants, for their interest and fruitful contribution for the project capacity building for the implementation of the EGNOS in Africa.

The next working session will be held early 2015. The topics to be addressed will be discussed with JPO, EC, and ESSP. Terms of reference for next working session will be sent to the steering committee.

Mr. Reuben LUBANGA (ANS Director –KCAA) thanked all the participants and mentioned that the discussions were very interesting and will help to ensure Africa interest.

All the participants were very satisfied of the outcomes of this working session. It gives an overview of the issues to be addressed.

## ANNEX 1: EFFECTIVE PARTICIPANTS LIST

### SAFIR - Working Session n°6 - Nairobi - 27/28/29/30 October 2014

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## SAFIR - Working Session n°6 - Nairobi - 27/28/29/30 October 2014

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## ANNEX 2: AGENDA (distributed)



### SAFIR Working Session #6 on JPO Missions – EGNOS V3 implementation Nairobi – 27 - 30 October 2014 - AGENDA

**DAY 1: 27 October 2014 – 8:30 / 17:00**  
**Working Session #6 on EGNOS – Africa Joint Programme Office (JPO)**

<b>8:30 – 9:00</b>	<b>Participants registration</b>
<b>9:00 – 9:30</b>	<b>Opening session - Welcome of the participants</b>
<b>9:30 – 9:45</b>	<b>Introduction &amp; Objectives of the WS on missions</b>
<b>9:45 – 10:30</b>	<b>EGNOS Last information</b>
<b>10:30 – 10:45</b>	<b>Break</b>
<b>10:45 – 11:30</b>	<b>JPO background and missions</b>
<b>11:30 – 12:15</b>	<b>JPO work programme</b>
<b>12:15 – 14:00</b>	<b>Lunch</b>
<b>14:00 – 14:45</b>	<b>Prospective view of the future JPO</b>
<b>14:45 – 15:30</b>	<b>Development of EGNOS services implementation roadmap</b>
<b>15:30 – 15:45</b>	<b>Break</b>
<b>15:45 – 16:30</b>	<b>Development of EGNOS services implementation roadmap</b>
<b>16:30 – 17:00</b>	<b>Open discussion: Development of EGNOS services implementation roadmap</b>



**DAY 2: 28 October 2014 – 9:00 / 17:00**

**Working Session #6 on EGNOS V3 Governance/Certification/Liability**

<b>9:00 – 9:45</b>	<b>Reminder on Working Sessions achievements</b>
<b>9:45 – 10:45</b>	<b>Presentation of Governance Schemes</b>
<b>10:30 – 10:45</b>	<b><i>Break</i></b>
<b>10:45 – 12:15</b>	<b>Brainstorming on Governance Schemes</b>
<b>12:15 – 14:00</b>	<b><i>Lunch</i></b>
<b>14:00 – 15:15</b>	<b>Presentation of Certification Schemes (from WS5)</b>
<b>15:15 – 15:30</b>	<b><i>Break</i></b>
<b>15:30 – 16:30</b>	<b>Brainstorming on Certification Schemes</b>
<b>16:30 – 17:00</b>	<b>Outcomes of Governance &amp; Certification Schemes</b>



**DAY 3: 29 October 2014 – 9:00 / 17:00**

**Working Session #6 on EGNOS V3 Governance/Certification/Liability**

<b>9:00 – 9:45</b>	<b>Reminder on Liability Scheme (from WS2)</b>
<b>9:45 – 10:45</b>	<b>Presentation of Liability Schemes for a module</b>
<b>10:30 – 10:45</b>	<b><i>Break</i></b>
<b>10:45 – 12:15</b>	<b>Brainstorming on Liability Schemes for a module</b>
<b>12:15 – 14:00</b>	<b><i>Lunch</i></b>
<b>14:00 – 14:45</b>	<b>Brainstorming on Liability Schemes for a module</b>
<b>14:45 – 15:15</b>	<b>Brainstorming on Liability issues related to modular implementation</b>
<b>15:15 – 15:30</b>	<b><i>Break</i></b>
<b>15:30 – 16:30</b>	<b>Brainstorming on Liability issues related to modular implementation</b>
<b>16:30 – 17:00</b>	<b>Outcomes of Liability Schemes</b>



<p><b>DAY 4: 30 October 2014 – 9:00 / 17:00</b></p> <p><b>Working Session #6 on Potential New Modules in Africa</b></p>
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<b>9:00 – 9:45</b>	<b>GNSS implementation overview in Africa</b>
<b>9:45 – 10:30</b>	<b>Potential module in ASECNA</b>
<b>10:30 – 10:45</b>	<i>Break</i>
<b>10:45 – 11:30</b>	<b>EAC CNS/ATM study and its relationship to EGNOS</b>
<b>11:30 – 12:15</b>	<b>Key issues for new modules</b>
<b>12:15 – 14:00</b>	<i>Lunch</i>
<b>14:00 – 15:15</b>	<b>Brainstorming on new potential modules</b>
<b>15:15 – 15:30</b>	<i>Break</i>
<b>15:30 – 16:30</b>	<b>Outcomes on new potential modules</b>
<b>16:30 – 17:00</b>	<b>Closure of SAFIR Working Session #6</b>

