Deutsche Telekom AG

Answer to Public Consultation on MSS-Aero CGC

Deutsche Telekom AG
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Management Summary

Deutsche Telekom AG (DT) welcomes the efforts of EETT to draft a framework on Aero CGC usage in Greece and the possibility to contribute to the process within the framework of this public consultation.

DT is of the opinion that the framework provides a sound basis for the terms of use as it refers to all the relevant technical standards and procedures established in ITU, CEPT and ETSI and clearly states that the planned European Aviation Network (EAN) is in line with them. We do also welcome the draft fee regulations and especially the efforts of EETT to consult with other regulatory authorities within Europe to finally install a very balanced fee regime. Finally we want to point out that the planned EAN is a service that does not affect the competition in the Greek terrestrial mobile telephony market in any way. This is due to the fact that the ground component of the satellite led hybrid system is up tilted to provide connectivity to airplanes and not suitable to provide terrestrial coverage or services. In addition the Greek ground component of the system will be deployed and operated by COSMOTE. COSMOTE's role is to provide the ground component of the European Aviation Network (EAN) under development by Inmarsat and Deutsche Telekom.. and therefore to provide connectivity between the core network and the airplane. This is so to say just the "bit pipe" between the aircraft and the Internet. Considering this it is obvious that the provision of the CGC service does not affect the competition in the terrestrial mobile market on Greece territory in any way.

All in all DT sees that the proposal of EETT is suitable and well balanced to set the regulatory framework for MSS services including Aero CGC in the frequency bands 1980-2010 MHz and 2170-2200 MHz in Greece.

Question 1: Do you agree with the proposed Regulation of the Terms of Use?

DT almost fully agrees with the proposed regulation of the Terms of Use. The conditions for the use of a complementary ground-based component (CGC) in addition to the mobile satellite service (MSS) have been defined by Commission Decision 2007/98 / EC, as set out in the consultation document. The conditions set out in this document are all fulfilled by the planned business model of Inmarsat

• According to Article 2, the CGC of the planned EAN is a radio service between a mobile ground station (in this case the aircraft) and several fixed ground stations (the CGC ground network with its approximately 300 base stations)

• In accordance with Article 3 (2), the ground stations are an integral part of the satellite mobile radio system and are controlled by the satellite-based resource and network management system of Inmarsat. They transmit on the same frequencies and in the same signal direction as the satellite system. The frequency requirement of the integrated satellite mobile radio system is not increased by the ground stations.

• In accordance with section (4), the ground stations supplement only the service of the satellite in this system. They enable an increase in the quality of land and near-shore waters, where communication via the satellite can't be guaranteed with the required quality. The full coverage of the service is guaranteed by the satellite, the ground station supplement the service with additional capacity. The ratio of the data transmitted over the two components is not relevant for the legal assessment as long as the CGC does not generate any additional frequency requirements and is controlled by the satellite-based resource and network management system.

• In accordance with section (9), the MSS Service enjoys exclusive protection against interference. The ground stations correspond to this specification so that they can be used according to the approval procedure even if the satellite segment does not transmit any signal. The ground stations are still part of the overall network, which is controlled by the resource and network management system of the mobile satellite system.

In addition, the consultation refers to the passages of Decision 626/2008 / EC of the European Parliament and of the Council, which also concern the admissibility of a CGC deployment. The Inmarsat business model also fully complies with the conditions laid down in this decision: the system comprises a satellite and the supplementary ground component is used to improve the availability of MSS within the footprint of the satellite. As explained above, the conditions for the national approval of the supplementary ground component are fulfilled: The EAN uses the assigned frequencies; CGC is controlled as an integral part of a mobile satellite system by the resource and network management systems of Inmarsat.

Last but least does DT fully support the drafted technical conditions within the consultation text as it refers to the officially agreed CEPT and ETSI standards and therefore gives a perfectly harmonized framework for the MSS services including the CGC. The EAN will be compliant with all mentioned standards and Decisions.

Finally, DT wants to comment on one point in the consultation that we want to clarify a bit more:

- ECC REC 233

  The Consultation refers to the point that

  > "It is proposed that the operation of aeronautical terminals and aircraft earth stations will not be allowed on the ground and at a height less than 3.000 meters above the ground, on the condition that they operate according to the provisions of ECC Report 233."

  while ECC REC 233 states in the conclusions:

  > "In cases where the effects of aggregated interference, from several aeronautical terminals, towards ECN BSs should be considered, specific planning of CGC ground stations for communication with aeronautical terminals at altitudes below 3000 m a.g.l. may be required."

From that we want to clearly point out that ECC REC 233 does not restrict the operation of aeronautical terminals and aircraft base stations to an altitude of 3.000m and above. It does only set the necessary mitigation measures for operation below 3.000m altitude above NN.

Question 2: Do you agree with the proposed Regulation on Spectrum Usage Fees?

DT agrees with the proposed fees. We think they are well balanced compared to the European Peers and explicitly welcome the underdone consultation with other regulatory authorities within the European Union. A station based fee is reasonable for a service that is just complementing the satellite and does not provide terrestrial coverage.

Question 3: Do you agree that providing mobile satellite services on aircraft (i.e. the EAN service) has no impact in terms of competition with terrestrial mobile services in Greece?

DT agrees that providing mobile satellite services on aircraft (i.e. the EAN service) has no impact in terms of competition with terrestrial mobile services in Greece. We will justify our assessment in the following text as well from a technical as from a competition point of view.

Technical arguments to interference with other systems

The assignment of the 1980-2010 MHz and 2170-2200 MHz frequency bands to the Mobile Satellite Services (MSS) by ECC Decision ECC/DEC(06)09 took place after studies on the compatibility of both the satellite component and the Complementary Ground Component (CGC) have been concluded with existing neighboring radio networks. These studies (CEPT 013 and ECC Report 197) dealt with a scenario in which the MSS system, including CGC, is used similarly to a mobile network. In this case, the terminals are located

on the ground and are supplied by base stations of a CGC, the characteristics of which have been assumed to be commonly used in mobile radio networks.

Within the framework of the EAN business model, however, the situation is different in some respects. The goal here is not to serve end devices on the ground but rather "end devices" in the airspace. The airspace here is the vertical space, which is usually flown by commercial aircraft.

This will result in the following major changes for the CGC and the "terminal":

- The base stations on the ground have an antenna characteristic, the vertical profile, which is significantly different from the usual profile of the mobile radio network. Instead of a relatively narrow, downwards oriented vertical profile, a broad, upwards directed profile is used.
- The cell radii and therefore the distances between the individual base stations are comparatively large
- The "terminals" have a defined, downward profile instead of a relatively isotropic antenna profile
- The "terminals" are at a high altitude

Investigations cannot simply be applied to the business model found in the EAN business model. Consequently, it was necessary to re-examine the interference question. The examination result is presented in the form of the ECC report 233. This report deals specifically with the case of an "Aeronautical CGC" and defines the parameters that are relevant in the case of the EAN. As expected, the Aeronautical CGC Base Stations are not expected to interfere. The benefit of this is that the radiation characteristics lead to a lower field strength on the ground than it would be expected with "conventional" mobile radio stations.

The larger height of the terminal, referred to in the ECC report "Aeronautical Terminal", leads in some scenarios to certain "mitigation measures" to ensure non-interference: From the point of view of a mobile radio operator in the frequency band 1920-1980 MHz, the auxiliary transmissions which the Aeronautical Terminal transmits are relevant. The ECC Report 233 proposes a mask for the power flux density, which must be adhered to by the Aeronautical Terminal. This can be achieved either by corresponding filtering of the secondary emitters or by a reduction in the transmission power at low heights. The same considerations are applicable to other radio systems on the ground, in particular to a further MSS system in the adjacent frequency range. Further interference considerations concern "system-internal" interferences, in which the interplay of the satellite component with the CGC is considered. These are scenarios in which the EAN network itself would interfere with the fact that the same spectrum is used for the communication to the satellite (MSS) and the ground (CGC). This dual use of the spectrum is made possible by suitable antenna characteristics as well as by shielding the aircraft fuselage (top towards the bottom).

Overall, the report concludes that interference is not to be feared:

"The results show that the aeronautical CGC ground stations will not create any harmful interference to the Electronic Communication Network (ECN), VLCC and Mobile Communications on Aircraft (MCA) systems."

The measures described in the report for minimizing interference are technically implementable and are fully implemented in the intended EAN network.

Market influence

EAN strengthens competition in the aviation connectivity market. As an innovative service, the EAN is a perfect complement to the current market offer. It does not affect any competition of mobile operators in any country of operation of EAN. The reasons for this fact or as follows:

- The EAN ground component will be operated completely separately from the mobile networks of COSMOTE and/or DT. As there is no linkage between them EAN can't affect the competition in the mobile market on Greek territory.
- The management of the EAN subscriber base will be held strictly separated from the mobile subscriber base of COSMOTE and DT. The EAN subscriber base will be managed by the ISP. In cases where T-Mobile Hotspot GmbH (TMHS) will be ISP there will be no connection between TMHS customer data and the mobile operator's ones.
- The EAN is not designed for terrestrial coverage, neither in terms of site locations (rural, hills, airports) and coverage or in terms of the antenna design and therefore does not compete with any Greek terrestrial mobile networks. Furthermore the system is led by the satellite component and therefore clearly no land mobile system.
- EAN will not offer mobile communication services to end users with the cabin of the aircraft. It is neither capable to deliver M2M services to air cargo as the signal needs to be received by the antennas installed outside the aircraft and the fuselage shields the interior of the aircraft against the signal.
- EAN will connect aircrafts. The aircrafts are equipped with specific designed antennas on the bottom of the aircraft to receive signal. EAN is not designed to serve for terrestrial mobile services nor have the mobile devices of end users the ability to use the S-band.
- Customers in the aircraft will not connect directly to the EAN network. They will connect their devices via a local Wi-Fi network inside the aircrafts cabin. That means, that the EAN is a usual Wi-Fi service for the end users as the EAN only connects the aircraft to the internet. The service on board will be provided by an ISP.
- While the customers in aircraft cabin are connected to an independently operated Wi-Fi-network there is no chance that any of the in EAN involved parties will be favored in a discriminatory matter in regard to handover of roaming customers for example.
- Under the terms of the EAN project currently being developed with Inmarsat, it will be Inmarsat alone which contracts with the airlines, by selling them connectivity and add-on services. In contrast, neither Cosmote nor DT would make any commercial offer of EAN services to customers: Cosmote would provide DT with connectivity on Greek territory and DT would contract with Inmarsat to provide ground connectivity in Greece and other countries. Hence the project under development cannot have any impact on competition in terrestrial mobile services.

Concluding all the points mentioned before it is obviously, that EAN is not even able to impact the terrestrial mobile market in Greece (nor in any other country) and therefore there is no need further follow this point. The EAN will not impact the competition in the terrestrial mobile market in Greece.