SECTION 25.114 (d) TECHNICAL INFORMATION

SECTION 25.114 (d) INFORMATION FOR HISPASAT 1C SPACE STATION

(1) General description of overall system facilities, operations and services;

HISPASAT operates a fleet of geostationary communication satellites at 30º W longitude orbital location, used to provide a wide range of telecommunications services, including routing and DTH delivery of video and audio programs, satellite news gathering, VSAT applications, Internet backbone services, etc. both within Europe and between Europe and another parts of the worth. HISPASAT was established in 1989. Its first operational satellite was launched in 1992.

(2) If applicable, the feeder link and inter-satellite service frequencies requested for the satellite, together with any demonstration otherwise required by this chapter for use of those frequencies (see, e.g., §§25.203(j) and (k));

N/A

(3) Predicted space station antenna gain contour(s) for each transmit and each receive antenna beam and nominal orbital location requested. These contour(s) should be plotted on an area map at 2 dB intervals down to 10 dB below the peak value of the parameter and at 5 dB intervals between 10 dB and 20 dB below the peak values, with the peak value and sense of polarization clearly specified on each plotted contour. For applications for geostationary orbit satellites, this information must be provided in the .gxt format.

The station antenna gain contour in copolar and crosspolar for the AMERICA beam are contained electronically in .gxt format in the files named *AMEKU_R_HC.gxt* (AMERICA receive beam horizontal polarization, copolar), *AMEKU_R_HX.gxt* (AMERICA receive beam horizontal polarization, crosspolar), *AMEKU_R_VC.gxt* (AMERICA receive beam vertical polarization, copolar), *AMEKU_R_VX.gxt* (AMERICA receive beam vertical polarization, crosspolar), *AMEKU_T_HC.gxt* (AMERICA transmit beam horizontal polarization, copolar), *AMEKU_T_HX.gxt* (AMERICA transmit beam horizontal polarization, crosspolar), *AMEKU_T_VC.gxt* (AMERICA transmit beam vertical polarization, copolar) and *AMEKU_T_VX.gxt* (AMERICA transmit beam vertical polarization, crosspolar) attached to this application.
For the AMERICA beam, the gain peak is 31,4 dBi for receiving antenna and 31.2 dBi for the transmitting antenna.

(4) A description of the types of services to be provided, and the areas to be served, including a description of the transmission characteristics and performance objectives for each type of proposed service, details of the link noise budget, typical or baseline earth station parameters, modulation parameters, and overall link performance analysis (including an analysis of the effects of each contributing noise and interference source);

The HISPASAT-1C satellite is used for digital communications services, including video and internet applications, with bit rates ranging from 64 Kbit/s, possibly less, to 45 Mbit/s.

The HISPASAT-1C satellite serves Iberian Peninsula, Balearics, Canaries, Azores/Madeira Islands and most part of Europe and North of America as well as a large part of America, from South of Argentina to Canada.
The files called *NUEVA YORK-BOGOTA_12M_2degrees_interference.pdf* and *NUEVA YORK-BOGOTA_512K_2degrees_interference.pdf* attached to this application contain link noise budgets. Also these link budgets are a two-degree spacing interference analysis for HISPASAT-1C.

(5) Calculation of power flux density levels within each coverage area and of the energy dispersal, if any, needed for compliance with §25.208; Calculation of power flux density levels within each coverage area and of the energy dispersal, if any, needed for compliance with §25.208, for angles of arrival other than 5°, 10°, 15°, 20°, and 25° above the horizontal.

N/A for the HISPASAT-1C downlink frequency range.

(6) Public interest considerations in support of grant;

The HISPASAT-1C satellite will ensure digital transmission services between the United States and Europe at the 30º W longitude orbital location.

The entry of the HISPASAT-1C satellite into the market to meet US and European customers' demand for such services will enhance competition in that market. Accordingly, the grant of this application is in the public interest.

(7) Applications for authorizations for fixed-satellite space stations shall also include the information specified in §25.140;

Costs of construction of the space station: 75 millions Euros.
Costs of launch of the space station: 55 millions Euros.
Operating expenses for one year after launch: 290.000 Euros.

Balance sheet current for the latest fiscal year (2004) is shown in the files called *informecuentasanualesPyGBALANCE2004.pdf* and *informecuentasanualesconsolidadasPyGBALANCE2004.pdf* attached to this application.

(8) Applications for authorizations in the Mobile-Satellite Service in the 1545–1559/1646.5–1660.5 MHz frequency bands shall also provide all information necessary to comply with the policies and procedures set forth in Rules and Policies Pertaining to the Use of Radio Frequencies in a Land Mobile Satellite Service, 2 FCC Rcd 485 (1987) (Available at address in §0.445 of this chapter.);

N/A

(9) Applications to license multiple space station systems in the non-voice, non-geostationary mobile-satellite service under blanket operating authority shall also provide all information specified in §25.142; and

N/A

(10) Applications for authorizations in the 1.6/2.4 GHz Mobile-Satellite Service shall also provide all information specified in §25.143.

N/A

(11) In addition to a statement of whether the space station is to be operated on a common carrier basis, or whether non-common carrier transactions are proposed, as specified in paragraph (c)(11) of this section, satellite applications in the Direct Broadcast Satellite service must provide a clear and detailed statement of whether the space station is to be operated on a broadcast or non-broadcast basis.

N/A

(12) Applications for authorizations in the non-geostationary satellite orbit fixed-satellite service (NGSO FSS) in the bands 10.7 GHz to 14.5 GHz shall also provide all information specified in §25.146.

N/A

(13) For satellite applications in the Direct Broadcast Satellite service, if the proposed system's technical characteristics differ from those specified in the Appendix 30 BSS Plans, the Appendix 30A feeder link Plans, Annex 5 to Appendix 30 or Annex 3 to Appendix 30A, each applicant shall provide:

(i) The information requested in Appendix 4 of the ITU's Radio Regulations. Further, applicants shall provide sufficient technical showing that the proposed system could operate satisfactorily if all assignments in the BSS and feeder link Plans were implemented.

N/A

(ii) Analyses of the proposed system with respect to the limits in Annex 1 to Appendices 30 and 30A.

N/A

(14) A description of the design and operational strategies that will be used to mitigate orbital debris

a) Hispasat has implemented a dedicated Software tool to monitor and control the collision risk with other space objects.

The approach followed is to consider a dedicated facility using publicly available Two-Line Elements (TLEs), which provide orbital information for a catalogue of space objects. This catalogue includes all the active and inactive objects having a relevant size to be potentially dangerous.

The system is working as follows: it downloads the most up-to-date TLE information from the Internet, gets the operational data that corresponds to the operators satellites, performs the collision risk assessment and provides a report.

The close approach prediction function is based on the same computational modules than the current operational Flight Dynamics System implemented at Hispasat. The system uses the orbital and maneuver information provided by the user for a given geostationary satellite and propagates it as needed to cover the applicable time interval. Additionally, it gets the orbital information of third party objects as a TLE. The TLEs are propagated as needed using the standard model recommended by NORAD.

Apart from the notification message and a standard output for the execution, the system also generates a set of plots. In particular, a separations plot, a mean eccentricity and inclination plot and an alpha angle plot are generated.

The collision avoidance is under the operations engineering department responsibility which is also responsible for orbital control of the geostationary satellites. Once a warning is detected having enough risk to be considered as dangerous, we are able to retrieve all the information related to this potential risk including orbit from the dangerous object and the geostationary satellite, and the associated epochs. Using this information and the existing Flight Dynamics operational system we are able to determine manually the required collision avoidance maneuver, and to verify the performance achieved using this estimated avoidance maneuver.

b) Hispasat satellites are in geostationary-Earth orbit; Hispasat keeps a fuel reserve for all the satellites in the fleet in order to follow the ITU guidelines for post-mission disposal manoeuvres.