

Description

Lockheed Martin Corporation (“Lockheed Martin”) requests special temporary authority (“STA”) to operate its Carpentersville, New Jersey Ku-band fixed earth station (*see* File No. SES-LIC-20081103-01443, as amended) to provide telemetry, tracking and control (“TT&C”) functions during the post-launch and transfer orbit phases of operation for the Eutelsat 25B satellite.¹ Eutelsat 25B, a satellite jointly licensed by France and Qatar and destined for the 25.5° E.L. orbital location, is currently scheduled for launch on August 29, 2013 from the European spaceport at Kourou, French Guiana.² Accordingly, Lockheed Martin would likely need to begin test transmissions in preparation for the launch on or about August 22, 2013.³

Lockheed Martin specifically seeks authority to transmit telecommand signals on the 14.250 GHz and 14.4998 GHz frequencies for in transit communications and on the 14.0005 GHz and 14.0010 GHz frequencies for on-station operations, and to receive telemetry signals from the satellite on the 11.1998 GHz and 11.6986 GHz frequencies. Lockheed Martin is requesting the duration of this STA to be a total of 30 days from August 22, 2013, to cover any slippage in the anticipated dates of the various phases of operation; it nonetheless expects that all Carpentersville operations in support of the launch will be completed for Eutelsat 25B within 10 days after the satellite is launched.

The transmit frequencies that Lockheed Martin seeks to use for the Eutelsat 25B TT&C launch and early operations support were part of Lockheed Martin’s license for Call Sign E920702 and are specified in its current application for the Ku-band antenna in File No. SES-LIC-20081130-01443 (under Call Sign E7541). Lockheed Martin’s proposed transmissions on both transmit frequencies will use the emission designators for telecommand that are proposed in the pending license application, or will use carriers that do not exceed the highest e.i.r.p., e.i.r.p. density, and bandwidth prescribed in the application for the telecommand carriers. When no commands are being sent, a CW carrier that is within the emission envelope proposed in Lockheed Martin’s application, as amended, would be present. *See* File No. SES-AMD-20081219-01664, at Schedule B. The information in the Schedule B portion of Lockheed Martin’s pending application in File No. SES-LIC-20081130-01443, as amended, is hereby incorporated by reference.

¹ The pending application in File No. SES-LIC-20081103-01443, under Call Sign E7541, was filed on a provisional basis to replace Lockheed Martin’s inadvertently non-renewed license for a 14.2 meter Ku-band antenna at the Carpentersville, NJ site under Call Sign E920702. Lockheed Martin’s petition to reinstate the license for Call Sign E920702, as well as the “replacement” application it filed in the alternative under File No. SES-LIC-20081103-01443 and Call Sign E7541, are pending.

² *See, e.g.*, “SSL Delivers Satellite for Eutelsat, Es’hailSat,” Space News, Aug, 5, 2013.

³ The test transmissions that would begin on or about August 22nd would occur over a period of approximately two to three days. During these tests, the earth station would not be communicating with any satellite; instead, the transmissions will be made with the antenna at zenith to verify RF functionality.

Both of the frequencies on which satellite telemetry transmissions from Eutelsat 25B will be received under the STA requested here are also included as receive frequencies in Lockheed Martin's Ku-band authorization under Call Sign E920702 and application under Call Sign E7541. All of Lockheed Martin's proposed TT&C operations in support of the Eutelsat 25B launch will be on a strictly non-harmful interference, non-protected basis.

Lockheed Martin believes that the limited operations it proposes in support of the launch of Eutelsat 25B satellite – operations Lockheed Martin and the satellite operator will coordinate in advance with any and all potentially affected entities that operate communications systems in compliance with the Table of Frequency Allocations during the limited period of use – are required in the public interest. Eutelsat 25B will allow expanded service and enhanced coverage across the Middle East, North Africa and Central Asia as a follow on to Eutelsat 25C, which is currently operated at 25.5° E.L. Lockheed Martin's earth station will be part of a global network of control facilities that will be used to position the satellite as it progresses from transfer orbit to its final location. The safe and orderly use of the entire geostationary orbital resource and protection of the hundreds of satellites licensed by the U.S. and other countries that operate there depends in no small part on ensuring that the Eutelsat 25B satellite is controlled while over North America; Lockheed Martin's earth station thus will serve a vital function.

Lockheed Martin designates Michael Usarzewicz to be the contact person that will be available whenever transmission to, or reception from, Eutelsat 25B is to occur through the subject earth station. Mr. Usarzewicz can be reached at the following cell phone number: (609)-865-2658 and/or station number: (908) 859-4050.

The antenna to be used for this STA is already built. It is the same antenna that was authorized under Call Sign E920270 and that is now the subject of the pending reinstatement request described in Note 1 above, and has been used on an STA-basis to support other satellite launches. *See, e.g.*, Request of Lockheed Martin Corp. for STA to operate Carpentersville, NJ earth station in support of launch of Amazonas-3, File No. SES-STA-20130122-00078 (granted Feb. 4, 2013); Request of Lockheed Martin Corp. for STA to operate Carpentersville, NJ earth station in support of launch of SES-4, File No. SES-STA-20111209-01447 (granted Dec. 14, 2011); Request of Lockheed Martin Corp. for STA to operate Carpentersville, NJ earth station in support of launch of JCSAT-12, File No. SES-STA-20090615-00734 (granted July 20, 2009). For this reason, Lockheed Martin does not provide a new analysis of non-ionizing radiation for the antenna, or any of the detailed transmission/reception parameters for the signals. Instead, Lockheed Martin incorporates by reference the radiation hazard study and Schedule B information that were included with the November 2008 modification application in File No. SES-LIC-20081103-01443, as amended.

In sum, Lockheed Martin requests authority to operate its Carpentersville, NJ Ku-band earth station antenna to provide critical TT&C services during the launch and early operations phase of the Eutelsat 25B satellite, for a term of 30 days commencing August 22, 2013.

Operating Parameters for Proposed Carpentersville, NJ Ku-Band TT&C LEOp STA

Parameter	Performance
Orbit-Raising Operations and Contingency Operations (Telemetry) Antenna coverage Antenna polarization Antenna configuration	+126° to -94° from +Z and +66° to -34° from -Z RHCP Four antennas Two +Z elements (11.2 GHz and 11.7 GHz) Two -Z elements (11.2 GHz and 11.7 GHz)
On-Station Normal Operations (Telemetry) Antenna coverage Antenna polarization Antenna configuration	Regional Linear, X-Polarization Global horn, off pointed towards Fucino
Orbit-Raising Operations and Contingency Operations (Command) Antenna coverage Antenna polarization Antenna configuration	+126° to -94° from +Z and +66° to -34° from -Z LHCP Four antennas Two +Z elements (14.250 and 14.4998 GHz) Two -Z elements (14.250 and 14.4998 GHz)
On-Station Normal Operations (Command) Antenna coverage Antenna polarization Antenna configuration	Regional Linear, X-polarization Global horn, off pointed towards Fucino
Telemetry Frequency Frequency stability Short-term phase stability	11.1998 GHz 11.6986 GHz ±1 ppm, 24 hour ±50 kHz, over life 10 Hz, -35 dBc/Hz 100 Hz, -55 dBc/Hz 1 kHz, -63 dBc/Hz 100 kHz, -105 dBc/Hz

Parameter	Performance
Telemetry (Cont'd)	
Frequency stability	±1 ppm, 24-hour ±50 kHz, over life
Short-term phase stability	10 Hz, -35 dBc/Hz 100 Hz, -55 dBc/Hz 1 kHz, -63 dBc/Hz 100 kHz, -105 dBc/Hz
EIRP variation	0.2 dB p-p, any 2 minutes
EIRP	
Transfer orbit	> 7 dBW
Synchronous orbit	> 15 dBW towards EOC
Modulation	Phase modulation telemetry and/or ranging
Telemetry	
PC1	PCM/NRZ-L/BPSK 16 kbps on 128 kHz subcarrier
Ranging	Between 15 kHz and 50 kHz
Coding	Viterbi, rate ½, 32,000 symbols/sec
Phase deviation	Automatic gain controlled as follows:
Ranging subcarrier	1.15 ±10% radian
Ranging + Telemetry	1.15 ±10% radian
TLM to RNG mod index ratio	2:1 (1.028 : 0.514 radian)
Command	
Frequency	14.250 and 14.4998 GHz (FM) 14.0005 and 14.0010 GHz (PM) on-station
Uplink TCR Sites	Nominal Rambouillet – France Sintra – Portugal Dubna – Russia Fucino – Italy Makarios – Cyprus Canical – Madeira West Beam Rambouillet – France Fucino – Italy
Flux density (min)	
Orbit Raising	-89.5 dBW/m ²
Contingency	-89.5 dBW/m ²
On-Station – Nominal	-113.0 dBW/m ²
On-Station – West	-102.0 dBW/m ²
No Damage	-50 dBW/m ²

Parameter	Performance
Command (Cont'd) Carrier modulation – FM Type Deviation Carrier modulation – PM Type Modulation Index Bit rate Baseband encoding Data modulation	Frequency Modulation (FM) ±400 kHz Phase Modulation (PM) 1 radian 1000 bps Non-Return to Zero-Level (NRZ-L) Binary Phase-Shift Keyed (BPSK) on 16-kHz subcarrier, coherent
Ranging Baseband Modulation Uplink Downlink End-to-end ranging delay accuracy	Between 15 kHz and 50 kHz Same as Command Same as Telemetry ±50 ns