EXHIBIT C
HNS License Sub, LLC
Modification of License Application
Response to Question 35
September 2011

PETITION FOR PARTIAL WAIVER OF DATA SUBMISSION REQUIREMENT OF SECTION 25.115(e)

Pursuant to Sections 1.3 of the Commission's rules, 47 C.F.R. § 1.3, HNS License Sub, LLC ("Hughes") respectfully requests a partial waiver of Section 25.115(e) of the Commission's Rules, 47 C.F.R. § 25.115(e), with respect to some of the information that is required to be submitted with all applications for 20/30 GHz band fixed-satellite service ("FSS") earth station applications. This waiver is requested for the new 9.2m TT&C antennas that will be added to the Call Sign E060382 and E060383 licenses, but is *not* required for the three new 1.8m beacon uplink antennas that will be added to the Call Sign E060382 license.

Hughes' two proposed new 9.2m earth station antennas at Fillmore, California and Castle Rock, Colorado (Call Signs E060383 and E060382, respectively) will be used to provide telemetry, telecommand, and control ("TT&C") functions for Hughes' Jupiter 107W satellite that is scheduled to be launched in 2012 to the 107.1° W.L. orbital location. Hughes seeks this limited waiver in order to allow the processing and grant of authority for its new antennas prior to the submission of certain data elements from Section 25.138 that are called for in Section 25.115(e) of the rules. The required data will not be available to Hughes until after the subject earth stations are constructed and readied for operation. As explained more fully below, there is good cause to waive this rule and doing so would not be inconsistent with Commission precedent – in particular, because Hughes will supply the information required as soon as it is able to

generate the data.[1] Grant of this request will serve the public interest by allowing the provision of additional satellite broadband communication services in the United States without undermining the purpose of the Commission's rules.

Section 25.115(e) of the Commission's rules provides that an application to license an individual earth station operating in the FSS in the 20/30 GHz bands shall be filed on FCC Form 312, Main Form and Schedule B, and shall include the information described in Section 25.138. Section 25.138(a) specifies GSO FSS earth station antenna off-axis EIRP spectral density requirements for transmissions in the 29.5-30 GHz band, while Section 25.138(d) specifies that a series of measured antenna radiation patterns are to be provided for the purpose of determining compliance with the off-axis EIRP density levels in Section 25.138(a). Similar data for the receive band is called for in Section 25.138(e). The requirements of Sections 25.138(a), (d), and (e) are aimed at ensuring that an earth station transmitting to a satellite in the geostationary arc does not cause excessive interference to neighboring satellites.

As discussed in more detail below, Hughes is seeking a partial and limited waiver of the obligation to provide with these TT&C earth station applications the information called for in Sections 25.138(d) and (e) of the Commission's rules, and instead to allow Hughes to provide the required data in connection with its post-grant certification of earth station construction pursuant to Section 25.133(b) of the Commission's rules, 47 C.F.R. § 25.133(b), on the basis that:

- the earth station that is the subject of this application has not been built yet, and the

[1] The Commission previously granted a similar waiver request. *See Satellite Communications Services Information Re: Actions Taken*, Report No. SES-00748, File No. SES-AMD-20050901-01203 (Sept. 14, 2005) (Public Notice) (granting DirecTV a waiver of Section 25.138 information requirements). Moreover, when it granted the initial applications under Call Signs E060382 and E060383 for the TT&C earth station antennas for operation with Hughes's SPACEWAY 3 satellite, it granted waivers identical to those requested here. *See, e.g.*, License for Call Sign E060382 at Condition 253.

specific new model of antenna specified for the two locations has not previously been field deployed (meaning that the measured data required by Section 25.138(d) of the FCC rules is not available;

- the proposed antennas are not "production" antennas in the mass-production, ubiquitous deployment of small terminal sense of the word. Instead, the two 9.2 m antennas proposed in the applications for which waivers are sought are non-consumer TT&C antennas that should be subjected to a different level of scrutiny than potentially problematic small antennas targeted for ubiquitous deployment to commercial and consumer users;

- Hughes will provide currently-unavailable data per the specifications in Sections 25.138(d) and (e) of the FCC's rules after the antenna is built in connection with its required certification under Section 25.133(b) of the Commission's rules.

Section 25.138(d) specifies that an applicant shall provide, for each earth station antenna type, a series of radiation patterns measured on a production antenna performed on a calibrated antenna range and, as a minimum, shall be made at the bottom, middle, and top frequencies of the 30 GHz band. The radiation patterns are:

> (1) Co-polarized patterns for each of two orthogonal senses of polarizations in two orthogonal planes of the antenna.
>
> > (i) In the azimuth plane, plus and minus 10 degrees and plus and minus 180 degrees.
> > (ii) In the elevation plane, zero to 30 degrees.
>
> (2) Cross-polarization patterns in the E- and H-planes, plus and minus 10 degrees.
>
> (3) Main beam gain.[2]

Section 25.138(e) imposes similar information requirements for the 20 GHz band receiving earth station antenna.[3]

By virtue of Section 25.115(e) of the Commission's rules, Hughes is obliged to submit, as part of its applications for any Ka-band earth station, measured antenna patterns from

[2] *See* 47 C.F.R. § 25.138(d).

[3] *See* id. at § 25.138(e).

a production antenna of the type it proposes to deploy. This requirement causes a dilemma that has precipitated the instant limited waiver request. The 9.2m TT&C antenna that is the subject of this instant license application has not been built yet; is not truly a "production" antenna; and measured data for this new GDSATCOM antenna model is not yet available.

Although Hughes seeks a waiver of the requirement to provide unavailable data with its application – and submits that it is not reasonable for Hughes to have to build the two new antennas at its own risk under special temporary authority without any assurance that it will ultimately be licensed to operate the stations – Hughes does provide other detailed information here in order to show that the protection of adjacent satellites will be ensured. Specifically, Hughes provides the RF specifications for this antenna as provided by the manufacturer. (See Annexes 1 to this Exhibit C.) This submission strongly suggests that the antenna performance will comply with the requirements of Section 25.209 of the Commission's rules.

Under the Commission's rules and associated decisions, a waiver of the Commission's rules is warranted when "good cause" is shown.[4] A waiver may be granted if the grant "would not undermine the policy objective of the rule in question and would otherwise serve the public interest."[5]

Hughes' requests for a partial waiver of Section 25.115(e) with respect to some of the information called for in Section 25.138 satisfies these criteria. As explained above, the required measurements of the Ka-band antennas that are the subject of the modification applications are not feasible because the antennas in question have not been built.

[4] 47 C.F.R. § 1.3. *See also WAIT Radio v. FCC*, 418 F.2d 1153, 1157 (D.C. Cir. 1969).

[5] *EchoStar KuX Corp. Application for Authority to Construct, Launch and Operate a Geostationary Satellite Using the Extended Ku-band Frequencies in the Fixed-Satellite Service at the 83° W.L. Orbital Location*, Order and Authorization, 20 FCC Rcd 919, 923 (¶ 12) (2004) (Commission waiver for "good cause shown").

The purpose of the Section 25.115(e) is to ensure that FSS earth station operations in the 20/30 GHz frequency band do not subject neighboring satellite networks to harmful interference. Hughes' demonstration of compliance with FCC Rule 25.138(a) for the 9.2m antennas is included as Exhibit B to the instant application. As such, interference to other GSO FSS satellites will be within the levels permitted by the Commission's rules, and GSO operations of other satellite operators will not be subject to harmful interference. Additionally, Hughes stands prepared to provide the additional data per the specifications in Sections 25.138(d) and (e) of the Commission's rules after the antennas are built.

Furthermore, Section 25.138 was intended to address blanket licensing of ubiquitously deployed production antennas. As correctly noted in another application for licensing of a fixed transmit receive earth stations in the 30/20 GHz band, "the wide range of measurement parameters specified in the rule was meant to account for the wide range of installation possibilities for such mass marketed antennas, and for the fact that not every antenna would be tested after installation."[6] In the instant case, only one TT&C antenna will be operated at any given point in time with Jupiter 107W, while the other will be serving as backup. The beacon antennas will be very carefully installed and tested – much more so than routine antennas of a similar size used for communications services. The available antenna data points to the fact that co-frequency FSS operations of adjacent satellites will not be subject to harmful interference. Moreover, Hughes notes that the TT&C functions for Jupiter 107Wcan and will meet the levels in Section 25.138(a) during all routine operations. To the extent that the Section 25.138(a) levels may be exceeded by Hughes's beacon uplink earth stations, such operations at levels in excess of Section 25.138 will be coordinated with neighboring satellite operators.

[6] *See supra* n.1.

Finally, grant of this waiver would be consistent with commission precedent, as the antenna sidelobe performance is expected to be similar to that of other 9.2m Ka-band antennas from the same manufacturer, and the Commission issued a waiver to Hughes for the TT&C stations it uses successfully today with SPACEWAY 3.

In short, Hughes's request for a partial, limited waiver of the information requirements in Section 25.115(e) in connection with its proposed TT&C and beacon earth stations for Jupiter 107W are fully consistent with the purposes of the underlying rule. Morevoer, grant of Hughes's waiver request will serve the public interest by expanding the range and quality of communication services that are available in the United States.

For the reasons stated herein, grant of Hughes's waiver request will serve the public interest without undermining the purpose of the Commission's rules. Accordingly, and for good cause shown, Hughes asks that the Commission grant this waiver request.

ANNEX 1: RF SPECIFICATION FOR ANTENNA (GDSATCOM 9.2m) [7]

PERFORMANCE PARAMETERS	KA-BAND	
Reflector	9.2 meter, counterweight	
Optics Configuration	Cassegrain	
Frequency Transmit Receive	Standard Band 28.35-30.00 GHz 18.30-20.20 GHz	Custom Band 27.50-31.00 GHz 17.70-21.20 GHz
Antenna Gain (Standard Band) Transmit @ Feed Tx Port Input Receive @ LNA Input	66.1+20Log(F/30.0) dBi 63.2+20Log(F/20.2) dBi	
G/T (min) @ 30° Elevation and 120K LNA (Standard Band)	**39.2 + 20 Log (F/20.2) dBi/K (includes Feed to LNA losses for 1:2 LNA Redundancy)**	
Polarization (Transmit and Receive)	Dual Circular (RHCP/LHCP)	
3 dB Beamwidth Transmit Receive	 0.08° 0.12°	
Axial Ratio @ 1dB BW (X-POL Isolation in dB)	0.5 dB (30.7 dB)	
Port to Port Isolation Transmit to Receive Receive to Transmit Transmit to Transmit Receive to Recieve	 85 dB 85 dB 20 dB 20 dB	
VSWR	1.35:1 Max	
Sidelobe Performance (Tx/Rx)	ITU-RS.580-5 FCC CFR-47 & 25.209	
Power Handling	1 kW CW Per Port, 2 kW Total	
Feed Waveguide Flange	Rx (WR-42), Tx (WR-34)	
Pressurization Operational Maximum	 0.5 psi 2.0 psi	
Elevation Travel	0 to 90° Continuous	
Azimuth Travel	±90° Continuous	
Axis Velocity	0.5°/s	
Axis Acceleration	0.2°/s²	
Azimuth Drive Configuration	Gear and Pinion, Single Motor Drive	
Elevation Drive Configuration	Jackscrew, Single Motor Drive	
Motor Type for Azimuth and Elevation	Servo Motor	
Antenna Two-Axis Pointing Performance (over 10 degree of axis travel)	0.0066° RMS, No Wind 0.0140° RMS Winds 30 mph gusting to 45 mph	
Tracking Performance for Optrack (C/No: 45 dB-Hz)	0.0041° RMS, No Wind 0.0084° RMS Winds 45 mph gusting to 60 mph	
Tracking Performance for Monopulse (C/No: 45 dB-Hz)	0.0041° RMS, No Wind 0.0047° RMS Winds 45 mph gusting to 60 mph	
Tracking Modes	Program Track Optrack /Step Track Monopulse	
Anti-Icing	Feed Blower Heated Subreflector Optional Primary Reflector – Gas or Electric (as required)	

[7] As provided by GDSATCOM.