

Exhibit A
Intelsat License LLC
Nuevo, California
VERTEX/RSI 9 Meter Earth Station
Call Sign: E060384

Compliance with FCC Report & Order (FCC 96-377) for the 13.75 - 14.0 GHz Band
Analysis and Calculations

1. Background

This Exhibit is presented to demonstrate the extent to which the Intelsat License LLC (“Intelsat”) satellite earth station in Nuevo, California is in compliance with Federal Communications Commission (“FCC”) Report and Order 96-377. The potential interference from the earth station to U.S. Navy shipboard radiolocation operations (“RADAR”) and the National Aeronautics and Space Administration (“NASA”) space research activities in the 13.75 - 14.0 GHz band is addressed in this exhibit. The parameters for the earth station are:

Table 1. Earth Station Characteristics

- Coordinates (NAD83): 33° 47’ 47.3” N, 117° 5’ 15.0” W
- Satellite Location for Earth Station: Intelsat 30 at 95.05° W
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- Frequency Band: 13.75-14.5 GHz for uplink
- Polarizations: Circular, Linear
- Emissions: 900KF2D
- Modulation: FM/PSK
- Maximum Aggregate Uplink EIRP: 88.8 dBW for all Carriers
- Transmit Antenna Characteristics
 - Antenna Size: 9 Meters in Diameter
 - Antenna Type/Model: VERTEX/RSI
 - Gain: 60.1 dBi
- RF power into Antenna Flange: 28.7 dBW or 5.2 dBW/4 kHz (Maximum)
- Minimum Elevation Angle:
Nuevo, CA 43.4° @ 164.8° Az. at 95.05° W.
- Side Lobe Antenna Gain: 29 - 25*log(θ)

Because the above uplink spectrum is shared with the Federal Government, coordination in this band requires resolution data pertaining to potential interference between the earth stations and both U.S. Navy Department and NASA systems. Potential interference from the earth station could impact the U.S. Navy and/or NASA systems in two areas. These areas are noted in FCC Report and Order 96-377 and consist of (1) Radiolocation and radio navigation, (2) Data Relay Satellites.

Summary of Coordination Issues:

- 1) Potential Impact to Government Radiolocation (Shipboard Radar)
- 2) Potential Impact to NASA Tracking and Data Relay Satellite Systems (“TDRSS”)

2. Potential Impact to Government Radiolocation (Shipboard Radar)

RADAR may occur anywhere in the 13.4 – 14.0 GHz frequency band aboard ocean going U.S. Navy ships. FCC Order 96-377 allocates the top 250 MHz of this 600 MHz band to the Fixed Satellite Service (“FSS”) on a co-primary basis with the radiolocation operations and provides for an interference protection level of -167 dBW/m²/4 kHz.

The closest distance to the shoreline from the Nuevo, California earth station is approximately 63 km southwest toward the Pacific Ocean. The calculation of the power spectral density at this distance is given by:

- 1. Clear Sky EIRP: 88.8 dBW
- 2. Carrier Bandwidth: 900 kHz
- 3. PD at antenna input: 5.2 dBW/4kHz
- 4. Transmit Antenna Gain: 60.1 dBi
- 5. Antenna Gain Horizon: FCC Reference Pattern
- 6. Antenna Elevation Angles: 43°

The earth station will radiate interference toward the ocean according to its off-axis side-lobe performance. A conservative analysis, using the FCC standard reference pattern, results in off-axis antenna gains of -10.0 dBi towards the Pacific Ocean.

The signal density at the shoreline, through free space is:

$$\begin{aligned}
 \text{PFD} &= \text{Antenna Feed Power density (dBW/4kHz)} + \text{Antenna Off-Axis Gain (dBi)} - \\
 &\quad \text{Spread Loss (dbW-m}^2\text{)} \\
 &= 5.2 \text{ dBW/4kHz} + (-10.0) \text{ dBi} - 10 \cdot \log[4\pi \cdot (63204\text{m})^2] \\
 &= -111.8 \text{ dBW/ m}^2\text{/4 kHz} - \text{Additional Path Losses (~63.4 dB)} \\
 &= -175.2 \text{ dBW/ m}^2\text{/4 kHz}
 \end{aligned}$$

Our calculations indicate additional path loss of approximately 63.4 dB including absorption loss and earth diffraction loss for the actual path profiles from the earth station to the nearest shoreline.

The calculated PFD, including additional path losses to the closest shoreline, is $-175.2 \text{ dBW/m}^2/4 \text{ kHz}$. This is 8.2 dB below the $-167.0 \text{ dBW/m}^2/4 \text{ kHz}$ interference criteria of the R&O 96-377. Therefore, there should be no interference to the U.S. Navy RADAR from the Nuevo, California earth station due to the distance and the terrain blockage between the site and the shore.

3. Potential Impact to NASA's Tracking and Data Relay Satellite System

The geographic location of the Intelsat earth station in Nuevo, California is outside the 390 km radius coordination contour surrounding NASA's White Sands, New Mexico ground station complex. Therefore, the TDRSS space-to-earth link will not be impacted by the Intelsat earth station in Nuevo, California.

The TDRSS space-to-space link in the 13.772 to 13.778 GHz band is assumed to be protected if an earth station produces an EIRP less than 71 dBW/6 MHz in this band. The 9 meter earth station antenna will not transmit in this band. Therefore, there will be no potential interference to the TDRSS space-to-space link.

4. Coordination Result Summary and Conclusions

The results of the analysis and calculations performed in this exhibit indicate that compatible operation between the earth station at the Nuevo, California facility and the U.S. Navy and NASA TDRSS space-to-earth and space-to-space links are possible. No interference to US Navy RADAR or NASA TDRSS operations from the Nuevo, California site earth station will occur.