The Boeing Company
Thuraya Satellite Testing
Building S-03A, Chamber A6
El Segundo, CA

Submitted on

03/31/06

By

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Purpose

The purpose is to test the satellite transmitters.

Why we are applying for an STA

Specific portions of the tests exceed Part 15 and therefore require an STA.

Component being Tested

The article under test is the Thuraya Satellite. There are several test configurations that are required to be tested.

The L-band tests in the A6 Chamber as shown in figure 3 are Part 15 compliant and an STA is not required.

The C-band downlink (from the satellite) emissions radiate into the A6 Chamber. The chamber does not provide adequate shielding effectiveness in this band and an STA is required to perform the tests.

Other C-Band uplink (to the satellite) emissions are very low level and contained adequately within the A6 Chamber. An STA is not required for this test.

Schedule

The schedule for testing is for 3 months. We are applying for a 6 month STA to accommodate schedule sliding. Because of this schedule, Boeing is requesting the STA from May 1 to Oct 31, 2006. Boeing anticipates about three months of actual testing is required during the 6 month period.

Military Contracts

None. This is a commercial project.

FAA Pre-Approval

Not required.

Frequencies, Emissions and RF power

Band	Frequency MHz	Emission	Antennas *	EIRP Watts **
C	3616.0	CW-N0N	3 Types: Bicone, Pipes and Spot	10.0
C	3618.0	CW-N0N	3 Types: Bicone, Pipes and Spot	10.0

* The antennas are part of the satellite and are custom designed and manufactured by Boeing Satellite Services

** C-band radiation is mostly contained in the A6 Chamber but does not meet Part 15. The 3.6 GHz frequencies require an STA. Part 15 levels are exceeded between 2.2 and 59.4 dB according to EM measurements and calculations. The 59.4 dB leak will be reduced, but it is unknown by what amount.

Location

Boeing Satellite Development
Building S-03A, (92-033), Chamber A6
901 N Nash St
El Segundo (Los Angeles County), CA 90245-2844
33-55-43
118-23-20
WGS 84
AMSL 105 Feet

From the figure below, the location indicated by the yellow diamond symbol in the center of the map below and is south of the Los Angeles Airport by about 2,000 feet.

S-03A Exterior Building Wall Construction: All steel walls and doors, no windows.

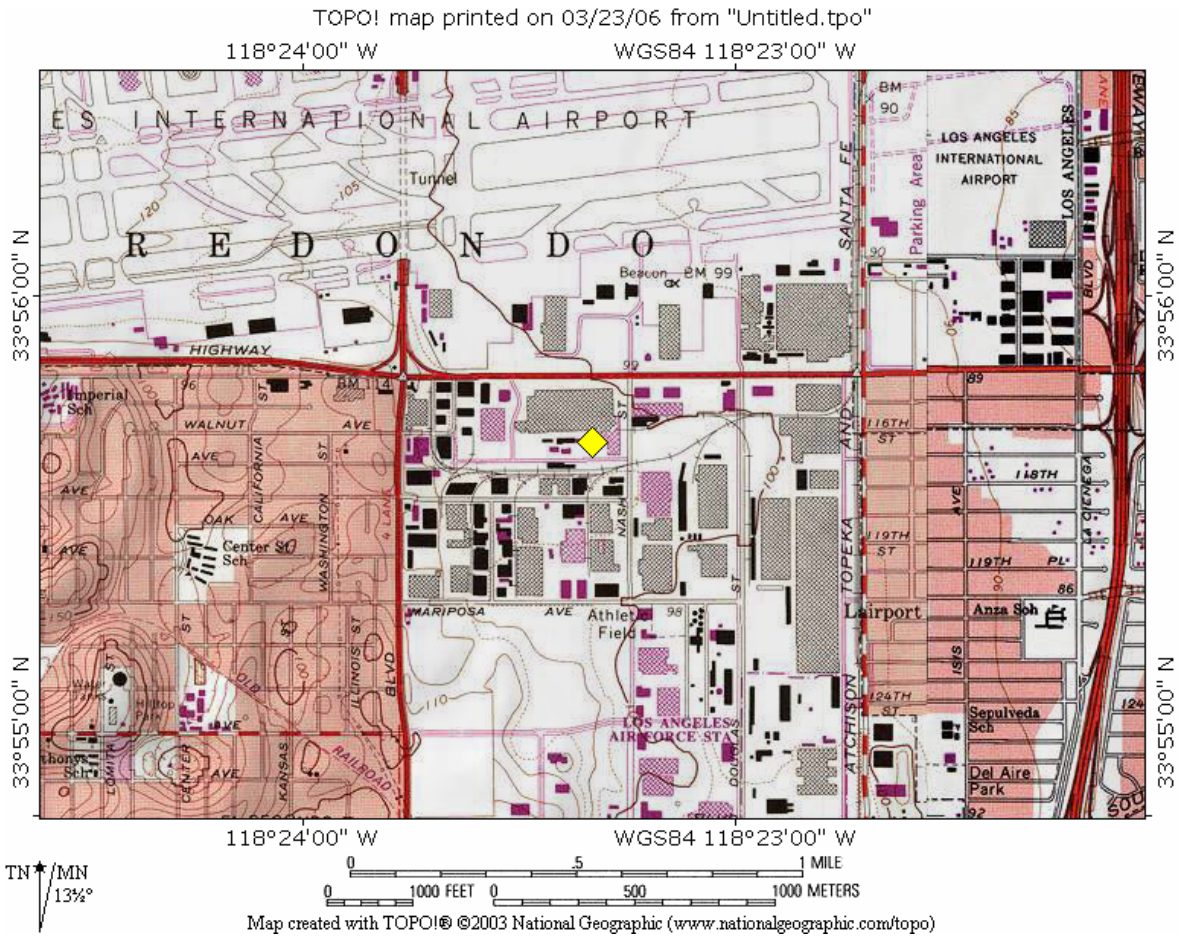

Figure 1 – El Segundo Location

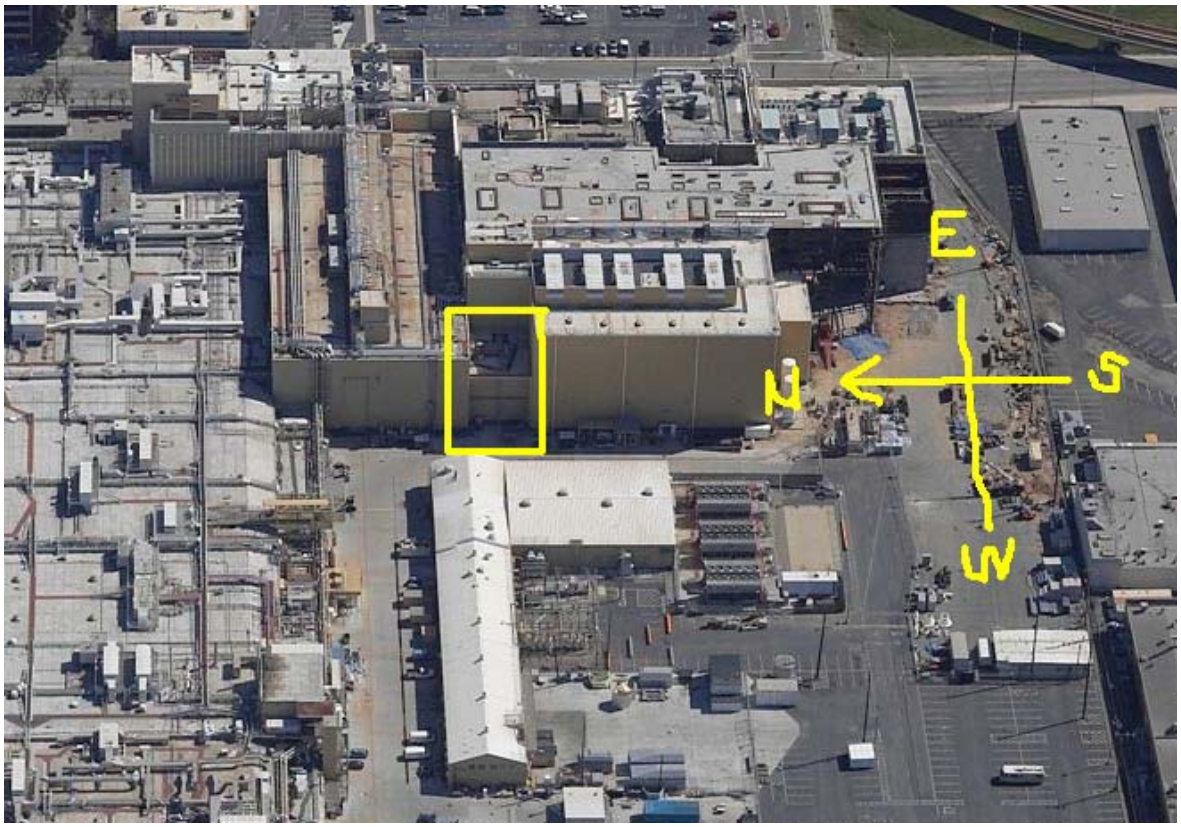

Figure 2 - Aerial Photo, west facing exterior wall and roof of the A6 Chamber

RF Test Setup Diagrams

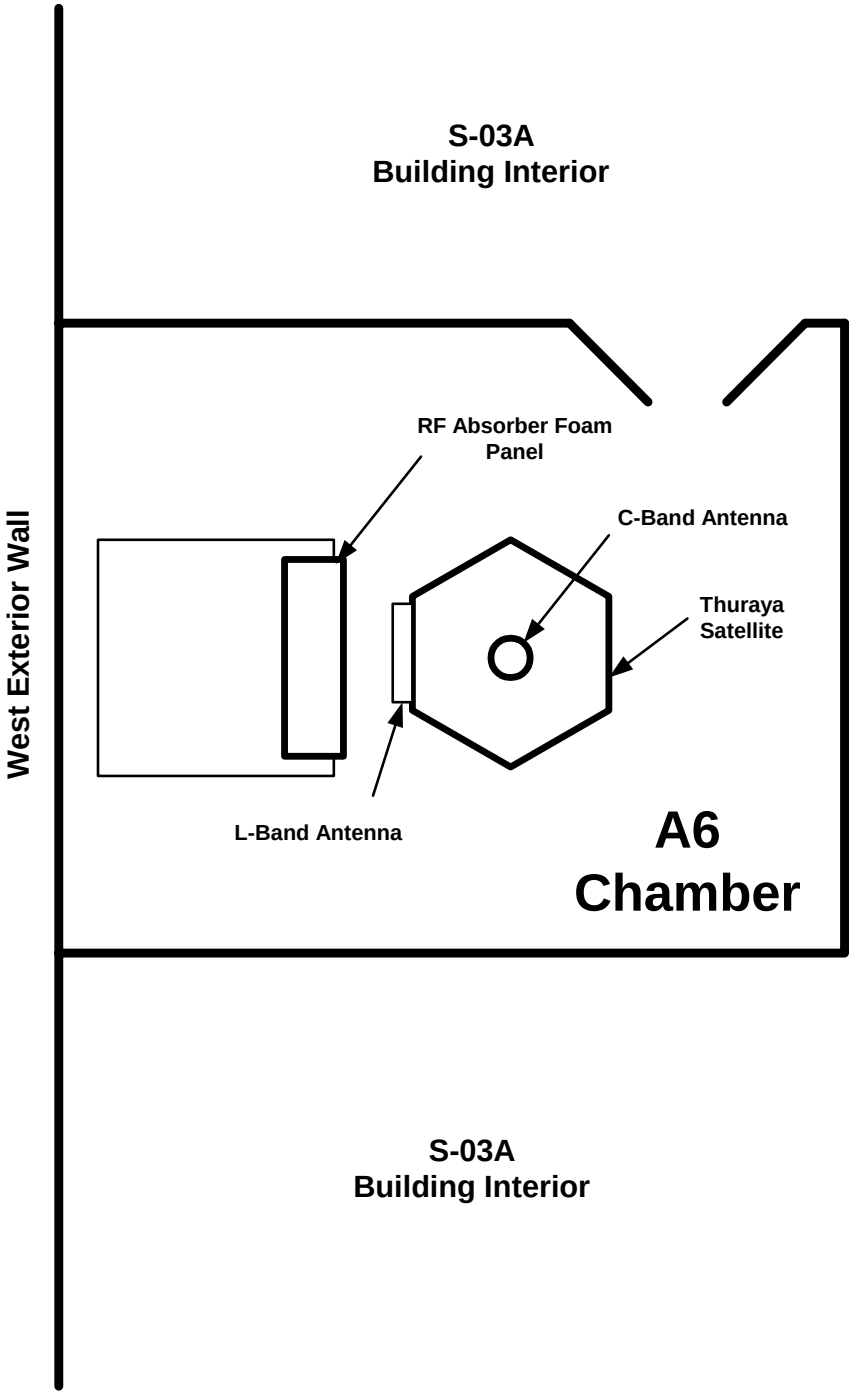

Figure 3- Thuraya Satellite Test Set Up in A6 Chamber

A6 Chamber and Building RF Shielding Effectiveness

L-Band

An EM survey and analytical radiated emissions for the L-band tests were conducted. The results were reported in the Field Emission Thuraya A6 Report dated 3/13/06 by the project engineer, Robert Reynolds of Boeing Satellite Development Center.

Based on the worst case assumptions, the results tabulated in the report show that the shielding effectiveness is adequate and no STA is required for any L-band emissions. A review by our resident EM engineer in Seattle, James Hamlin, P.E., concurs with the report and calculations.

Therefore, an STA is not required.

C-Band 3.5 GHz

A similar EM survey and analytical radiated emissions for the C-band tests were conducted. The results were reported in the Field Emission Thuraya A6 Report dated 3/13/06 by the project engineer, Robert Reynolds of Boeing Satellite Development Center.

The resulting C-band RF field emissions are based on the worst case assumptions. The results tabulated in the report show that the shielding effectiveness is compliant with two exceptions.

The results indicate four leaks where radiated emissions exceed Part 15. They are the West Wall Penetration Plate (a margin of -59.4 dB), West Wall Absorber (a margin of -7.4 dB), West Wall in General (a margin of -21.4 dB) and the Roof Vent (a margin of -31.4 dB). Our engineers have recommended that there is no easy solution that will totally mitigate the potential leaks to bring C-band emissions into verifiable compliance. The planned mitigation will reduce the leaking emissions, but by an unknown amount.

Therefore, an STA is required.

RF Equipment

Thuraya satellite internal transmitters.
Boeing is the current owner and operator of the equipment.

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