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June 19, 2008

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JUN 19 2008

Federal Communications Commission
Office of the Secretary

Marlene H. Dorch
Secretary
Federal Communications Commission
445 Twelfth Street, S.W.
Washington, D.C. 20554

**Re: Applications of Northrop Grumman Space & Mission
Systems Corporation for Special Temporary Authority,
File Nos. SES-SAT-20080331-00371 through -00374**

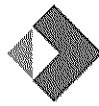
Dear Ms. Dorch:

In this letter, Northrop Grumman Space & Mission Systems Corporation (“NGST”) addresses two aspects of its pending, above-referenced requests for special temporary authority (“STA”) to operate receive-only earth stations for demonstration purposes with a non-U.S.-licensed spacecraft that transmits in the 8025-8400 MHz earth-exploration satellite service (“EESS”) band. First, and at the request of the Commission’s International Bureau, NGST has contacted the National Aeronautics and Space Administration (“NASA”) Jet Propulsion Laboratory (“JPL”) to informally coordinate the operations that NGST proposes in the above-referenced STA requests to conduct through its proposed receive-only earth stations in the 8025-8400 MHz EESS band, and identifies the conditions on such operations that are now agreed between NGST and NASA/JPL. Second, NGST addresses the impact of changes in the demonstration schedule that will delay the onset of the demonstration beyond the originally-proposed July 1 – August 15, 2008 commencement window.

Coordination with NASA/JPL:

As a result of the discussions, JPL has identified a series of operating conditions that would apply to three of the four earth station locations that are the subject of NGST’s STA requests. These proposed conditions are identified by JPL on page 3 of the attached document, “NASA/JPL Response to NGST STA Request.” Specifically, JPL indicates that:

1. No conditions are required for the proposed NGST earth station in Honolulu, Hawaii;



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2. Operation of the proposed NGST earth station in Duluth, Georgia should be conditioned on the use by NGST of a 30-degree elevation angle mask;
3. Operation of the proposed NGST earth stations in Redondo Beach, California and Irving, Texas should be subject to the conditions (i) that only the center frequency of 8150 MHz on the subject satellite is to be used; and (ii) that receive operations should occur only when the angle of the ground station to the satellite is greater than or equal to 20 degrees.

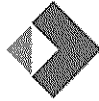
NGST has reviewed the analysis provided by JPL, and agrees to restrict the operation of the Duluth, Redondo Beach, and Irving earth stations in the manner described by JPL. All other operations would be as technically proposed in the subject NGST STA requests.

Change to NGST Demonstration Timetable:

NGST offers the following update to information regarding its proposed timetable of operations. In the STA requests, NGST proposed that the Commission grant the STAs for a period of 30 consecutive days, to commence between July 1, 2008 and August 15, 2008, the precise dates of which NGST was to provide in writing to the Commission no fewer than 3 business days ahead of the term's commencement. NGST hereby reiterates its intention to have the STAs run for a 30-day period commencing on a minimum of 3 business days' notice. However, due to the complexity of arrangements with the operator of the non-U.S. licensed satellite whose signals NGST would receive, and issues regarding the earth station receive equipment the company will be using, NGST will not be in a position to commence the proposed operations by August 15, 2008, and there is a possibility that the program may be delayed by six months or more.

Under these circumstances, NGST requests that the Commission specify that the 30-day demonstration period is to commence on or before February 15, 2009 (six months after the last day, August 15, 2008, of the commencement window proposed in the above-referenced STA requests). As is currently proposed, the 30-day term itself is subject to the condition that NGST verify the starting date in writing no fewer than 3 business days prior to the start of the term.

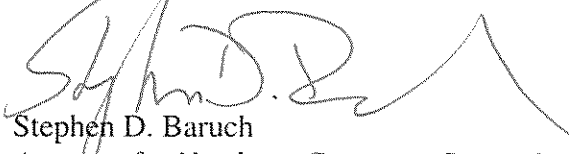
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Please let me know if you have any questions concerning the foregoing discussion or the attached materials from NASA/JPL.

Respectfully yours,



Stephen D. Baruch
*Attorney for Northrop Grunman Space &
Mission Systems Corp.*

Enclosure

cc (w/ encl.): Mr. Scott Kotler
Karl Kensinger, Esq.
Mr. Peter J. Hadinger



JPL

NASA/JPL Response to NGST STA Request

June 4, 2008



Background



- NASA/JPL received a special temporary authority (STA) coordination request (file #: SES-STA-20080331-00371, SES-STA-20080331-00372, SES-STA-20080331-00373, and SES-STA-20080331-00374) about Northrop Grumman Space & Mission Systems Corporation (NGST) plans to operate three receive-only earth station antennas with an Israeli spacecraft – TECSAR – as part of a demonstration program.
- The proposed receive-only earth stations are Redondo Beach, California, Honolulu, Hawaii, and either Duluth, Georgia or Irving, Texas. NGST will use only one earth station at a time, and over the course of the requested 30-day period, which will commence between July 1, 2008 and August 15, 2008.
- The proposed receive frequencies are 8150 MHz, 8250 MHz, and 8350 MHz. Only the one that centers at 8150 MHz will be received at Redondo Beach.



JPL Position



1. JPL has no objection to operations of TECSAR at the Honolulu ground station.
2. JPL has no objection to operations of the TECSAR at Duluth ground station if a 30-degree elevation mask is used at that ground station.
3. Using information and link parameters provided by NGST and/or derived from the NGST's STA, a study has been conducted to determine if potential interference to the NASA Deep Space Network (DSN) at Goldstone exists. Results show that TECSAR can meet the deep space protection criterion when downlinking to the ground station in Redondo Beach, CA if the following conditions are met
 - Use only the 8150 MHz frequency, and
 - Downlink only when the ground station to satellite elevation is 20 degrees or above.

The same conditions are applied to Irving ground station.



Backup Slides

JPL

TECSAR-DSN Interference Analysis



Interference Analysis



- A software (SOAP) simulation for 100 days was performed to determine if the TECSAR satellite can interfere with NASA Deep Space Network (DSN) at Goldstone site when downlinking to the Earth Station in Redondo Beach, CA using frequency 8150 MHz.
- The study was based on a set of parameters either provided by NGST or derived from the STA Request:
 - Spectral rolloff of 45 dB from 8150 MHz to DSN band, 8400 MHz - 8450 MHz
 - Antenna pattern for the transmitting satellite antenna based on ITU-R S672-4 with the following parameters
 - Circular beam, 41 dBi peak gain
 - LS= -30 dB
 - Backlobe level: 41 dB below the peak gain
 - Satellite on-axis EIRP: 26 dBW
 - Data rate of 155 Msps using 8 PSK modulation, resulting in 51.6 Msps channel symbol rate
 - Peak transmitted EIRP density of -51 dB(W/Hz), see next chart for detail
- In addition, the study assumes that the 70m DSN antenna at Goldstone is pointed to the TECSAR satellite



Interference Link Budget



Carrier Frequency	8150	MHz
Satellite On-Axis EIRP	26	dB(W)
Data Rate	155	Mbps
Modulation	8PSK	
Channel Symbol Rate	51.7	Mbps
	77.1	dB(Hz)
On-Axis EIRP Density	-51.1	dB(W/Hz)
Off-Axis Gain Reduction	-25	(assumed)
Space Loss	-169	dB (assuming 825 km range)
DSN Revd Ant Gain	74.5	on-axis, 70m
Spectral Rolloff	-45	dB (based on information from NGST)
DSN Received Interference Spectral Density	-215.6	dB(W/Hz)
Protection Criterion	-221	dB(W/Hz)
Interference Margin	-5.4	dB

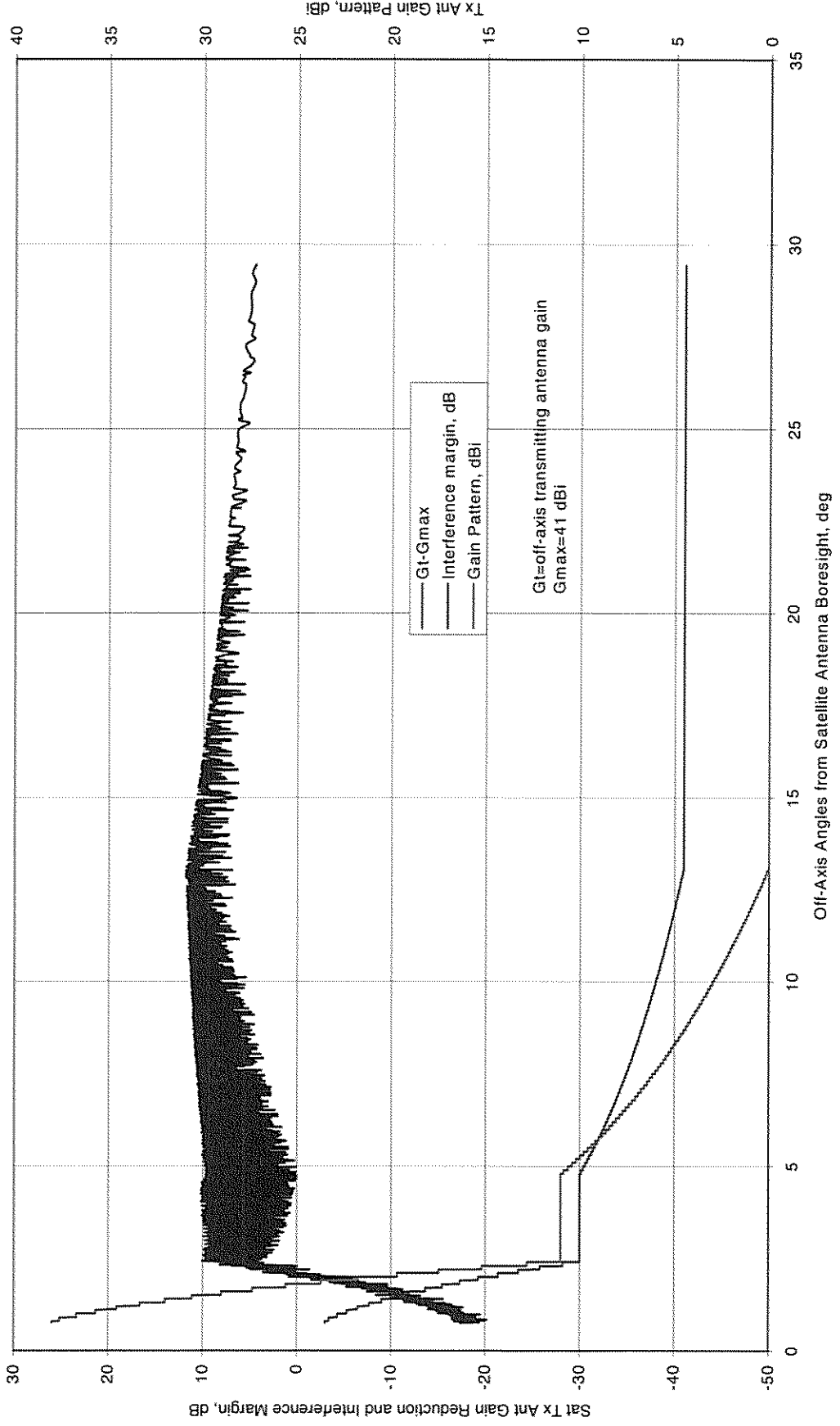
- The above simple link analysis indicates that TECSAR can interfere with the Goldstone DSN when TECSAR transmits at 8150 MHz to Redondo Beach.
- This is confirmed by a computer simulation using SOAP.



SOAP Output based on a simulation for 100 days



Figure 1. Interference Margin, Ant Pattern and Ant Gain Reduction vs. Sat Ant Off-Axis Angle

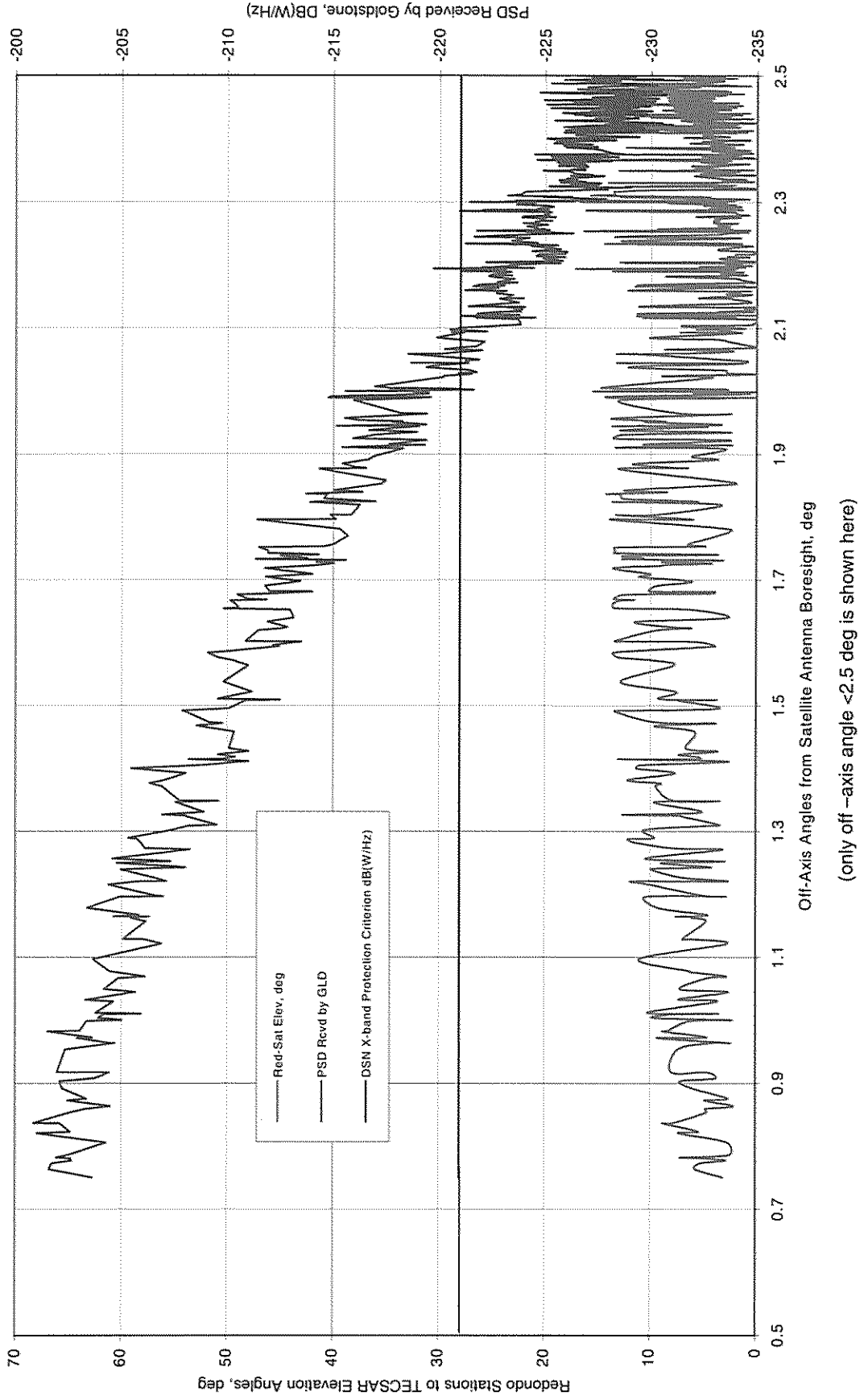




SOAP Output based on a simulation for 100 days-cont'd



Figure 2. Redondo Elevation Angle and Goldstone-received PSD vs. Sat Ant Off-Axis Angle





SOAP Output based on a simulation for 100 days-cont'd



Figure 3. TECSAR Elevation Angle with Relative to Redondo Beach

