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March 18, 2009

Marlene H. Dortch, Secretary
Federal Communications Commission
445 12th Street, S.W.
Washington, D.C. 20054

Re: Northrop Grumman Space & Mission Systems Corporation,
File Nos. SES-STA-20090212-00172 through -00175

Dear Ms. Dortch:

On behalf of Northrop Grumman Space & Mission Systems Corp., now abbreviated as "NGAS," I enclose a supplemental statement regarding orbital debris mitigation and post-mission disposal that pertains to the receive-only earth station demonstration program that NGAS will be conducting pursuant to the above-reference requests for Special Temporary Authority ("STA"). NGAS reported on its efforts to obtain information from the manufacturer of the Israeli earth exploration-satellite service ("EESS") satellite that will be providing the space segment transmissions for NGAS's limited program in the narrative exhibit of its February 12, 2009 STA requests, as well as in the predecessor STA requests (File Nos. SES-STA-20080331-00371 through -00374) that the Commission granted last year. NGAS's attached Supplemental Statement details steps NGAS has taken to acquire additional information and insight into the orbital debris mitigation and post-mission disposal plans and capabilities of the subject TECSAR satellite, and updates information in the February 12 STA requests (three of which remain pending) with information that should be considered in conjunction with the showings on this matter that NGAS has already made.

The Supplemental Statement reflects NGAS's continuing commitment to the policy and practical objectives that are specified in the Commission's orbital debris mitigation rules. NGAS will apprise the Commission of any additional insights it may gain from its ongoing efforts.

Please direct any questions you may have to me.

Respectfully yours,

Stephen D. Baruch
Attorney for Northrop Grumman Space & Mission Systems Corporation

Attachment
cc (w/ attachment): Mr. Karl Kensinger
Mr. Scott Kotler
Mr. Peter Hadinger

ATTACHMENT

Supplemental Statement of Northrop Grumman Space & Mission Systems Corp. Regarding Orbital Debris Mitigation and Post-Mission Disposal for TECSAR Receive-Only Demonstration Program

The TECSAR satellite was launched on January 21, 2008. It operates in the earth exploration-satellite service ("EESS") and uses the 8025-8400 MHz for its space-to-Earth transmissions. In April 2007, Northrop Grumman Space & Mission Systems Corp. (NGAS) and Israel Aerospace Industries (IAI) established an exclusive teaming agreement to provide the U.S. Government with a responsive, cost-effective, space-based SAR capability based on IAI's TECSAR EESS satellite. NGAS is currently evaluating the quality of the TECSAR EESS satellite, including the 8025-8400 MHz downlink through the establishment of a ground terminal segment consisting of a receive-only earth terminal, demodulators, and an image processor.

Prior to requesting STAs from the FCC last year to operate the receive-only terminal from several locations as part of the TECSAR demonstration program, NGAS requested information from IAI on several occasions regarding details of IAI's plan for orbital debris mitigation and post-mission disposal of the TECSAR satellite. IAI/TECSAR was not prepared to disclose the details of its orbital debris mitigation strategy and post–mission disposal plans for TECSAR with NGAS at that time. In the 2008 STA requests, however, NGAS reported that IAI had informed it that IAI had developed orbital debris mitigation plans and post-mission disposal procedures for TECSAR that are consistent with standard industry practices designed to ensure that all system space operations will minimize contributions to orbital debris, and that TECSAR would reserve sufficient fuel to accomplish post-mission disposal.

When it became clear earlier this year that NGAS would need to extend and obtain additional STAs for receive-only earth stations to operate with TECSAR for the now-delayed NGAS/TECSAR demonstration program, NGAS approached IAI again seeking additional information on the operator's orbital debris mitigation and post-mission disposal plans for the spacecraft. Even though NGAS would only use the satellite's signals for short-duration demonstrations at several locations (including for equipment validation at the equipment manufacturer's facility in Texas), the company was committed to adhering as closely as possible to the intent and objectives of the FCC's rules regarding orbital debris and end-of-life maneuvers.

In response to the latest inquiries from NGAS, IAI has now informed NGAS that:

- The state of Israel has ratified 'The Convention on International Liability for Damage Caused by Space Objects' (and most other space related treaties as well).
- The state of Israel owns and operates TECSAR and is responsible for all of the decisions and actions regarding its orbit control and end of life disposal.
- The current and planned orbit has a natural decay time far lower than the recommended 25 years decay time.

- If U.S. Government officials wish to request further information specific to TECSAR, a direct dialog will be necessary between appropriate government officials as there are no other publicly available documents to cite.

It is NGAS's understanding, based on discussions with IAI over the course of the planning for the demonstration project, that IAI's orbital debris mitigation plans and post-mission disposal procedures for TECSAR that are consistent with standard industry practices designed to ensure that all system space operations will minimize contributions to orbital debris, including measures to estimate and limit the probability of collision with known objects during in-orbit lifetime. IAI also stated to NGAS that no debris is planned to be released during the course of normal operations and TECSAR will reserve a sufficient fuel to accomplish post-mission disposal.

To date, and despite its requests of IAI, NGAS has not received the details of the methodologies (propulsion, avionics, electronics, propellant lines, valves, reaction wheels, etc.) that are currently employed on the TECSAR satellite to limit the effects of small object collisions on the operation and safety of the spacecraft. NGAS understands the Commission's interest in better characterizing the orbital debris impact of TECSAR, and has continued to work with IAI to document this impact (within limits set by the government of Israel). NGAS's preliminary findings and the results of internal analysis NGAS has conducted so far are summarized below:

- The TECSAR space vehicle is designed for zero release of debris during normal operations, including protective covers and deployment mechanisms actuated during on-orbit initialization.
- TECSAR is operated to avoid known orbiting debris, and its control system is designed with cross-strap redundancy to enable recovery from multiple possible failure modes (including collision with small debris objects).
- TECSAR disposal policy calls for lowering perigee to 150 km to minimize the probability of accidental collision, and reduce the re-entry timeline. After orbit lowering, residual propellant is vented to space and the batteries are discharged to minimize the probability of explosion due to stored energy. The passivated satellite will re-enter within 5 years from its mission orbit, or within 2 years after perigee lowering, depending on solar season. The satellite is designed to start final re-entry in an intact configuration; it is not designed for intentional breakup.

NGAS's effort in this regard is ongoing, and NGAS will keep the Commission informed of relevant findings and of any further relevant information on orbital debris mitigation and post-mission disposal for TECSAR that the company receives from IAI or the government of Israel.

It should be noted that NGAS will use the TECSAR satellite for only a short period of time at each of four locations during a demonstration for evaluation purposes. If the demonstration is successful, NGAS would co-produce a slightly modified version of the TECSAR satellite in its manufacturing facility in Redondo Beach, CA.

As it indicated in its February 12, 2009 STA requests, NGAS understands that operators of space stations that seek to provide service to and from the United States under an experimental or permanent FCC authorization are required to disclose their orbital debris mitigation plans (including post-mission disposal arrangements) as part of the technical information they provide

to the Commission under Part 5 or Part 25 of the regulations. In the event that NGAS is to seek any direct authorization from the FCC to launch and/or operate the new EESS satellite, it will be required to provide all applicable orbital debris mitigation and post-mission disposal information the Commission's rules specify, and to meet all other applicable FCC rules and regulations.

As a manufacturer and operator of spacecraft, NGAS remains deeply committed to the policy and practical objectives that are specified in the Commission's orbital debris mitigation rules. NGAS recognizes that the situation here is not ideal, and NGAS's efforts both to acquire more information from IAI and the government of Israel, as well as to generate more comprehensive analysis results of its own, are ongoing. NGAS will apprise the Commission of any further relevant insights it gains from these activities. Nevertheless, NGAS maintains that the commitments and understandings it has secured from IAI regarding IAI's adherence to these principles for TECSAR are sufficient to provide a basis for allowing NGAS very limited-duration receive-only access to TECSAR under the February 12 STA requests, and that such a grant will neither contravene nor otherwise undermine the Commission's rules or the public interest in their observance.