

## Request for Special Temporary Authority

Pursuant to Section 5.61 of the Commission's rules, 47 C.F.R. § 5.61, SES Americom ("SES") requests an experimental special temporary authorization ("STA") solely to conduct in-orbit and end-to-end testing of the ICO Global Communications (Holdings) Limited (together with its subsidiaries, "ICO") medium-earth-orbit ("MEO") mobile satellite service ("MSS") system for a period of five months. The testing will occur using two earth station antennas licensed to SES that were previously authorized to perform testing with the ICO system, E990067 (primary) and E990068 (back-up). The experimental authorization will permit the resumption of testing using the ICO F-2 satellite, in order to facilitate future efforts to launch and operate a larger MEO constellation for service outside the United States.

### I. Background

SES holds conditional authorizations for five transmit/receive earth stations located at Brewster, Washington to provide tracking, telemetry and command ("TT&C") communications for the ICO medium-earth-orbit ("MEO") mobile satellite service ("MSS") system.<sup>1</sup> The stations are authorized to use the 5150-5250 MHz (uplink) frequencies and 6975-7075 MHz (downlink) frequencies for TT&C communications not related to commercial operations.

The ICO MEO constellation of 12 satellites is authorized by the United Kingdom. In 2001, the Commission granted ICO a "letter of intent" authorization to provide MSS in the 2 GHz band using its MEO satellite system.<sup>2</sup> The first satellite in the constellation, F-1, was launched in March 2000 but was destroyed in a launch vehicle failure. A second satellite, F-2, was launched on June 19, 2001, and successfully placed into orbit. In 2005, the Commission granted ICO's request to modify this authorization to substitute a geostationary satellite for provision of MSS to the United States, so that ICO will not provide MSS to the United States using its MEO system, including its F-2 satellite.<sup>3</sup> The ICO MEO system, however, remains authorized under U.K. regulations and is fully coordinated with U.S.-licensed satellites.

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<sup>1</sup> SES holds the five earth station authorizations pursuant to a series of assignment authorizations. The original licensee, U.S. Electrodynamics, Inc. ("USEI"), was granted conditional authorizations in 1999 and 2000 to use 11 MHz of spectrum in the 5 GHz and 7 GHz band for TT&C communications not related to commercial operations. See *U.S. Electrodynamics, Inc.*, 14 FCC Rcd 9809 (IB, 1999) ("*Initial TT&C Order*"); *U.S. Electrodynamics, Inc.*, 15 FCC Rcd 8610 (IB/OET 2000) ("*Modification Order*"). In 2000, the Commission approved the assignment of USEI earth station authorizations to ATC Teleports, Inc., including the five Brewster authorizations. See FCC Public Notice, *Satellite Communications Services Information; Re: Actions Taken*, Report No. SES-00173 (Apr. 12, 2000). ATC Teleports, Inc. later changed its name to Verestar, Inc. In 2005, the Commission granted Verestar, Inc.'s applications to assign the five earth station authorizations to SES. See *Applications of Verestar, Inc. (Debtor-In-Possession) for Consent to Assignment of Licenses to SES Americom, Inc.*, 19 FCC Rcd 22750 (IB/WTB 2005).

<sup>2</sup> See *ICO Services Limited*, 16 FCC Rcd 13762 (IB/OET 2001) ("*ICO Authorization Order*").

<sup>3</sup> See *ICO Satellite Service, G.P.*, 20 FCC Rcd 9797 (IB 2005).

SES's predecessor-in-interest was previously authorized to conduct in-orbit and end-to-end testing at the Brewster, Washington earth station. Specifically, in May 2001, the Commission granted a 60-day special temporary authorization ("STA") to operate the Brewster, Washington earth stations in support of initial equipment and in-orbit tests of the ICO F-2 satellite, which was launched on June 19, 2001.<sup>4</sup> On July 18, 2001, the Commission extended its May 2001 STA grant for an additional 120 days, through November 9, 2001.<sup>5</sup> The Brewster facility continues to serve as an ICO satellite access node ("SAN") (*i.e.*, gateway earth station) for TT&C purposes, pursuant to FCC conditional authorizations. These present and past uses of the Brewster facility for ICO operations make it the most appropriate facility for conducting the proposed tests.

## **II. Experimental STA Request (Proposed Time and Dates)**

SES now requests an experimental STA to resume and complete the testing of the ICO F-2 satellite begun in 2001 from the Brewster, Washington earth station facilities. Specifically, SES seeks to (1) re-validate in-orbit testing performed when the ICO F-2 satellite was launched, and (2) perform tests planned but not completed following the ICO F-2 launch. In-orbit testing from Brewster is presently scheduled to begin November 10, 2006, subject to Commission approval. SES also seeks to conduct end-to-end testing from Brewster for a period of five months beginning on November 24, 2006.

## **III. Description and Purpose of Proposed STA Operation**

### **A. In-Orbit Testing**

The overall purpose of the experiment is to ascertain the proper function of the forward-link (5 GHz uplink to satellite and 2 GHz downlink to earth station) and the return-link (2 GHz uplink to satellite and 7 GHz downlink to earth station) through all available 2 GHz spot-beams. The planned in-orbit payload testing is intended to verify the performance of the satellite payload, including 2 GHz repeaters and the related antenna subsystem.<sup>6</sup>

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<sup>4</sup> See *Verestar, Inc.*, 16 FCC Rcd 9575, ¶ 1 (IB 2001). The order described the tests as follows: (1) verification and calibration of test equipment and earth station radio frequency ("RF") equipment from approximately May 6, 2001, until launch date; (2) in-orbit testing of the ICO F-2 satellite immediately following its launch, scheduled for June 6, 2001, until approximately September 6, 2001; (3) in-orbit testing from approximately mid-September 2001 until May 6, 2002; and finally (4) end-to-end testing for every ICO satellite following the completion of each in orbit test to begin approximately on December 31, 2001 until May 6, 2002.

<sup>5</sup> See *Verestar, Inc.*, 16 FCC Rcd 13833, ¶ 1 (IB, OET & WTB 2001).

<sup>6</sup> These tests include, for example, measurement of C-band (7 GHz down-link) satellite EIRP as a function of saturation flux density at the satellite service link receiver (2 GHz uplink), payload gain transfer, effective satellite spot beam antenna patterns and satellite C-band cross-polarization isolation (the feeder link transponder operates with dual polarization).

In order to perform in-orbit testing, SES Americom must transmit multiple test carriers at frequencies in the 5 GHz feeder uplink band between 5186–5212 MHz and receive a similar set of test carriers in the 7 GHz feeder downlink band between 7017–7043 MHz. The ICO SAN at Brewster is equipped with 2 GHz transmit/receive test feed horns. The proposed tests will involve transmit and receive signals from and to the Brewster SAN in a portion of the 2 GHz MSS bands (*i.e.*, 2000–2015 MHz and 2180–2200 MHz). Accordingly, there is a need for temporary access to the 5 GHz, 7 GHz and 2 GHz spectrum for in-orbit testing purposes.

#### **B. End-to-End Testing**

End-to-end testing will allow a full assessment of the end-to-end performance of the ICO MEO system. In this case, the Brewster SAN will use both 5/7 GHz and 2 GHz carriers on a “loop-back” basis at the Brewster station. This end-to-end testing will emulate the carrier of the user terminal link’s (*i.e.*, the mobile earth station) send/receive capabilities in order to validate the complete service link and feeder link radio paths of connectivity that would normally take place between the user terminal handsets and the ICO SAN.

#### **IV. Need for Testing; Non-commercial Use; Limited Test Period**

The sole purpose of this experimental STA application is to test and integrate relevant components of the ICO MEO system. The tests will resume and complete validation and end-to-end testing of spacecraft hardware and payload operations, and will assist ICO in developing ICO user terminals that are interoperable with its North America and global MSS systems. Successful completion of the testing phase will facilitate future launch and operation outside of the United States of the larger MEO constellation, as authorized by the United Kingdom.

These tests will not permit the use of 2 GHz MSS frequencies to provide commercial MSS to the public, and are not intended to facilitate commercial use of the MEO system to provide MSS to the United States. ICO does not intend to use the Brewster earth station for any permanent MSS or feeder link operations. The Brewster facility, however, can be more rapidly provisioned for the proposed tests than other potential test sites, and it is the facility most readily accessible to the various personnel involved in conducting the tests.

The proposed testing is scheduled for a five-month period, from November 10, 2006, to April 21, 2007, subject to Commission approval. Testing must be completed no later than April 2007 to avoid any possible overlap with other authorized uses of 2 GHz MSS frequencies, which are scheduled to commence in the latter half of 2007.

## **V. Demonstration of Compliance with Regulatory Requirements**

### **A. Conditions under Brewster Earth Station Authorizations**

The Commission imposed several conditions in its conditional authorizations for the Brewster earth stations.<sup>7</sup> SES affirms that it will continue to comply with these conditions in conducting the proposed tests. Specifically, SES agrees as follows:

- (1) Its operations will not cause harmful interference to authorized communications services.
- (2) Upon validated notification of harmful interference caused to authorized radio-communications services, SES immediately will cease such operations or adjust such operations to avoid such harmful interference.
- (3) The Brewster SAN 5/7 GHz TT&C and other 5/7 GHz operations will not cause unacceptable interference to relevant Globalstar operations. A statement signed by ICO and Globalstar, attached as Exhibit 1, affirms that their interim coordination agreement remains in force, and that Globalstar has no objection to the use of frequencies for testing as described in this application.
- (4) The Brewster SAN 5 GHz operations will not cause harmful interference to the existing or planned Federal Aviation Administration (“FAA”) Microwave Landing Service (“MLS”) operations. In a letter attached as Exhibit 2, the FAA recently affirmed its previous conclusion that it has no objection to the Brewster earth station operations in support of the ICO MEO system.<sup>8</sup>

### **B. Frequency Coordination**

Attached as Exhibit 3 is a study performed by Comsearch, a frequency coordination contractor, demonstrating that 2 and 5 GHz transmit operations at Brewster

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<sup>7</sup> See *Initial TT&C Order*, 14 FCC Rcd at 9817-18, and *Modification Order*, 15 FCC Rcd at 8613-14. The Commission’s conditions were imposed prior to, but in anticipation of, the adoption by the Commission of new policies and rules regarding the authorization of MSS systems in the U.S., and the utilization of the 2 GHz spectrum for MSS operators. See *Establishment of Policies and Service Rules of the Mobile Satellite Service in the 2 GHz Band*, Report and Order, 15 FCC Rcd 16127 (2000) (“2 GHz MSS Order”). See also *Amendment of Section 2.106 of the Commission’s Rules to Allocate Spectrum at 2 GHz for Use by the Mobile-Satellite Service*, Second Report and Order and Second Memorandum Opinion and Order, 15 FCC Rcd 12315 (2000). The Commission ultimately allocated the 5091-5250 MHz band for feeder uplinks and the 6700-7025 MHz band for feeder downlinks in the FSS to support Big LEO and 2 GHz MSS systems. See *Amendment of Parts 2, 25 and 97 of the Commission’s Rules with Regard to the Mobile-Satellite Service Above 1 GHz*, Report and Order, 17 FCC Rcd 2658 (2002) (“MSS Report and Order”). The allocation order also grandfathered two existing Globalstar gateway earth station sites, and one existing ICO gateway earth station site, that use some or all of the 7025-7075 MHz downlink band. *Id.* at 2675-76.

<sup>8</sup> See Letter from Michael Richmond, FAA, to Karl Nebbia, Chairman, Interdepartment Radio Advisory Committee, NTIA (Aug. 23, 2006).

will not cause harmful interference to authorized radio communications services in the vicinity of Brewster, including broadcasting services. Finally, the only other party authorized to use 2 GHz MSS frequencies to provide MSS in the United States, TMI Communications and Company, Limited Partnership, is not scheduled to launch its satellite until November 2007.<sup>9</sup>

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<sup>9</sup> See *TMI Communications and Company, Limited Partnership*, 19 FCC Rcd 12603, 12623 (2004).