

**STA REQUEST
AND DESCRIPTION OF OPERATIONS**

1. **Introduction**

By the instant application ("STA Request"), BAE Systems Information and Electronic Systems Integration Inc. ("BAE Systems") requests that the Commission grant special temporary authority ("STA") to permit BAE Systems to operate the facilities (the "Facilities") specified in the instant STA Request.

STA is requested for a period of six (6) months, with a commencement date of October 14, 2005.

2. **Purpose of the Operation**

BAE Systems Information & Electronic Warfare Systems (IEWS), a business unit of the Information and Electronic Systems Integration Sector (IESI) within BAE Systems North America, will conduct the testing specified in this STA Request at the company's Litchfield Antenna Test Range. IEWS is a major producer of electronic warfare systems, protection systems, and tactical surveillance and intelligence systems for all branches of the armed forces. IEWS' lines of business include Electronic Warfare/Electronic Protection, Electronic Warfare/Information Warfare, Integrated Defense Solutions, and Mission Electronics with products and services spanning the whole electromagnetic spectrum.

The testing at the Litchfield Antenna Test Range is a critical part of the manufacture and delivery of the military system required under the specified Navy Contract. As a general matter, the purpose of the facilities for which consent is requested herein is to measure individually the performance of scale model antennas of various types (i.e., loop, monopole, dipole), then install arrays of these antennas on scale models of various military fixtures, and measure the performance of the antennas in their installed configuration. More specifically, the testing under the requested STA is for the purpose of implementing a contract awarded to BAE Systems by the U.S. Navy for the manufacture, integration, test and installation of a Cooperative Outboard Logistics Upgrade (COBLU) Communications Electronic Support Measures system. This system is being procured by the U.S. Naval Sea Systems Command under a Foreign Military Sales Contract for a Mediterranean NATO Ally. The testing required at the Litchfield Antenna Test Range is in support of this contract. The following information regarding the relevant contract is provided pursuant to Commission requirements:

Agency:	Naval Sea Systems Command
Point of Contact:	Kemal Atam (of NAVSEA) 202-781-0420
Contract #:	N00024-04-C-4210

3. Discussions Regarding the Specified Frequency Bands

A. Generally

The STA Request seeks Commission authority to operate on a number of different frequencies. Although BAE Systems is aware that requesting authority for such a broad selection of frequencies will require significant review and coordination efforts, BAE Systems notes that the subject system's capabilities will span the HF to Millimeter-wave frequency spectrum. As contractually specified by all government procurement agencies, any development and/or product sell-off requires realistic measurement of a system. Should BAE Systems be denied the critical ability to perform radiation measurement over a broad range of frequencies, such denial would severely hinder the execution of the programs and systems to be developed under the underlying contract. Accordingly, authorization under such a broad variety of frequencies is necessary in this context.

B. Overlap of Numerous Frequencies With Prior STA Grant

It is noted that the Commission has already previously granted STA to BAE Systems under File No. 0391-EX-ST-2005 (WC9XFV) to operate on a number of the same requested frequencies specified herein. In point of fact, the experiment identified in this STA Request is identical to the experiment authorized under File No. 0391-EX-ST-2005 with respect to the nature of the experiment, the type and characteristics of antennas, amplifiers, emissions, etc., with the only difference being as follows: the experiment authorized under File No. 0391-EX-ST-2005 was for *full scale* antenna testing at *zero degrees elevation*, whereas the experiment associated with this STA Request will involve *scale model* testing with the antennas being tested at *various elevations up to 36.6 meters* (see footnote 1). The frequencies specified in the instant STA Request which overlap with the frequencies granted under File No. 0391-EX-ST-2005 are as follows:

22.6 MHz

(this frequency overlaps with the band 15-29.9 MHz previously granted under File No. 0391-EX-ST-2005)

110.5, 113, 116

(this frequency overlaps with the band 108.5-118.4 MHz previously granted under File No. 0391-EX-ST-2005)

130.5, 133.5

(this frequency overlaps with the band 129.5-135.2 MHz previously granted under File No. 0391-EX-ST-2005)

166, 170

(this frequency overlaps with the band 164-173.6 MHz previously granted under File No. 0391-EX-ST-2005)

955, 980, 1000, 1025, 1050, 1075, 1105, 1130, 1160, 1185

(this frequency overlaps with the band 940.4-1200 MHz previously granted under File No. 0391-EX-ST-2005)

BAE Systems trusts that the above-described overlap of requested frequencies with the grant issued under File No. 0391-EX-ST-2005 (WC9XFV) will serve to expedite Commission processing and approval of these particular frequencies.

C. Coordination of Frequencies Relevant to Part 74

BAE Systems is aware that a number of the requested frequencies fall within bands that are assigned for Part 74 operations. In this regard, BAE Systems – in the context of another experimental request – has worked with the appropriate Society of Broadcast Engineers (“SBE”) coordinators to identify a coordination plan that appears to sufficiently protect these Part 74 frequencies. Specifically, the coordination plan developed in that other context involved the following steps:

- BAE Systems will inform the SBE coordinator for New Hampshire roughly one week in advance regarding the specific frequency(s) to be tested in the upcoming week.
- The coordinator will then notify any relevant Part 74 users in the area of BAE Systems’ intended operation and the coordinator will coordinate usage by BAE Systems with any users who may be impacted by the testing.

BAE Systems hereby advises the Commission that it will consent to be subject to the above coordination plan with respect to the Part 74 frequencies specified in the instant STA Request. BAE Systems further advises the Commission that it will work with the appropriate SBE coordinator to confirm this coordination plan with respect to the Part 74 frequencies requested in the instant STA Request. The Part 74 frequencies requested in the instant STA Request are listed below:

454.5 MHz, 476.5 MHz, 488 MHz, 500 MHz, 620 MHz, 635 MHz, 650 MHz,
665 MHz, 685 MHz, 700 MHz, 715 MHz, 735 MHz, 750 MHz, 790 MHz

4. Why STA is in the Public Interest

STA is being requested in order to obtain processing by the Commission and Other Governmental Agencies as expeditiously as possible so that the commencement of operation of the proposed facilities can occur as soon as possible. As a leader in technological advancements, BAE Systems continually drives new research efforts in support of the war fighter. Each candidate antenna design is fabricated and tested using the antenna measurement system described in the application. Accordingly, evaluation of the performance of the antenna will be conducted in the near term before integrated into the system. In this particular case, authority to operate the Facilities under STA is necessary so that BAE Systems can demonstrate and verify performance of the subject system in accordance with current testing schedules.

As stated above, the testing at the Antenna Test Range Facilities is a critical part of the manufacture and delivery of military systems required under the specified Navy Contract and BAE Systems is not in a position to delay the commencement of these tests. Commission grant of STA in this case will permit BAE Systems to commence operations under a timeframe that meets current testing schedules. For the foregoing reasons, approval of this STA Request is in the public interest, convenience and necessity.

5. Other Issues

A. Requested Area of Operation

The Litchfield Antenna Test Range is comprised of multiple separate testing locations on the BAE Systems campus at which the subject experiment may be conducted. In addition, depending on the particular requirements of the experiment (i.e., when generating signals at zero degree elevation), it may be necessary to move a given antenna along the bore site line on the range up to a distance of 100 feet. ***Accordingly, in order to accommodate these requirements, by this STA Request, BAE Systems is requesting authority to operate all of the specified facilities within a 1,500 foot radius from the centerpoint geographic coordinates identified in the STA Request*** (i.e., 42-48-22 N.Lat.; 071-25-33 W.Long. [NAD 83]). Commission approval of such area of operation will provide BAE Systems with the flexibility it requires to move the specified test equipment to any appropriate testing location on the Litchfield Antenna Test Range during the authorized term of operation, in response to the requirements of the experiment.

B. Directionality and Height of Antennas

A single Antenna Registration has been submitted for the instant STA Request, and such Antenna Registration specifies “Yes” in response to the questions: “Is a directional antenna used?”, and “Will the antenna extend more than 6 meters above the ground....” In accordance with discussions with Commission staff, such approach was taken in order to simplify the filing process and to reduce the amount of duplicative information contained in the STA Request. However, as further discussed with Commission staff, certain of the antennas involved in the subject experiment are not directional in nature, and certain of the antennas do not exceed 6 meters in height. Therefore, the following breakdown of antenna groupings is set forth to provide an accurate understanding of the directionality and height of the antennas involved in the experiment:

i. Non-Directional (Omni-directional) Antennas With Heights Lower Than 6 Meters

This antenna grouping relates to 5 different antennas which are non-directional (omni-directional) in nature, and which do not exceed 6 meters in height above the ground (or above any structure). These antennas are as follows:

Manufacturer	Model #	Quantity	Gain (Nominal)	3dB BW E (Vertical)	3dB BW H (Horizontal)
Shakespeare	229B	2	-15 to +5 dBi	OMNI	N/A
Sanders	1/4Mon	4	-5.2 dBi	OMNI	N/A
Sanders	TASES 36	2	-60 to -5dBi	OMNI	N/A
Sanders	TASES 24	2	-31.5 to +1.1 dBi	OMNI	N/A
Sanders	Slant	1	-20 to -5	OMNI	N/A

ii. Directional Antennas
With Heights Above 6 Meters

This antenna grouping relates to 6 different antennas which are directional in nature, and which exceed 6 meters in height above the ground (or above any structure).¹ These antennas are as follows:

Manufacturer	Model #	Quantity	Gain (Nominal)	3dB BW E (Vertical)	3dB BW H (Horizontal)
KMA	26500	1	-6dBi	90°	90°
SA	26-0.1	1	+8 dBi	60°	120°
SA	29-0.1	2	+8 dBi	60°	120°
SA	27-1.0/8	1	+8 dBi	9°	1.5°
SA	28-1.0/8/10	1	+8 dBi	9°	4.5°
SA	28-2.0/8/10	1	+8dBi	60-30°	60-30°

C. Note Regarding Output Power/ERP Figures

For the purpose of completion of the attached form, antenna efficiency has been assumed to be 100%. Therefore, the transmitter power and the radiated power are reported as equal (i.e., both the Output Power and the ERP are reported as “.007 W”). In practice the antenna efficiency and cable loss between the transmitter and the antenna will be considered and the transmitter power adjusted to achieve the approved output radiated power level.

D. Note Regarding “Mean” Power Designation

In the attached form, the power levels are reported as a “Mean” value. The transmitter will not be left on continuously due to the nature of the experiment and the need to physically reposition the unit under test between measurements, cycle through frequencies, change elevation angles of the transmit antenna, etc. where the transmit power is reduced to zero. The actual duty cycle of the transmit system is approximately 7%. Mean power is therefore a more accurate representation of the applicant’s proposed activity.

E. Transmitting Equipment

In response to Item No. 8 in the Administrative portion of the STA Request, the following information is provided with respect to the transmitting equipment to be involved in the experiment. It is noted that each of these transmitters is non-experimental in nature:

¹ In the attached form, the “overall height of above ground to tip of antenna” is identified as 36.6 meters. It should be noted that this figure represents the highest point to which the subject antennas would be raised in the course of the experiment. Based on the particular requirements of the experiment, a given antenna in this grouping may be lowered, or raised to the 36.6 meter limit, to generate appropriate receive angles.

Manufacturer	Model	Quantity
HP	HP8341	1
HP	HP8643A	2
HP	HP8340B	2
HP	HP8662A	1
HP	HP8671A	1
HP	HP8753A	2
HP	HP8753D	2
HP	HP8753E	2
HP	HP8510B	1
HP	HP8510C	1

F. Additional Signal Amplification

Due to the low gain of the transmit antennas, an additional signal amplification may be utilized as follows:

Power Amplifiers	Model	Frequency Band	Power Output	Quantity
OPHIR	5069	.5MHz to 500MHz	8W	1
OPHIR	5094	1MHz to 1000MHz	3W	1
OPHIR	5160	.8GHz to 4.2GHz	7W	1
ENI	510L	1.7MHz to 500MHz	9.5W	2
ENI	603L	.8 MHz to 1000MHz	3W	1

G. Prevention of Interference

BAE Systems hereby advises the Commission that the tests to be conducted under the requested Commission authorization are to be conducted solely on the campus of BAE Systems' Litchfield, New Hampshire facilities. Such location will result in the separation of the test facilities from other existing transmit or receive facilities. BAE Systems' Richard C. Ball will be personally conducting the test and will be available by wireless telephone at (603) 318-6913. Mr. Ball will act as a "stop buzzer" if any issues regarding interference arise during testing.