

*Correspondence***Anthony Serafini**

From: EXT-Nalda, Carlos M [Carlos.M.Nalda@boeing.com]
Sent: Monday, November 28, 2005 5:49 PM
To: Anthony Serafini
Cc: Nalda, Carlos @ Mintz; EXT-Nalda, Carlos M
Subject: Boeing Maritime Experimental - File No. 0401-EX-ST-2005
Importance: High

Tony,

I apologize for the delay in getting back to you on the issues associated with the above-referenced experimental application. As you know, Boeing has been testing the antenna at its SIF facility and can now provide you with answers to your questions. Importantly, Boeing still requires the experimental STA authority to continue ESV antenna testing in the real-world environment (i.e., at sea) and conduct limited market tests. I believe that grant of File No. 0401-EX-ST-2005 would be appropriate to satisfy Boeing's ongoing maritime testing requirements. That said, given the long pendency of the STA request, we would request that the STA period be modified to commence December 1, 2005 for a period of six months (until June 1, 2006). Boeing respectfully requests that its experimental STA request be granted at the earliest possible time.

Since Boeing originally filed its request, it has ceased its test program of the Seatel 2403 .6m antenna and no longer seeks experimental authority for this antenna. Thus, it can be eliminated from the STA request I can certainly do that on this end if necessary). The following discussion of antenna performance focuses on the 1m MELCO antenna. As described below, the 1m MELCO antenna complies with the Commission's ESV technical requirements, with the possible exception of cessation of transmissions. Even so, because the antenna will at all times comply with the Commission's off-axis e.i.r.p. requirements, from an interference perspective it operates consistent with the FCC's requirements.

Boeing's responses are set forth in blue beneath your specific questions, below.

Best regards,

Carlos

Questions:

(1) Boeing does not indicate whether these tests are going to occur on U.S.-flagged ships. If not, we cannot authorize use of these antennas. 47 U.S.C. § 306. Rather, Boeing would need to seek authority to operate the ESV network through its U.S.-based hubs, with an indication that the ESVs operating through those hubs will comply with the ESV rules.

Boeing Response: Boeing seeks experimental authority to operate ESVs on U.S.-flagged vessels only. However, U.S.-flagged vessels and foreign vessels operating through a U.S.-based hub will comply with the Commission's rules. Please note Boeing is leasing hub earth station services so they are not separately licensed by the Commission, but the same ESVs will be deployed on both U.S. and foreign-flagged vessels and they will operate in precisely the same manner.

12/16/2005

(2) The discussion of ESV Antenna Pointing Control does not indicate whether the ESV complies with the pointing error rule, § 25.222(a)(6)-(7) (i.e., a pointing error of less than 0.2° between the orbital location of the target satellite and the axis of the main lobe of the ESV antenna; all emissions from the ESV shall automatically cease within 100 milliseconds if the angle between the orbital location of the target satellite and the axis of the main lobe of the ESV antenna exceeds 0.5° and transmission will not resume until such angle is less than 0.2°).

Boeing Response: Boeing's tests of the MELCO 1m antenna reveal a pointing accuracy of approximately .11 degrees rms when ship motion (yaw, pitch, roll) is taken into account, well below the .2 degree pointing accuracy requirement. The antenna's approach to cessation of emissions is as follows: (i) sampling of pointing error is taken at every 100 ms; (ii) the rms pointing error is computed every 100 ms over a software-settable sampling period (currently set at 20 sec) in the Antenna Drive Module; (iii) when the rms value exceeds 0.5° , the ADM does not send a "heartbeat" signal (which is sent every 10 ms) to Radio Frequency Module; (iv) in the absence of the 'heartbeat', the RFM initiates the transmit cessation process, which occurs within 85 m sec. Thus, the total time from detection of rms pointing error exceeding 0.5° to cessation of emissions will be less than or equal to 95 m sec. The antenna does not resume transmissions until pointing accuracy is .2 degrees or better.

The MELCO antenna could be viewed not to comply with cessations of emissions limit in the Commission's ESV rules because cessation of emissions is triggered by an exceedance of rms pointing error defined over a sampling period. However, Boeing takes into account mispointing in determining ESV power in order to ensure transmitting ESVs will ALWAYS meet the aggregate off-axis e.i.r.p. mask. Thus, EVEN IF MISPOINTED .5 DEGREES or more, the ESV will operate at reduced power such that the victim satellite will experience off-axis e.i.r.p. levels of a perfectly pointed ESV. (The pointing accuracy and cessation of emissions rule assume constant uplink power - i.e., an ESV at maximum power mispointed .2 degrees is permissible from an interference standpoint, and must stop only if exceeds .5 deg while transmitting at the same maximum power). Because Boeing takes pointing error into account to ensure that the aggregate off-axis mask is always satisfied, the MELCO antenna's approach to cessations of emission will not increase the potential for harmful interference even if it is considered not to satisfy the Section 25.222(a)(7). As a result, Boeing submits that the Commission can grant this experimental STA request to permit real-world testing of the MELCO antenna. Of course, Boeing will operate on a non-harmful interference basis and immediately cease operations upon any occurrence of harmful interference.

(3) The section on Protection of Other Authorized Services divides proposed off-axis e.i.r.p limit compliance between "when using satellites that have been coordinated for 2-degree spacing and/or to which the Commission's 2-degree spacing rules apply" and "when using satellite that have been coordinated for larger orbital spacings and/or where the Commission's 2-degree spacing rules do not apply." License will be conditioned so that it authorizes use of only the 2-degree spacing off-axis eirp limits.

Boeing Response: This is acceptable to Boeing for purposes of this experimental STA.

(4) Boeing acknowledges the need to coordinate with NTIA/IRAC to protect RAS and SRS. Any license should include conditions based on § 25.222(d) and (e).

Boeing Response: Boeing acknowledges the need to coordinate with NTIA/IRAC to protect RAS and SRS.

(5) Boeing needs to supply a point of contact in the U.S. (phone number, address) available 24/7, with

authority and ability to cease all emissions from the ESVs. § 25.222(a)(8).

Boeing Response: Point of Contact will be Mike Turner, Bldg 18-03, Room 21C6, 20403 68th Avenue S. Kent, Washington 98203. 253.773.0609.

(6) Boeing should maintain a record of the ship's location and be ready to share this information. See 25.222(c)(1)

Boeing Response: Boeing will maintain a record of the ship's location and be able to share the information according to the Commission's rules.

From: Anthony Serafini [mailto:Anthony.Serafini@fcc.gov]

Sent: Thursday, August 18, 2005 3:15 PM

To: EXT-Nalda, Carlos M

Subject: Boeing ESV experiment applications

Carlos

This is regarding the current Boeing applications 0289-EX-PL-2004, 0401-EX-ST-2005 and 0200-EX-PI-2005. I believe these are all related and maybe we can address them as one and handle them together under 0200pl05, if that seems reasonable. Please correct me if I'm wrong. Does 0200pl05 handle all the requirements of the other two applications?

Here are some issues and questions I received back from our International Bureau. Their review and comments are based on the recent rulemaking. Any license will be conditioned and granted with regard to the rules adopted.

Please address the following:

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(6) Boeing should maintain a record of the ship's location and be ready to share this information. See 25.222 (c)(1)

Tony Serafini