

**Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C., 20554**

In the Matter of

Promoting Expanded Opportunities for Radio
Experimentation and Market Trials under Part 5 of
the Commission's Rules and Streamlining Other
Related Rules

2006 Biennial Review of Telecommunications
Regulations – Part 2 Administered by the
Office Of Engineering and Technology (OET)

To: The Commission

ET Docket No. 10-236

ET Docket No. 06-155

**REPLY COMMENTS OF
THE BOEING COMPANY**

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SUMMARY

The Boeing Company (“Boeing”) reiterates its support for the Commission’s proposal to amend its experimental licensing rules to encourage and promote the development of innovative technologies. As a substantial holder of experimental licenses and a contributor of advanced products and services, Boeing appreciates the steps the Commission has already taken to streamline its experimental licensing rules. Boeing emphasizes that the Commission can further improve its experimental licensing rules and procedures in a manner that fosters innovation and growth while protecting incumbent users.

The record in this proceeding demonstrates clear industry-wide support for the Commission to expand its proposed program experimental and innovation zone authorizations to all eligible parties, including commercial entities. In addition, Boeing urges the Commission to remove burdensome coordination and consent requirements that effectively prevent experimental license holders from performing the necessary testing required to develop innovative technologies. At a minimum, as several commenting parties suggest, any coordination and consent conditions imposed on experimental licensees should be coupled with appropriate time limits and good faith obligations on incumbent licensees to complete coordination.

Finally, Boeing requests that the Commission permit the experimental testing of devices operating pursuant to Part 15 of the Commission’s rules, or at levels below Part 15, within RF enclosures and in other environments without an experimental license. Such operations are unlikely to cause harmful interference to incumbent licensees and have the potential to result in numerous cutting-edge technologies and services. No commenting party has opposed this proposal and, in fact, many commenters support increasing experimental testing flexibility in such a manner.

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The Boeing Company (“Boeing”), by its attorneys and pursuant to Section 1.415 of the Commission’s Rules, 47 C.F.R. § 1.415, hereby submits these reply comments in response to comments filed in the above-referenced docket.¹ Boeing supports those commenters that urged the Commission to expand the availability of program experimental and innovation zone licenses to all eligible institutions, including commercial entities. Boeing, however, requests that the Commission refrain from imposing burdensome coordination and consent requirements, as proposed by a few wireless service providers, on such experimental licenses. Finally, Boeing supports those comments that advocate the use of RF enclosures for experimental operations, without the requirement to obtain an experimental license.

¹ See *In the Matter of Promoting Expanded Opportunities for Radio Experimentation and Market Trials under Part 5 of the Commission’s Rules and Streamlining Other Related Rules*, Notice of Proposed Rulemaking, FCC 10-197 (Nov. 30, 2010) (“*NPRM*”).

I. THE COMMISSION SHOULD EXTEND THE AVAILABILITY OF PROGRAM EXPERIMENTAL LICENSES AND INNOVATION ZONES TO ALL ELIGIBLE ENTITIES AND SHOULD PERMIT THE USE OF CMRS SPECTRUM

The record in this proceeding is clear – the majority of commenting parties agree that program experimental and innovation zone licenses should be made available to all eligible entities, including for-profit institutions.² The Commission has consistently stated that the overarching goal of this proceeding and the purpose behind amending its experimental licensing rules is to accelerate innovative spectrum use and foster rapid development of new cutting-edge technologies.³ Commercial entities and large manufacturers such as Boeing have proven to be highly innovative users of spectrum and, as evidenced by the comments filed, have a substantial demand for the proposed experimental authorizations. In order to maximize the anticipated benefits of the experimental programs, the Commission should permit all eligible parties to utilize these new licenses.

Boeing further urges the Commission to continue to permit program experimental and innovation zone licensees to utilize Commercial Mobile Radio Service (“CMRS”) spectrum for their testing activities. Experimental operations have historically been permitted in CMRS spectrum bands.⁴ In some cases, licensees are required by law to utilize CMRS spectrum to

² See *Comments of CTIA – The Wireless Association*, ET Docket No. 10-236, at 8 (filed March 10, 2011); *Comments of AT&T Inc.*, ET Docket No. 10-236, at 9 (filed March 10, 2011) (“*AT&T Comments*”); *Comments of BAE Systems Information and Electronic Systems Integration Inc.*, ET Docket No. 10-236, at 4 (filed March 10, 2011) (“*BAE Comments*”); *Comments of Motorola Solutions, Inc.*, ET Docket No. 10-236, at 3 (filed March 10, 2011).

³ See *NPRM*, ¶ 15, Statement of Chairman Julius Genachowski.

⁴ See, e.g., *The Boeing Company*, ELS File No. 0299-EX-PL-2004 (Call Sign WD2XOA) (requiring no interference protections); *BAE Systems Information and Electronic Systems Integration Inc.*, ELS File No. 0509-EX-ST-2003 (Call Sign WB9XWZ) (mandating immediate shut down if interference occurs).

perform certain testing activities. For example, under Federal Aviation Administration (“FAA”) regulations, before certifying an aircraft as being airworthy, licensees must perform High Intensity Radiated Field testing to ensure that the aircraft’s flight systems are not disrupted by spurious emissions of electromagnetic energy.⁵ Boeing has also required the use of CMRS spectrum in order to test the effect of mobile phone use and other communications systems onboard aircraft.⁶ This testing is essential to ensure that aircraft flight systems are not disrupted by harmful interference and remain safe for the public.

Boeing recognizes and appreciates that wireless service providers are concerned about the potential for harmful interference due to increased experimental operations in CMRS spectrum bands. Boeing believes the Commission can permit all eligible entities to utilize the Commission’s proposed experimental authorizations and still protect incumbent CMRS spectrum users by establishing reasonable technical and operating requirements. Program experimental and innovation zone authorizations should be conditioned on a party’s ability to demonstrate to OET that it is sophisticated in the design and operation of wireless systems and in the use of various forms of attenuation to minimize the possibility of harmful interference. Once the requesting party demonstrates to the Commission’s satisfaction that it can meet these requirements, it should be permitted to receive a program experimental or innovation zone license. These conditions will enable institutions to develop new services and devices, and thus foster technological advances in the United States, while also protecting wireless service

⁵ See *Comments of The Boeing Company*, ET Docket No. 10-236, at 3 (filed March 10, 2011) (“*Boeing Comments*”); *Comments of The Boeing Company*, GN Docket No. 09-157 and GN Docket No. 09-51, at 10-12 (filed Sept. 30, 2009) (“*Boeing Wireless Innovation Comments*”).

⁶ See *The Boeing Company*, ELS File No. 0720-EX-ST-2006 (Call Sign WC9XMW) (authorizing Boeing to test, without coordination conditions, tools that could be used to predict interior field distribution produced by cellular devices).

providers from harmful interference by ensuring that only qualified innovators receive program experimental and innovation zone experimental authorizations.

II. THE COMMISSION SHOULD PROTECT INCUMBENT LICENSEES, BUT SHOULD NOT SUBJECT PROGRAM EXPERIMENTAL AND INNOVATION ZONE LICENSEES TO BURDENSOME COORDINATION AND CONSENT REQUIREMENTS

Boeing fully supports protecting all incumbent spectrum users from harmful interference caused by experimental operations. The Commission, however, should refrain from granting incumbents a direct role in the approval process to the detriment of innovation and growth. Onerous license conditions, such as direct incumbent coordination and consent requirements, will suppress the development and advancement of technology and are unlikely to afford additional interference protection to incumbents beyond the safeguards that are already imposed by OET and employed by experimental licensees. In the event the Commission determines that coordination as well as consent requirements are necessary in a particular circumstance, Boeing suggests that the Commission couple such requirements with a “shot clock” on incumbent licensees to respond or raise concerns, in conjunction with strict good faith requirements and deadlines on incumbent licensees to complete coordination.

A. Coordination And Consent Requirements Delay Experimental Testing And Suppress Innovation Growth

As Boeing has repeatedly explained to the Commission, requiring experimental licensees to coordinate directly with and secure consent from other licensees authorized to use the same spectrum in a given geographic region prior to commencing operations often overburdens

holders of experimental licenses and, as a result, suppresses innovative technological growth.⁷ In Boeing's experience, commercial wireless providers have often refused consent to coordination requests despite the lack of any potential interference to their commercial wireless receivers.⁸ Consequently, experimental licensees have experienced substantial delivery delays and increased costs. Several commenting parties agree with Boeing that direct coordination requirements stifle innovation and, in some cases, have provided examples of how coordination and consent requirements have delayed or prevented their experimental activities.⁹

Boeing observes that wireless service providers have conceded that coordination and consent requirements can result in delays to experimental activities,¹⁰ and thus have the potential to threaten technological growth. Nonetheless, a few wireless carriers have suggested that experimental licensees should be required to coordinate with incumbent licensees and obtain consent to any experimental activities in CMRS spectrum at least thirty days prior to

⁷ See *Boeing Comments*, at 12-13; *Boeing Wireless Innovation Comments*, at 10-12 (describing Boeing's difficulty in coordinating consent from wireless service licensees to enable High Intensity Radiated Field testing of new aircraft).

⁸ See also *In re AirCell, Inc.; Petition, Pursuant to Section 7 of the Act, for a Waiver of the Airborne Cellular Rule, or, in the Alternative, for a Declaratory Ruling*, Order on Reconsideration, 14 FCC Rcd 18430 (1999) ("*AirCell Order II*") (noting that AirCell has complained that licensees "have refused despite repeated requests . . . to coordinate as contemplated") (citation omitted).

⁹ See *BAE Comments*, at 12, 16; *Comments of Lockheed Martin Corp.*, ET Docket No. 10-236, at 2 (filed March 10, 2011) ("*Lockheed Comments*"); see also *Comments of Lockheed Martin Corp.*, GN Docket No. 09-157 and GN Docket No. 09-51, at 5 (filed Sept. 30, 2009).

¹⁰ See *Comments of the Wireless Communications Association International, Inc.*, ET Docket No. 10-236, at 6 (filed March 10, 2011) ("*WCAI Comments*"); *AT&T Comments*, at 5.

commencing operations.¹¹ One party has gone as far to suggest that notice also be provided to spectrum users operating in adjacent bands.¹²

Boeing strongly opposes these proposals. As noted above, the Commission has regularly awarded Boeing and other entities experimental authorizations using CMRS and other spectrum bands.¹³ Many of these authorizations were granted to experimental licensees without additional spectrum sharing requirements beyond the obligation not to cause harmful interference.¹⁴ Boeing has consistently complied with this rule and has received no complaints, either from co- or adjacent-band users, of harmful interference resulting from its experimental testing activities. There is simply no indication that additional protections such as coordination or consent requirements are necessary. Indeed, the commenting parties fail to cite any examples of how wireless service providers, let alone adjacent band users, have been harmed without additional interference protections.

¹¹ See *Comments of Verizon Wireless*, ET Docket No. 10-236, at 4 (filed March 10, 2011) (“*Verizon Comments*”); *Comments of V-Comm, L.L.C.*, ET Docket No. 10-236, at 6-7 (filed March 10, 2011) (“*VComm Comments*”).

¹² See *Verizon Comments*, at 4.

¹³ See also *In re AirCell, Inc.; Petition, Pursuant to Section 7 of the Act, for a Waiver of the Airborne Cellular Rule, or, in the Alternative, for a Declaratory Ruling*, Order, 14 FCC Rcd 806 (1998) (discussing AirCell’s authority to test an experimental radio station utilizing the same frequency range as other cellular telephones).

¹⁴ See *The Boeing Company*, ELS File No. 0276-EX-RR-2009 (Call Sign KA2XLY) (requiring only that: (1) the occupied bandwidth of the emission be limited; and (2) the licensee shuts down operations in the event harmful interference occurs).

B. Adequate Protections To Limit Harmful Interference Are Already In Place And Additional Safeguards Are Unnecessary

Further, as the Commission is well aware, there are already several procedures and policies in place that have proven to be sufficient to protect incumbents from harmful interference. Boeing has consistently noted that experimental licensees often use emergency “cease buzzer” procedures to ensure that their operations are shut down immediately should they cause harmful interference to other authorized spectrum users. Experimental licensees regularly agree to provide contact information, such as a toll free telephone number, that is staffed throughout the testing process to address any complaints of suspected harmful interference.¹⁵

More importantly, the primary rule governing experimental authorizations is that testing must be performed on a non-interference basis.¹⁶ The Commission has recognized that the obligation not to cause harmful interference alone is sufficient to protect other spectrum users. For instance, the Commission routinely acknowledges that licensees operating primary services are not required to coordinate with licensees operating secondary services because secondary services are simply governed by the obligation not to cause interference to primary services.¹⁷

¹⁵ See *Manual of Regulations and Procedures for Federal Radio Frequency Management*, U.S. Department of Commerce, National Telecommunications and Information Administration, at 8.3.28 (May 2010) (requiring the identification of a “Stop Buzzer” point of contact that must be available at all times during GPS re-radiation operation of devices).

¹⁶ See 47 C.F.R. § 5.85(c).

¹⁷ See *Amendment of Parts 2 and 25 of the Commission’s Rules to Allocate Spectrum and Adopt Service Rules and Procedures to Govern the Use of Vehicle-Mounted Earth Stations in Certain Frequency Bands Allocated to the Fixed-Satellite Service*, IB Docket No. 07-101, Report and Order, 24 FCC Rcd 10414, ¶ 8, n14 (2009) (stating that “[c]o-primary systems generally are obligated to coordinate with each other on a first-come, first-served basis, whereas a system operating under a secondary allocation must not give interference to, and must accept interference from, systems operating with primary status.”); *AirCell Order II*, ¶ 14 (noting that

Footnote continued . . .

Licenses with secondary status, like experimental licenses, are prohibited from causing harmful interference and will be required to either move or otherwise cease their operations. Accordingly, it is unnecessary for the Commission to establish additional mechanisms to prevent harmful interference.

C. If Coordination And Consent Conditions Are Imposed On Experimental Licenses, Incumbent Licenses Should Be Required To Negotiate In Good Faith And Within Established Timeframes

To the extent the Commission determines that program experimental and innovation zone licenses should be required to directly coordinate with and obtain advanced consent from CMRS licenses, Boeing urges the Commission to limit the ability of wireless carriers to refuse to coordinate spectrum use. One party has suggested that the Commission “impose a shot clock on existing licenses to either (1) consent to the experiment or (2) raise interference concerns and begin a collaborative process to resolve any such complaint.”¹⁸ Another party has suggested that incumbent licenses be required to negotiate in good faith.¹⁹

Boeing agrees that if coordination and consent conditions are required, commercial licenses should be obligated to act in good faith and to respond promptly to requests from experimental licenses. Boeing requests that the Commission establish a firm timeframe within which commercial licenses are allowed to raise technical or interference concerns. If a commercial licensee fails to respond or raise its concerns within the established deadlines, the

Footnote continued . . .

“additional protection for primary services against any possible harmful interference is guaranteed by the AirCell’s operation’s status as a secondary service.”).

¹⁸ *WCAI Comments*, at 6.

¹⁹ *See AT&T Comments*, at 5.

Commission should deem the licensee's consent granted by operation of law or, in the alternative, OET's Experimental Licensing Branch should be instructed to waive the consent and coordination requirement. In this way, the Commission can ensure that program experimental and innovation zone licenses are authorized without burdensome impediments that would hinder the ability of innovators to test and introduce new and cutting-edge technologies.

III. THE COMMISSION SHOULD PERMIT EXPERIMENTS OPERATING IN ACCORDANCE WITH THE EMISSIONS LIMITS IN PART 15 OF THE COMMISSION'S RULES, WHETHER OR NOT INSIDE RF ENCLOSURES, WITHOUT REQUIRING AN EXPERIMENTAL LICENSE

Finally, as requested in Boeing's initial comments, the Commission should codify its policy of permitting entities to conduct experiments within RF enclosures, such as anechoic chambers or Faraday cages, without an experimental license.²⁰ The Commission should also permit entities to utilize low-power devices operating within the emissions limits of Part 15, whether or not within RF-shielded facilities, without securing a separate experimental authorization. The record in this proceeding demonstrates that there is wide support for such policies.²¹ Several commenting parties agree that testing in RF enclosures, if fully isolated and done correctly, involves essentially no potential for interference to authorized radio communications.²² Interference protections, and the experimental licenses that carry the protections, are thus unnecessary for experiments conducted within these enclosures.

²⁰ See *Boeing Comments*, at 16-21.

²¹ See, e.g., *Comments of the Hewlett Packard Co.*, ET Docket No. 10-236, at 3-4 (filed March 9, 2011) ("*HP Comments*"); *Comments of Qualcomm Inc.*, ET Docket No. 10-236, at 10 (filed March 10, 2011) ("*Qualcomm Comments*"); *VComm Comments*, at 19; see also *Lockheed Comments*, at 2, 6.

²² See *HP Comments*, at 3; *Qualcomm Comments*, at 10.

As Boeing previously suggested, if the Commission is concerned about protecting authorized radios from interference by experimental operations within RF enclosures, the Commission should impose frequency-specific maximum emissions limits as measured at a specific distance outside of the enclosures. Although Boeing does not advocate specific emissions limits, Boeing urges the Commission not to mandate stricter emissions limits than the ones that currently exist for class A digital device unintentional radiators under Part 15 of the Commission's rules.²³ No commenting party has objected to such an approach or has otherwise suggested specific emissions limits for entities utilizing RF enclosures.

It follows that testing devices that operate below the power levels set forth in Part 15 of the Commission's rules, whether or not within RF enclosures, should also be permitted without an experimental license. Testing such devices should be permitted not only at trade shows demonstrations, but also for any legitimate testing or evaluation activities that are consistent with the Part 15 rules. Several commenting parties agree that experimental licenses are unnecessary for devices operating at or below the power limits in Part 15 in any environment because they are unlikely to cause harmful interference.²⁴ Eliminating this requirement would promote innovation and would be administratively efficient, providing OET's Experimental Licensing Branch more time to consider other applications.

²³ See 47 C.F.R. § 15.109(b).

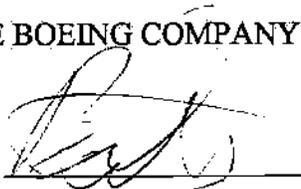
²⁴ See, e.g., *Lockheed Comments*, at 6; *Comments of The Telecommunications Industry Association*, ET Docket No. 10-236, at 7-8 (filed March 10, 2011).

IV. CONCLUSION

Boeing is eager to support the Commission in ensuring that the United States achieves its goal of remaining a world leader in radio technology research and development.²⁵ Boeing, therefore, respectfully requests that the Commission take action to expand its experimental licensing program to encourage all qualified entities to test and develop new products, and to avoid cumbersome coordination and consent requirements from being imposed on experimental licensees. Boeing also urges the Commission to confirm that experimental licenses are unnecessary for operations within RF enclosures or for devices operating pursuant to Part 15 of the Commission's rules. Codification of such policies will expedite the experimental licensing process and foster the growth and development of innovative technologies to the benefit of the public interest, while fulfilling the Commission's mandate to protect incumbent users from harmful interference.

Respectfully submitted,

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²⁵ See *NPRM*, ¶ 15.