

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)

ET Docket No. 10-236

ET Docket No. 06-155

REPORT AND ORDER

Adopted: January 31, 2013

Released: January 31, 2013

By the Commission: Chairman Genachowski and Commissioners McDowell, Clyburn, Rosenworcel,
and Pai issuing separate statements.

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I. INTRODUCTION AND EXECUTIVE SUMMARY

1. By its actions today, the Commission revises and streamlines its rules to modernize the Experimental Radio Service (ERS). The rules adopted in this Report and Order will update the ERS to a more flexible framework to keep pace with the speed of modern technological change while continuing to provide an environment where creativity can thrive. To accomplish this transition, we are creating three new types of ERS licenses – the program license, the medical testing license, and the compliance testing license – to benefit the development of new technologies, expedite their introduction to the marketplace, and unleash the full power of innovators to keep the United States at the forefront of the communications industry. Our actions also modify the market trial rules to eliminate confusion and more clearly articulate our policies with respect to marketing products prior to equipment certification. We believe that these actions will remove regulatory barriers to experimentation, thereby permitting institutions to move from concept to experimentation to finished product more rapidly and to more quickly implement creative problem-solving methodologies.

2. This Report and Order takes the following actions:

- Consolidates rules for broadcasting experiments¹ into a new subpart within Part 5 and eliminates developmental licensing rules in several Commission rules parts so that all experimental authority will be under the Part 5 ERS Rules, providing clear and consistent guidelines to applicants for all types of experimentation.
- Establishes program experimental licenses for colleges and universities with an accredited graduate research program in engineering, research laboratories, manufacturers of radio frequency (RF) equipment, manufacturers that integrate radio frequency equipment into their end products and health care institutions to allow broad experimental authority under a single license.
- Creates a Commission website where program licensees will register individual experiments to be conducted under a program license at least ten days prior to commencing the experiment.
- Requires that each program licensee post on the Commission website a report for each individual experiment completed, including a description of its results.
- Establishes a compliance testing license, which will be available to Commission-recognized testing laboratories that test radio frequency devices for certification purposes.
- Establishes a medical testing license to permit health care facilities to undertake clinical trials of cutting-edge wireless medical technologies.
- Establishes a process whereby the Commission can specify innovation zones where program licensees may operate in addition to their authorized area of operations.
- Broadens opportunities for market trials by adopting a new subpart within the ERS Rules² that contains provisions for product developmental trials, as well as market trials, and modifies the rules to clarify when operation or marketing of radio frequency devices is permitted prior to equipment certification, including the number of devices that can be imported for such purposes.
- Makes other targeted changes to our experimental rules and procedures.

¹ Rules for experimentation related to broadcast services are currently located in 47 C.F.R. Parts 73 and 74 (Parts 73 and 74).

² The ERS Rules are contained in 47 C.F.R. Part 5 (Part 5).

II. BACKGROUND

3. The Commission's Rules contain numerous provisions for experimentation and development of new radio equipment and techniques. The ERS Rules, which are contained in Part 5 and permit a broad range of experiments in all services except for broadcast systems (which are currently authorized separately under Parts 73 and 74), prescribe the manner in which the radio spectrum may be made available to manufacturers, inventors, entrepreneurs, and students to experiment with new radio technologies, equipment designs, characteristics of radio wave propagation, or service concepts related to the use of the radio spectrum.³ To encourage innovation, the Part 5 rules provide flexibility regarding allowable frequency range, power, and emissions. In exchange for this flexibility, experimental operations are not protected from harmful interference from allocated services, and ERS licensees must not cause harmful interference to stations of authorized services, including secondary services.⁴

4. In the Commission's August 2009 Wireless Innovation *Notice of Inquiry* (*Wireless Innovation NOI*), the Commission sought comment on the types of experimentation that would promote innovation in the wireless sector, including exploring whether its current rules for the issuance of experimental licenses should be revised.⁵ Subsequently, Recommendation 5.14 of the March 2010 *National Broadband Plan* recommended that the Commission initiate proceedings to enhance research and development that will advance the science of spectrum access.⁶

5. In November 2010, the Commission adopted a *Notice of Proposed Rulemaking* (*NPRM*) in this proceeding to implement Recommendations 5.14 and 7.7 of the *National Broadband Plan*.⁷ In that *NPRM*, the Commission also sought comment on several proposed changes to the ERS Rules to provide additional flexibility to innovators, so that they can more quickly transform their ideas to fully functional new products and services that meet consumer needs. Specifically, the Commission proposed to create a new program experimental license to provide greater flexibility than the conventional experimental license to allow experimenters to alter the course of their tests, if needed, without having to request specific permission from the Commission. It targeted this proposal at specific sectors of the communications ecosystem, including universities and non-profit research organizations and medical institutions. It also proposed to eliminate the almost unused developmental license, consolidate all experimental rules including broadcast experimental rules in Parts 73 and 74 into Part 5, clarify the market trial rules, and make targeted rule changes aimed at providing additional flexibility and clarity of its rules. The Commission received 26 comments and 18 reply comments to the *NPRM*.⁸

³ See, e.g., 47 C.F.R. §§ 5.1, 5.3, and 5.89.

⁴ See 47 C.F.R. § 5.85. See also 47 C.F.R. § 2.102(b)(2) and (3).

⁵ See *Fostering Innovation in the Wireless Communications Market*, GN Docket No. 90-157; *A National Broadband Plan for Our Future*; GN Docket No. 09-51; *Notice of Inquiry*, 24 FCC Rcd 11322, at 11343-44, para. 65 (2009).

⁶ See *Connecting America: The National Broadband Plan*, March 2010 (available at <http://www.broadband.gov/plan>), at Recommendation 5.14, p.96.

⁷ See *Promoting Expanded Opportunities for Radio Experimentation and Market Trials Under Part 5 of the Commission's Rules and Streamlining Other Related Rules*, ET Docket No. 10-236; *2006 Biennial Review of Telecommunications Regulations – Part 2*, Administered by the Office of Engineering and Technology (OET), ET Docket 06-155; *Notice of Proposed Rulemaking*, 25 FCC Rcd 16544 (2010); *Erratum*, 26 FCC Rcd 3828 (2011).

⁸ A list of commenting parties may be found in Appendix A.

III. DISCUSSION

6. As the communications industry continues to become more competitive, development cycles for new devices and products continue to get shorter as manufacturers and telecommunications providers seek to outpace their competitors. An integral part of that development cycle is the ability to test devices both for function and user acceptability. While the Commission's experimental licensing program has been successful in fulfilling this need, we believe that it can be improved to better meet the needs of the telecommunications industry in the current innovation environment. As industry streamlines its processes, we are doing likewise. This Report and Order revises our rules and implements a new process that manufacturers and communications providers can take advantage of that will allow them to remain competitive and keep the United States at the forefront of this industry.

7. First, we are streamlining and reorganizing the Commission's Rules regarding experimentation. We are consolidating rules for broadcast experiments, now authorized pursuant to Parts 73 and 74, into a new subpart within Part 5 to take advantage of similarities between the ERS Rules and the broadcast experimental rules. We also are eliminating the developmental licensing rules that exist in several Commission rule parts, and will evaluate all future applications seeking any form of experimental authority under the ERS Rules. Thus, all Commission rules for experimentation regardless of the type of equipment and where the equipment is in the development process (from basic research and development to market trials) will reside in Part 5. This consolidation will provide clear and consistent guidelines to all parties seeking to experiment and innovate, and will make it easier for applicants to choose the best approach for their specific needs.

8. Next, we are creating new experimental license types to eliminate administrative burdens on those who are engaged in ongoing programs of research, experimentation, and testing. These consist of the program experimental license, the compliance testing license, and the medical testing license. The current rules allow for an experimenter to apply for and be issued a license to cover a single or a series of closely related experiments – referred to hereinafter as a conventional experimental license – which generally limits the scope of the experiment, frequencies, emissions, and power levels. If licensees want to vary any of their authorized parameters, they must apply for new or modified licenses. While the current process works well for those applicants who need to undertake only a single experiment, it can be cumbersome for applicants who wish to pursue ongoing research and can significantly delay the introduction of new technologies and services into the marketplace. We will continue to issue conventional experimental licenses for specific types of experimentation, but we also will issue program and testing experimental licenses to promote ongoing research. Together, these new licenses will allow researchers and laboratories to conduct multiple non-related experiments under a single authorization over a longer period of time, thus eliminating regulatory delay and uncertainty.

9. Additionally, we are modifying our rules for product and market trials and clarifying the rules regarding equipment operation at early stages of development, *i.e.*, prior to receiving a grant of equipment certification. We are broadening the opportunities for introducing new products into the market by creating a new subpart in Part 5 that contains provisions for two types of trials – product development trials and market trials. A product development trial will permit parties to evaluate product performance in the conceptual, developmental, and design stages, whereas a market trial will permit parties to evaluate product performance and customer acceptability prior to the production stage. In concert with this change, we are modifying the rules limiting imports to allow a greater number of RF devices to enter the U.S. for testing and evaluation purposes. Finally, we are making targeted changes to specific rules and procedures that will augment the efficiency of the ERS.

A. Streamlining the Commission's Rules for Experimentation

10. *Background.* In the *NPRM*, the Commission noted that one goal of this proceeding was to examine the experimental rules, as well as associated developmental rules in various services, to reduce

duplicative and confusing requirements. To that end, the Commission observed that licenses suitable for performing experimentation and development of new innovative products and services are scattered among various rule sections. Most notably, the Commission observed that it offers options for obtaining either an experimental license or a developmental license for entities that are developing new technology or promoting advances in existing technology. It further observed that the developmental licensing rules appear to be largely duplicative of the ERS Rules, and that the vast majority of applicants apply for experimental licenses under Part 5, rather than for developmental licenses under other rule parts. In addition, the *NPRM* noted that experimental licenses are available not only under Part 5, but also under Parts 73 and 74, in cases in which the experiment involves broadcast technology.⁹ The Commission observed that many of the rules covering broadcast and non-broadcast experimental licenses, as well as developmental licenses, are duplicative and often lead to confusion among would-be innovators. It envisioned a single “one stop shop” in Part 5 of its rules to make its experimental processes easier to understand, allow it to eliminate duplicative provisions, and ultimately encourage greater experimentation.¹⁰

11. To achieve these goals, the Commission proposed to eliminate the developmental rules and evaluate all future applications seeking any form of experimental or developmental authority under a consolidated Part 5, with the relevant portions of the existing experimental broadcasting rules that are now in Parts 73 and 74 moved to Part 5. In short, the Commission proposed a new framework, wherein all experimental applications would be evaluated under either broadcast experimental rules or non-broadcast experimental rules. It stated its belief that eliminating developmental licenses in favor of experimental licenses would have little or no impact, as experimental rules are either similar¹¹ or less burdensome.¹² It also observed that there are very few currently active developmental licenses.¹³ The Commission concluded that its proposals would provide clear and consistent guidelines to all parties seeking to experiment and innovate, leading to increased opportunities for experimentation.¹⁴

12. In addition to the broad proposals outlined above, the Commission made proposals regarding three specific developmental licensing issues. First, because broadcast experiments pursuant to Parts 73 and 74 of its rules rely heavily on broadcasting-specific engineering and licensing knowledge, and are typically designed to support the operations of existing broadcasters, it did not propose to alter these processes, the ways these applications are filed or evaluated by our Media Bureau, or otherwise disturb existing practice. Instead, the Commission simply proposed to create a new subpart within Part 5 into which it would move the relevant portions of the existing rules that are now in Parts 73 and 74.¹⁵ It noted that this consolidation would remove duplicative or unneeded language and provide clearer

⁹ We note that Part 5 of our rules provides for the Experimental Radio Service (except for Broadcasting) and is administered by the Office of Engineering and Technology. Broadcast experimental licenses are issued under Part 74 of our rules and are issued by the Media Bureau.

¹⁰ See *NPRM*, 25 FCC Rcd 16573, at paras. 74-75.

¹¹ Both experimental and developmental licenses were designed to provide for research, development, and advancements in radio. In addition, both licensing regimes authorize operation only on a non-interference basis, and licenses may be cancelled at any time without the opportunity for a hearing.

¹² For example, experimental applications require only the submission of a narrative statement describing the program of research and experimentation proposed, whereas many developmental applications must also be accompanied by a Petition for Proposed Rulemaking.

¹³ This number stands at ten, as of October 11, 2012.

¹⁴ See *NPRM*, 25 FCC Rcd 16574-75, at paras. 76-77.

¹⁵ Specifically, the *NPRM* proposed to move 47 C.F.R. § 73.1510, and Part 74 Subpart A, to Part 5.

guidance than is available today regarding when an applicant should file for a broadcast experimental license – as opposed to a more general ERS license – while retaining the necessary distinctions for broadcast-specific experimentation. Further, the Commission noted that, in consolidating the Parts 73 and 74 rules into Part 5, it did not intend to propose any change to the Section 106 historic preservation review applicable to broadcast experimental radio stations authorized by the Commission. Additionally, the Commission proposed to cancel all existing developmental licenses and reissue them as experimental licenses under the Part 5 rules.¹⁶

13. Finally, the Commission noted that the rules for private radio meteor burst communications in Section 90.250 require that new authorizations be issued subject to the developmental grant procedure, and that an application for issuance of a permanent authorization must be filed prior to the expiration of the developmental authorization.¹⁷ Therefore, it proposed to retain the existing rule, simply substituting the developmental license requirement with a requirement to instead obtain an experimental license to satisfy the existing “pre-license” requirement.¹⁸

14. *Comments.* Commenting parties strongly favored the proposals to streamline the rules for experimentation. The Hewlett Packard Company (HP) states that consolidating and simplifying the rules that cover experimental activities is a highly desirable way to promote innovation.¹⁹ CTIA – The Wireless Association (CTIA) supports eliminating the developmental licensing rules to provide additional clarity and regulatory certainty to innovators and promote additional experimentation.²⁰ CTIA also recommends revising Section 5.79 of the rules to provide streamlined processing for transfers of control and assignment applications involving experimental licenses.²¹ Similarly, Lockheed Martin Corporation (Lockheed Martin) recommends that the Commission facilitate experimentation by streamlining approvals and eliminating unnecessary requirements related to existing types of authorizations, including removing experimental licensing requirements in areas where there is negligible risk of harmful interference, and omitting unnecessary restrictions on experimental license operations.²²

15. The Satellite Industry Association (SIA) agrees with the Commission that the developmental rules can be eliminated in their entirety without adversely affecting the objective of promoting expanded experimentation. SIA argues that the developmental rules are largely redundant and no longer fill a need, as indicated by the very low number of developmental applications granted by the Commission over the past several years. Moreover, SIA contends, the Commission eliminated former developmental service rules under Part 25 several years ago in favor of reliance on the ERS Rules, and there were no adverse or unintended consequences. Accordingly, SIA concurs that the developmental rules can be subsumed by the experimental rules, as proposed.²³

16. *Decision.* The Commission’s proposal to consolidate all of its experimental and developmental rules into Part 5 received widespread support, and we find that adopting that proposal will promote greater experimentation and efficiency, thus providing a significant benefit at little or no cost to

¹⁶ See *NPRM*, 25 FCC Rcd 16575-76, at paras. 79-80.

¹⁷ See 47 C.F.R. § 90.250(i).

¹⁸ See *NPRM*, 25 FCC Rcd 16575, at para. 78.

¹⁹ See HP Comments to *NPRM* at 3.

²⁰ See CTIA Comments to *NPRM* at 17.

²¹ *Id.* at 3.

²² See Lockheed Martin Reply Comments to *NPRM* at 2 and 4.

²³ See SIA Comments to *NPRM* at 5.

the public.²⁴ The current rule structure involves experimental and developmental operations scattered across ten rule parts with varying policies and eligibility requirements.²⁵ To remove the confusion among license applicants caused by the varying rules, we consolidate our developmental rules from various rule parts and our experimental rules from Parts 5, 73, and 74 into a consolidated Part 5. As proposed, we are retaining all necessary distinctions for broadcast-specific experimentation in the revised rules.

17. For the reasons set forth in the *NPRM*,²⁶ we also adopt the proposal to convert the few existing developmental licenses to experimental licenses. We will cancel developmental licenses and reissue them as Part 5 experimental licenses with the same technical parameters that they currently enjoy. In addition, these licenses will be freed from the specific developmental rules to which they must now adhere, and instead will follow the ERS Rules. Further, because we did not receive any comments opposing the proposal for handling meteor burst communication systems under Section 90.250 and it is in the public interest to do so, we will adopt the *NPRM*'s proposal to require applicants for these systems to first obtain and operate under an experimental license prior to applying for a permanent meteor burst communication system under Part 90 licensing requirements.²⁷

18. Regarding CTIA's recommendation that we provide streamlined processing for transfers of control and assignment applications involving experimental licenses, we observe that these transactions already generally occur on an expeditious basis and we see no reason to alter our existing processes. In cases where there may be a long lag time between application filing and grant of a transfer of control, we note that many of these experimental transactions are components in a much larger transaction such as a merger involving licenses from many Commission licensing systems. In these cases, the experimental license transfer of control cannot be granted until the Commission issues a decision on the larger transaction. Once that occurs, the experimental license transfer of control generally occurs very quickly, often within one day.²⁸ We will continue to handle these types of transactions on a case-by-case basis.

19. Similarly, regarding Lockheed Martin's recommendation that we remove experimental licensing requirements in areas where there is negligible risk of harmful interference and omit

²⁴ There will be little or no cost to current developmental licensees because we will automatically convert their licenses to experimental licenses. Further, there will be little or no cost to our staff because such conversions will require minimal staff time.

²⁵ In addition to Parts 5, 73, and 74 experimental authorizations, Parts 22, 73, 74, 80, 87, 90, and 101 of our rules provide for issuance of developmental licenses. See 47 C.F.R. §§ 22.165(2); 22.377(b); 22.401; 22.403; 22.409; 22.413; 22.591(a); 22.599(b); 73.72; 73.1010(e)(1); 73.1510; 73.1010; 73.3500(a); 73.3533(a)(2); 73.3536(b)(2); 73.3539(a); 74.1; 74.15; 74.16; 74.101; 74.102; 74.103; 74.112; 74.113; 74.131; 74.132; 74.133; 74.151; 74.161; 74.162; 74.163; 74.165; 74.181; 74.182; 74.183; 74.184; 78.107(a)(2)(ii); 80.25(c); 80.33; 80.377; 80.391; 87.27(b); 87.37; 90.35(c)(75); 90.35(c)(89); 90.35(d)(6); 90.250(i); 90.501; 90.503; 90.505; 90.507; 90.509; 90.511; 90.513; 90.515; 90.517; 101.21(b); 101.129(a); 101.401; 101.403; 101.405; 101.407; 101.409; 101.411; and 101.413. Additionally, provisions contained in Part 1 set forth general rules for development licenses issued in these rule parts. See 47 C.F.R. §§ 1.913(a)(1); 1.981; and 1.2003.

²⁶ See *NPRM*, 25 FCC Rcd 16574-75, at paras. 77-79.

²⁷ See *NPRM*, 25 FCC Rcd 16575, at para. 78.

²⁸ For example, Liberty Media Corporation (Liberty) filed a series of applications to transfer *de jure* control of Sirius XM Radio, Inc. in the summer of 2012. As part of that transaction, Liberty also filed applications to transfer control of Wireless Telecommunications Bureau Licenses and Experimental Licenses. The Commission granted consent for the transfer of control on January 3, 2013 (See Sirius XM Radio, Inc., Transferor and Liberty Media Corporation, Transferee Applications for *De Jure* Control of Sirius XM Radio, Inc., IB Dkt. No. 12-282, *Order* (rel. Jan. 3, 2013). Transfer of control of experimental license WE2XSS was completed on January 4, 2013.

unnecessary restrictions on experimental license operations, we note that Lockheed Martin offers no specific suggestions on which we can take action. However, we believe that our actions in this Report and Order to provide for new program experimental licenses will serve Lockheed Martin's stated recommendation to streamline our rules. In addition, we take many additional actions in this Report and Order based on specific comments to further streamline, simplify, and clarify the experimental licensing process.²⁹

B. Program Experimental Radio Licenses

20. *Background.* In the *NPRM*, the Commission noted that research institutions already use its experimental licensing program to deliver impressive results, but that its existing experimental rules are not always nimble enough to account for the speed of today's technological development. Currently, the rules allow for an experimenter to apply for a conventional experimental license to cover a single or several closely related experiments for 2-5 year periods with options for renewals for up to 5 years.³⁰ Any qualified company or individual, including students, may apply for a license, and experiments cannot begin until the Commission grants the license.³¹ These conventional experimental licenses are characterized by a narrowly defined purpose and specific limitations on frequencies, emissions, and power levels. If, during the course of experimentation, a licensee determines that it would be better served by conducting experiments using parameters that would differ from what was authorized, the licensee must often request a modified or new license before exploring a new line of experimentation. This process can delay the introduction of new technologies into the marketplace and may prevent the American public from expeditiously taking advantage of technological advances.³²

21. In pursuit of a process that could keep pace with innovation, the Commission proposed in the *NPRM* to establish a new type of experimental license – a program license – under which qualified institutions would be permitted to conduct an ongoing program of research and experimentation under a single experimental authorization for a five year period on a non-interference basis without having to obtain prior authorization for each distinct experiment or series of unrelated experiments.³³ The Commission's intent was to allow experimentation with limited constraints, and it proposed few requirements for these program licenses beyond a provision for public notice prior to each experiment and an obligation to report results at the conclusion of each experiment. Its proposal was designed to establish a balance that allows organizations the greatest level of flexibility to experiment – particularly in high-value frequency bands that may host the newest generation of consumer devices and applications – in order to unlock enormous economic and social benefits, while respecting the fundamental principle that experiments must be designed to avoid harmful interference to existing services.

22. In the *NPRM*, the Commission proposed to establish three different types of program licenses and further proposed that eligibility for each would require applicants to demonstrate basic expertise in radio management.³⁴ First, it proposed a research program experimental radio license under which colleges, universities, and non-profit research organizations would be permitted to use a broad range of radio frequencies for research and experimentation. It proposed to restrict the research program experimental license to Accreditation Board for Engineering and Technology (ABET) colleges or

²⁹ See Section III.F, *infra*.

³⁰ See 47 C.F.R. § 5.71(a).

³¹ See 47 C.F.R. §§ 5.51 and 5.89.

³² See *NPRM*, 25 FCC Rcd 16549-51, at paras. 15-17.

³³ *Id.*, 25 FCC Rcd 16548, at para. 12.

³⁴ *Id.*, 25 FCC Rcd 16548-49, at para. 12; 16560, at para. 41; and 16564, at para. 50.

universities with graduate research programs or existing industry partnerships and a defined geographic location, or to nationally recognized non-profit research laboratories with a defined geographic location. The Commission reasoned that these institutions typically have a record of generating the types of innovations and technological breakthroughs that it seeks to foster, and argued that this new license option would provide more flexibility to accelerate the rate of these innovations. It proposed to restrict all research experiments to the grounds of the license holder's location and to require that licensees have institutional processes to monitor and effectively manage a wide variety of research projects.³⁵

23. Second, the Commission proposed to establish a medical program experimental radio license, available to hospitals and other health care institutions, to expedite the process by which medical equipment is approved under its equipment authorization procedures, eliminate the need to obtain multiple experimental licenses, and encourage the creation of test-beds for medical device innovation. It proposed that this license would be limited to experiments for therapeutic and diagnostic medical equipment designed to comply with the Commission's Rules for such equipment. It noted that the Food and Drug Administration's (FDA) investigational device exemption (IDE) may be applicable when these experiments involve patients.³⁶ In this regard, the Commission noted that the FDA in consultation with the Commission is exploring approaches to streamline IDEs for wireless medical devices, when an IDE is required. The Commission proposed that the medical program experimental license be supervised by it, in consultation with the FDA, to ensure that patient safety is considered, and noted that the new program is not intended to replace the FDA's existing oversight and review programs.³⁷

24. Finally, the Commission proposed an innovation zone experimental radio license to provide greater opportunities for testing and experimentation in specified geographic locations with pre-authorized boundary conditions. It envisioned that such zones, which could include isolated or protected areas, could become havens for enterprise and innovation because they would permit experimenters to explore a variety of technologies with reduced barriers to entry. Its proposal to establish an innovation zone program license was intended to complement its research program license proposal by making a carefully restricted set of locations available to foster robust wireless engineering experimentation and development, but with different eligibility and use restrictions. Specifically, the Commission's proposal stated that innovation zone licensees did not necessarily have to be associated with a college, university, or nonprofit research organization. The Commission further proposed to permit operations over large areas that are available for use by multiple parties, and proposed to prohibit use by a single entity at an exclusive-use facility (such as within the grounds of a large manufacturer's plant).³⁸

25. *Comments.* Commenters were virtually unanimous in supporting the establishment of program experimental licenses as a way to promote innovation by increasing opportunities for experimentation.³⁹ While a number of commenting parties expressed concern about operation of program

³⁵ *Id.*, 25 FCC Rcd 16551-52, at paras. 20-22.

³⁶ An approved IDE permits a device that otherwise would be required to comply with a performance standard or to have premarket approval to be shipped lawfully for the purpose of conducting investigations of that device. *See* 21 C.F.R. § 812.1. IDE procedures are not applicable when testing or experimentation is done in a laboratory setting where patients are not exposed to RF energy.

³⁷ *See NPRM*, 25 FCC Rcd 16563-64, at para. 48.

³⁸ *Id.*, 25 FCC Rcd 16560, at para. 41.

³⁹ *See* Boeing Comments to *NPRM* at 1, 4 (program licenses would support the Commission's overarching goal of promoting innovation and efficient spectrum use); TechAmerica Comments to *NPRM* at 3 (program experimental licenses can foster robust levels of experimentation); SIA Comments to *NPRM* at 3 (program license would accommodate the explosive growth in innovation in telecommunications services by addressing the need for new, (continued....))

experimental licenses in certain bands,⁴⁰ none recommended that we decline to adopt rules creating this new type of license. AT&T Inc. (AT&T) recommends a measured approach, asking that the Commission consider adopting a pilot program, in which we would grant new research licenses to a limited number of institutions and then evaluate the program before expanding its scope.⁴¹

26. Many commenters suggested extending eligibility for research experimental program licenses beyond colleges, universities and non-profit research institutions, and no parties argue against expanding eligibility. The Boeing Company (Boeing) recommends that the Commission extend the availability of research program experimental authority to any proven testing entity that can demonstrate to our Office of Engineering and Technology (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.⁴² Cisco Systems, Inc. (Cisco) notes that development of radio technology includes both commercial and academic activities. It argues that streamlining the work of corporate scientists, by providing a geographic-based authorization, would be beneficial to radio innovation and help ensure that U.S. industry remains at the forefront of the mobile Internet.⁴³ Similarly, Q-Track Corporation (Q-Track) contends that a persuasive case can be made that industrial research is the prime mover of advances in wireless technology and recommends that the research experimental license be made available to all researchers without discriminating based on those researchers' affiliations.⁴⁴ The Telecommunications Industry Association (TIA) states that for-profit entities face the same burdensome and inefficient process of applying for multiple licenses as do non-profit entities, and contends that the majority of advances in technology have occurred in the private sector.⁴⁵

27. Mayo Clinic (Mayo) argues that it is in a unique position, as it can be considered a medical institution as well as a manufacturer and developer, and could be eligible for both research and medical program licenses. To that end, Mayo requests clarification of the definition of "nationally recognized non-profit research laboratories," stating that it employs engineering staff who were trained in ABET-accredited university programs, and is unclear whether that means that it would qualify for a research experimental program license as a nationally recognized non-profit research laboratory; *i.e.*, Mayo inquires whether the *NPRM*'s proposal limits eligibility to Federally funded research and

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less rigid means of conducting tests); CTIA Comments to *NPRM* at 2 (program license would provide additional experimentation flexibility).

⁴⁰ See AT&T Comments to *NPRM* at 4 (although the *Notice*'s proposed rules may adequately protect non-CMRS licensees, the protections afforded to CMRS licensees are severely deficient); SIA Comments to *NPRM* at 16 (the Commission's proposed experimental frequency range is over-inclusive, in that it overlooks certain bands, in addition to the public safety bands, that require protection at all times. These bands include designated safety-of-life related services (*e.g.*, aviation, AMS(R)S, and radionavigation-satellite service); Verizon Wireless Reply Comments to *NPRM* at 1-2 (the Commission should, at a minimum amend the proposed rules to issue experimental authorizations in CMRS spectrum only if CMRS licensees expressly consent); V-COMM LLC Comments to *NPRM* at 4 (universities, research organizations, and health care facilities should not utilize licensed CMRS spectrum to conduct unproven radio experiments, which can result in harmful interference to incumbent CMRS services); Wireless Communications Industry Association Comments to *NPRM* at 9 (even if the Commission does not adopt for all bands the adjustments WCAI proposes above, it should adopt them for mobile and public safety bands.)

⁴¹ See AT&T Comments to *NPRM* at 6-7.

⁴² See Boeing Comments to *NPRM* at 4-5. See also Lockheed Martin Corporation Reply Comments to *NPRM* at 7-8.

⁴³ See Cisco Comments to *NPRM* at 2.

⁴⁴ See Q-Track Comments to *NPRM* at 2.

⁴⁵ See TIA Comments to *NPRM* at 4.

development centers.⁴⁶ Mayo also recommends that, for medical institutions that conduct experiments over multiple facilities in varying geographic regions, a single research license should apply to that institution, as opposed to the license applying only to a single facility of that institution. Mayo contends that this arrangement would permit the institution's central engineering services to be spread across individual locations, and that coordination with potentially-affected spectrum users by the institution's local engineers should be sufficient to avoid interference to those users.⁴⁷

28. In addition to supporting the Commission's proposal to create a research program experimental license, commenters also support the proposal to establish a medical experimental radio license. Mayo states that – of the three new experimental program licenses proposed – the medical license supports technology development activities at the individual patient-worn medical device level, but that to enable complete system level testing, components of the innovation zone program license would be required so that testing could take place at multiple locations, such as the licensee's facility and individual homes and continuing care facilities.⁴⁸ The mHealth Regulatory Coalition (mHealth) observes that establishing a medical program license to conduct appropriate and necessary interoperability and RF immunity testing may complement the FDA's IDE process.⁴⁹ Medtronic, Inc. (Medtronic) cautions that, while the goal of improving the speed of issuance of medical research licenses through consultation between the Commission and the FDA is commendable, the two agencies should first issue clear guidelines as to what their respective separate responsibilities are in the application, review, and approval processes.⁵⁰

29. Comments were mixed on the innovation zone license proposal. Commenters offered differing views on where innovation zones should be located and who should be eligible for such a license. Boeing states that such authorizations should be permitted within the confines of exclusive-use facilities, such as manufacturing plants.⁵¹ SIA contends that, not only would permitting entities to secure innovation zone licenses covering exclusive-use facilities foster experimentation, but that relaxing that eligibility requirement would also more efficiently further U.S. policy objectives without jeopardizing national security.⁵² Nikolaus Leggett (Leggett) recommends that we consider the potential of urban zones, as well as innovation zones that are in more remote and isolated regions.⁵³ Engineers for the

⁴⁶ See Mayo Comments to *NPRM* at 3, 5.

⁴⁷ *Id.* at 4-5.

⁴⁸ *Id.* at 3.

⁴⁹ See mHealth Comments to *NPRM* at 1.

⁵⁰ See Medtronic Comments to *NPRM* at 1-5. Medtronic recommends that the process for review and approval of the FDA's IDE remain exclusively with the FDA, and that the agencies delineate the responsibilities for risk management oversight so there will be no duplication and/or potentially conflicting opinions.

⁵¹ See Boeing Comments to *NPRM* at 6-10. Boeing argues that the location restrictions inherent in the innovation zone proposal provide enough safeguards against harmful interference such that restricting the pool of eligible licensees is unnecessary.

⁵² See SIA Comments to *NPRM* at 17-18. SIA argues that, during the development stage of a new product or technology, most – if not all – private entities seek to design and test new wireless products and services on a proprietary basis, including the testing of defense and military related technologies, and that a failure to maintain the confidentiality of a new product or technology could eliminate a company's ability to secure a patent for that technology once it is developed.

⁵³ See Leggett Reply Comments to *NPRM* at 2. For example, Leggett argues, an urban zone could be established within the city of Detroit, Michigan to attract communications development activity to that city. Leggett acknowledges that an urban zone would have more interference issues than innovation zones in remote areas, but argues that the scope of an urban zone could be more limited than an innovation zone.

Integrity of Broadcast Auxiliary Spectrum (EIBASS) recommends that we decide on a case-by-case basis what constitutes a sufficiently isolated area because such a determination involves a complex combination of geographic location, terrain isolation, frequency bands, and population density.⁵⁴ The National Radio Astronomy Observatory (Observatory) requests that the Commission not establish innovation zones in areas where radio astronomy operations in any portion of the frequency spectrum could be impacted.⁵⁵

30. Several commenters expressed concern that operations in an innovation zone could cause interference to authorized spectrum users. V-COMM, LLC (V-Comm) recommends that innovation zone licenses be designated for non-auctioned or unlicensed spectrum bands only.⁵⁶ ARRL – The National Association for Amateur Radio (ARRL) contends that many bands allocated for the Amateur Radio service are unsuitable for experimentation and inclusion in an unregulated innovation zone because they are utilized ubiquitously and on a frequency agile, rather than a channel assignment, basis.⁵⁷ CTIA recommends that the Commission hold all innovation zone experimental licensees accountable for their use and that it require licensees to provide detailed information in license applications and reporting before, during, and after testing.⁵⁸ Finally, Marcus Spectrum Solutions, LLC. (Marcus) proposes that the Commission work with the National Telecommunications and Information Administration (NTIA) to determine areas of the country where Federal bands, particularly those identified for transfer to non-Federal licensing, are not wholly or partially in use and can be designated as innovation zones.⁵⁹

31. *Decision.* We find that adding rules for a program experimental license will augment the existing experimental radio license program by affording new options for experimentation that will reduce regulatory delay and uncertainty and promote innovation. We will continue to issue conventional experimental licenses under existing rules, but we also will have the ability to authorize ongoing experimentation and research for qualified applicants under a program license. There are significant differences between conventional and program experimental licenses, thus enabling the Commission to satisfy different needs. In this section, we describe the new program experimental license in general terms, and compare it to the conventional experimental license that is already permitted under our rules.

32. A conventional experimental license authorizes a narrowly defined single experiment or several closely related experiments, including product and market trials, which are discussed in more detail below. Any qualified company or individual, including students, may apply for a conventional experimental license, and experiments cannot begin until the Commission grants the license. The Commission may permit experiments to be conducted in certain restricted frequency bands on a case-by-case basis.⁶⁰ These licenses may be limited to a defined geographic area, but such limitation is not required. The Commission in its discretion and on a case-by-case basis may require that the licensee submit a report on the results of its experimentation, and applicants and licensees can request confidential treatment of information that they file with the Commission.

⁵⁴ See EIBASS Comments to *NPRM* at 10.

⁵⁵ See Observatory Comments to *NPRM* at 2.

⁵⁶ See V-Comm Comments to *NPRM* at 12.

⁵⁷ See ARRL Comments to *NPRM* at 15.

⁵⁸ See CTIA Comments to *NPRM* at 11-12. For example, the Commission should maintain a record of experimentation by requiring licensees to submit applications outlining the parameters of each experiment and to file reports specifying the results of each experiment.

⁵⁹ See Marcus Comments to *NPRM* at 11.

⁶⁰ The restricted bands are listed at 47 C.F.R. § 15.205.

33. We are adopting rules for program licenses that differ somewhat from the proposals in the *NPRM* based on comments to the *NPRM* and our further evaluation. As an initial matter, we are reducing the categories of program licenses from research, medical, and innovation zones to a single category encompassing all program experimental radio licenses. The rules that we adopt incorporate, to a large extent, the proposals for research and medical program licenses, but not the proposal for the innovation zone program license. We believe, upon further reflection, that distinguishing separate licenses for general research and medical research is unnecessary. Instead, we are creating a single program experimental license to encompass all basic research and experimentation. Thus, basic medical research and experimentation conducted by a hospital or health care institution that does not involve “clinical trials”⁶¹ will be covered by the program experimental license, and we are creating a separate medical testing license for those experiments that do involve clinical trials – *see* Section III.D., *infra*. Mayo’s comments highlight the fact that there are two types of medical experiments – those involving basic research and those involving real-world patient testing. Moreover, medical experiments that involve patient testing generally require FDA participation. Thus, we find it more logical and administratively convenient to treat basic medical device research experiments under the program experimental license.⁶² In response to Medtronic’s concerns, we do not believe that the issuance of further guidelines about the Commission’s and FDA’s respective roles in the application, review, and approval processes should serve as a precondition to or otherwise keep us from adopting the proposed rules. We have an ongoing coordination process in place with FDA regarding medical radiocommunication device matters,⁶³ and will continue our practice of releasing advice and information as it becomes available. Licensees seeking to test medical devices who have specific questions about the respective roles of the Commission and FDA regarding a planned course of experimentation should continue to raise these matters directly with staff at the respective agencies. Also, in consideration of the comments and upon further analysis, we are adopting rules that will enable us to create innovation zones, but we will not create a specific innovation zone program license as proposed. Instead we will periodically designate areas as innovation zones for specific experimentation, as described below.

34. The basic framework for a program license differs from a conventional license in several significant ways. A program license will permit innovators to conduct any number of unrelated experiments at defined geographic locations under the licensee’s control. Licensees will be able to conduct experiments within a broad range of frequencies, emissions and power levels to support ongoing research. These licenses will be issued for a 5-year term and may be renewed for additional 5-year periods. Eligibility will be limited to certain categories of researchers, as discussed below. Licensees will be required to provide public notice of individual experiments before they are initiated and the results of those experiments after they are concluded. With limited exceptions, experimentation will not be permitted in restricted frequency bands. We discuss all of the requirements for program licenses in detail below.

35. We believe that a program license will provide a more efficient way for many qualified institutions to conduct cutting-edge research and experimentation and accelerate innovation in RF technology to more quickly transform ideas into important new consumer products and services. The new license will offer experimenters a wide range of flexibility to design their experiments and to change

⁶¹ In the context of this proceeding, clinical trials are experiments that are designed to evaluate the effectiveness and safety of medical devices that transmit via RF energy information regarding a patient’s condition, such as his/her vital signs.

⁶² We address Mayo’s concern regarding clinical testing outside of medical campuses in Section III.D, *infra*.

⁶³ *See, e.g.*, Joint Statement on Wireless Medical Devices (FDA and FCC, July 26, 2010) (available at http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-300200A1.doc). We also note that we coordinated a draft of this Report and Order with FDA.

course with respect to frequencies, emissions, and power – subject to certain limitations – as experimenters conduct their research. We believe that establishing such a license will more closely align our rules with the iterative nature of the learning and discovery process that occurs in laboratories today. Further, we note that this addition to our experimental licensing program will more closely align it with other licensing regimes within the Commission that have moved to a more flexible structure.⁶⁴ Experimenters taking advantage of this new option will now be free to follow their research wherever it leads (subject to the basic tenets of the overall experimental license framework, such as not causing harmful interference and operating within the scope of the authorization). This should substantially reduce how often they need to engage the Commission to seek permission to make changes to a preconceived course of experimentation.

36. We emphasize that this new license will build on our existing experimental license structure, rather than replace it. As with existing experimental licenses, the Commission may, at its discretion, place special conditions on program experimental licenses to ensure that a licensee conducts its experimental program in a manner that ensures that no harmful interference is caused to existing licensees and Federal Government operations as authorized by NTIA. We could, for example, require that experiments be restricted to a specified portion of the program licensee's research campus or conducted during specified hours; require additional coordination for experiments that exceed a certain power level, operate outdoors, or operate on a specific frequency band; or impose additional notification requirements for the first set of experiments that a new licensee conducts under its program experimental license. We emphasize that such conditions, when imposed, will be narrowly tailored to address specific potential concerns we identify and that a program experimental licensee will be afforded the freedom to design and conduct a wide range of experiments under the terms of its license.

37. Individuals and institutions that do not qualify for our new program experimental licenses may still apply for conventional experimental licenses. Additionally, institutions that do qualify may nonetheless choose to apply for conventional experimental licenses in certain instances – such as when the particular experiment that they wish to undertake is not permitted under the program experimental license rules.⁶⁵ We find that by providing both conventional experimental license and program experimental license opportunities, we will provide greater flexibility to experimenters and promote greater levels of experimentation that will serve the public interest by spurring innovation, creating new products and services, and ultimately leading to the creation of new jobs. Further, we find that under the program license, licensees conducting consecutive experiments will accrue cost savings by filing fewer applications and having the ability to begin their experiments in a timelier manner. Thus, we find that for these licensees the program license will be more efficient than obtaining multiple conventional licenses. These efficiencies should also result in faster service for the remaining conventional license applicants. Accordingly creating a new program experimental license could provide significant public benefits at little or no cost, and so we herein adopt that proposal, as modified. As proposed, the rules for this license will be contained in a new subpart E within Part 5 of the Commission's Rules.

38. Under the rules we adopt, conventional experimental licenses and program experimental licenses will co-exist under our general experimental licensing framework. BAE Systems Information and Electronic Systems Integration Inc. (BAE) requests that we adopt rules to address how existing conventional experimental licenses authorizing operations at specific geographic locations would be

⁶⁴ For example, licenses for commercial mobile radio services generally allow licensees to operate mobile and/or fixed stations under a single license; *see, e.g.* 47 C.F.R. § 22.901, pertaining to cellular radio systems. Similarly, the Commission's Rules allow licensees in certain satellite bands to operate ancillary terrestrial service under their satellite licenses; *see* 47 C.F.R. §§ 25.252-25.254.

⁶⁵ For example, a conventional experimental license would be needed if an environmental assessment is required. *See* para. 90, *infra*.

impacted by newly granted research licenses authorizing operations at those same locations. BAE suggests that the Commission specify that a conventional license could be renewed provided that the parameters of that license do not overlap with the new research license.⁶⁶ We disagree with BAE's recommendation and see no need to implement such rules. We observe that experimental radio licenses do not convey any exclusive spectrum rights, and often different conventional experimental licensees have conducted experiments in the same general area on a non-interference basis. If an interference problem is anticipated between an existing conventional experimental licensee and a new program experimental licensee, we see no reason why this cannot be resolved by the parties, just as is the case at present between two conventional experimental licensees.⁶⁷

39. Research institutions have made important discoveries via our existing experimental licensing program, and we foresee even greater potential under our new license. We conclude that a research program experimental license has significant potential to advance the state-of-the-art in communications research and applied development, including medical research, thus enhancing economic and social welfare. However, upon consideration of the record in this proceeding and further reflection regarding the fundamental nature of the research program license, we are making certain modifications to the proposal to better align the final rules to expand eligibility and the types of experimentation that will be encompassed.

1. Eligibility

40. Based on the record and our decision to define a program license as one that supports all types of basic RF research, including medical research, we conclude that it is appropriate to expand the scope of eligibility for program experimental licenses beyond what was proposed in the *NPRM*. Thus, program experimental licenses may be granted to the following qualified entities: a college or university with a graduate research program in engineering that is accredited by ABET; a research laboratory; a hospital or health care institution; a manufacturer of radio frequency equipment; or a manufacturer that integrates RF equipment into its end products. This expanded eligibility will permit enhanced public benefits by significantly expanding the scope of RF research with no public costs.

41. Many commenters argued that the *NPRM's* proposal was too limited by, for example, its focus on colleges, universities, and non-profit research institutions.⁶⁸ We agree. The Commission's rationale in the *NPRM* for limited eligibility was that it would hasten testing efforts prior to final approval and marketing of new RF devices. However, we now conclude that, by expanding eligibility under a revised program experimental license structure, we will help expedite the development of devices regardless of the setting in which the development takes place. As several commenters observe, development of radio technology includes both commercial and academic activities, and the number of corporate facilities located in the United States where radio experimentation occurs is limited. Therefore, while the *NPRM* proposed to exclude all manufacturers from eligibility for research program licenses, we will permit manufacturers that have demonstrated expertise in radio spectrum management⁶⁹ to hold such licenses under our revised program license structure. By expanding program license eligibility in this

⁶⁶ See BAE Comments to *NPRM* at 8-9.

⁶⁷ For example, licensees can reach agreements such that they aim their antennas away from each other or transmit at different times. In addition, we note that if parties are unable to reach agreement among themselves they may contact the Commission, which would then be the final arbiter of any dispute.

⁶⁸ See AT&T Comments to *NPRM* at 9; Cisco Comments to *NPRM* at 2; Q-Track Comments to *NPRM* at 2; SIA Comments to *NPRM* at 9; and TIA Comments to *NPRM* at 4.

⁶⁹ This includes non-federal as well as federal operations, as necessary for the frequency band(s) under consideration for experimentation.

manner, we can expand the level of experimentation beyond what would have been possible under the *NPRM*'s proposal.

42. Regarding Mayo's question of whether the *NPRM*'s proposal to include eligibility for nationally recognized non-profit research laboratories limits eligibility to Federally funded research and development centers or whether it includes other non-profit institutions that have engineering staff that were trained at ABET-accredited university programs, we are modifying the *NPRM*'s proposal to permit any qualified research laboratory to be eligible for a program license. Our goal is to enable a wide variety of laboratories to take advantage of the flexibility we are providing. As with manufacturers, these labs must possess demonstrated ability to manage projects involving RF technology and will be subject to the same certification requirement that we mandated above for manufacturers. We recognize that some institutions may not be well versed in Commission rules or spectrum management issues and may have to collaborate with another entity to develop new devices once a specific need is identified. We will allow such arrangements so long as they are clearly articulated with the application. In addition, we remind interested parties that ultimate responsibility for operations under a license grant remains with the licensee, whether it possesses the requisite expertise itself or partners with an entity for such services.⁷⁰ This action will expand the eligibility of program licenses beyond those for which we originally proposed and allow more institutions to take advantage of these licenses to develop innovative devices and applications for the public benefit.

43. We emphasize that under the eligibility rules we adopt, we will limit program experimental licensees to those entities that have demonstrated experience with RF technology (or have partnered with an entity possessing the requisite expertise) and have defined geographic areas. By so doing, program experiments will be unlikely to cause harmful interference to incumbent spectrum licensees, but if that should inadvertently occur, the experimenter will be able to quickly remedy it. To ensure that this condition is met, we will require each applicant for a program license to accompany its application with an explanation of how its staff possesses the expertise with RF technology to supervise all experiments to achieve compliance with this condition, and to so certify in its application.

44. We find it unnecessary to take the step recommended by AT&T of requiring a pilot program before making experimental program licenses widely available. The certification requirements that we are imposing are an appropriate method for ensuring that program licensees do not cause harmful interference to service licensees. The Commission has used similar application certifications in the past to ensure compliance with certain requirements, and we conclude that this approach is suitable here.⁷¹ In this regard, we note that the Communications Act provides for the Commission to impose penalties, including fines, license revocation, and preclusion from obtaining future Commission licenses on applicants who willfully provide false statements on application forms.⁷²

45. Applicants for program experimental licenses must apply on FCC Form 442 ("Application For New Or Modified Radio Station Authorization Under Part 5 Of FCC Rules - Experimental Radio Service (Other Than Broadcast)"). We are revising this form to include not only

⁷⁰ In the case of medical test-beds, we believe it would provide administrative simplicity for the institution sponsoring the test-bed to obtain the experimental license, so that it could easily test multiple devices under identical conditions. However, we also recognize that the sponsoring institution may be unwilling to take on the responsibility of ensuring that harmful interference is not caused to licensed spectrum users, and thus may decline to become a licensee.

⁷¹ For example, we note that FCC 601, "FCC Application for Radio Station Authorization: Wireless Telecommunications Bureau, Public Safety and Homeland Security Bureau," requires eight general certification statements; *see* .

⁷² *See* 47 U.S.C. §§ 312(a)(1) and 503.

conventional experimental licenses, but also program experimental licenses, medical testing experimental licenses, and compliance testing experimental licenses.⁷³ Each applicant for a program experimental license must specify how it meets the eligibility requirements for such a license, a certification of RF expertise or partnership with another entity possessing such expertise, the purpose of its proposed experimental program, and whether its research program includes federal frequencies, CMRS frequencies, public safety frequencies or medical testing. We note that program experimental licenses may not be transferred without Commission approval.⁷⁴ Additionally, applications must specify, and the Commission will grant authorizations for, a geographic area that is inclusive of an institution's real-property facilities where the experimentation will be conducted and that is under the applicant's control. If an applicant needs to conduct experiments in more than one defined geographic area, it must apply for a license for each location. We are not persuaded by Mayo's recommendation that a single license should be available for medical institutions that conduct experiments over multiple facilities in varying geographic regions. We conclude that because interference issues are unique to each area,⁷⁵ the limitation on the geographic scope of a program experimental license provides an appropriate way for the Commission to take these factors into account within the licensing process.

46. We believe that this approach is well tailored for the experimental program license concept. Unlike a conventional experimental license application, which can be filed by any party and is subject to case-by-case analysis, a test planned under the authority of a program license will be conducted by a licensee whose qualifications have already been reviewed by the Commission. This entity will have already committed to design and conduct experimental testing in a way that will not cause harmful interference, and risks revocation of its license and other Commission sanctions if it fails to do so.

2. General License Requirements

47. In the *NPRM*, the Commission made a number of proposals relating to operating parameters of program experimental licenses. Many of those proposals followed directly from requirements already in place for conventional experimental licenses. First, the Commission proposed that: (1) program licenses be granted for five year, renewable terms;⁷⁶ (2) it have the authority to prohibit or require modification of specific experiments at any time without notice or hearing, if in its discretion the need for such action arises;⁷⁷ and (3) all experiments must be conducted on a non-interference basis to primary and secondary licensees, and that the licensee must take all necessary technical and operational steps to avoid harmful interference to authorized services.⁷⁸ Commenters strongly support all of these proposals, and we adopt them.

48. Additionally, the Commission proposed that within 30 days after completion of each experiment, the licensee must file a narrative statement describing its results, including any interference incidents and steps taken to resolve them.⁷⁹ It further proposed that, before conducting tests, a licensee must evaluate the propagation characteristics of the frequencies to be used in individual experiments, the

⁷³ Compliance testing experimental licenses are discussed in Section III.C., *infra*.

⁷⁴ See 47 C.F.R. § 5.79.

⁷⁵ The potential to cause interference is a function of many factors including: geography, frequency, technical parameters such as power and bandwidth, and proximity of other licensees.

⁷⁶ See *NPRM*, 25 FCC Rcd 16557, at para. 35; 16562, at para. 44; and 16565, at para. 53.

⁷⁷ *Id.*, 25 FCC Rcd 16597, at § 5.83(b).

⁷⁸ *Id.*, 25 FCC Rcd 16553-54, at para. 25. Section 333 of the Communications Act, as amended, prohibits willful or malicious interference to authorized services. See 47 U.S.C. § 333.

⁷⁹ *Id.*, 25 FCC Rcd 16607, at § 5.309(d).

operational nature of the services normally operating on those and nearby frequencies, and the specific operations listed within the Commission's licensing databases.⁸⁰ The Commission noted that online tools, such as its General Menu Reports system, which allows users to search many different Commission licensing databases from one place, could facilitate these tasks. Moreover, it proposed that experiments be designed to use the minimum power necessary and be restricted to the smallest practicable area needed to accomplish the experiment's goals, *e.g.*, an individual laboratory, specific building, or designated portion of a campus. The Commission observed that experimenters may also choose to reduce the frequencies used, restrict the time of use, limit the duration of tests, or employ other means to address potential interference concerns. Finally, the Commission proposed to require that all experiments comply with its existing experimental rules involving matters such as protected geographic areas and antenna structure placement.⁸¹ All of these proposals found support in the record, and we are also adopting them.

49. In the *NPRM*, the Commission noted that its existing experimental licensing rules requires a licensee to transmit the licensee's assigned call sign unless that call sign has been specifically exempted by the terms of the licensee's station authorization.⁸² The Commission therefore proposed to require that tests conducted under the authority of a research license either transmit station identification as part of the broadcast or provide detailed testing information (such as starting time and duration) via a web-based reporting portal, and proposed to require the communication of information that is sufficient to identify the license holder and the geographic coordinates of the station. As stated in the *NPRM*, this requirement is important for mitigating interference, should an authorized service licensee receive any.⁸³ The only commenter that addressed this issue was Mayo, who stated that station identification requirements must address the necessity to protect patient confidential information in medical testing experiments.⁸⁴ We conclude that the proposal to require station identification or testing disclosure is sufficiently flexible to accommodate patient confidentiality in the medical context. In most cases, the testing information that must be disclosed – parameters like starting time and duration – would not implicate patient confidential information, and geographic information would likely identify a healthcare facility's campus broadly as opposed to a specific individual's location. As such, we adopt the proposal to require that tests conducted under the authority of a research license either transmit station identification as part of the broadcast or provide detailed testing information on the Commission's program experimental registration website.⁸⁵ To the extent that a research program licensee believes that a particular test scenario creates a conflict between the requirement to provide detailed testing information and the necessity to protect patient confidential information, we encourage the licensee to first discuss the matter with Commission staff and the U.S. Department of Health and Human Services. If the licensee concludes that the information it must disclose would jeopardize the confidentiality of patient information, the licensee should then consider pursuing that particular test under our conventional experimental licensing procedures. We find that our general program experimental rules will provide a public benefit at minimal cost by ensuring that program experiments can be undertaken on a non-interference basis to incumbent operations, while protecting the confidentiality of medical information.

⁸⁰ Access to these services is made available via the Internet and other sources on the Commission website at <http://www.fcc.gov>.

⁸¹ See *NPRM*, 25 FCC Rcd 16553-54, at para. 25.

⁸² See 47 C.F.R. § 5.115.

⁸³ See *NPRM*, 25 FCC Rcd 16554, at para. 25.

⁸⁴ See Mayo Comments to *NPRM* at 6.

⁸⁵ We will issue Public Notices with specific information pertaining to the location and use of the registration website as we progress with its development.

3. Operating Frequencies and Additional Requirements Related to Safety of the Public

50. In the *NPRM*, the Commission proposed that program experimental licensees be permitted to operate in any frequency band, except in bands exclusively allocated to passive services (as are conventional experimental licensees) or in certain restricted bands. More specifically, it proposed that program licensees – unlike conventional experimental licensees – would not be permitted to operate on the restricted band frequencies that are listed in Section 15.205(a) of the Commission’s Rules,⁸⁶ except that they would be permitted to operate in frequency bands above 38.6 GHz unless they are listed in footnote US246 of the Table of Frequency Allocations.⁸⁷ Except for these restrictions, the Commission proposed that program licensees be permitted to conduct experiments on all other frequencies, as are conventional licensees, and thus have access to the largest range of frequencies practical to enable a broad range of experimentation.⁸⁸ However, for experiments that may affect bands used for the provision of commercial mobile services, emergency notifications, or public safety purposes, the Commission proposed that the program experimental radio licensee develop a specific plan to avoid interference to these bands, prior to commencing operation, including providing:

- (a) notice to parties, including other Commission licensees and end users, who might be affected by the experiment;
- (b) provisions for the quick identification and elimination of any harm the experiment may cause; and
- (c) an alternate means for accomplishing potentially affected vital public safety functions during the experiment.⁸⁹

The Commission proposed applying these provisions to all experiments that implicate these critical service bands (*i.e.* bands used for the provision of commercial mobile services, emergency notifications, or public safety purposes), and that they would be in addition to the notification requirements that apply to all program experimental licenses, which we discuss in Section III.B.4., below. As specific examples of the bands that would be subject to these special provisions, the Commission cited the Cellular Radiotelephone Service, broadband Personal Communications Service (PCS), the Advanced Wireless Service, and the 700 MHz band.⁹⁰

51. *Comments.* Many commenters were supportive of the *NPRM*’s frequency band proposals, and in some cases argue for additional flexibility. For example, Boeing recommends that program experimental licensees be permitted to use any spectrum, including the restricted bands listed in Section 15.205(a) of the Commission’s Rules and footnote US246 of the Table of Frequency Allocations, provided that they demonstrate that sufficient precautions have been taken to prevent harmful interference. Boeing further recommends that the process for securing Commission approval for operations in restricted or other highly sensitive spectrum bands be largely identical to the process that currently exists for conventional experimental licensees seeking to secure new or modified licenses. Boeing argues that most experimental operations are conducted at such low power levels and in such remote locations that they could not interfere with other networks.⁹¹ BAE argues that, while it is critical

⁸⁶ See 47 C.F.R. § 15.205(a). The rules allow only for spurious emissions in any of the restricted frequency bands.

⁸⁷ See 47 C.F.R. § 2.106, footnote US246.

⁸⁸ See *NPRM*, 25 FCC Rcd 16606, at § 5.303.

⁸⁹ *Id.*, 25 FCC Rcd 16607, at § 5.311.

⁹⁰ See *NPRM*, 25 FCC Rcd 16556, at para. 31.

⁹¹ See Boeing Comments to *NPRM* at 10-11.

to ensure that experimental operations do not cause interference to any licensed services, blanket prohibitions are not warranted. BAE maintains that, if service licensees are permitted to object to conventional experimental applications based on technical demonstrations of predicted interference, and if such objections are required to be resolved in a timely manner, there is no reason to prohibit, or require prior consent for, experimental operations on any licensed frequencies.⁹²

52. Other commenters suggest that the *NPRM*'s proposals did not go far enough in protecting services that they identify as critical or bands with unique interference concerns. For example, the Association of Public-Safety Communications Officials-International, Inc. (APCO) recommends that our final rules regarding program experimental licenses include safeguards against interference to public safety communications systems, just as they now do for conventional experimental licenses.⁹³ SIA maintains that experimentation within some bands should be evaluated on a case-by-case basis, such as bands including designated safety-of-life related services (*e.g.*, aviation, Aeronautical Mobile-Satellite (Route) Service, and radionavigation-satellite services) and bands where interference can be expected to have an impact far beyond the locale of the experiment and may be difficult to identify and precisely locate (*e.g.*, the Fixed-Satellite Service, Mobile-Satellite Service, Broadcasting-Satellite Service, and the meteorological satellite bands).⁹⁴ Similarly, ARRL expresses particular concern about interference from experiments in High-Frequency (HF) bands between 3 and 30 MHz which have worldwide propagation capabilities and potentially very large interference contours, and thus should be much more carefully regulated than bands that have a high re-use capacity, such as those above 40 GHz. ARRL also contends that, in some bands used by Amateur Radio operators at HF, VHF, UHF and microwave ranges, there are exceptionally weak-signal communications being conducted on an ongoing, daily basis which cannot tolerate co-channel experimental operation, even if not geographically co-located with experimental operations.⁹⁵

53. Several commenters contend that the rules need to provide measures to protect commercial mobile frequencies that are more expansive than the additional procedures we proposed in the *NPRM*. The Wireless Communications Association International (WCAI) and AT&T state that program experimental licenses would be problematic in mobile bands because of heavy consumer use of those bands – especially on university campuses – and because those bands provide vital services, such as E911. To avoid widespread disruption to critical consumer services in mobile bands, WCAI recommends that the Commission require advance consent of service licensees prior to experiments commencing at least for the following services: the Cellular Radiotelephone Service, broadband PCS, Advanced Wireless Services, 700/800 MHz wireless services, and Broadband Radio Service (BRS)/Educational Broadband Service (EBS).⁹⁶ AT&T supports the Commission's proposal to adopt special provisions where experiments would involve bands used to provide commercial mobile services, and recommends that, in areas where commercial mobile radio service (CMRS) licensees operate, experiments should be confined to set locations and not made mobile.⁹⁷ V-Comm argues that there should be a ban on experiments in

⁹² See BAE Reply Comments to *NPRM* at 15.

⁹³ See, *e.g.*, 47 C.F.R. § 5.85(d) which states, in part, that "Applicants in the Experimental Radio Service must avoid use of public safety frequencies except when a compelling showing can be made that use of such frequencies is in the public interest." APCO argues that the danger of harmful interference to public safety communications exists regardless of the nature of the experimental license. See APCO Comments to *NPRM* at 1-2.

⁹⁴ See SIA Comments to *NPRM* at 15-16.

⁹⁵ See ARRL Reply Comments to *NPRM* at 7-8.

⁹⁶ See WCAI Comments to *NPRM* at 4-9.

⁹⁷ See AT&T Comments to *NPRM* at 4-5 & nn. 9, 12 (citing the Commission's identification of the Cellular Radiotelephone Service, broadband PCS, AWS, and 700 MHz bands as examples of the implicated bands).

CMRS spectrum; otherwise, CMRS networks would have to avoid the use of channels on which experiments are being conducted to avoid experiencing losses in system capacity, reduced data throughputs, disruptions, and poor quality of service due to increases in noise and interference levels.⁹⁸ Clearwire Corporation (Clearwire) supports various measures to protect the incumbent licensees in the 2.5 GHz band using BRS and EBS spectrum where it provides mobile broadband services.⁹⁹

54. Verizon Wireless (Verizon) recommends that, in the heavily used licensed CMRS bands, any new rules explicitly require prior approval of a CMRS licensee before an experimental licensee may commence operations on CMRS spectrum.¹⁰⁰ Otherwise, in Verizon's view, we would be effectively requiring a CMRS licensee to share its spectrum, which would violate CMRS licensees' existing spectrum rights.¹⁰¹ Verizon makes a number of arguments to support its contention that allowing experimental licensees to operate in spectrum used for CMRS operations would violate the licensee's existing spectrum rights. In regard to spectrum bands that have been subject to auction, Verizon argues that the auction establishes a contract between the Commission and licensees which the Commission will unlawfully devalue and impair by granting experimental licensee's the right to operate in the spectrum without the licensee's consent.¹⁰² Verizon also claims that the proposed rules would amount to a modification of the CMRS spectrum licenses, which the Commission cannot do without complying with Section 316 of the Communications Act and, furthermore, that we cannot justify this modification under Section 316.¹⁰³ Verizon also argues that the Commission's actions in adopting the proposed rules would be arbitrary and capricious by fundamentally undermining CMRS licensees' rights to exclude others from operating on their licensed spectrum and to use their licensed spectrum to the maximum extent possible.¹⁰⁴ Furthermore, Verizon claims that adoption of the proposed experimental licensing rules would constitute an unconstitutional taking of CMRS licensees' property rights in violation of the Fifth Amendment.¹⁰⁵

55. Several commenters recommend that the Commission not exclude bands used in the provision of CMRS from program experiments. Virginia Polytechnic Institute and State University (Virginia Tech) maintains that, with proper safeguards, such as required coordination with CMRS licensees, it will be possible to conduct safe experimentation in those bands.¹⁰⁶ However, Virginia Tech recommends that the Commission require these licensees to respond to all requests for coordination within two weeks of notification by the experimenter, and that these licensees be permitted to reject consent only if they deem that there is a high likelihood of interference to their subscribers based on a full technical evaluation.¹⁰⁷ Boeing maintains that experimental operations have historically been permitted in CMRS spectrum bands and that, in some cases, licensees are required by law to utilize CMRS spectrum

⁹⁸ See V-Comm Comments to *NPRM* at 4-12.

⁹⁹ See Clearwire *Ex Parte* Filing, ET Docket No. 10-236, May 17, 2012.

¹⁰⁰ See Verizon Comments to *NPRM* at 3-4, 7-9.

¹⁰¹ *Id.* at 7-9.

¹⁰² *Id.* at 8-9.

¹⁰³ See Verizon Reply Comments to *NPRM* at 5.

¹⁰⁴ *Id.* at 6.

¹⁰⁵ *Id.* at 10-13. Verizon claims this taking of property qualifies as both a taking *per se* and a regulatory taking.

¹⁰⁶ See Virginia Tech Reply Comments to *NPRM* at 3-4. See also, AT&T comments to *NPRM* at 5.

¹⁰⁷ See Virginia Tech Reply Comments to *NPRM* at 3-4.

to perform certain testing activities. Boeing states that eligible entities can utilize the CMRS bands and still protect incumbents by establishing reasonable technical and operating requirements.¹⁰⁸

56. *Decision.* As an initial matter, we concur with APCO that, consistent with current rules, experimental licenses of all kinds should avoid use of public safety frequencies¹⁰⁹ except when a compelling showing can be made that use of such frequencies is in the public interest.¹¹⁰ On the other hand, we believe that SIA's concerns regarding interference to other services are unfounded. An examination of the frequency bands in Section 15.205 reveals that, generally, it is the safety-of-life services, including aviation services, and passive services that have been designated as restricted. Experimenters who desire to use these bands may still do so, but they must apply for a conventional experimental license and be subject to the case-by-case review inherent in that process. Thus, as proposed, the rules we adopt herein will not provide authority for program licensees to operate on specific public safety and passive frequency bands. Parties interested in conducting experiments on these restricted frequency bands must apply for a traditional conventional experimental license and provide the required showing.

57. Second, regarding Boeing's and BAE's appeal for additional flexibility by allowing experiments in the restricted bands at very low power with proper site selection, we do not believe that such a deviation from our proposal is warranted nor is there sufficient evidence to support allowing such experimentation under a program license at this time. Many of the operations in these bands are Federal and must be coordinated with NTIA through its Interdepartment Radio Advisory Committee. We note that we are not foreclosing experiments of the nature suggested by Boeing and BAE; rather, they can be accomplished using the current process of obtaining a conventional experimental license.

58. Third, regarding operation on other frequencies, including the bands used for critical services that we described in the *NPRM*, we concur with Virginia Tech and Boeing that, in general, program experiments can safely be performed in these bands, provided that a specific plan is developed to ensure no disruption to those services. Thus, we find no reason to bar program experiments in bands used by Amateur radio operators. Again, we appreciate the concern expressed by various licensees, but we reiterate that harmful interference caused by program license experiments to any licensed services is unacceptable and will not be countenanced.

59. For program license experiments that may affect critical service bands (*i.e.* bands used for the provision of commercial mobile services, emergency notifications, or public safety purposes), we adopt the Commission's proposal that the program licensee must develop a specific plan to avoid harmful interference to operations in these bands. For purposes of this requirement, we include the following bands used for the provision of various commercial mobile services (including broadband) – the Cellular Radio Service, Specialized Mobile Radio (SMR) service, broadband Personal Communications Service (PCS), Advanced Wireless Service (AWS), 700 MHz band, Broadband Radio Service (BRS)/Educational Broadband Service (EBS), and Wireless Communications Service in the 2.3 GHz band.¹¹¹ That plan must be developed by the program licensee prior to commencing an experiment, and provide notice to licensees

¹⁰⁸ See Boeing Reply Comments to *NPRM* at 2-4.

¹⁰⁹ Public safety services include “the radio communications of governmental entities and the following categories of activities: Medical services, rescue organizations, veterinarians, persons with disabilities, disaster relief organizations, school buses, beach patrols, establishments in isolated places, communications standby facilities, and emergency repair of public communications facilities.” See 47 C.F.R. § 90.15.

¹¹⁰ See 47 C.F.R. § 5.85(d).

¹¹¹ This list of services is illustrative only. Licensees must ensure that they comply with these rules, including for frequency bands which may be designated for commercial mobile services in the future.

and, as appropriate, to end users of the critical service bands who could potentially be affected by the experiment describing how the program licensee intends to quickly identify and eliminate any harm that the experiment may cause.¹¹² If the experiment may potentially impact safety of the public, the program licensee must specify how potentially affected public safety functions will be provided during the duration of the experiment. We will also require that, for these experiments, licensees supplement their web-based notifications described in Section III.B.4., *infra*, to include a list of the critical service licensees that operate in the affected bands in the geographic vicinity of the planned experiment. Doing so will serve as an effective check that the program experimental licensee has conducted sufficient research to meet the requirement that it has contacted all critical service licensees who might be affected by the experiment, and will aid us in evaluating whether the licensee is conducting its activities with the high level of rigor and diligence that we will demand under the program experimental license program.

60. We also conclude that it is not in the public interest to categorically prohibit or restrict experimentation in commercial mobile service bands, as suggested by V-Comm, Verizon, AT&T, and SIA, and we disagree with V-Comm that there should be an outright ban on experiments in these bands. We believe that it is desirable to support experimentation in all bands where it is practical, and observe that successful innovation in the commercial mobile service space has the potential to directly and immediately improve some of the most widespread and ubiquitous consumer services. Many entities are engaged in designing products specifically for these bands that are intended to work with various operators' systems, and eliminating the ability to experiment in this spectrum would remove one of the avenues available for such development. We also note that experimenters may often work with network providers to develop equipment, and adopting rules limiting such operations would not be to either party's benefit. This point is made by WCAI which states that "... existing licensees have an incentive to support harmless PERL [program experimental radio license] experiments because many radio experiments have the potential to enhance the operations of existing licensees."¹¹³ Further, we note that these bands are not restricted bands under Part 15, and experimenters in these bands can already test new designs and prototypes on that spectrum. We also disagree with V-Comm that CMRS providers would have to avoid the use of channels on which experiments are being conducted and with AT&T that experiments on CMRS spectrum be confined to set locations and not involve operation of mobile equipment. The rules stipulate that all experimentation is on a non-interference basis and that it is incumbent on all experimenters to ensure that they do not cause interference to service licensees' operations or risk fines and the possibility of license forfeiture. Moreover, while many experiments will be fixed, devices often are built for mobility, and we do not find it in the public interest to limit the ability of experimenters to fully test their devices. We further address the issues of coordination with these commercial mobile service licensees in the section below on notification requirements for program licensees.

61. Moreover, regarding Verizon's claims regarding violation of the legal rights of licensees of spectrum used to provide CMRS, its arguments rest on the assumption that these licensees have had an

¹¹² In this context, the notice to end users does not imply that we expect a program experimental licensee to contact every end user or subscriber of a CMRS or public safety system. Rather, the experimental licensee can contact the potentially affected Commission licensees who can act as an agent in this case on behalf of their subscribers or end users. Those licensees are in a position to determine if additional notification measures are warranted based on the specific parameters of the experiment. Or, in other cases, the program experimental licensee can take measures to ensure that specific end users are directly notified. For example, a university could use social media such as twitter or its texting or e-mail capability to send a message to faculty and students to alert them that a test will be in progress during certain times.

¹¹³ See WCAI Comments to *NPRM* at 4.

absolute right to exclude others from their spectrum. This assumption is invalid. The Commission has previously determined that permitting secondary use of spectrum is not a license modification.¹¹⁴ In addition, we point out that the Commission's existing experimental rules already permit secondary use of commercial mobile service spectrum by experimental licensees. As the Commission has noted, the U.S. Court of Appeals for the D.C. Circuit has affirmed "that an exclusive licensee could not object to the Commission's policy decision to permit secondary use rights where such secondary use did not cause harmful interference."¹¹⁵ We emphasize that we are not proposing to alter the basic principles of the experimental licensing program – including the obligation of experimental licenses to avoid causing harmful interference to incumbent service licensees. Accordingly, we reject Verizon's arguments that the rules we adopt can be construed to be a modification of these licenses, a taking of spectrum rights, or an undermining of these spectrum rights in an arbitrary and capricious manner.¹¹⁶ We further conclude that Verizon's claim that the rules we are adopting will devalue or impair this spectrum is without merit. Experimental licensees not only are prohibited from causing harmful interference to commercial mobile service licensees, but they must alter or discontinue their experimental operations, as necessary, in light of any modification that such a licensee makes to its spectrum use. Consequently, these licensees are not impeded in use of their spectrum and the spectrum is not devalued.¹¹⁷

62. Accordingly, we adopt our proposed rules to permit program experimental licensees to operate in any frequency band, except for frequency bands exclusively designated as restricted in Section 15.205(a) of the Commission's rules, with the additional exception that program licensees would be permitted to operate in frequency bands above 38.6 GHz, unless these bands are listed in footnote US246 of the Table of Frequency Allocations. Additionally, for experiments that may affect bands used for the provision of commercial mobile services, emergency notifications, or public safety purposes, program experimental radio licensees must develop a specific plan to avoid interference to these bands prior to commencing operation. As part of this plan, licensees must provide notice to critical service licensees and, as appropriate, end users who might be affected by the experiment; provide for the quick identification and elimination of any harm the experiment may cause; and provide an alternate means for accomplishing potentially affected vital public safety functions during the experiment. We emphasize

¹¹⁴ 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, *Memorandum Opinion and Order*, 15 FCC Rcd 9622, 9633-36 paras. 25-30 (2000) *Affirmed by AT&T Wireless v. FCC*, 270 F.3d 959 (D.C. 2001) (remanded to explain interference threshold used); *See also* Revision of Part 15 of the Commission's Rules Regarding Ultra-Wideband Transmission Systems, ET Docket No. 98-153, *Memorandum Opinion and Order and Further Notice of Proposed Rule Making*, 18 FCC Rcd 3857, 3886 para. 74 (2003) ("no basis for [licensees'] claim that cellular or PCS exclusivity prohibits the Commission from providing for the operation of new services" that could place emissions within the bands); *See also AMSC Subsidiary v. FCC*, 216 F.3d 1154, 1160 (D.C. Cir. 2000).

¹¹⁵ Revision of Part 15 of the Commission's Rules Regarding Ultra-Wideband Transmission Systems, ET Docket No. 98-153, *Second Report and Order and Second Memorandum Opinion and Order*, 19 FCC Rcd 24558, para. 90 (2004) (describing *AT&T Wireless v. FCC*, 270 F.3d 959 (D.C. Cir. 2001)).

¹¹⁶ In regard to Verizon's takings claims, courts have concluded that licensees do not have property rights in any license that the Commission issues to them, and so are not protected by the Fifth Amendment. *See FCC v. Sanders Bros. Radio Station*, 309 U.S. 470, 475 (1940); *CBS, Inc. v. FCC*, 453 U.S. 367, 395 (1981); *Prometheus Radio Project v. FCC*, 373 F.3d 372, 428 (3rd Cir., 2004).

¹¹⁷ Therefore, assuming for the sake of argument that Verizon could have a property interest in its license that could be subject to the takings clause of the Fifth Amendment, application of the experimental rules would not constitute a regulatory taking because application of those rules would not deprive Verizon of all economically beneficial use of that theoretical property interest. *See Stop the Beach Renourishment, Inc. v. Florida Department of Environmental Protection*, 560 U.S. ___, 130 S.Ct. 2592, 2601 (2010), *citing Loretto v. Teleprompter Manhattan CATV Corp.*, 458 U.S. 419, 425-26 (1982), *Lucas v. South Carolina Coastal Council*, 505 U.S. 1003, 1019 (1992).

that the burden is on program licensees to contact any and all commercial mobile service, emergency notification, or public safety licensees who *might* be affected by a program experiment, even if the probability of harmful interference as the result of that program experiment is thought to be relatively low. The proposed rules were crafted to ensure that harmful interference from program experiments would not occur to any service licensee, and we believe that those rules, together with additional rules described below, will provide a significant public benefit at minimal cost by creating an environment ripe for experimentation and innovation, while protecting incumbent operations.

4. Responsible Party and Notification Requirements

63. In the *NPRM*, the Commission proposed that each program licensee register its experiments on a newly-created Commission program experimental registration website at least seven calendar days prior to the commencement of each experiment. This seven-day period was intended to provide interested parties with sufficient time to assess whether they believe harmful interference may occur to their systems. To ensure that such analysis could be done, the Commission proposed that registrations include the following information:

- (1) a narrative statement describing the experiment;
- (2) contact information for the researcher in charge;
- (3) technical details, including:
 - (i) the frequency or frequency bands;
 - (ii) the maximum effective isotropically radiated power (EIRP) or effective radiated power (ERP) under consideration;
 - (iii) the emission designators to be used;
 - (iv) a description of the geographic area in which the test will be conducted;
 - (v) the number of units to be used;
 - (vi) a public safety mitigation plan, if necessary; and
 - (vii) for medical program experimental radio licenses, the rule part for which the experimental device is intended.¹¹⁸

64. The Commission proposed that, once this seven-day notification period elapsed, an experiment under a program license would be permitted to commence without further approval or additional authorization from the Commission; however, if any licensee of an authorized service raised interference concerns, it would have to contact the program licensee and post its complaint on the Commission's program experimental registration website. In the event that a complaint is lodged, the Commission proposed that the experiment would be placed on hold pending resolution of the complaint. Specifically, it proposed that before conducting an experiment, the program licensee evaluate and account for interference concerns raised by interested parties, and that it would have to obey any instructions from the Commission to delay, modify, or abandon the experiment. Additionally, it proposed that the experiment not be permitted to commence until the parties had resolved the issue. Moreover, it proposed that the complainant bear the burden of proof that the proposed experiment would cause harmful interference, and that the parties work in good faith to resolve the complaint.¹¹⁹ Finally, the Commission proposed to implement measures, such as adding a Real Simple Syndication (RSS) feed, to make it easier for incumbent licensees and other interested parties to become aware of pending tests and make experimenters aware of their concerns. The *NPRM* sought comment on what those measures should be.¹²⁰

¹¹⁸ See *NPRM*, 25 FCC Rcd 16606-07, at § 5.309(a).

¹¹⁹ *Id.*, 25 FCC Rcd 16607, at § 5.309 (b).

¹²⁰ *Id.*, 25 FCC Rcd 16555-56, at para. 30.

65. *Comments.* Commenting parties broadly supported the general proposal for program licensees to provide advance notice to the Commission and other licensees of the parameters of each experiment via a newly created Commission website. However, several commenters stated that each program license should also provide a “stop buzzer” point of contact in addition to a general point of contact so that an experiment could be halted immediately in the event of harmful interference.¹²¹ In addition, some commenters disagreed with some specific aspects of the proposed procedures; most notably, the requirements that: (1) an experiment may not commence until the experimenter and any affected service licensees resolve an interference concern, and (2) a complainant bear the burden of proof that the proposed experiment will cause harmful interference. We discuss these and other specific comments below.

66. BAE generally supports the proposal to not require a specific coordination requirement, but to instead rely on a public notification via a Commission web-based process.¹²² It further states that there are sufficient safeguards in the ERS Rules to ensure that licensee’s operations are protected from receiving harmful interference from an experiment, without requiring prior consent of those licensees. BAE adds that the Commission must ensure that the procedures adopted do not allow service licensees to stifle innovation through the objection process.¹²³ To that end, BAE recommends that the Commission only impose coordination conditions when absolutely necessary based on a prior substantive technical review of the proposed experiment. BAE also recommends that we clarify that the only valid basis for a service licensee’s objection to a coordination request is a fully articulated technical demonstration that interference will occur, and that failure to provide such showing within the timeframe requested by the coordinator will be deemed to constitute the licensee’s consent or a waiver of the coordination requirement. Moreover, BAE recommends that we adopt specific rules and procedures to allow for resolution of disputes between experimental applicants/licensees and service licensees on the issue of interference protection, in cases in which the issue cannot be resolved within a specified timeframe. In this regard, BAE recommends that we allow either party to promptly schedule a Commission-monitored settlement conference, similar to the procedure currently set forth in our rules at Section 1.956.¹²⁴

67. Boeing generally agrees with BAE, recommending that we not impose coordination conditions requiring licensees to secure prior consent, unless the conditions are absolutely necessary. Boeing argues that such requirements unnecessarily hinder experimental operations and incentives to invest, thereby limiting technological advances and growth. Boeing also argues that incumbent licensees have no incentive to furnish their consent to experimental testing. In its experience, incumbent licensees have frequently refused consent to coordination requests – thus thwarting necessary experiments even when there has been no specific claim that the testing will affect commercial wireless receivers. This results in certification and delivery delays for new and innovative products and adds to the developmental costs. Lockheed Martin concurs with Boeing on this point and urges the Commission to clarify that, in cases where coordination is required by the Commission, incumbent licensees may not refuse or delay coordination, absent legitimate concerns about harmful interference.¹²⁵ Lockheed Martin contends that

¹²¹ See, for example, AT&T Comments to *NPRM* at 6; BAE Comments to *NPRM* at 11; and CTIA Comments to *NPRM* at 4.

¹²² See BAE Comments to *NPRM* at 11.

¹²³ *Id.* at 12.

¹²⁴ *Id.* at 17-19. See also, 47 C.F.R. § 1.956, which specifies that – for wireless radio services – parties are encouraged to use alternative dispute resolution procedures to settle disputes; and that, in any contested proceeding, the Commission, in its discretion, may direct the parties or their attorneys to appear before it for a conference.

¹²⁵ See Lockheed Martin Reply Comments to *NPRM* at 3. Lockheed Martin contends that service licensees have, on occasion, been unwilling to coordinate with conventional experimenters, and that – even when coordination takes (continued....)

this could be accomplished by limiting coordination objections to those that involve a licensee's existing operations and frequencies, establishing standard processes and reasonable time limits for resolution of coordination disputes, and making use of "stop buzzer" requirements for experimental licensees. Boeing adds that the most important protection from harmful interference for incumbent licensees is the requirement that testing must be performed on a non-interference basis or the experiment must immediately cease.¹²⁶ Boeing further recommends that the Commission establish an experimental "safe harbor" that avoids a coordination requirement for experimental operations when there are controlled test areas where there is no risk of harmful interference to authorized services.¹²⁷ Clearwire Corporation (Clearwire) supports Boeing's safe harbor proposal.¹²⁸ Marcus offers a variation on the safe harbor proposal and recommends that we codify an option to permit a special technical showing of *de minimis* interference risk as an alternative to coordination between an experimental licensee and affected authorized spectrum users.¹²⁹

68. Other commenters favor greater use of coordination and consent requirements. As we noted above, several commenters argue that the Commission should require either coordination with or the consent of service licensees in commercial mobile bands before experiments can be conducted in those bands.¹³⁰ CTIA recommends that, for all tests or experiments that would affect the CMRS bands (*i.e.*, experiments that are intended to operate in spectrum bands used by CMRS providers or in adjacent bands), the Commission require that each program experimental licensee coordinate with these affected licensees by filing with the Commission a specific plan to avoid interference prior to the commencement of any such test or experiment.¹³¹ CTIA argues that, under certain conditions, such as when experiments are conducted outside or away from controlled venues, we should require a licensee's concurrence prior to a test. AT&T advocates that the Commission should require a program licensee to provide notice to potentially affected commercial licensees with existing CMRS networks and subscribers and obtain consent from each CMRS licensee.¹³² Verizon takes a similar position and contends that such consent should be obtained from each potentially affected licensee including CMRS licensees operating on adjacent bands and adjacent markets.¹³³ WCAI argues that requiring consent of service licensees before an experiment begins is the best way to ensure a streamlined and predictable experimental application process while protecting service licensees and their end users from harmful interference.¹³⁴

69. Several licensees argue that the *NPRM's* proposal effectively shifts the burden of avoiding interference from experimental licensees to service licensees. For example, Motorola Solutions, Inc. (MSI) contends that the proposal unreasonably shifts experimental oversight obligations to (Continued from previous page) _____ place – open-ended coordination obligations can result in significant delays before service licensees consent to permit the experiment.

¹²⁶ See Boeing Comments to *NPRM* at 12-14.

¹²⁷ See Boeing *Ex Parte* Filing, ET Docket Nos. 10-236 and 06-155, May 2, 2012, at 2.

¹²⁸ See Clearwire *Ex Parte* Filing, ET Docket Nos. 10-236 and 06-155, June 21, 2012.

¹²⁹ See Marcus Comments to *NPRM* at 13.

¹³⁰ See paras. 53-54, *supra*.

¹³¹ CTIA further recommends that all authorizations affecting the spectrum bands used by CMRS providers be limited to the activities described in the experimentation plan and only for the necessary duration, and that these activities be conducted during off-peak usage hours whenever possible. See CTIA Comments to *NPRM* at 5-6.

¹³² See AT&T Comments to *NPRM* at 2-3.

¹³³ See Verizon Reply Comments to *NPRM* at 3-4.

¹³⁴ See WCAI Comments to *NPRM* at 2-4.

potentially-affected service licensees. Similarly, ARRL expresses concern that the proposal does not require any advance showing or representation by the experimental applicant of compatibility with incumbent licensees. ARRL argues that nothing is proposed that would obligate the qualified research institutions to demonstrate that interference will not be caused to licensed radio services from a broad experiment.¹³⁵ Similarly, WCAI does not support the Commission's proposal to place the burden of monitoring program experiments on service licensees.¹³⁶ TIA argues that the proposal would result in service licensees having to dedicate increased resources to determining the source of experimental interference and resolving related issues. Moreover, in TIA's view, there would be a significant danger of service licensee actually experiencing interference.¹³⁷

70. Finally, the record reflects a wide variety of suggestions for structuring the responsibilities of program experimental licensees and their interactions with commercial mobile service licensees. For example, some commenters contend that the proposed seven day notification period is too short. CTIA and Verizon recommend that we require 30 days advance notice to affected licensees.¹³⁸ Clearwire, which recommends pre-filing coordination of all ERS applications with affected primary service licensees to alleviate the risk of harmful interference, proposes that this requirement be combined with both a "shot-clock" rule that requires a primary licensee to respond to a coordination notice from an ERS applicant within 30 days and a requirement that both the applicant and the licensee work in good faith to successfully coordinate the request.¹³⁹ WCAI supports the Commission's proposal that, if any service licensee raises interference concerns, the experiment not be permitted to commence until the parties resolve the complaint.¹⁴⁰ SIA suggests an alternative approach whereby service licensees would register bands of interest and their geographic locations on a common Commission website and any proposed experiment under that license in the registered band and applicable geographic area would trigger a seven-day advance notice requirement.¹⁴¹ MSI recommends that we maintain our current policies which, among other things, impose an independent obligation on experimental licensees to: (1) research and assess the potential for interference to primary licensees before they conduct any experiment, (2) coordinate directly with primary users only when necessary to ensure against possible interference, and (3) submit such analyses or concurrences to the Commission, when required. MSI argues that experimental licensees are better equipped than service licensees to ensure a minimum potential for interference, and recommends that we re-affirm the obligation of all experimenters to comply with the Commission's existing policies and requirements to ensure against interference to primary licensees, rather than adopting a website-based notification requirement.¹⁴²

71. *Decision.* Our overriding goal is to ensure that program experiments can proceed in an efficient and expeditious manner, without impairing or causing harmful interference to the operations of incumbent operations. We conclude that, based on the comments, some modifications to the *NPRM's* proposed procedures will provide a better, more equitable way to move forward with program licenses and protect incumbent users. As a baseline, we are adopting a Commission web-based notification

¹³⁵ See ARRL Reply Comments to *NPRM* at 6-7.

¹³⁶ See WCAI Comments to *NPRM* at 2-4.

¹³⁷ See TIA Comments to *NPRM* at 6-7.

¹³⁸ See CTIA Comments to *NPRM* at 9 and Verizon Reply Comments to *NPRM* at 3-4.

¹³⁹ See Clearwire *Ex Parte* Filing, ET Docket No. 10-236 and 06-155, May 17, 2012.

¹⁴⁰ See WCAI Comments to *NPRM* at 2-4.

¹⁴¹ See SIA Comments to *NPRM* at 12.

¹⁴² See MSI Comments to *NPRM* at 3-4.

procedure with the information requirements proposed in the *NPRM*. We also are expanding a program experimental licensee's obligations and responsibilities in several significant ways.

72. First, we note that commenters ask that we explicitly collect contact information for a "stop buzzer" point of contact who can immediately shut down an experiment if harmful interference occurs to services entitled under our rules to protection. We agree. The Commission's intent with the proposed criteria was that collecting information for the researcher-in-charge would fill this need. However, because this contact could be different than the person actually conducting the experiment, we will explicitly add a "stop buzzer" point of contact to the list of required information in Section 5.307 of the rules. We will also add a new Section 5.308 to the rules requiring the "stop buzzer" point of contact to be available at all times during operation of each experiment conducted under a program license.¹⁴³

73. Second, while the *NPRM* proposed that program licensees report the specifics of their proposed experiments to the Commission's program experimental registration website at least seven calendar days prior to commencement of the experiment, upon reflection we find ten calendar days to be a more appropriate period. We note that, in some instances, holidays and weekends would shorten the number of business days in a seven calendar-day period. By increasing the notification period to ten calendar days, we will better ensure that licensees, if so interested, have adequate time to examine and respond to an experimental posting in a timely manner. Additionally, the *NPRM* proposed that the incumbent licensee would have the burden of identifying interference concerns, but commenters have convinced us that the proposed procedures would unduly shift the burden of proof regarding interference from experimenters to incumbent users. We find that this goal can be best achieved by modifying this proposal to better reflect the balance of license rights and interference protection afforded under the existing rules and to be consistent with our policies for conventional experimental licenses. Under the Commission's traditional conventional experimental license program, applicants file with the Commission all relevant information, and the Commission makes a determination as to whether the proposed experiment is: a) acceptable as proposed, due to a minimal risk of harmful interference, or b) unacceptable as proposed, due to a significant risk of harmful interference. The Commission may also impose certain requirements on granted licenses.¹⁴⁴ Based on a re-evaluation of the *NPRM*'s proposal, we agree with commenters that we should not shift the burden regarding interference analysis onto incumbent licensees. Therefore, we herein adopt rules that more closely adhere to current policy and procedure for conventional experimental licenses in this regard.

74. First, we will require that at the time of application for a program license, applicants indicate whether they intend to operate on CMRS or public safety frequencies. This will provide a simple means for interested CMRS and public safety licensees to determine if they need to seek further information on a program licensee's specific experiments from the web-based registration system.¹⁴⁵ If we become aware of an applicant who fails to specify in its application that it will be experimenting on CMRS or public safety frequencies, but once licensed either reports its intent for such use or actually initiates such use, the Commission will take disciplinary action including, but not limited to loss of license and/or fines.¹⁴⁶ If an experimenter alters plans after the initial application to subsequently include

¹⁴³ We expect that, if contacted by a licensee, the stop buzzer contact will work with that licensee to resolve any interference issues. If the issues cannot be resolved by the licensees then the affected licensee should contact the Commission. See para. 83, *infra*.

¹⁴⁴ 47 C.F.R. § 5.85(e) provides that, "[t]he Commission may, at its discretion, condition any experimental license or STA on the requirement that before commencing operation, the new licensee coordinate its proposed facility with other licensees that may receive interference as a result of the new licensee's operations."

¹⁴⁵ See para. 84, *infra*. for more information regarding public access to the web-based registration system.

¹⁴⁶ See 47 C.F.R. § 1.80.

CMRS spectrum or public safety frequencies, it must file an application to amend its license. We believe that this procedure, along with the web-based registration of specific experiments, will adequately protect critical operations from harmful interference from tests conducted under program experimental license while still providing for experiment flexibility for program licensees.

75. Second, we are adopting a requirement, similar to that proposed by MSI, that each web posting include a document describing the planned experiment and explaining the measures being taken to avoid causing harmful interference to any incumbent service licensee. We do not find that describing their experiments in web postings will be excessively burdensome to program licensees, as we can expect them to have already undertaken internal analyses regarding the interference potential of their experiments. Thus, this requirement is intended to provide an open and transparent method for potentially affected service licensees and other interested parties not only to become aware of planned experiments, but also to have assurance that adequate planning that has gone into such experiments.

76. We view this analysis as an essential requirement for program licensees and caution prospective licensees that this analysis should not be taken lightly. We expect that in exchange for the flexibility we are providing through the program license, program licensees will do a thorough analysis to ensure that incumbent licensees are protected from harmful interference.¹⁴⁷ We note, however, that in many instances, this explanation could be brief, such as in cases in which experiments are proposed to be conducted indoors, outdoors at low power, at remote locations, or on unused frequencies. In other instances, where the interference risk is greater, the explanation may need more detail, such as detailed link budgets and propagation and interference analyses.

77. We believe that the requirement for program experimental licensees to post their interference analysis to the Commission's program experimental registration website will generally obviate the need for incumbent licensees to perform their own detailed analyses to ensure protection from interference. In this manner, we believe that the burdens associated with preventing harmful interference remain the same as at present – on the potential interferer. For that same reason, we are not adopting the experimental safe harbor recommended by Boeing. Similarly, we reject Marcus's recommendation as the term "*de minimis* interference" is undefined. Allowing each licensee to determine what they consider to be "*de minimis*" interference to other potentially affected licensees would be ripe for abuse and could lead to increased instances of harmful interference.¹⁴⁸

78. We disagree with commenters that advocate a consent requirement on program licensees that plan to experiment in commercial mobile service spectrum. Implementing a rule requiring consent could slow the ability for innovation without providing any substantial benefits in interference protection to the licensee in return. We also believe that a formal pre-filing coordination requirement is generally unnecessary. However, we concur with CTIA that there may be certain circumstances where there may be additional concerns about how a proposed experiment conducted under a program experimental license could potentially affect a commercial mobile service provider's network. The Commission has discretion to place coordination conditions on any experimental license. We discussed *supra* how we may choose to

¹⁴⁷ We note that the Commission has several tools available on its website for searching its various licensing databases. All of the databases can be accessed from <http://www.fcc.gov/online-filing>.

¹⁴⁸ Regarding harmful interference, Marcus also argues that clarifying what constitutes such interference could expedite resolution of interference disputes and add certainty to experimentation and encourage innovation. See Marcus Comments to *NPRM* at 12. We note that our rules include the internationally agreed upon definition for harmful interference that provides flexibility, as the evaluation of whether any interference rises to the level of harmful is different for different radio services. See 47 C.F.R. § 2.1. Any consideration of modifying this definition, in general or in the context of experimental applications, is beyond the scope of this proceeding and is not considered here. The Commission will continue its current practice of evaluating interference on a case-by-case basis.

place special conditions on program experimental licenses, and particular licensees may already be operating under such conditions. Similarly, we also have the discretion to impose conditions on a particular experiment performed under a program license beyond any blanket conditions that may be imposed on those licenses. Historically, the Commission has generally requested that experimental licensees notify or coordinate with commercial mobile service licensees as a condition of the experimental license when the experimental licensee seeks to use commercial mobile service spectrum. We will continue to use our discretion to place appropriate conditions on experimental licenses in general and experiments conducted under a program license in particular. We are especially concerned about experiments involving commercial mobile service spectrum in scenarios where we determine there may be an increased risk of causing interference to commercial mobile service licensees – for instance, in public spaces – and may require prior notification or coordination, as necessary. As we gain experience with this new licensing approach, we will be better able to tailor notification and coordination requirements as necessary to apply only those that are most appropriate for the specific circumstances. We also observe that new Section 5.311 imposes additional requirements for experiments conducted in critical safety bands, including bands used for the provision of commercial mobile services.¹⁴⁹ In reviewing the website posting of the planned experiment, Commission staff could determine that other conditions are necessary; alternately, a licensee who is concerned about a posted experiment plan and who has been unable to resolve its concerns with the experimental licensee could seek assistance from us.

79. We conclude that the approach we are implementing for program experimental licenses is both consistent with our current rules and offers additional opportunities for licensees to identify and resolve potential interference concerns. Neither coordination nor consent is required under the current rules. Rather, the Commission examines all applications for conventional experimental licenses and determines whether the proposed operations are acceptable due to the risk of harmful interference. If we determine that an experimental licensee should coordinate with an incumbent licensee to reduce the risk of interference, we may condition the experimental licensee accordingly.

80. Moreover, we are concerned that imposing a new coordination or consent requirement by rule could stifle innovation and undermine our goal of removing barriers to effective experimentation. For example, we envision that service licensees may not have an incentive to either quickly coordinate or provide consent to innovators with whom they may have not done prior business under a rule imposing a mandatory course of coordination. We emphasize that it is incumbent on program licensees in all circumstances to conduct due diligence in their local operating environment to identify any interference risks, and to plan accordingly to avoid causing harmful interference to incumbent licensees.¹⁵⁰ We expect that the nature of this due diligence will vary based on the particular experiment – taking into account its scope, complexity, and the licensees and operational characteristics of the affected bands. We are, for example, requiring each program licensee to post an interference analysis on our program experimental registration website, but we recognize that the size and scope of this analysis will necessarily be driven by the specifics of the particular planned experiment. In a similar vein, we conclude that coordination requirements, when appropriate, can only be determined on a case-by-case basis.¹⁵¹

¹⁴⁹ See para. 59, *supra*.

¹⁵⁰ A basic tenet of our experimental licensing program is that an experiment may not cause harmful interference. Our rules already stipulate that all experimental operations are conducted on the basis of not causing harmful interference to authorized stations. If harmful interference occurs, the experimental station is required by rule to cease transmissions. See 47 C.F.R. § 5.84.

¹⁵¹ We note that an experimental licensee may initiate its own coordination with other Commission licensees and that the Commission from time to time has placed coordination and/or consent requirements on conventional experimental licenses for experiments that operate in commercial mobile service bands.

81. For these reasons, we will not require coordination between program licensees and incumbent commercial mobile service providers. We recognize that there could be situations in which we determine that there would be an increased possibility that a planned program experiment could have a greater potential to cause harmful interference to a commercial mobile service licensee, and we will impose additional requirements in the program licensee – or we may even prohibit the experiment in its entirety. Further, we emphasize that if we become aware that a program licensee is not providing adequate analysis of the interference environment as required by our rules, we may place a coordination requirement on a particular course of experimentation, or even on all future experiments, that are conducted under that license. In addition, if a violation is particularly egregious or if there are instances of repeat violations, we have the authority to cancel that license and deny that entity from operating under a program license in the future. In cases in which we do impose a coordination requirement, we expect that all parties will cooperate to work in good faith to expeditiously resolve any concerns.

82. Some commenters requested that we provide as much as 30 days between a program licensee's notification of their experiment to the web-based registration system and when they could commence their experiment. We note, however, that those comments were predicated on the *NPRM's* proposal, which would have placed the burden of proof for claims of harmful interference on the incumbent licensees. Now, with our modified rule which places that burden on the program licensee, we have relieved incumbent licensees of much, if not all, of this task. Nonetheless, as discussed in paragraph 73, *supra*, we have increased the notification period by three days. We believe that this 10-day notification period is a reasonable timeframe to allow incumbents to examine, if they so choose, any filing of interest, while not creating long delays in experimentation.¹⁵² In addition, we note that all license applications already require contact information to be provided, and we are setting forth specific requirements for program experimental licensees. Service licensees who have questions about a proposed experiment or its accompanying interference analysis will have a ready point of contact.

83. To recap, while a program license will be granted for a series of experiments, each individual experiment must be preceded by a web posting containing information required by the rules. We emphasize that incumbent licensees may object to a particular experiment, and they may contact the program licensee to try and work out any objections. However, only the Commission has the authority to prevent a program licensee from beginning operations or to order the cessation of operations. We are not adopting the proposal that an experiment automatically not be permitted to commence until the parties resolve all outstanding interference objections. The added requirement that a program experimental licensee must submit an interference analyses in conjunction with its notice of proposed experimentation reduces any benefit from this proposed provision (which we also recognize could be used to block or delay important experimental work). If an incumbent licensee believes that it will suffer interference and does not informally resolve the matter with the experimental licensee, the service licensee would have to bring its concerns to the Commission for action.¹⁵³ In such an event, the Commission would examine the evidence and decide whether the experiment should proceed as planned, should not be permitted to

¹⁵² As we design the Commission's program license website, we intend to include tools to allow searches by frequency band or geographic area, which should make it easier for incumbent licensees to easily identify experimentation in proximity to their own operations.

¹⁵³ We note that OET, under 47 C.F.R. § 0.241(c), has delegated authority to administer the experimental radio licensing program. Under this authority, OET may from time to time issue a public notice with procedural information for licensees.

proceed, or if specific notification or coordination requirements should be imposed.¹⁵⁴ OET will issue such a public notice with instructions regarding the complaint procedure.

84. We now address the process that will be used for experiments that propose to use exclusive Federal spectrum or shared Federal/non-Federal spectrum. As an initial matter, we note that under a Memorandum of Understanding (MOU) between the Commission and NTIA, we coordinate all such applications for Commission operating licenses with NTIA, which is afforded 15 days to reply to the Commission. Under our application procedures for program licenses, however, we will not be collecting specific frequency information, but rather only location information with the initial application. As described, frequency information will be prior-reported by the licensee to the Commission's website before any experimentation may begin. To satisfy our obligation to prior coordinate experiments that will be using either Federal exclusive or Federal shared spectrum, we will add a question to the application form where applicants for a program license can indicate if they are planning on using any spectrum that is allocated to the Federal government on a shared or exclusive basis and, thus, is subject to coordination under the MOU.¹⁵⁵ An affirmative answer will trigger a location-specific coordination with NTIA and based on the outcome of that coordination we may place special conditions on the license which could include a list of frequencies or frequency bands on which the applicant would be restricted from operating on at the proposed location.¹⁵⁶ Applicants who plan on using such spectrum should plan to ensure they apply with sufficient time to complete this coordination prior to the time they intend to begin transmitting as we will not grant authority to operate until the conclusion of the coordination process. The Commission, at that time, will take any action if it deems that any is warranted. As with the similar requirement that we are implementing for experiments on CMRS spectrum described above,¹⁵⁷ we note that if we become aware of an applicant indicating in its application that it will not be experimenting on frequencies that are part of a Federal spectrum allocation, but once licensed either report its intent for such use or actually initiates such use, the Commission will take disciplinary action including, but not limited to loss of license and/or fines.¹⁵⁸ If an experimenter alters plans after the initial application to subsequently include Federal spectrum, it must file an application to amend its license. We believe that this procedure will adequately protect Federal operations from harmful interference from tests conducted under program experimental license while still providing for experiment flexibility for program licensees.

85. We believe that our amended approach for prior notification of experiments in which the licensee provides a description of how it will avoid interference will result in more carefully planned program experiments, while not imposing an undue burden on experimenters. Further, in developing the Commission's new program experimental registration website, we will emphasize the importance of implementing additional measures to make it easier for incumbent licensees and other interested parties to become aware of program experiments, such as by developing an automated process for distributing information regarding program experiments by RSS feeds or other appropriate means. We find that our overall approach balances the needs of both program licensees and service incumbents, providing a public benefit significantly outweighing its cost.

¹⁵⁴ Under the Commission's Rules, OET has delegated authority to administer the experimental radio licensing program. We envision that OET, acting under this authority, would act on such complaints in the first instance. *See* 47 C.F.R. §§ 0.241(c) and 5.85(e).

¹⁵⁵ We will also create a web page that lists which frequency bands are Federal exclusive or Federal/non-Federal shared so that applicants can easily determine if they are planning on using any of this spectrum.

¹⁵⁶ We also note that we could initiate coordination depending on the distance of a proposed experiment to a Federal facility.

¹⁵⁷ *See* para. 74, *supra*.

¹⁵⁸ *See* 47 C.F.R. § 1.80.

5. Use Prohibitions

86. In the *NPRM*, the Commission proposed that experiments could not be conducted under a program experimental license when the applicant requires non-disclosure of proprietary information.¹⁵⁹ Several commenters expressed disagreement with the latter proposal. For example, BAE argues that the very nature of next-generation-radio research involves the testing of new systems and techniques that are often proprietary and that meet Freedom of Information Act (FOIA) standards for non-disclosure. In addition, BAE and Lockheed Martin contend, that for radio research in the areas of public safety, homeland security and defense, non-disclosure of sensitive program information may be in the public interest or required under Department of Defense security policies. Accordingly, BAE concludes that, provided the basic technical parameters (geographic location, frequencies, power levels, emissions, bandwidth, modulation) of the program license are made publicly available, proprietary information should be protected from disclosure as part of an application for a program license.¹⁶⁰ Lockheed Martin adds that the Commission should accept program experimental applications even when those applications request protection for certain sensitive information. Finally, Lockheed Martin and Boeing argue that, if the Commission establishes new reporting requirements, it is vital that these requirements afford program experimental applicants the opportunity to protect highly sensitive information from disclosure.¹⁶¹ Boeing urges the Commission to recognize the public interest harms that would occur if experimental licensees are required to share certain confidential information, and concludes that any reporting requirement imposed should be narrowly tailored and as minimally burdensome as possible.¹⁶²

87. The *NPRM* also proposed that experiments could not be conducted under a program experimental license when an environmental assessment or orbital debris mitigation plan must be filed with the Commission.¹⁶³ There is little or no objection to this aspect of the *NPRM*.

88. *Decision.* Commenters generally request that they be permitted to maintain confidentiality of proprietary information and still take advantage of the flexibility we are affording through the program experimental license. As we have stated throughout this proceeding, our goal is to enable more robust experimentation. With that principle in mind and based on the comments and an examination of our current process, we are modifying the proposal related to the treatment of confidential and proprietary information.

89. We believe that program licensees can describe their experiments under the prior notification procedures discussed above and report on the results of their experiments on the Commission's website in general terms that do not disclose any proprietary or confidential information. We will require public disclosure of frequency, power, location, emission designators and contact information. We observe that this information, with the exception of power and emission designators, is required for public disclosure today for conventional experimental licenses. We find that also requiring public disclosure of power and emission designators is necessary so that potentially affected service licensees can assess the program licensee's analysis of interference avoidance and mitigation, given the reduced level of Commission review that may occur prior to specific experiments under the program license. Moreover, we observe that the Commission may have to request a program licensee to provide

¹⁵⁹ See *NPRM*, 25 FCC Rcd 16553, at para. 24.

¹⁶⁰ See BAE Comments to *NPRM* at 10.

¹⁶¹ See Lockheed Martin Reply Comments to *NPRM* at 8-10. Q-Track, SIA, and V-Comm provide similar comments. See Q-Track Comments to *NPRM* at 7; SIA Comments to *NPRM* at 13; and V-Comm Comments to *NPRM* at 8.

¹⁶² See Boeing Comments to *NPRM* at 15.

¹⁶³ See *NPRM*, 25 FCC Rcd 16553, at para. 24.

information in addition to that required by the rules, which could include proprietary or confidential information. For example, such information requests may be necessary to resolve an interference complaint, to gain a better understanding of new technology development, or to audit the program to ensure that parties are conducting actual experiments. If confidential or proprietary information must be disclosed due to Commission request for additional information, we will entertain requests to keep such information from the public, consistent with the current rules for treating confidential information set forth in Section 0.459. Failure to comply with a Commission request for additional information or, if review of such information reveals that a licensee is not conducting a program of actual experimentation, could result in forfeiture of the program license and loss of privilege of obtaining such a license in the future. We are modifying our rules accordingly. Finally, we reiterate that if entities believe that they need to disclose confidential or proprietary information as part of the justification for their license, they can forego the program experimental license and instead obtain a conventional experimental license.¹⁶⁴

90. Additionally, we adopt the *NPRM*'s proposal to prohibit program experimental licenses when an environmental assessment or orbital debris mitigation plan must be filed with the Commission. We find that these prohibitions are necessary due to the required Commission review and approval of these filings prior to the onset of operation.¹⁶⁵ Our overall approach to use prohibitions balances the need to reduce the costs of regulatory burdens on experimental licensees and the benefits of protecting the public from harmful interference to existing radio services.

6. Innovation Zones

91. As discussed above, many commenters are skeptical of the *NPRM*'s proposal to create a discrete innovation zone program license, and we are not doing so in this Report and Order. Nevertheless, we believe that there is a place for designating specific areas where licensees can operate experimental devices to assess real world performance in the presence of other similar or dissimilar devices, differing terrain, and changing atmospheric conditions. We believe that, if properly structured, such zones can provide equipment developers valuable insight to ensure that their products perform as intended when they become available to the public. As described below, we establish a mechanism by which we can create innovation zones – designated geographic areas and frequency ranges – in which program licensees will be afforded additional opportunities to design and conduct experimentation.

92. EIBASS and others observe that establishing an innovation zone under the *NPRM*'s proposed rules would have been a complex undertaking whose risks would have been difficult to evaluate without any experience with other types of program experimental licenses.¹⁶⁶ Further, because we did not propose any restriction on who could hold an innovation zone license, organizations and individuals not as well-versed in RF spectrum management as research licensees could potentially have obtained such licenses, thereby increasing the interference risk to licensed services. While we have considered restricting eligibility for innovation zone licenses in the same fashion that was proposed in the *NPRM* for research and medical licenses, we herein decline such an approach, as it could severely limit the utility we envision for such zones.

93. We conclude that there is a better way to enable the type of widespread experimentation that we envisioned under the *NPRM*'s innovation zone proposal. Accordingly, we adopt rules that allow us – on our own motion or in response to a public request – to designate a defined geographic area and frequency range(s) as an innovation zone for specific types of experiments. An innovation zone

¹⁶⁴ We note that in 2011 there were 1,563 conventional experimental applications filed with OET, and 263 of those requested confidential treatment of at least some of the information contained in the application.

¹⁶⁵ See, respectively, 47 C.F.R. §§ 5.53(c) and 5.63(e).

¹⁶⁶ See EIBASS Comments to *NPRM* at 10.

designation will not confer operating authority on the entity that owns or manages the designated site. Instead, under the rules that we are herein adopting, we will permit research program experimental licensees to operate in innovation zones within guidelines that we will establish on a case-by-case basis. These zones may include geographic areas beyond a program licensee's authorized area. Thus, we will effectively provide in some circumstances an extension of a research program license, without the licensee being required to modify that license to cover a new location. By modifying the *NPRM*'s proposal in this manner to limit operational authority within an innovation zone to program licensees, we can better manage the potential for harmful interference from individual experiments, while still providing opportunities to test potentially innovative wireless devices in real world operating environments.

94. For example, the Commission has recent experience working with officials in Wilmington, North Carolina – first as a test-bed for the digital TV transition¹⁶⁷ and recently to host the first commercial deployment of TV broadband devices (TVBDs) operating in TV “white spaces.”¹⁶⁸ If the rule we adopt herein had been in place, we could have designated the greater Wilmington area an innovation zone for testing TVBDs, and any research program licensee developing these devices could, under its program license, also conduct testing in the Wilmington area without modifying its license to specifically include this area. Another potential use for innovation zones would be to create test-beds at national laboratories or other facilities for developers to test new developments in cognitive radios¹⁶⁹ or other spectrum sharing techniques¹⁷⁰ or at a health care institution for testing medical devices under actual-use conditions. We also note that, as suggested by Marcus, the Commission working with NTIA may be able to designate certain area and frequency combinations within frequency bands designated for transfer from Federal to non-Federal use as innovation zones. Taking such action would allow equipment developers to get a jump start on designing and testing new devices prior to the Commission issuing service licenses and therefore expedite the elapsed time from licensing to system deployment.

95. We recognize that there must be some limits and constraints to minimize the potential of harmful interference due to operation under this expanded flexibility. First, we reiterate that these innovation zones may be created only by specific Commission action in response to a request, or alternatively, on the Commission's own motion. An innovation zone designation will be conveyed via Public Notice and posted on the Commission's new program experimental registration website, detailing

¹⁶⁷ See “DTV Transition Premiers in Wilmington, North Carolina,” *Public Notice*, Federal Communications Commission, released May 8, 2008.

¹⁶⁸ In December 2011, the Commission issued a Public Notice announcing the approval of this deployment; see “Office of Engineering and Technology Announces the Approval of Spectrum Bridge, Inc.’s TV Bands Database System for Operation,” *Public Notice*, DA 11-2043, ET Docket No. 04-186, released December 22, 2011. TVBDs provide video surveillance, water monitoring, and some broadband services in Wilmington, including services to areas that cannot be reached by wireless fidelity (Wi-Fi) networks. See *Wireless Week*, January 26, 2012, “White Spaces Go Live in Wilmington, N.C.,” by Maisie Ramsay; available at <http://www.wirelessweek.com/News/2012/01/Technology-White-Space-Goes-Live-Wilmington-NC-Wireless-Networks>.

¹⁶⁹ A cognitive radio is aware of its environment and internal state, and can make decisions about and adjust its operating characteristics based upon predefined objectives and new information to obtain access to spectrum dynamically without causing harmful interference to other spectrum users.

¹⁷⁰ As evidenced by the recent grant of experimental special temporary authority to T-Mobile for testing spectrum sharing techniques in the 1755-1850 MHz band (see call sign WF9XQW), spectrum sharing is becoming increasingly important as the Commission, along with the National Telecommunications and Information Administration (NTIA, which manages Federal spectrum use), continues its goal of identifying more spectrum for broadband devices and applications.

the specific geographic area(s) included and the technical parameters, such as frequency bands and power limits, included. In that connection, we observe that OET has delegated authority to generally administer the ERS, which therefore gives it the authority to designate experimental innovation zones and their operational conditions.¹⁷¹ Second, operation under this authority will not permit a program licensee to abdicate its notification and reporting responsibilities. Prior to operating in an innovation zone, program licensees must provide notification of their intended operations consistent with the procedures adopted in this Report and Order.¹⁷² It is important that all licensees have full knowledge of operations in an area, so that, if necessary, they can remedy harmful interference. Finally, only program licensees will be permitted to operate in an innovation zone under their existing authorization. Conventional licensees will have to apply for and receive a license modification if they want to expand the scope of their experimentation to an area and frequency band that is part of an innovation zone.

96. Structuring innovation zones in this way will allow targeted experimentation in response to specific industry or regulatory needs. We believe that these innovation zones hold great promise to enable development of robust devices that can withstand the increasingly complex communications environment in which they must operate. Accordingly our revised innovation zone structure can provide a significant public benefit, while reducing substantially the potential interference costs of the *NPRM*'s innovation zone proposal.

C. Compliance Testing License

97. The *NPRM* noted that Section 2.803 of the Commission's Rules provides for the operation of RF devices for compliance testing, but does not eliminate the requirement to obtain a station license for products that normally require a license to operate. The *NPRM* therefore asked how laboratories engaged in the testing of equipment, but that are not themselves manufacturers or licensed service providers, should be authorized to conduct their work. It also asked if the Commission should make specific provisions in its Part 5 experimental radio service rules to issue licenses to laboratories accredited by accreditation bodies that its recognizes for RF product testing and consistent with their approved competencies.¹⁷³

98. In a related issue,¹⁷⁴ the *NPRM* noted that the Commission's equipment approval process often requires testing at an Open Area Test Site (OATS).¹⁷⁵ The *NPRM* observed that the Commission's existing rules require an experimental license for radiation emissions testing in conjunction with regulatory approval¹⁷⁶ and asked how entities engaged in open area testing, but that are not themselves manufacturers or licensed service providers, should be authorized to conduct their work. The *NPRM*

¹⁷¹ Section 0.241(c) of our rules states: "The Chief of the Office of Engineering and Technology is delegated authority to administer the Experimental Radio licensing program pursuant to part 5 of this chapter." See 47 C.F.R. § 0.241(c).

¹⁷² This includes the required notice to CMRS and public safety licensees if the Commission, after receiving public input, designates an innovation zone that includes spectrum used by those licensees.

¹⁷³ See *NPRM*, 25 FCC Rcd 16571, at para. 68. The Commission maintains a web search utility that provides parties the ability to search our database of recognized test labs. Parties may also download the entire list. See <https://apps.fcc.gov/oetcf/eas/reports/TestFirmSearch.cfm>.

¹⁷⁴ *Id.*, 25 FCC Rcd 16576-77, at para. 83.

¹⁷⁵ The qualifications for an Open Area Test Site are described in ANSI C63.4, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz. ANSI C63.4 standard is available from the IEEE at <http://standards.ieee.org/findstds/standard/C63.4-1991.html>.

¹⁷⁶ See 47 C.F.R. § 5.3(g).

sought comment on whether the Commission should make specific provisions in its Part 5 experimental radio service rules to issue licenses to these entities patterned after the program license model.

99. *Comments.* Few parties responded to the *NPRM*'s request for comment on these issues. CTIA recommends that the Commission issue licenses to such laboratories and entities testing at an OATS that are patterned after the proposed program experimental licenses, with similar terms, conditions, and renewal processes. CTIA states that such testing facilities can provide additional avenues for innovators to obtain technical feedback on their products.¹⁷⁷

100. EIBASS recommends that any OATS testing require some type of Commission license.¹⁷⁸ V-Comm recommends that experiments performed at an OATS require experimental licenses to operate in licensed spectrum bands, and should be required to show substantial justifications for operation in licensed bands and proof of non-interference to existing licensed services. V-Comm further recommends that signal leakage measurements be performed on all frequency bands and power levels utilized in tests to confirm non-interference to existing services operating in licensed spectrum bands outside the facilities.¹⁷⁹

101. *Decision.* We concur with the commenters' assessment that it is appropriate for us to issue laboratories engaged in the compliance testing of equipment, including those operating an OATS but that are not themselves manufacturers or licensed service providers, licenses with similar terms, conditions, and renewal processes as we are adopting for program experimental licenses. We will therefore create another type of experimental license – a compliance testing experimental license – to account for the work of test labs that conduct FCC rules compliance testing under our equipment authorization program. This license will be available both to those test labs that we currently recognize for RF product testing and to any other test lab that we find has sufficient expertise to undertake such testing. Due to the nature of the compliance testing process, we will not impose on them most of the limitations and reporting requirements that we are imposing on program licenses. Specifically, because compliance testing often involves emission measurements in restricted bands, compliance testing licensees will be exempt from the prohibition on operating in the restricted bands listed in 15.205(a) of the rules and from operating in the bands allocated exclusively to the passive services. In addition, we will not impose the designation of a “stop buzzer” point of contact nor the ten-day notification period requirements on these licenses, as we do not believe that any significant interference risk exists for products reaching this stage of development, when operated by a test lab solely for the purposes of certifying equipment for compliance with our rules. Finally, we will not require the filing of a narrative statement detailing the results of the testing done under this license. By its nature, successful testing results in the issuance of an equipment certification grant and an entry in the Commission's Equipment Authorization System. Test labs are already required to include various test reports and other documentation, negating any need to mandate compliance with the more general program license reporting requirement. Compliance testing experimental licensees will also be exempt from the additional requirements in Section 5.311 of our rules that relate to safety of the public.

102. We do find, however, that some restrictions are necessary on these licenses. First, while we received no comment regarding eligibility, we find it important to limit eligibility to Commission-recognized testing laboratories to provide assurance to the public of the competency of the entities that are engaged in compliance testing and operating under this broad authority. However, we do not currently require that Commission-recognized testing laboratories be accredited, and thus we will not limit

¹⁷⁷ See CTIA Comments to *NPRM* at 16-17.

¹⁷⁸ See EIBASS Comments to *NPRM* at 15.

¹⁷⁹ See V-Comm Comments to *NPRM* at 19.

eligibility to accredited laboratories. Rather, we will grant compliance testing experimental radio licenses to those laboratories recognized by the Commission as being competent to perform measurements of equipment for equipment authorization.¹⁸⁰

103. In addition, we will limit the authority of compliance testing experimental licenses to only those testing activities necessary for product certification. Accordingly, compliance testing experimental licensees will not be permitted to conduct immunity testing under this license. Such testing often entails high powered emissions over a very broad swath of spectrum, which could pose a significant risk of interference to other systems, including Federal systems. A traditional conventional experimental license will be required for immunity testing to ensure that all necessary coordination is conducted and that all reasonable precautions against interference are taken. Finally, consistent with our new program and medical testing experimental licenses, we will require compliance testing license applicants to apply on revised FCC Form 442, and we will issue compliance testing licenses for five years and prohibit transfers of such licenses. Each applicant must specify how it is eligible to receive a compliance testing experimental license, such as by including a description or other proof of its qualifications. We find that this structure will provide public benefits by ensuring efficient compliance testing at minimal costs. Rules specific to this license are contained in a new subpart G within Part 5 of the Commission's Rules.

D. Medical Testing License

104. In this section, we establish an additional type of license to meet specific needs of the medical community for clinical trials – the medical testing license. While non-clinical trial testing is permitted under our program license,¹⁸¹ we find that the Commission can best meet medical RF experimentation needs by providing several different types of authorizations that can support a broad range of medical device research, development and testing, rather than limiting such experimentation to the medical program license concept that was proposed in the *NPRM*.¹⁸²

105. As an initial matter, we note that the medical program experimental radio license proposed in the *NPRM* was narrowly targeted for hospitals and other health care institutions.¹⁸³ The Commission proposed that this license would be limited to the testing and operation of new medical devices that use wireless telecommunications technology for therapeutic, monitoring, or diagnostic purposes that have not yet been submitted for equipment certification, or for devices that use RF for ablation, so long as the equipment is designed to meet the Commission's technical rules.¹⁸⁴ As we

¹⁸⁰ See n.173, *supra*. We note that the Commission has a program to formally recognize test laboratories for Part 15 and 18 equipment authorizations. See 47 C.F.R. § 2.948.

¹⁸¹ See para. 33, *supra*.

¹⁸² See *NPRM*, 25 FCC Rcd 16563-64, at para. 48.

¹⁸³ We inquired whether this eligibility requirement could be satisfied by an industry partner, rather than by the host health care institution, or whether a third party's expertise could be used to satisfy this requirement. We observed that the American Society for Healthcare Engineering (ASHE) was designated by the Commission to manage the use of medical wireless telemetry equipment in health care settings, and that information on wireless medical device registration is available on ASHE's website at: <http://www.ashe.org/resources/WMTS>. See *NPRM* at para. 50.

¹⁸⁴ See *NPRM*, 25 FCC Rcd 16563, at para. 48. Medical experimentation uses RF energy for a variety of purposes, including ablation. Ablation involves removal of a part of biological tissue, usually by surgery, by very precisely delivering RF energy to kill specific cells, such as cancer cells, without causing damage to nearby healthy cells. RF ablation devices are subject to equipment verification, and are regulated under our Industrial, Scientific, and Medical Equipment rules (Part 18). Non-ablation RF medical devices include data transfer, device control, programming, power transmission, remote sensing and monitoring, and identification – see the FDA's Radio-Frequency Wireless Technology in Medical Devices Draft Guidance at: <http://www.fda.gov/MedicalDevices/DeviceRegulationandGuidance/GuidanceDocuments/ucm077210.htm>. These (continued....)

discussed above, ongoing programs of related or unrelated experiments that encompass basic research and experimentation – including medical research and experimentation – logically fall under the broader category of research experiments. Research laboratories and manufacturers, as well as health care institutions, that conduct medical RF experimentation will be eligible for a program license, thus meeting the needs of a broad range of entities. Accordingly, we are not creating a medical-specific program experimental radio license category.

106. Nevertheless, the enormous growth of medical devices that use wireless telecommunications technology – and the testing requirements associated with this burgeoning area – support further action. In the *NPRM*, the Commission also requested comment on whether operations conducted under a medical experimental authorization should be limited to a specific geographic area – such as the licensee’s medical campus – or, alternatively, inquired whether the other proposed limitations on eligibility and operations provide sufficient protection against unanticipated consequences. On a related point, the *NPRM* also requested comment on whether testing under a medical experimental radio license should be expanded to include body-worn or implanted devices that travel with the patient. Finally, while the *NPRM* did not propose any limitations on power and frequency use for medical experimenters, other than those proposed for other program licenses, it did observe that many medical devices typically operate on a shared, non-exclusive, secondary basis and at low power levels. In addition, we note that the *NPRM*’s proposals implicitly limit medical testing experimental devices because of the requirement that licensees specify the rule part under which their experimental device is intended to operate.¹⁸⁵ Thus, it is assumed that such devices are designed to comply with existing rules.

107. *Comments.* The comments demonstrate that the experimental licensing program needs to accommodate a range of activities to support medical RF experimentation. As noted above, commenters state that many research laboratories and manufacturers are engaged in basic research developing medical RF devices and should be eligible for the proposed medical program license.¹⁸⁶ Commenters also point out that support is needed for technology development activities not only at the individual patient-worn medical device level, but also to enable complete system level testing at multiple locations – such as the licensee’s facility, individual homes, and continuing care facilities – and to conduct appropriate and necessary interoperability and RF immunity testing to complement the FDA’s IDE process.¹⁸⁷

108. For example, Mayo argues that, for the type of research it contemplates, experiments need to be extended to real world non-hospital settings. It states that some tests related to these concepts would include a variety of home environments and span time frames of varying lengths. In particular, Mayo cites issues such as remote monitoring, device tolerance to potential interference sources, and patient ability to use devices without the benefit of assistance as critical aspects of experiments conducted outside of medical campuses.¹⁸⁸ Mayo argues that a large number of medical devices are worn outside hospitals, and an experimental license program that fails to reflect this reality will be considerably less valuable to doctors, patients, and health technologists.¹⁸⁹

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non-ablation devices are subject to equipment certification, and are regulated under our Wireless Medical Telemetry Service (Part 95, subpart H), our Private Land Mobile Radio Service (Part 90), or as unlicensed devices (Part 15).

¹⁸⁵ See *NPRM*, 25 FCC Rcd 16565, at para. 53.

¹⁸⁶ See para. 27, *supra*.

¹⁸⁷ See para. 28, *supra*. See also Medtronic Comments to *NPRM* at 1-5; EIBASS Comments to *NPRM* at 11.

¹⁸⁸ See Mayo Comments to *NPRM* at 6-7.

¹⁸⁹ See Mayo *Ex Parte* Filing, ET Docket No. 10-236, July 25, 2011, at 1.

109. Similarly, Medtronic argues that, at least for devices that have been designed to comply with either Part 15 or Part 95 of the Commission's Rules, the Commission should allow such devices to be used in residential settings when operation is initiated through a clinical trial authorized by the FDA. Medtronic observes that most medical implant devices studied in clinical trials are implanted at medical facilities, but eventually will be used by participating patients outside of such facilities. Accordingly, Medtronic concludes, authority to operate in residential areas without seeking a separate experimental authorization or certification for a device in the latter stages of development would facilitate completion of the clinical trial process leading to the eventual availability of new medical technologies.¹⁹⁰

110. Several commenters express concerns that medical device experimentation could cause interference to other authorized users and suggest that such experimentation be conducted only by entities that have demonstrated skills in basic radio systems management¹⁹¹ and only at locations under the control of the licensee, preferably within the confines of a health care facility.¹⁹² Although CTIA argues that any device with a general medical purpose should be included for experimental testing, it and others express concerns about testing devices implanted or worn by patients that would allow them to move beyond a controlled testing site.¹⁹³ SIA contends that allowing any device "with a general medical purpose" to be tested under a medical license invites abuse because it could open the door to testing equipment with a multiplicity of uses, only one of which may be a nominal medical use. Accordingly, SIA recommends that the Commission clarify that experiments conducted under the medical program experimental license, as proposed in the *NPRM*, involve devices that are uniquely medical in nature.¹⁹⁴

111. *Decision.* We find that the program license framework may not meet all of the testing needs of the medical device community. For example, licensees that operate under a program license will be required to conduct tests at geographic locations under their control. This will limit the ability of entities doing medical research to conduct clinical trials – particularly those involving patients or devices used for home care.

112. To meet these needs, we are establishing the medical testing license. This license will be available to health care facilities as defined in Section 95.1103(b) of the rules¹⁹⁵ so they can conduct clinical trials¹⁹⁶ of medical devices that have already passed through the early developmental stage and are ready to be assessed for patient compatibility and use, as well as operational, interference, and RF immunity issues in real world situations. The health care facility itself will be the responsible party for all testing and responsible for proper operation of equipment, as well as being responsible for remedying any

¹⁹⁰ See Medtronic Comments to *NPRM* at 7.

¹⁹¹ See Mayo Comments to *NPRM* at 5; EIBASS Comments to *NPRM* at 11.

¹⁹² See SIA Comments to *NPRM* at 15; CTIA Comments to *NPRM* at 12-13.

¹⁹³ See CTIA Comments to *NPRM* at 12; V-Comm Comments to *NPRM* at 11.

¹⁹⁴ See SIA Comments to *NPRM* at 15; SIA Reply Comments to *NPRM* at 7.

¹⁹⁵ See 47 C.F.R. § 95.1103(b) which defines a health care facility to include, "... hospitals and other establishments that offer services, facilities and beds for use beyond a 24 hour period in rendering medical treatment, and institutions and organizations regularly engaged in providing medical services through clinics, public health facilities, and similar establishments, including government entities and agencies such as Veterans Administration hospitals; except the term health care facility does not include an ambulance or other moving vehicle.

¹⁹⁶ Clinical trials are generally considered to be research studies with human beings that follow a pre-defined protocol. Clinical trials using RF devices may be used, for example, to test a patient's acceptance of a device, to ensure that the device properly provides the necessary treatment, therapy or monitoring, or to determine RF interoperability in a health care or other anticipated use environment.

interference issues that might arise during the trial. We will scrutinize the qualifications of applicants for medical testing licenses to ensure that they have sufficient expertise in RF management so as not to cause harmful interference to any authorized spectrum user. Similar to the requirement for program experimental licenses, we will require each applicant to submit a statement with its application detailing how it meets eligibility requirement relative to RF expertise.

113. While we will not explicitly condition medical testing licenses on health care facilities obtaining FDA approval to conduct a clinical trial for the RF devices to be tested under a medical testing license, as we can envision some applications where such approval may not be necessary, we caution that all parties involved in clinical testing must be aware of the FDA's jurisdiction and take all necessary steps to satisfy the requirements of both the FDA and the Commission prior to testing a device.¹⁹⁷ Thus, medical testing licensees must consider that a license grant by the Commission may not by itself be sufficient to begin testing. Each experimenter must determine whether the device needs specific pre-approval from the FDA, including whether the device meets the criteria for testing under an IDE. We also note that the Commission and FDA may consult from time to time if questions arise regarding the use of devices under the medical testing license. If the Commission determines that FDA requirements have not been met for a particular device that is the subject of an experiment, we may take action up to and including termination of the experimental license.

114. Because medical testing licenses are primarily designed to address the needs of health care facilities that want to conduct their own clinical trials, they are similar to product development licenses. However, medical testing licenses are targeted to a distinct user community to provide the flexibility needed to conduct clinical trials. Similar to program licenses, we will issue medical testing licenses for five year, renewable terms, and the licensee will be authorized to conduct multiple unrelated experiments under just one license. Although we proposed that medical program licenses be limited to investigations and tests involving therapeutic, monitoring, and diagnostic medical equipment that have not yet been submitted for equipment certification, or for devices that use RF for ablation, we will slightly modify this description to be consistent with the FDA's definition of a medical device. Specifically, we will define a medical device for the purposes of a medical testing license as a device that uses RF wireless technology or communications functions for diagnosis, treatment, or patient monitoring.¹⁹⁸ Under the

¹⁹⁷ EIBASS recommends that medical experimental applicants be required to hold an FDA IDE as the first step in demonstrating a credible program in need of a medical experimental license. EIBASS further recommends that medical experimental applicants be accredited by a nationally recognized certifying body or a Federal government entity such as Department of Veterans Affairs, the U.S. military, or NTIA. See EIBASS Comments to *NPRM* at 11.

¹⁹⁸ Section 201(h) of the Federal Food, Drug, & Cosmetic Act (21 USC § 321(h)) defines a medical device as:

"an instrument, apparatus, implement, machine, contrivance, implant, in vitro reagent, or other similar or related article, including a component part, or accessory which is:
 recognized in the official National Formulary, or the United States Pharmacopoeia, or any supplement to them, intended for use in the diagnosis of disease or other conditions, or in the cure, mitigation, treatment, or prevention of disease, in man or other animals, or intended to affect the structure or any function of the body of man or other animals, and which does not achieve any of its primary intended purposes through chemical action within or on the body of man or other animals and which is not dependent upon being metabolized for the achievement of any of its primary intended purposes."

See FDA webpage titled "Is The Product A Medical Device?" available at: <http://www.fda.gov/medicaldevices/deviceregulationandguidance/overview/classifyyourdevice/ucm051512.htm> (last updated on December 5, 2012).

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rules adopted herein, we will permit medical testing licensees to operate in any frequency band under Part 15 (Radio Frequency Devices), Part 18 (Industrial, Scientific, and Medical Equipment), or Part 95 (Personal Radio Services, Subpart H – Wireless Medical Telemetry Service and Subpart I – Medical Device Radiocommunication Service) of the Commission’s Rules.¹⁹⁹ Our goal is to speed the process for device development to benefit the public, and we believe that goal is best served by requiring that the device being tested under a medical testing license comply with existing Parts 15, 18, or 95 rules, so that additional rulemaking efforts are not necessary.²⁰⁰ If medical devices do not comply with the technical limits in these rules, they must be tested under a conventional or program experimental license.²⁰¹ While we are sympathetic to CTIA’s argument that this limitation may restrict the development of other innovative medical technologies, we find persuasive SIA’s contention that allowing any device with a general medical purpose to be tested under a medical testing license could result in wide-ranging experiments involving devices with a multiplicity of uses, most of which are non-medical in nature. For example, hand-held wireless phones could have software programs enabling some medical applicability, but are clearly not “medical equipment” that would be authorized by the Commission under Parts 15, 18, or 95 of its rules.²⁰²

115. We find no need to adopt special power and frequency rules for medical testing licenses as some commenters suggest. For example, although Mayo recommends that power limits imposed by Part 15 rules should serve as a guideline for medical experiments, it argues that dynamic power control could safely permit increased power in certain instances, such as medical emergencies.²⁰³ With respect to such emergencies, Mayo maintains that public safety frequencies may be the most appropriate to use, provided that use of such frequencies had been previously coordinated with local emergency communications officials.²⁰⁴ As will be the case for program experiments, each medical testing

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We note that the FDA definition of a medical device is inclusive of the definition we adopt herein.

¹⁹⁹ One additional difference between the general program license and medical testing licenses is that we will permit medical testing licensees to operate in restricted bands where authorized medical devices are already permitted to be deployed under our Part 95 rules. *See, e.g.*, 47 C.F.R. § 95.628, permitting the medical radiocommunications service use of the 401-406 MHz band, which is designated as a restricted band under 47 C.F.R. § 15.205.

²⁰⁰ As a general matter, we may authorize experiments that do not comply with current rules for frequency, power, or emissions, etc. to facilitate the development of new technologies. However, such experimental devices would not qualify for approval under our Part 2 equipment authorization rules unless we permit their manufacture and operation either under waiver or new rules established by rulemaking.

²⁰¹ In these situations, parties should be aware that they may need to file a petition for rulemaking or a request for rule waiver for the device under test.

²⁰² In this regard, we observe that the FDA’s role and approach towards software applications on wireless devices differs from the Commission interest in issuing Part 5 licenses for RF experimentation. In July 2011, the FDA issued for comment a document titled “Mobile Medical Applications Draft Guidance,” which informs manufacturers, distributors, and other entities about how it intends to apply its regulatory authority to select software applications intended for use on mobile platforms. *See* <http://www.fda.gov/medicaldevices/deviceregulationandguidance/guidancedocuments/ucm263280.htm>. Specifically, the document states that the FDA plans to apply its regulatory oversight only to certain types of mobile applications (apps) that either have traditionally been considered medical devices or that affect the performance or functionality of a currently regulated medical device.²⁰² We will continue to coordinate with the FDA on the topic of mobile medical apps, but observe that the use of a software application on a Commission approved RF device does not constitute an RF experiment as defined by the Commission under Part 5. Such apps fall under the jurisdiction of the FDA and should follow requirements pursuant to the final mobile medical applications guidance document.

²⁰³ *See* Mayo Comments to *NPRM* at 4.

²⁰⁴ *Id.* at 5.

experiment will be required to use only the power level necessary to carry out that experiment. As we explained above,²⁰⁵ the same limitations on use of public safety frequencies will apply to all experiments, whether medical in nature or not. As provided in Section 5.311 of our rules, program experimental applicants that propose to operate on public safety frequencies will be required to submit a specific plan to avoid interference to users of those frequencies.

116. Medtronic states that clinical devices that are designed for use under the MedRadio Service rules of Part 95 and those that would operate under Part 15 pose little risk of interference.²⁰⁶ However, Medtronic recommends that the Commission limit out-of-band and spurious emissions into the 401-406 MHz band from experimental medical radio devices, particularly when collocation of medical implant and peripheral devices is highly likely, *e.g.*, within facilities under the control of a medical program licenses.²⁰⁷ We are not persuaded that we need to impose any specific emission limitations into the 401-406 MHz MedRadio Service band, and we believe that doing so could actually restrict experimentation in RF compatibility. ARRL argues that, with appropriate notifications to amateur radio operators, medical equipment experiments could be conducted in Amateur allocations, but it also contends that the ubiquitous and frequency-agile nature of Amateur Radio spectrum use makes such spectrum largely unsuitable for any medical equipment experimentation.²⁰⁸ We note again that harmful interference caused by an experimental licensee to any licensed service is unacceptable, and thus we find no need to exclude certain Amateur Radio bands from potential use by medical testing licensees. More generally, we do not find the concerns raised regarding medical experimental licenses to be fundamentally different than the concerns raised about research program experimental licenses, which we already address above. In particular, any Part 5 licensee, including a medical testing licensee, will be responsible for ensuring that harmful interference is not caused to authorized spectrum users. Similarly, medical testing licensees must ensure that their devices are immune to interference affects from authorized services sharing the same bands as their devices. Testing under a medical testing license will allow for such testing. Thus, we will not restrict medical testing licensees from operating in any of the specific bands noted by commenters.

117. To make the medical testing license as useful as possible for clinical trials, we will permit licensees to conduct these trials not only at the facilities (*e.g.*, a hospital) under their control – a requirement for program licensees – but also to conduct product testing in other locations. For example, we will permit licensees to conduct experiments when patients are confined to their homes as they recover from medical procedures or when patients, who are using implanted or body-worn medical devices, are ambulatory. As Mayo noted, this flexibility is necessary to ensure critical functions for many medical devices – such as remote monitoring, device tolerance to potential interference sources, and patient ability to use devices without the benefit of assistance as critical aspects of experiments conducted outside of medical campuses. Health care facilities will specify their intended area of operation when they apply for a medical testing license, as specified in Section 5.404 of our rules. We recognize that some commenters expressed concerns about the interference potential that could be caused to authorized services if medical

²⁰⁵ See paras. 56-62, *supra*.

²⁰⁶ See Medtronic Comments to *NPRM* at 7.

²⁰⁷ Medtronic therefore recommends that a limit of 100 microvolts per meter at 3 meters on unwanted emissions into the 401-406 MHz band be a condition attendant to all medical program experimental licenses that are issued. Medtronic Comments to *NPRM* at 4.

²⁰⁸ See ARRL Reply Comments to *NPRM* at 17. ARRL also argues that only medical facilities and not manufacturers should be eligible for a medical program license and that experimenters are obligated to address interference susceptibility issues before commencement of experimental operations and affirmatively assume all responsibility for such interference.

experiments are conducted outside a health care facility.²⁰⁹ We believe that this concern is addressed in several ways. First, a medical testing license will be used primarily for clinical trials, not basic medical research. This means that the basic RF experimentation for the medical device will have already been completed and the device, in many cases, will already have received FDA IDE approval for such testing. In addition, although a health care facility could oversee a clinical trial beyond its facility, it may not want to assume this responsibility in some cases and instead prefer that the device manufacturer or health practitioner, under a conventional or product development trial license, assume responsibility for clinical trials outside the health care facility. We will also require that medical testing licensees follow the same responsible party and designation of “stop buzzer” point of contact requirements as program licensees. Finally, we will require that medical testing licensees follow the same notice and reporting requirements as program licensees – *i.e.*, medical testing licensees must provide both prior notification of planned experimentation and a report of experimental results on the Commission’s program experimental registration website. This public disclosure of medical testing prior to and at the conclusion of each trial will notify authorized users of such testing in their geographic area. We intend to closely monitor medical testing experiments and may revisit these geographic requirements as we gain some experience with this new type of license.

118. In the *NPRM*, the Commission proposed that medical program experimental licensees file yearly reports to the experimental licensing system of the activity that has been performed under their licenses to provide a venue for sharing information that medical researchers would find beneficial in the goal of patient care.²¹⁰ No one commented on this proposal. We conclude that a yearly reporting requirement for medical testing licenses will likewise support the sharing of useful information within the medical community, and we adopt such a requirement. These reports will be filed through the same website that will be used for registering experiments and will be available to the public. This action will facilitate the dissemination of information obtained in medical testing experiments that may be beneficial in providing improved patient care.

119. Finally, we are adopting the *NPRM*’s proposal that tests conducted under a medical experimental authorization not be subject to our traditional station identification rules. As the Commission observed in the *NPRM*, its past experience in the medical device field suggests that such requirements are impractical for many of the devices expected to be tested under the proposed new authorization, and the typical power level and deployment environment for such devices will serve to reduce the potential for unanticipated interference that cannot be readily identified and resolved.²¹¹

120. We also note that health care facilities that wish to enable medical device testing by program licensees under real-world conditions (including testing with patients) can instead request that they be designated as an innovation zone for such testing. Thus, a health care institution that would like to offer its facilities as a test-bed, but lacks the expertise to oversee such operations itself, can petition the Commission to designate their facility as an innovation zone, so that individual developers and manufacturers with research program licenses can use the facility under their license. This approach may be particularly useful for manufacturers who want to test medical or other types of equipment that will be used in a health care setting while it is in the product development stage, but who will not be eligible for the medical testing license.²¹² We note that under the innovation zone approach, the program licensee

²⁰⁹ See CTIA Comments to *NPRM* at 12-13; V-Comm Comments to *NPRM* at 11.

²¹⁰ See *NPRM*, 25 FCC Rcd 16566, at para. 55.

²¹¹ Only Mayo commented on this proposal and agreed with it. See Mayo Comment to *NPRM* at 6.

²¹² A manufacturer of medical devices would be able to continue its product testing for clinical trials under its program license at a designated innovation zone without having to apply for a separate product development trial (continued....)

that the health care facility permits to experiment on its premises would be the responsible party for the testing and operation of equipment within the innovation zone. This is different from the medical testing license, in which the health care facility is the responsible party.

121. These different licensing options represent a multi-faceted approach to facilitate robust medical RF experimentation that responds to the record developed in this proceeding. The medical testing experimental license complements the types of medical RF experimentation that parties will be able to conduct under either a conventional or program experimental license. This overall approach will provide a significant benefit to the public at no public cost by streamlining the process by which medical equipment is approved under our equipment authorization procedures, thus reducing the time it takes to develop cutting-edge medical devices and systems.

E. Broadening Opportunities for Market Trials

122. In the *NPRM*, the Commission noted that market studies and real-world trials, which require operation of equipment prior to authorization, can be vital to the transformation of prototypes to fully functional new products and services that meet consumer needs. This observation continued from the more general examinations of the market study process undertaken by the Commission in the August 2009 *Wireless Innovation NOI*²¹³ and the March 2010 *National Broadband Plan*.²¹⁴ The Commission observed in the *NPRM* that its rules generally prohibit marketing or operation of equipment prior to authorization, but that some exceptions exist. Specifically, Section 2.803 of the Commission's Rules allows for advertising and display, conditional sales and to certain businesses, outright sales of equipment that has not yet been authorized, so long as proper notice is provided to the prospective buyer. This rule section also permits a manufacturer to operate its product for demonstration or evaluation purposes under the authority of a local Commission-licensed service provider so long as that equipment operates in the bands licensed to that service provider. Additionally, Section 5.3(j) of the rules permits licensees operating non-certified equipment under experimental radio authorizations to conduct "limited market studies," on a case-by-case basis subject to limitations established by the Commission. Because these rules and exceptions are scattered over several rule parts, equipment manufacturers and licensees are often confused as to which particular rules apply to various situations.²¹⁵ Thus, the *NPRM* proposed to bring more clarity to the rules regarding the operation and marketing of RF devices prior to equipment approval and also to relax the conditions under which market trials can be conducted to enable more robust market trial activities by a greater number of innovators.²¹⁶

123. As a first step, the *NPRM* proposed to parse the existing rule into separate rule sections – one addressing rules for marketing devices prior to equipment authorization and one addressing operation of devices prior to equipment authorization. These rule sections – Section 2.803 and Section 2.805, (Continued from previous page) _____ license. This reduces time and costs for experimenters. *See also infra* para. 136 regarding product development trials.

²¹³ In the *Wireless Innovation NOI*, the Commission sought comment on the benefits of revising its rules governing market studies, with particular focus on whether the requirement that experimenters own all of the transmitting and/or receiving equipment used in a study favors manufacturers over others who seek to conduct market studies. *See* 24 FCC Rcd 11343-44, para. 65.

²¹⁴ Recommendation 7.7 of the *National Broadband Plan* recommended that the Commission start a rulemaking process to establish more flexible experimental licensing rules for spectrum and facilitate the use of this spectrum by researchers, including evaluating whether regulatory restrictions should be relaxed to permit research organizations to conduct broader market studies. *See* Recommendation 7.7, p.125 (discussing the rules for market studies codified at 47 C.F.R. § 5.93).

²¹⁵ *See NPRM*, 25 FCC Rcd 16567, at para 57.

²¹⁶ *Id.*, 25 FCC Rcd 16568-69, at para. 60.

respectively – would more clearly define the parameters for marketing and operating devices prior to equipment authorization.²¹⁷ Cisco agrees with the proposals in the *NPRM* to expand and clarify the rules.²¹⁸ No other party commented directly on these proposals and we therefore adopt the proposed new rule structure, which we find will provide the public benefit of increased clarity at no public cost.

124. The *NPRM* did not propose to alter the substance of the existing rules in Section 2.803, but rather proposed only to clarify them so that they would be easier to understand. However, commenters raise an issue with the provision that effectively prohibits operating unauthorized devices in residential areas. Under existing Section 2.803(e)(1)(iv) of our rules, RF devices may be operated, but not marketed, for the purposes of “evaluation of product performance and determination of customer acceptability, provided such operation takes place at the manufacturer's facilities during developmental, design, or pre-production states.”²¹⁹ CTIA and TIA argue that the current prohibition does not allow for valuable testing in a residential setting during the development process, and places a burden on product developers to needlessly expend resources in this area when field testing could suffice. Further, they state that to realistically assess pre-approved commercial products such as cell phones, smartphones, and tablet computers, the effectiveness of such devices must be evaluated in residential areas. CTIA and TIA conclude that, so long as a manufacturer is working with a carrier under the carrier's license, the risk of harmful interference is very slight and if any does occur, it could be remedied very quickly.²²⁰

125. We agree with CTIA and TIA. In the case of testing devices in conjunction with a service provider, that provider is the licensee and is ultimately responsible for operations under its license. Moreover, the service provider has a direct interest in not causing interference to its own customers and therefore has a significant incentive to take steps to minimize any risk. We will therefore modify proposed Sections 2.805(b)(3)(iii) and 2.805(b)(3)(iv) of the rules to permit a manufacturer to operate unauthorized equipment in a residential area, so long as it is operated in conjunction with, and under the authority of, a service provider's license. Finally, the rules we are adopting require that licensees in market trials ensure that trial devices are either rendered inoperable or retrieved from trial participants at the conclusion of the trial, and that licensees notify participants in advance of the trial that operation of trial devices is not permitted following the trial. These rules essentially follow existing rules and procedures currently available in the ERS for limited market studies.

126. In a related issue, the *NPRM* inquired whether the Commission should modify its rules to permit operation of RF devices that are not yet authorized without an experimental license, so long as the devices are operated as part of a trade show demonstration and at or below the maximum power level permitted for unlicensed devices under the Commission's Part 15 rules.²²¹ Commenters were supportive of this idea. Boeing contends that devices that operate below the power levels set forth in Part 15 are not a threat to interfere with authorized Commission services. Boeing therefore proposes that the Commission permit entities to utilize any low-power device claimed to be operating within the emission limits of Part 15, whether or not certified, at trade show demonstrations, without securing a separate experimental authorization.²²² SIA also supports such a provision and contends that demonstrations of RF devices under these conditions will facilitate the market for, and thus the development of, new communications equipment. However, SIA cautions that it bases its support on the assumption that

²¹⁷ *Id.*, 25 FCC Rcd 16569, at para. 61.

²¹⁸ See Cisco Comments to *NPRM* at 5.

²¹⁹ See 47 C.F.R. § 2.803(e)(1)(iv).

²²⁰ See TIA Comments to *NPRM* at 7-8; CTIA Comments to *NPRM* at 15.

²²¹ See *NPRM*, 25 FCC Rcd 16577, at para 84.

²²² See Boeing Reply Comments to *NPRM* at 9-10.

instances of non-compliance with the Part 15 power levels will be immediately addressed and, where necessary, resolved through strict enforcement of the Commission's Rules.²²³ TIA argues that relaxation of the rules regarding uncertified RF devices should not be limited to trade show demonstrations. TIA contends that testing undertaken within the envelope of Part 15 technical parameters and associated rules will allow innovative research to be done at power levels the Commission has already determined will not cause interference, without the additional requirement for licensing.²²⁴

127. In consideration of the comments, we will add a provision to the rules in Section 2.805(b)(2) to permit general operation of RF devices subject to certification that have not yet been certified without the need for an experimental license, provided that the devices are operated as part of a trade show demonstration and at or below the maximum power level permitted for unlicensed devices under our Part 15 rules. Current rules provide such an exception only for devices designed to operate under Parts 15, 18, or 95. Expanding this exception to devices designed to operate under any rule part, but capping the power level for demonstration purposes to the Part 15 levels,²²⁵ will reduce burdens on manufacturers, as they will no longer need to obtain an experimental license to conduct such demonstrations. Further, this expansion will increase opportunities for manufacturers to demonstrate their products, with little potential for increasing interference, as emissions at Part 15 levels are currently permitted. We do not find it necessary to restrict such use to indoor only or to preclude in-motion operations. We observe that the current exceptions do not include such restrictions, and we have not received any interference complaints. However, we will not allow RF devices operating under this provision to be used beyond trade shows. Trade show schedules and operating hours are known and generally occur in confined areas, and often have their own frequency coordinators, so any instance of harmful interference can be identified and remedied quickly. In contrast, unrestricted use of uncertified devices at any location, even at the Part 15 levels, could increase the likelihood of interference to authorized spectrum users without any such ability for quick remediation. Accordingly, we find that our revised rules strike an appropriate balance between the benefits of enhanced opportunities for manufacturers of RF devices to demonstrate their products and the potential costs of harmful interference to authorized Commission radio services.

1. Product Development and Marketing Trials

128. In the *NPRM*, the Commission proposed to expand upon the existing concept of "limited market studies" as currently codified in our Part 5 rules.²²⁶ Specifically, it proposed to adopt a new subpart that contains provisions for two types of trials – product development trials and market trials. As an initial matter, because Part 5 does not contain a definition of marketing, the Commission proposed to cross-reference the Part 2 definition²²⁷ in the revised Part 5 market trial rules and sought comment on whether this definition meets the needs of Part 5 licensees.²²⁸ It then proposed that a product development trial be defined as an experimental program designed to evaluate product performance in the conceptual, developmental, and design stages, and that a market trial be defined as a program designed to

²²³ See SIA Comments to *NPRM* at 6.

²²⁴ See TIA Comments to *NPRM* at 7.

²²⁵ General requirements for Part 15 radiation emission limits are shown in Section 15.209, and restricted bands of operation are listed in Section 15.205(a). See 47 C.F.R. §§ 15.209 and 15.205(a).

²²⁶ See 47 C.F.R. § 5.93.

²²⁷ See 47 C.F.R. § 2.803(e)(4). The Part 2 definition of marketing includes sale or lease of equipment, or offering for sale or lease, including advertising for sale or lease, or importation, shipment, or distribution for the purpose of selling or leasing or offering for sale or lease.

²²⁸ See *NPRM*, 25 FCC Rcd 16569, at para. 62.

evaluate product performance and customer acceptability prior to the production stage. The Commission proposed that these trials be conducted under the authority of a Part 5 license and – because they would typically involve equipment that has not yet been certified – operate as an exception to the general Part 2 rule restricting such operation.

129. The *NPRM* envisioned that product development trials could include equipment that would not be able to operate in compliance with existing Commission rules, absent an experimental radio authorization. Thus, the Commission’s proposals were designed to generally track the existing rules for limited market studies, in that the *NPRM* proposed to explicitly prohibit the marketing of devices operated as part of a product development trial and retain the requirements that licensees retain ownership of the equipment and they notify users that they are part of a limited market study.²²⁹

130. Regarding market trials, the Commission recognized that they often involve the offer for sale or lease of a device operated pursuant to a license, so that manufacturers and service providers can evaluate customer demand for new capabilities or services at various price points. It proposed that under a market trial, licensees would be permitted to lease equipment to trial participants. However, it also proposed to continue the prohibition on sale of equipment that has not yet been certified to market trial participants, such as consumer end users, and require that licensees retain ownership of equipment. To do otherwise, the Commission reasoned, would put the ownership of uncertified equipment directly with consumers and complicate the Commission’s efforts to enforce its rules when the trial ends. The Commission also proposed to require that licensees ensure that trial devices are either rendered inoperable or are retrieved at the end of the trial. Additionally, recognizing that two parties may plan to conduct a market trial together (*e.g.*, a manufacturer working in conjunction with a service provider), it proposed rules that would permit it to issue a Part 5 license to more than one party, and to allow licensees to sell equipment to each other.²³⁰ In these instances, it proposed that one party must be designated as the responsible party for that trial. Finally, to ensure that it would have a licensee identified as the responsible party for all market trials, the Commission proposed that a Part 5 license would be necessary for all market trials, even those for devices designed to be authorized under Parts 15, 18, or 95 of its rules.²³¹

131. *Comments.* Commenting parties generally agreed with the *NPRM*’s premise to modify and provide additional flexibility to the market study rules. In support of those proposals, Boeing maintains that the faster new products and services are introduced into the marketplace, the more innovative technologies will follow.²³² TechAmerica generally concurs and adds that the proposed rules, by virtue of granting experimental authorizations to a broad array of eligible entities and multiple licenses to parties engaged in the same market trial, will more efficiently ensure that new devices are thoroughly tested prior to commercial launch.²³³ CTIA also supports the *NPRM*’s proposals to expand the existing concept of limited market studies to include both product development trials and market trials and states that the proposed market trial rules would create new marketing opportunities for a wide range of entities, including manufacturers, service providers, researchers, developers, and other innovators. CTIA further

²²⁹ *Id.*, 25 FCC Rcd 16569, at para. 64.

²³⁰ For example a manufacturer holding a Part 5 experimental license could sell uncertified equipment to a service provider that holds a Part 5 experimental license for a market trial.

²³¹ *See NPRM*, 25 FCC Rcd 16570, at para. 66.

²³² *See* Boeing Comments to *NPRM* at 15-16.

²³³ *See* TechAmerica Comments to *NPRM* at 5.

states that the proposed rules will help identify product concerns and any remaining design issues under actual customer use scenarios at an earlier stage in the development process.²³⁴

132. Several commenters also expressed concern over the *NPRM*'s proposals. CTIA cautions that any new or modified rules should not enable parties to “game” the licensing processes and undermine the goals of this proceeding by allowing parties to use an experimental radio service license to conduct “soft” product rollouts disguised as market trials. To that end, CTIA agrees with the Commission that market trials should not permit sales to consumers of equipment that has not yet been certified. Similarly, SIA argues that the proposals to broaden opportunities for market trials pose the risk of a proliferation of trials with pseudo-commercial appearances that could lead to a flood of uncertified and potentially interfering equipment that may be difficult to retrieve. SIA contends that the proposal to prohibit the sale of uncertified devices to trial participants does not preclude those devices from causing interference because they can be leased. For this reason, SIA recommends that the Commission impose viable controls to ensure retrieval of all devices following market trials, and further recommends that we impose penalties with meaningful consequences against parties that fail to retrieve equipment.²³⁵ Likewise, EIBASS asserts that product development trials and market trials would be open invitations for parties to skirt the current requirements for the manufacturing, importation, or sale of RF devices, and could quickly result in the introduction of unapproved RF devices into the marketplace that could cause interference to licensed users.²³⁶ Finally, Mayo recommends that a medical device be differentiated from a more general commercial application, either by including in the product development definition new medical devices used in a clinical trial or, alternatively, providing a new category for these types of devices.²³⁷

133. *Decision.* As stated in the *NPRM*, we believe that the Commission’s proposals will expand the availability of trials, so that manufacturers and service providers can gain valuable insight to the needs of consumers prior to offering new products and services to the broader marketplace. Commenters generally agreed, and we adopt those proposals with only minor modifications, as detailed below. We find that the proposed changes are in the public interest and will provide a significant benefit at little or no cost.

134. We believe that these rules address the concerns that some commenters expressed. CTIA’s concern about a “soft” product or service rollout, and SIA’s and EIBASS’s concern regarding the potential for proliferation of unauthorized equipment, is addressed by our prohibition on the sale of such equipment to consumers. This prohibition has been in place for market studies under Part 5 for some time, as has a requirement that each experimental licensee inform all participants in a market trial that the operation of the service or device is being conducted under an experimental authorization and is strictly temporary. These rules have worked well in the past and we believe that they will continue to function as designed to ensure that trials do not become proxies for actual product or service offerings.

135. Regarding Mayo’s concern that the proposed definition of a product development trial in Section 5.5 is too narrow and should be expanded to explicitly include medical devices, we concur. As we have observed in our discussions regarding medical testing licenses, above, medical devices must not only be evaluated in the conceptual, developmental, and design stages, but also through extensive clinical trials. We envision that a party developing a medical device might seek authorization for a product development trial when, for example, it has developed equipment that would not be able to be operated in

²³⁴ See CTIA Comments to *NPRM* at 13-14.

²³⁵ See SIA Comments to *NPRM* at 7-8.

²³⁶ See EIBASS Comments to *NPRM* at 14-15.

²³⁷ See Mayo Comments to *NPRM* at 6.

compliance with existing Commission rules, absent an experimental radio authorization.²³⁸ To remove any uncertainty about the potential scope of a product development trial, we modify the definition of a product development trial to specifically include medical devices being used in clinical trials.

136. The rules that we adopt differentiate between product development trials and market trials, as set forth in Sections 5.501 and 5.502 of our rules, respectively. In a product development trial, licensees must own all of the equipment, must inform all participants of the nature of the trial, and must not market devices or offer services for hire. Market trials, coming later in the development process, will also have a requirement that the licensee retain ownership of all equipment, but we will allow limited marketing of equipment. Specifically, we will permit the sale of equipment between licensees in a market trial, provided that they each have an experimental license authorizing a market trial. We will also permit the lease of equipment to trial participants. As an example, a manufacturer holding an experimental license for a market trial may sell equipment to a similarly licensed service provider, but neither of those licensees may sell equipment to an unlicensed trial participant – rather, those participants may only lease trial equipment. In addition, the rules require that if more than one licensee is authorized for a market trial, one of those licensees must be designated as the responsible party for the trial. We will designate the responsible party, if the parties themselves do not submit that information to us. Finally, the rules require that licensees in market trials ensure that trial devices are either rendered inoperable or retrieved from trial participants at the conclusion of the trial, and that licensees notify participants in advance of the trial that operation of trial devices is not permitted following the trial. These rules essentially follow existing rules and procedures currently available in the ERS for limited market studies.

137. We find it logical to require that both product development and market trials be authorized under conventional – rather than a program – experimental licenses. We do so in recognition of the inherent difference between product development and market trials and “regular” experimentation and testing – the most prominent difference being the necessity to prevent an experimental licensee from creating a *de facto* service through the experimental licensing process. We do not believe that requiring a conventional license – a continuation of the Commission’s existing practice for market trials – will diminish either the ability of experimenters to conduct such trials or the independent value of a program license.

138. We believe that these rules will enhance and build on the rules previously available to Part 5 licensees for market studies. They provide additional flexibility for manufacturers and service providers to gain an understanding of the viability of their products in the marketplace. We are confident that experimental licenses will take advantage of them and provide a substantial benefit to the American public at minimal cost.

2. Evaluation Kits

139. Evaluation kits typically consist of a component that a manufacturer intends to offer for sale, mounted on a board, with or without an enclosure, in configurations that provide connections to a power supply, easy access to terminals, and sometimes supporting devices or other hardware. The *NPRM* noted that in many instances, developers and system integrators seek to obtain evaluation kits from manufacturers to test and evaluate a component that the manufacturer intends to offer for sale to facilitate the purchaser’s development of hardware and software for use with that component. The *NPRM* pointed out that, under the current rules, sales of these kits are not permitted before equipment authorization is granted for the component, and that this restriction delays the ability of manufacturers and system integrators to develop hardware and software for use with the component. Recognizing that this restriction leads to inefficiency in the device development process, the *NPRM* proposed to modify Section

²³⁸ As discussed in para. 114, *supra*, operation under a medical testing license is limited to devices that comply with existing Parts 15, 18 or 95 rules.

2.803 of the rules to allow the sale of these evaluation kits, so long as notice stating that the component has not yet been certified is provided to any buyer.²³⁹

140. *Comments.* Commenting parties support the *NPRM's* proposal. TIA states that such kits permit engineers and technicians to assess the viability of integrated circuit chips and other circuit components for possible inclusion in products under development, and that they also are used for hardware and software design and development purposes in teaching labs in engineering schools throughout the United States. Additionally, TIA and the Semiconductor Industry Association maintain that not all evaluation kits are currently considered contrary to the existing rules because some kits qualify as digital device testing equipment that are exempt from most regulation. TIA states that it welcomes the opportunity to work with the Commission to find ways to permit unauthorized evaluation kits to serve traditional roles, while not undercutting the goal of the equipment authorization program as a means of enabling communications without harmful interference.²⁴⁰ Finally, the Semiconductor Industry Association recommends that a definition of both “evaluation kit” and “end product” be added to Section 2.1 of our rules and that language be added to Section 2.803 to specify operating and labeling requirements for evaluation kits; and further recommends that we incorporate language changes to Section 2.805 to remove inconsistent rule references.²⁴¹

²³⁹ See *NPRM*, 25 FCC Rcd 16570-1, at para. 67.

²⁴⁰ See TIA Comments to *NPRM* at 8-10; see also, Semiconductor Industry Association Reply Comments to *NPRM* at 2.

²⁴¹ These recommended changes are as follows (italicized):

Section 2.1 is amended by inserting the following definitions:

Evaluation Kit: An assemblage of components, subassemblies or circuitry created by or for a component maker for the purpose of facilitating (i) end product developer evaluation of all or some of such components or (ii) the development of software to be used in an End Product.

End Product: An End Product is a completed electronic device that has received all requisite FCC approvals and is suitable for marketing in the normal course of business to end users.

Section 2.803(iv): A radio frequency device that constitutes an evaluation kit as defined in Section 2.1 of this Chapter may be sold as a kit provided that:

(A) the device is designed or developed for use by product and software developers;

(B) that the following notice is included with the device:

FCC NOTICE: This kit is designed to allow (i) product developers to evaluate electronic components, circuitry, or software associated with the kit to determine whether to incorporate such items in a finished product and (ii) software developers to write software applications for use with the end product. This kit is not a finished product and when assembled may not be resold or otherwise marketed unless all required FCC equipment authorizations are first obtained. Operation is subject to the conditions that this device not cause harmful interference to licensed radio stations and that this device accept harmful interference. Unless the assembled kit is designed to operate under Part 15, Part 18 or Part 95 of the FCC Rules, the operator of the kit must operate under the authority of an FCC license holder or must secure an experimental authorization under Part 5 of the FCC Rules.”

(C) that the device is labeled with the following legend: For evaluation only; not FCC approved for resale; and

(D) any intentional radiator employed as part of an evaluation kit shall be designed to comply with the FCC frequency use, spurious and out-of-band emission limits and maximum power or field strength ratings applicable to final products that would employ the components or circuitry to be evaluated.

Section 2.805(3)(ii): Demonstrations at a trade show provided a notice containing the wording specified in Section 2.803(c)(2)(iii) of this part is displayed in a conspicuous location on, or immediately adjacent to, the device;

Section 2.805(3)(iii): Demonstrations at an exhibition conducted at a business, commercial, industrial, scientific, or medical location, but excluding locations in a residential environment, provided a notice containing the wording specified in Section 2.803(c)(2)(iii) of this part is displayed in a conspicuous location on, or immediately adjacent to, the device or all prospective buyers at the exhibition are advised in writing that the equipment is subject to the (continued....)

141. *Decision.* There was no opposition to the proposal to modify Section 2.803 to allow for the sale of evaluation kits, provided that notification to the buyer is provided regarding the authorization status of the component. Accordingly, we adopt that proposal. In doing so, we note, as pointed out by TIA and the Semiconductor Industry Association, that not all sales of evaluation kits are prohibited by the rules. However, our action here removes any ambiguity that may exist over which kits fell into the prohibited category, thus simplifying our regulations for the benefit of continued innovation. Additionally, we incorporate – with some edits – the changes to Sections 2.1, 2.803, and 2.805 that were recommended by the Semiconductor Industry Association. In particular, we are modifying the Semiconductor Industry Association’s proposed definition of evaluation kits to include software, as well as to reference system integrators and product developers, so that the definition would read: “An assembly of components, subassemblies,²⁴² or circuitry, including software, created by or for a component maker, system integrator, or product developer for the sole purpose of facilitating: (i) end product developer evaluation of all or some of such components, subassemblies, or circuitry, or (ii) the development of software to be used in an end product.”

3. Importation Limits

142. In the *NPRM*, the Commission also addressed rules that place limits on the quantity of devices that can be imported for testing and evaluation to determine compliance with the rules or suitability for marketing. The current rule in Section 2.1204(a)(3) permits RF devices to be imported in quantities up to 2000 units for products designed solely for operation within a radio service that requires an operating license, and up to 200 units for all other devices. Based on comments from HP, the Office of Engineering and Technology proposed in its 2006 Biennial Review Staff Report to increase the importation limit for devices that do not require an individual station license from 200 units to 1200 units, and further proposed to treat devices that contain both licensed and unlicensed transmitters as licensed, and therefore subject to the 2000-unit importation limit applicable to licensed devices.²⁴³ The Commission reiterated that proposal in the *NPRM*, stating that these limits would better reflect current manufacturing, design, and marketing techniques, and would also decrease the administrative burden on both industry and the Commission.²⁴⁴

143. *Comments.* Commenting parties strongly support increasing the importation limit from 200 units to at least 1200 units for devices that do not require an individual station license. CTIA states

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 FCC rules and that the equipment will comply with the appropriate rules before delivery to the buyer or to centers of distribution; or
 Section 2.805(3)(iv): Evaluation of product performance and determination of customer acceptability, during developmental, design, or pre-production states provided such operation takes place at a business, commercial, industrial, scientific, or medical location, but excluding locations in a residential environment. If the product is not operated at the manufacturer’s facilities, it must be labeled with the wording specified in Section 2.803(c)(2)(iii) of this part or, in the case of an evaluation kit the wording 2.803(c)(2)(iii) of this part or, in the case of an evaluation kit the wording specified in Section 2.803(c)(2)(iv)(C). See Semiconductor Industry Association Reply Comments to *NPRM* at 5-10.

²⁴² We note that “subassemblies” that are expected to be approved as “modular transmitters” under Section 15.212 of our rules may be included in evaluation kits if the subassemblies are clearly marked as requiring further approval and are subject to the same regulations as evaluation kits.

²⁴³ See 2006 Biennial Review of Telecommunications Regulations – Part 2, Administered by the Office of Engineering and Technology, ET Docket 06-155, *Staff Report*, 22 FCC Rcd 2930 (2007). The Communications Act requires the Commission (1) to review biennially its regulations “that apply to the operations or activities of any provider of telecommunications service,” and (2) to “determine whether any such regulation is no longer necessary in the public interest as the result of meaningful economic competition between the providers of such service.”

²⁴⁴ See *NPRM*, 25 FCC Rcd 16572, at para. 71.

that a larger importation limit would provide additional flexibility for manufacturers to design effective market trials, especially for products that are intended to be produced and distributed on a nationwide basis.²⁴⁵ HP argues that the proposed increase will preserve Commission resources by freeing OET staff from addressing waiver requests necessary under the present prototype import rules. HP notes that it sells its products to a worldwide marketplace, and that the number of countries or regions it typically sells to act as multipliers on the number of prototypes needed to support development and marketing activities. Therefore, HP encourages the Commission to not only increase the importation limit on preapproved prototype units, but also to continue providing flexibility in those case where manufacturers need to import prototype units in excess of 1200.²⁴⁶

144. Qualcomm contends that increasing the 200-unit limit will support increased wireless experimentation and innovation within U.S. borders and reduce the administrative burden on the industry and the Commission to deal with waivers of the current rule and associated border reporting requirements.²⁴⁷ In supplemental comments, Qualcomm recommends that the limit be raised to 3000 units for both importation and sales of uncertified devices that do not require an individual station license. Qualcomm argues that this higher limit would better reflect today's marketplace for semiconductor chips incorporated into broadband devices and more effectively increase wireless experimentation and innovation in the U.S.²⁴⁸ Advocating even more flexibility, TIA urges that the import limit be raised to 8000 units for all devices.²⁴⁹

145. *Decision.* The rules limiting the importation of devices that have not yet been authorized are intended to strike a balance between ensuring that manufacturers have a sufficient number of devices available for compliance testing and market studies, while also ensuring that unauthorized devices are not distributed to the general public thereby reducing the risk of harmful interference to authorized devices. Originally, the Commission provided that unauthorized devices could be imported in "limited quantities." That ambiguous designation was later clarified to a limit of 200 devices for testing and evaluation to determine compliance with the Commission's Rules and Regulations or suitability for marketing.²⁵⁰ Subsequently, in 1998, the Commission adopted the current importation limits of 2000 devices for services in which a license is needed and 200 devices for all other services.²⁵¹ Since the Commission last modified its rules, the communications market has undergone significant changes characterized by a proliferation of both licensed and unlicensed devices, as well as highly-sophisticated new devices – such as the latest mobile phones – that contain several licensed and unlicensed transmitters. Such devices are being introduced to the marketplace at ever increasing rates. These changes have led to requirements for extensive testing, as well as significant market research trials, to ensure that these devices will meet user

²⁴⁵ See CTIA Comments to *NPRM* at 16-17.

²⁴⁶ See HP Comments to *NPRM* at 2.

²⁴⁷ See Qualcomm Comments to *NPRM* at 10.

²⁴⁸ See Qualcomm *Ex Parte* filing, ET Docket Nos. 10-236 and 06-155, June 14, 2011, at 1.

²⁴⁹ See TIA *Ex Parte* filing, ET Docket Nos. 10-236 and 06-155, July 20, 2012. See also, Letter from Brian Scarpelli, TIA to Marlene Dortch, August 6, 2012, which reiterates support for an importation limit of 8,000 units and also professes support for shifting the import compliance process to a registration system in conjunction with a change in the import limit. We note that any change in the import compliance process, such as to a registration system, is beyond the scope of this proceeding and not addressed herein.

²⁵⁰ See Amendment of Part 2 of the Rules Concerning the Importation of Radio Frequency Devices Capable of Causing Harmful Interference, GEN Docket No. 89-349, Order on Reconsideration, 7 FCC Rcd 4960 (1992).

²⁵¹ See In the Matter of Revision of Part 2 of The Commission's Rules Relating to the Marketing and Authorization of Radio Frequency Devices, ET Docket No. 94-45, Memorandum Opinion and Order, 13 FCC Rcd 12928 (1998).

expectations. Device testing is further augmented by the need for devices sold to multiple telecommunications providers to be tested on each provider's network. Thus, based on our experience – as well as the comments – the current importation limits are no longer adequate to meet the industry's needs. The need for increased device testing, in turn, has put additional pressure on the Commission to issue timely waivers of the existing limits, so that manufacturers and telecommunications providers can meet their deadlines.

146. We therefore adopt the proposal to increase the current importation limits. However, based on the comments and our experience in granting waivers of the current limits, we believe that the proposed increase was too modest to make a significant difference to manufacturers or to Commission staff. In particular, we note that several commenters – including Qualcomm and TIA – requested that the Commission raise the limits beyond what was proposed and that it apply a common limit for all devices. We agree with these commenters, and thus are adopting rules that increase the importation limit for all devices – those that require a license and those that do not – to 4000 units. Adopting a single limit for all devices will decrease the administrative burden on both manufacturers and the Commission. Additionally, given the number of devices available that contain a mix of unlicensed transmitters and transmitters that require operation pursuant to a Commission license, we find that the current distinction among device types is less meaningful. Furthermore, we do not expect that an increase in the limit will increase the risk of interference from devices that are solely unlicensed. Based on our experience, we believe that a new 4000-unit limit – which is one-third larger than the 3000-unit limit suggested by Qualcomm – will be sufficient to meet industry's needs. We find that a 4000-unit limit strikes the proper balance among ensuring that sufficient devices are available for testing, protecting authorized devices from harmful interference, and freeing up Commission resources from addressing excessive numbers of waiver requests. With respect to adoption of the 8000-unit limit recommended by TIA, we find a four-fold increase would be excessive. To the extent that a TIA member or other party has a specific need to import more than 4000 units for testing, we will continue the Commission's past practice of providing reasonable flexibility on a case-by-case basis, subject to justification for a higher number of imported units. Under this approach, we can still accommodate the interest of parties, such as TIA, that advocated for a larger importation limit. Accordingly, we find that this balanced approach benefits the public by reducing administrative burdens, while guarding against the costs of harmful interference to authorized Commission devices.

F. Modifying and Improving Rules and Procedures

147. *Anechoic Chambers and Faraday Cages.* In the *NPRM*, the Commission proposed to add rules to codify existing practices regarding the treatment of experiments conducted within anechoic chambers²⁵² and Faraday cages.²⁵³ Specifically, it proposed to permit RF tests and experiments that are fully contained within an anechoic chamber or a Faraday cage to occur without the need for obtaining an experimental license, and inquired whether there should be a minimum standard for the shielding effectiveness of the chamber.²⁵⁴

148. Commenters strongly supported the proposals regarding anechoic chambers and Faraday cages. Qualcomm states that codifying the Commission's policy of allowing wireless experimentation

²⁵² An anechoic chamber is a room, insulated from exterior sources of noise, and designed to stop reflections of electromagnetic waves. They are used to test and measure RF equipment such as antennas or radars or to conduct electromagnetic interference studies in isolation of external noise. Anechoic chambers are also used to measure emissions from unintentional radiators, such as a radio receiver or laptop computer.

²⁵³ A Faraday cage is an enclosure usually formed by a mesh of conducting material designed to block out external static and to keep RF fields generated within the cage from escaping.

²⁵⁴ See *NPRM*, 25 FCC Rcd 16576, at para. 82.

within such enclosures without the need for an experimental authorization will encourage greater levels of experimentation and relieve the Commission from the burden of responding to such inquiries from industry.²⁵⁵ SIA maintains that operations conducted within both types of facilities have significant experimental value and, when conducted properly, pose no threat of harmful interference to authorized services. However, SIA recommends that these operations be required to maintain RF levels outside anechoic chambers or Faraday cages equal to or lower than the emission and/or field strength levels that unintentional radiators in the same frequency bands are allowed under Part 15 of the Commission's Rules.²⁵⁶ V-Comm recommends that shielding effectiveness and signal leakage measurements be performed on all frequency bands, and that power levels utilized in tests ensure sufficient isolation and shielding effectiveness to prevent signals from leaking outside such facilities and causing harmful interference to existing services in licensed spectrum bands.²⁵⁷

149. Boeing recommends that operations in RF enclosed facilities be permitted in all frequency bands, but that those operations be subject to maximum emissions limits as measured outside the facilities. Boeing also recommends that entities be permitted to self certify compliance with the emissions limits.²⁵⁸ Lockheed Martin observes that the Commission's past guidance regarding RF enclosed facilities has never included any specific requirements regarding shielding thickness or other design specifications, but rather has relied on the fact that such environments are highly unlikely to cause harmful interference. It therefore recommends that the Commission not mandate compliance with a specific standard for shielding or impose similar construction requirements.²⁵⁹

150. Commenters were supportive of the *NPRM's* proposal to codify the Commission's existing policy of allowing RF tests and experiments that are fully contained within an anechoic chamber or a Faraday cage without the need for obtaining an experimental license. We are therefore adopting that proposal. In doing so, we observe that all experimenters, even those operating in RF enclosed facilities, are required to comply with the general prohibition against causing harmful interference to other spectrum users. Thus, we expect that experimenters who use these facilities will ensure proper functioning prior to use, including ensuring sufficient isolation of RF energy. Further, we observe that we are codifying existing practice that has been in place for quite some time, and that we have received no complaints from other spectrum users of harmful interference. Therefore, we do not believe it is necessary to adopt additional standards for emission limits outside these RF enclosures. This approach will reduce administrative burdens and provide cost savings to the public.

151. *Inter and Intra-Agency Coordination Procedures.* Several commenters bring up issues regarding the Commission's ability to resolve objections to and concerns regarding proposed experiments prior to the Commission taking action. Commenters note that these concerns and objections may be either from within the Commission or from other Federal agencies or both. BAE requests that we revise our rules to expressly provide conventional experimental applicants (for both Special Temporary Authorizations, or STAs, and regular licenses) an opportunity to resolve agency concerns, objections, or proposed frequency carve-outs prior to an experimental grant.²⁶⁰ Specifically, BAE recommends that a

²⁵⁵ See Qualcomm Comments to *NPRM* at 10.

²⁵⁶ See SIA Comments to *NPRM* at 5-6.

²⁵⁷ See V-Comm Comments to *NPRM* at 19.

²⁵⁸ See Boeing Comments to *NPRM* at 21.

²⁵⁹ See Lockheed Martin Comments to *NPRM* at 5.

²⁶⁰ BAE similarly requests that "Qualified Homeland Security Applicants" should be permitted to address concerns by either rebutting the findings or modifying the proposal to mitigate the concerns to allow more flexibility for internal research and development in military and public safety bands. BAE defines a Qualified Homeland Security (continued....)

conventional experimental applicant be permitted to engage a technical representative of the objecting agency within seven calendar days of the objection being identified.²⁶¹ In a related issue, BAE suggests that the Commission revise its process to allow conventional experimental license applicants greater access to application status details so that they can easily monitor for objections and address any that are identified in a timely manner.²⁶² SIA recommends that the Commission and NTIA jointly review experimental license applications that use shared Federal/non-Federal frequencies, and that such applications be routinely granted within 14 calendar days of submission, in the absence of an objection by NTIA.²⁶³

152. We believe that our existing coordination processes and procedures are sufficient. We disagree with commenters who assert that once an application is submitted it may not be readily apparent from checking the on-line experimental licensing system (ELS) where a specific application is in the process.²⁶⁴ In concert with NTIA, we have taken action to provide on-line tools for applicants. First, we note that applicants can query the ELS for the status of specific applications.²⁶⁵ Second, at our recommendation, NTIA has made available on its website status information regarding Commission applications – including experimental applications – that are being coordinated between the two agencies.²⁶⁶ Third, applicants may, and often do, call or e-mail our OET experimental licensing staff for status updates, and they respond to all inquiries in a timely manner. In that connection, we note that our experimental licensing staff routinely corresponds with applicants to work out mutually acceptable solutions for all parties. However, we recognize that parties might find value in having access to more detailed information about the status of their applications and additional methods for interacting with the Commission. We are working on projects to upgrade many of that Commission’s electronic filing systems, and we will endeavor to modify the ELS to make more detailed information available. Finally, regarding the timeframe for coordinating with NTIA, the Commission and NTIA have agreed in a Memorandum of Understanding (MOU) to coordination procedures between the two agencies, including a requirement for coordination to be accomplished within 15 working days of such requests. The vast majority of applications are coordinated within this timeframe. In cases where complex concerns are raised, our staff works closely with applicants and NTIA staff to find mutually agreeable solutions. We find that our current approach reduces administrative burdens and provides cost savings to the public.

153. Special Temporary Authorization. In the *NPRM*, the Commission proposed changes to Section 5.61, which contains rules for STAs.²⁶⁷ As an initial matter, BAE points out that it appears that

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Applicant as “for-profit entities (i) whose primary RF transmission activities support public safety, homeland security and defense priorities, and (ii) who can demonstrate to the Commission that they are sophisticated in the design and operation of RF systems, and in the use of various forms of attenuation to minimize the possibility of harmful interference.” See BAE Comments to *NPRM* at 4, 21-22.

²⁶¹ See BAE Comments to *NPRM* at 19-20.

²⁶² See BAE Reply Comments to *NPRM* at 20-21.

²⁶³ See SIA Comments to *NPRM* at 19.

²⁶⁴ The experimental licensing system is available at <https://apps.fcc.gov/oetcf/els>.

²⁶⁵ Experimental licensing system application status search is available at <https://apps.fcc.gov/oetcf/els/reports/ApplicationSearch.cfm>.

²⁶⁶ See <http://ntiacsd.ntia.doc.gov/webcoord/status.cfm> for a status list of all Commission applications, including experimental applications, being coordinated with NTIA. See also http://ntiacsd.ntia.doc.gov/webcoord/fcc_faa.cfm for a list of frequency applications submitted by the Commission to the Federal Aviation Administration for processing by NTIA in the Aeronautical bands.

²⁶⁷ See *NPRM*, 25 FCC Rcd 16592-93, at § 5.61.

the *NPRM* removed the requirement to file such requests electronically, and recommends that we modify the proposed rule to restore that requirement. We agree with BAE's recommendation. The proposed removal of this requirement was inadvertent, as the Commission has required electronic filing for quite some time. Accordingly, we are retaining this requirement in Section 5.61 of our rules. BAE also asks that we clarify the rule language in Section 5.61(c), which requires an application for a conventional experimental license be "consistent with the terms and conditions" of the prior-granted STA in order to obtain an extension of that STA. BAE specifically asks if this means that the application for a conventional license must mirror exactly every technical parameter of the prior-granted STA.²⁶⁸ Additionally, BAE asks about the situation in which a conventional license is associated with a different government contract than the STA or where it is for internal research and development (IR&D), rather than in support of a contract.²⁶⁹ We take this opportunity to state that the parameters of the conventional license application do not need to mirror exactly the parameters of the STA. They may differ so long as any changes do not increase the interference potential of the equipment under test. For example, a change to lower power or antenna height would be permissible, but an increase in those parameters would not. Likewise, a change in location or addition of locations would not be permissible under this rule. Under this guidance, a change in contract number or change to support IR&D rather than a contract would also be acceptable. We will add clarifying language to the rule, which codifies our existing practice and reduces regulatory burdens on some experimental applicants.

154. Clearwire states that it has observed an increase in the number of Part 5 STAs that are being issued for commercial uses – such as coverage of sporting events – where the application did not clearly indicate a research or experimental purpose.²⁷⁰ It contends that such grants are inconsistent with the ERS Rules and recommend that ERS STAs be granted only for true experiments. Clearwire recommends that a party desiring temporary rights for commercial use of spectrum that is licensed to another party should lease the spectrum from the licensee under Parts 1 and 27 of the Commission's Rules.²⁷¹ As Clearwire points out, we observe that a Part 5 authorization may be granted for a broad range of research and experimentation, including market trials.²⁷² Additionally, an ERS applicant must describe the program of research and experimentation proposed and the specific objectives it seeks to accomplish stating "how the program of experimentation has a reasonable promise of contribution to the development, extension, or expansion, or utilization of the radio art, or is along lines not already investigated."²⁷³ We rely on our staff to exercise their expertise and discretion in determining whether particular applications meet the requirements of the Part 5 rules and find no need to modify those rules. We find that our current approach reduces administrative burdens and provide cost savings to the public.

155. *Changes in Equipment and Emission Characteristics.* The *NPRM* proposed to modify Section 5.77(a) of the Commission's Rules to provide additional flexibility for licensees to make changes to equipment without prior Commission consent provided that certain conditions are met. Specifically, that proposal would require that the power output of the new equipment comply with the license and that the transmitter as a whole or output power rating of the transmitter not be changed. BAE suggests modifying these two conditions to a single one stating that changes can be made to equipment provided

²⁶⁸ See BAE Comments to *NPRM*, at 24-25.

²⁶⁹ *Id.* at 26.

²⁷⁰ See Clearwire *Ex Parte* filing, ET Docket Nos. 10-236 and 06-155, May 17, 2012, at 6-8.

²⁷¹ *Id.* at 6-8.

²⁷² See 47 C.F.R. § 5.3.

²⁷³ See 47 C.F.R. § 5.63(a).

that the ERP and directivity comply with the license and the regulations governing the license.²⁷⁴ We agree that such a change would be beneficial and provide licensees with additional flexibility to alter equipment as necessary without increasing interference potential to authorized services. We will therefore modify Section 5.77 to make this change. BAE also requests that we alter proposed Section 5.77(b) to retain language that states that licensees who make changes to their emissions and want such change to become a permanent part of their license may address such changes at the next renewal,²⁷⁵ rather than adopt the *NPRM*'s proposal to require that an application for modification must be filed. We disagree with BAE that any changes are necessary here. The *NPRM*'s proposal provides more flexibility than the previous rule, as it allows applicants to file an immediate application for modification to make emission changes permanent. We note that such a modification can also be made in conjunction with a renewal application as is current practice. Thus, we will adopt the *NPRM*'s proposed rule change to Section 5.77(b).

156. *Recognition of Internal Research and Development.* BAE observes that many applicants for experimental authorization that support homeland security, public safety, and defense priorities require such licenses for IR&D work, in addition to contractual work with various agencies. Accordingly, BAE requests that the Commission explicitly recognize IR&D work on experimental licenses.²⁷⁶ While we recognize the value of IR&D in the development of new equipment and techniques, we do not believe that it needs to be explicitly recognized on the experimental license or within the experimental licensing system database. We note that the vast majority of experimentation is for internal development rather than under a government contract, and so there is no need to track such instances as a separate category. We also note that we collect government contract information because it is needed in order to grant a non-Federal entity the ability to conduct experiments on a Federal facility's property.

157. *Commercial Off-The-Shelf (COTS) Equipment.* Lockheed Martin observes that both Commission Form 442 and Section 5.61 of the Commission's Rules ("Procedure for obtaining a special temporary authorization") require applicants to identify all equipment to be used in an experiment by supplying the manufacturer name and model number²⁷⁷ of that equipment. Lockheed Martin argues that this requirement is unnecessary for COTS equipment because Section 5.77 of our rules already permits experimental licensees to make changes to transmitters "without specific authorization from the Commission provided that the change does not result in operations inconsistent" (with the terms of the authorization).²⁷⁸ Lockheed Martin therefore recommends that an experimental applicant or licensee not be required to specify manufacturer identification of any COTS equipment used as part of an experiment. Alternatively, Lockheed Martin recommends that the Commission clarify that COTS equipment can be substituted during the term of the experimental authorization, provided that it otherwise complies with the requirements of the license.²⁷⁹

158. We agree with Lockheed Martin and note that the Commission has routinely allowed experimental licensees to substitute one piece of COTS equipment for another, provided it does not generally increase the risk of harmful interference to authorized spectrum users. To avoid any confusion on this matter, we are revising the instructions to Form 442 by adding a note stating: "Provided that commercial off-the-shelf (COTS) equipment used in experiments is operating in accordance with its

²⁷⁴ See BAE Comments to *NPRM* at 25-26.

²⁷⁵ *Id.*

²⁷⁶ *Id.* at 26.

²⁷⁷ Lockheed Martin refers to the model number as the "serial number."

²⁷⁸ See 47 C.F.R. § 5.77(a).

²⁷⁹ See Lockheed Martin Comments to *NPRM* at 7-8.

certification, substituting one piece of COTS equipment for another without notifying the Commission is permitted so long as such equipment substitution will not result in operations inconsistent with the terms of the authorization.” Licensees should be aware, however, that if they make any modifications to COTS equipment that would invalidate the equipment’s certification, they must modify their experimental license accordingly. We believe that this added clarification will reduce regulatory burdens on experimenters by enabling them to more easily choose equipment for conducting their testing, while not increasing the potential for causing harmful interference to authorized Commission radio services.

159. *Special Grant Conditions.* Lockheed Martin recommends that the Commission change its default practice of issuing special grant conditions that restrict experimentation when an applicant discloses that its experiment supports a U.S. government contract. Lockheed Martin argues that, while there are some instances where coordination requirements in Federal or shared Federal/non-Federal bands will necessitate restricting experimental transmissions only to those necessary to fulfill a government contract, there are other instances where a band can support developers who are working both toward meeting the specific requirements of a contract and on related independent activities designed to advance the state-of-the-art.²⁸⁰

160. We are sympathetic to Lockheed Martin’s arguments regarding making more efficient use of the spectrum and reducing administrative burdens; however, we decline to make the requested changes, as many special grant procedures are a direct consequence of the type of experiment or location. For example, the Commission does not have the legal authority to allow experimentation at a defense facility without permission of the military. Accordingly, the decision to impose special grant conditions will continue to be made on a case-by-case basis. We note however, that the use of special grant conditions in some circumstances does not preclude entities from obtaining experimental licenses, either conventional or program, to experiment in most bands for their own internal research and development efforts. We find that our approach best balances protecting the public from harmful interference to existing radio services and reducing regulatory burdens on experimental applicants.

161. *Permanent Discontinuance of License.* Clearwire contends that it is difficult for a service licensee to determine the source of interference to its operations if it does not know whether experiments have been discontinued or did not take place under an authorization listed in the Commission’s database.²⁸¹ As a remedy, Clearwire recommends that we enforce Section 5.81 of our rules, which requires that ERS licensees who have permanently discontinued their experiments notify OET.²⁸² As Clearwire notes, the rules already require licensees to notify the Commission if they permanently discontinue their experimental operations. However, it may be that some licensees simply just allow their licenses to expire once they conclude their experiments. To ensure that licensees are fully aware of their obligation to notify the Commission if they cease experimental operations prior to their license expiration date, we are adding clarifying language to explicitly state this in the rule in Section 5.81. In addition, we note that if we become aware of rule violations, the Commission can take disciplinary action to include fines and/or loss of ability to obtain future licenses.

162. *Coordination Charges.* Clearwire states that it charges ERS applicants the costs of coordinating requests for experimental use of spectrum that Clearwire uses on a primary basis.²⁸³ Boeing disagrees with this practice, and argues that because licensees under the Communications Act do not acquire an ownership interest in their licensed spectrum, the Commission has statutory authority to

²⁸⁰ *Id.* at 8-9.

²⁸¹ *See* Clearwire *Ex Parte* Filing, ET Docket Nos. 10-236 and 06-155, May 17, 2012, at 8.

²⁸² *Id.* *See* 47 C.F.R. § 5.81.

²⁸³ *See* Clearwire *Ex Parte* filing, ET Docket Nos. 10-236 and 06-155, July 10, 2012 at 1-2.

prohibit licensees from charging fees for reviewing and approving coordination requests for experimental use of spectrum.²⁸⁴ Clearwire responds that while it agrees with Boeing that “payment for approval” by authorized licensees would be inappropriate, such licensees should be permitted to recover their costs of coordinating with ERS applicants.²⁸⁵ We observe that, although the Commission has discretion under Part 5 to condition a license on coordination with the primary licensee in a frequency band, our Part 5 rules do not address the charging issue. Further, we note that we did not address this issue in the *NPRM*. Because we do not have proper notice of this issue, it is beyond the scope of this proceeding and we do not address it further.

163. *Electronic Filing of Informal Objections to Experimental License Applications Pursuant to Section 5.95.* The Commission adopted electronic filing procedures for experimental license applications using the ELS in 1998,²⁸⁶ and in a subsequent Order in 2003, mandated the electronic filing of all experimental applications.²⁸⁷ In that Order, the Commission also adopted a non-substantive procedural rule codifying in Section 5.95 of the Rules the existing procedures for filing informal objections to experimental license applications, but directed filers to make submissions pursuant to the requirements in Sections 1.41-1.52 of the Rules without clarifying how filers should make submissions electronically.²⁸⁸

164. Because the ELS did not support processing informal objections at the time Section 5.95 was adopted, we now adopt a non-substantive procedural change to Section 5.95 to clarify that filers shall no longer file informal objections using the process for print mail submissions in Sections 1.41-1.52, but shall submit all informal objections electronically via the ELS as otherwise required in Section 5.55 of the Rules. OET will release a public notice announcing the date after which no further paper filings will be accepted. This change merely clarifies the requirements for mandatory electronic filing. Thus, it is procedural in nature and does not substantively change the information required to be filed with the Commission, making the notice and comment requirements of the Administrative Procedure Act inapplicable.²⁸⁹

²⁸⁴ See Boeing *Ex Parte* filing, ET Docket Nos. 10-236 and 06-155, July 25, 2012, at 2. Boeing bases its assertion on section 301 of the Communications Act (47 U.S.C. § 301), which states in part, “[i]t is the purpose of this chapter, among other things, to maintain the control of the United States over all the channels of radio transmission; and to provide for the use of such channels, but not the ownership thereof, by persons for limited periods of time, under licenses granted by Federal authority, and no such license shall be construed to create any right, beyond the terms, conditions, and periods of the license.”

²⁸⁵ See Clearwire *Ex Parte* filing, ET Docket Nos. 10-236 and 06-155, August 8, 2012, at 3-4.

²⁸⁶ See Amendment Of Part 5 Of The Commission’s Rules To Revise The Experimental Radio Service Regulations, ET Docket No. 96-256, *Report and Order*, 13 FCC Rcd 21391 at 21394-95, para. 12 (1998); “The Experimental Licensing Branch Of The Office Of Engineering And Technology Announces The Availability Of Electronic Filing For Experimental License Forms And Requests For Special Temporary Authorization (STA)”, Public Notice No. 8023, released November 9, 1998.

²⁸⁷ See Amendment of Part 5 of the Commission’s Rules to Require Electronic Filing of Applications for Experimental Radio Licenses and Authorizations, FCC 03-207, *Order*, 18 FCC Rcd 16966 (2003).

²⁸⁸ Sections 1.41-1.52 of the Commission’s Rules (47 C.F.R. §§ 1.41-1.51 *et. seq.*) sets forth the procedures for filing various pleadings with the Commission including informal objections. In addition, these rules provide guidance on filing periods, format of pleadings, length of pleadings, etc.

²⁸⁹ See Section 553(b)(3)(A) of the Administrative Procedure Act, 5 U.S.C. § 553(b)(3)(A); *JEM Broadcasting Co. v. FCC*, 22 F.3d 320, 326 (D.C. Cir. 1994) (affirming that the FM “hard look” processing rules are procedural in nature and exempt from the general notice and comment requirements of the APA, and explaining that “the ‘critical feature’ of the procedural exception ‘is that it covers agency actions that do not themselves alter the rights or (continued....)”).

IV. PROCEDURAL MATTERS**A. Final Regulatory Flexibility Analysis**

165. As required by the Regulatory Flexibility Act of 1980, *see* 5 U.S.C. § 603, the Commission has prepared a Final Regulatory Flexibility Analysis (FRFA) of the possible significant economic impact on small entities of the policies and rules adopted in this Report and Order. The FRFA is set forth in Appendix C.

B. Paperwork Reduction Act Analysis

166. This document contains modified information collection requirements subject to the Paperwork Reduction Act of 1995 (PRA), Public Law 104-13. It will be submitted to the Office of Management and Budget (OMB) for review under Section 3507(d) of the PRA. OMB, the general public, and other Federal agencies are invited to comment on the modified information collection requirements contained in this proceeding. In addition, we note that pursuant to the Small Business Paperwork Relief Act of 2002, Public Law 107-198, *see* 44 U.S.C. 3506(c)(4), we previously sought specific comment on how we might further reduce the information collection burden for small business concerns with fewer than 25 employees.

C. Congressional Review Act

167. The Commission will send a copy of this Report and Order to Congress and the Government Accountability Office, pursuant to the Congressional Review Act, *see* 5 U.S.C. § 801(a)(1)(A).

V. ORDERING CLAUSES

168. Accordingly, IT IS ORDERED, that, pursuant to Sections 4(i), 301, and 303 of the Communications Act of 1934, as amended, 47 U.S.C. §§ 154(i), 301, and 303, this Report and Order IS ADOPTED.

169. IT IS FURTHER ORDERED that Parts 0, 1, 2, 5, 22, 73, 74, 80, 87, 90, and 101 of the Commission's Rules, 47 C.F.R. Parts 0, 1, 2, 5, 22, 73, 74, 80, 87, 90, and 101, ARE AMENDED as set forth in Appendix B. These revisions will take effect 30 days after publication of a summary of this Report and Order in the *Federal Register*, except for Sections 2.803(c)(2), 5.59, 5.61, 5.63, 5.64, 5.65, 5.73, 5.79, 5.81, 5.107, 5.115, 5.121, 5.123, 5.205, 5.207, 5.217(b), 5.307, 5.308, 5.309, 5.311, 5.404, 5.405, 5.406, 5.504, and 5.602. These rules contain new or modified information collection requirements that require approval by the Office of Management and Budget (OMB) under the Paperwork Reduction Act (PRA), and WILL BECOME EFFECTIVE after the Commission publishes a notice in the *Federal Register* announcing such approval and the relevant effective date.

(Continued from previous page) _____
interests of parties, although it may alter the manner in which the parties present themselves or their viewpoints to the agency.”). The electronic filing procedural requirements adopted in 2003 were not burdensome, and in light of current technology are in the public interest.

170. IT IS FURTHER ORDERED that the Commission's Consumer and Governmental Affairs Bureau, Reference Information Center, SHALL SEND a copy of this Report and Order, including the Final Regulatory Flexibility Analysis, to Congress and the Government Accountability Office, pursuant to the Congressional Review Act, *see* 5 U.S.C. § 801(a)(1)(A).

FEDERAL COMMUNICATIONS COMMISSION

Marlene H. Dortch
Secretary

APPENDIX A

Comments and Reply Comments to *NPRM*

Comments

Association of Public-Safety Communications Officials-International, Inc.

AT&T Inc.

BAE Systems Information and Electronic Systems Integration Inc.

The Boeing Company

Cisco Systems, Inc.

Cohen, Dippell, and Everist, P.C.

Stephen J. Crowley, P.E.

CTIA – The Wireless Association

Engineers for the Integrity of Broadcast Auxiliary Spectrum

Hewlett Packard Company

National Radio Astronomy Observatory

Nickolaus E. Leggett

Lockheed Martin Corporation

Marcus Spectrum Solutions, LLC

Mayo Clinic

Medtronic, Inc.

mHealth Regulatory Coalition

Motorola Solutions, Inc.

Q-Track Corporation

Qualcomm, Incorporated

Satellite Industry Association

TechAmerica

Telecommunications Industry Association

V-Comm, LLC

Verizon Wireless

Wireless Communications Association International

Reply Comments

The American Radio Relay League Incorporated

AT&T

BAE Systems Information and Electronic Systems Integration Inc.

The Boeing Company

Cohen, Dippell, and Everist, P.C.

Stephen J. Crowley, P.E.

Mark Cummings

Engineers for the Integrity of Broadcast Auxiliary Spectrum

Information Technology Industry Council

Nickolaus E. Leggett

Lockheed Martin Corporation

National Association of Broadcasters

Satellite Industry Association

Semiconductor Industry Association

Leonard J. Umina

V-Comm, L.L.C.

Verizon Wireless

Virginia Polytechnic Institute and State University

APPENDIX B

Final Rules

For the reasons set forth in the preamble the Federal Communications Commission amends Parts 0, 1, 2, 5, 22, 73, 74, 80, 87, 90 and 101 of the Code of Federal Regulations to read as follows:

PART 0—COMMISSION ORGANIZATION

- 1. The authority section of Part 0 continues to read as follows:

Authority: Sec. 5, 48 Stat. 1068, as amended; 47 U.S.C. 155, 225, unless otherwise noted.

- 2. Section 0.406 is amended by revising paragraph (b)(4) to read as follows:

§ 0.406 The rules and regulations.

* * * * *

(b) * * *

(4) Part 5, experimental radio service. Part 5 provides for the temporary use of radio frequencies for research in the radio art, for communications involving other research projects, for the development of equipment, data, or techniques, and for the conduct of equipment product development or market trials.

* * * * *

PART 1—PRACTICE AND PROCEDURE

- 3. The authority section of Part 1 continues to read as follows:

Authority: 15 U.S.C. 79 et seq.; 47 U.S.C. 151, 154(i), 154(j), 155, 157, 225, 303(r), and 309.

- 4. Section 1.77 is amended by revising paragraph (d) to read as follows:

§ 1.77 Detailed application procedures; cross references.

* * * * *

(d) Rules governing applications for authorizations in the Experimental Radio Service are set forth in part 5 of this chapter.

* * * * *

- 5. Section 1.1307 is amended by revising the twenty-seventh row of the table in paragraph (a)(1) to read as follows:

§ 1.1307 Actions that may have a significant environmental effect, for which Environmental Assessments (EAs) must be prepared.

(a) * * *

(1) * * *

Table 1—Transmitters, Facilities and Operations Subject to Routine Environmental Evaluation

Service (title 47 CFR rule part)	Evaluation required if:
* * *	* * *
Auxiliary and Special Broadcast and Other Program Distributional Services (part 74)	Subparts G and L: power > 100 W ERP.
* * *	* * *
* * * * *	

6. Section 1.913 is amended by revising paragraph (a)(1) to read as follows:

§ 1.913 Application and notification forms; electronic and manual filing.

(a) * * *

(1) *FCC Form 601, Application for Authorization in the Wireless Radio Services.* FCC Form 601 and associated schedules are used to apply for initial authorizations, modifications to existing authorizations, amendments to pending applications, renewals of station authorizations, special temporary authority, notifications, requests for extension of time, and administrative updates.

* * * * *

7. Section 1.981 is amended by removing paragraphs (a) and (b) and redesignating paragraph (c) as introductory text.

PART 2—FREQUENCY ALLOCATIONS AND RADIO TREATY MATTERS; GENERAL RULES AND REGULATIONS

8. The authority section of Part 2 continues to read as follows:

Authority: 47 U.S.C. 154, 302a, 303, and 336, unless otherwise noted.

9. Section 2.1 is amended by adding the following definitions in the appropriate places in alphabetical order:

End Product: A completed electronic device that has received all requisite FCC approvals and is suitable for marketing.

Evaluation Kit: An assembly of components, subassemblies, or circuitry, including software, created by or for a component maker, system integrator, or product developer for the sole purpose of facilitating: (i) end product developer evaluation of all or some of such components, subassemblies, or circuitry, or (ii) the development of software to be used in an end product.

10. Section 2.102 is amended by removing and reserving paragraph (b)(2).

11. Section 2.803 is amended to read as follows:

§ 2.803 Marketing of radio frequency products prior to equipment authorization.

- (a) Marketing, as used in this section, includes sale or lease, or offering for sale or lease, including advertising for sale or lease, or importation, shipment, or distribution for the purpose of selling or leasing or offering for sale or lease.
- (b) *General rule.* No person may market a radio frequency product unless:
- (1) For products subject to authorization under certification, the product has been authorized in accordance with the rules in Subpart J of this chapter and is properly identified and labeled as required by § 2.925 and other relevant sections in this chapter; or
 - (2) For products subject to authorization under verification or Declaration of Conformity in accordance with the rules in Subpart J of this chapter, the product complies with all applicable technical, labeling, identification and administrative requirements; or
 - (3) For products that do not require a grant of equipment authorization under Subpart J of this chapter but must comply with the specified technical standards prior to use, the product complies with all applicable, technical, labeling, identification and administrative requirements.
- (c) *Exceptions.* The following marketing activities are permitted prior to equipment authorization:
- (1) Activities under product development and market trials conducted pursuant to subpart H of Part 5.
 - (2) Limited marketing is permitted, as described below, for products that could be authorized under the current rules; could be authorized under waivers of such rules that are in effect at the time of marketing; or could be authorized under rules that have been adopted by the Commission but that have not yet become effective. These products may not be operated unless permitted by § 2.805 of this part.
 - (i) Conditional sales contracts (including agreements to produce new products manufactured in accordance with designated specifications) are permitted between manufacturers and wholesalers or retailers provided that delivery is made contingent upon compliance with the applicable equipment authorization and technical requirements.
 - (ii) A radio frequency product that is in the conceptual, developmental, design or pre-production stage may be offered for sale solely to business, commercial, industrial, scientific or medical users (but not an offer for sale to other parties or to end users located in a residential environment) if the prospective buyer is advised in writing at the time of the offer for sale that the equipment is subject to the FCC rules and that the equipment will comply with the appropriate rules before delivery to the buyer or to centers of distribution.
 - (iii) A radio frequency product may be advertised or displayed, (*e.g.*, at a trade show or exhibition) if accompanied by a conspicuous notice containing this language:

This product has not been authorized as required by the rules of the Federal Communications Commission. This product is not, and may not be, offered for sale or lease, or sold or leased, until authorization is obtained.
- If the product being displayed is a prototype of a product that has been properly authorized and the prototype, itself, is not authorized due to differences between the prototype and the authorized product, this language may be used instead:

Prototype. Not for sale.

- (iv) An evaluation kit as defined in § 2.1 of this chapter may be sold provided that:
 - (A) sales are limited to product developers, software developers, and system integrators;
 - (B) the following notice is included with the product:

FCC NOTICE: This kit is designed to allow (i) product developers to evaluate electronic components, circuitry, or software associated with the kit to determine whether to incorporate such items in a finished product and (ii) software developers to write software applications for use with the end product. This kit is not a finished product and when assembled may not be resold or otherwise marketed unless all required FCC equipment authorizations are first obtained. Operation is subject to the conditions that this product not cause harmful interference to licensed radio stations and that this product accept harmful interference. Unless the assembled kit is designed to operate under Part 15, Part 18 or Part 95 of the FCC Rules, the operator of the kit must operate under the authority of an FCC license holder or must secure an experimental authorization under Part 5 of the FCC Rules.

- (C) the product is labeled with the following legend:

For evaluation only; not FCC approved for resale; and

- (D) any radiofrequency transmitter employed as part of an evaluation kit shall be designed to comply with all applicable FCC technical rules, including frequency use, spurious and out-of-band emission limits, and maximum power or field strength ratings applicable to final products that would employ the components or circuitry to be evaluated.

- (d) *Importation.* The provisions of subpart K continue to apply to imported radio frequency products.

12. New Section 2.805 is added to read as follows:

§ 2.805 Operation of radio frequency products prior to equipment authorization.

- (a) *General rule.* A radio frequency product may not be operated prior to equipment authorization.
- (b) *Exceptions.*

(1) Operation prior to equipment authorization is permitted under the authority of an experimental radio service authorization issued under Part 5 of this chapter or in accordance with the following provisions; however, except as provided elsewhere in this chapter, radio frequency products operated under these provisions may not be marketed (as defined in § 2.803(a)):

- (i) The radio frequency product shall be operated in compliance with existing Commission rules, waivers of such rules that are in effect at the time of operation, or rules that have been adopted by the Commission, but that have not yet become effective; and
- (ii) Operation shall be conducted under the authority of a service license (only in the bands for which that service license holds a license) or a grant of special temporary authorization, or the radio frequency product is designed to operate at or below the maximum power level permitted for unlicensed products under Part 15 of this chapter; and
- (iii) The radio frequency product shall be operated for at least one of these purposes:

(A) Experimentation or compliance testing when fully contained within an anechoic chamber or a Faraday cage;

(B) Demonstrations at a trade show, provided a notice containing the wording specified in § 2.803(c)(2)(iii) is displayed in a conspicuous location on, or immediately adjacent to, the product;

(C) Demonstrations at an exhibition, provided a notice containing the wording specified in § 2.803(c)(2)(iii) is displayed in a conspicuous location on, or immediately adjacent to, the product or all prospective buyers at the exhibition are advised in writing that the equipment is subject to the FCC rules and that the equipment will comply with the appropriate rules before delivery to the buyer or to centers of distribution; or

(D) Evaluation of product performance and determination of customer acceptability, during developmental, design, or pre-production states. If the product is not operated at the manufacturer's facilities, it must be labeled with the wording specified in § 2.803(c)(2)(iii), in the case of an evaluation kit, the wording specified in § 2.803(c)(2)(iv)(C).

(2) Devices must either be rendered inoperable or retrieved at the conclusion of any operation conducted under paragraph (b).

(c) *Demonstration or evaluation.* A manufacturer may operate its product for demonstration or evaluation purposes under the authority of a licensed service provider, provided that the licensee grants permission to the manufacturer to operate in this manner and the licensee continues to remain responsible for complying with all of the operating conditions and requirements associated with its license.

(d) *Importation.* The provisions of subpart K continue to apply to imported radio frequency products.

13. Section 2.811 is amended to read as follows:

Section 2.803(a) through (c) shall not be applicable to a transmitter operated in any of the Radio Broadcast Services regulated under part 73 of this chapter, provided the conditions set out in part 73 of this chapter for the acceptability of such transmitter for use under licensing are met.

14. Section 2.1204 is amended by revising paragraph (a)(3) to read as follows:

§ 2.1204 Import conditions.

(a) * * *

* * *

(3) The radio frequency product is being imported in quantities of 4,000 or fewer units for testing and evaluation to determine compliance with the FCC Rules and Regulations, product development, or suitability for marketing. The products will not be offered for sale or marketed.

(i) Prior to importation of a greater number of units than shown above, written approval must be obtained from the Chief, Office of Engineering and Technology, FCC; and

(ii) Distinctly different models of a product and separate generations of a particular model under development are considered to be separate devices.

* * * * *

15. Part 5 is revised in its entirety, to read as follows:

PART 5—EXPERIMENTAL RADIO SERVICE

Subpart A—General

Sec.

- § 5.1 Basis and purpose.
- § 5.3 Scope of service.
- § 5.5 Definition of terms.

Subpart B—Applications and Licenses

LICENSE REQUIREMENTS

- § 5.51 Eligibility of license.
- § 5.53 Station authorization required.
- § 5.54 Types of authorizations available.

GENERAL FILING REQUIREMENTS

- § 5.55 Filing of applications.
- § 5.57 Who may sign applications.
- § 5.59 Forms to be used.
- § 5.61 Procedure for obtaining a special temporary authorization.
- § 5.63 Supplemental statements required.
- § 5.64 Special provisions for satellite systems.
- § 5.65 Defective applications.
- § 5.67 Amendment or dismissal of applications.
- § 5.69 License grants that differ from applications.
- § 5.71 License period.
- § 5.73 Experimental report.
- § 5.77 Change in equipment and emission characteristics.
- § 5.79 Transfer and assignment of station authorization for conventional, program , medical testing, and compliance testing experimental radio licenses.
- § 5.81 Discontinuance of station operation.
- § 5.83 Cancellation provisions.
- § 5.84 Non-interference criterion.
- § 5.85 Frequencies and policy governing frequency assignment.
- § 5.91 Notification to the National Radio Astronomy Observatory.
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Subpart G—Compliance Testing Experimental Licenses

- § 5.501 Applicable rules.
- § 5.502 Eligibility.
- § 5.503 Scope of testing activities.
- § 5.504 Responsible party.

§ 5.505 Exemption from station identification requirement.

Subpart H—Product Development and Market Trials

§ 5.601 Product Development Trials.

§ 5.602 Market Trials.

Authority: Secs. 4, 302, 303, 307, 336 48 Stat. 1066, 1082, as amended; 47 U.S.C. 154, 302, 303, 307, 336. Interpret or apply sec. 301, 48 Stat. 1081, as amended; 47 U.S.C. 301.

Subpart A—General

§ 5.1 Basis and purpose.

(a) *Basis.* The rules following in this part are promulgated pursuant to the provisions of Title III of the Communications Act of 1934, as amended, which vests authority in the Federal Communications Commission to regulate radio transmissions and to issue licenses for radio stations.

(b) *Purpose.* The rules in this part provide the conditions by which portions of the radio frequency spectrum may be used for the purposes of experimentation, product development, and market trials.

§ 5.3 Scope of service.

Stations operating in the Experimental Radio Service will be permitted to conduct the following type of operations:

- (a) Experimentations in scientific or technical radio research.
- (b) Experimentations in the broadcast services.
- (c) Experimentations under contractual agreement with the United States Government, or for export purposes.
- (d) Communications essential to a research project.
- (e) Technical demonstrations of equipment or techniques.
- (f) Field strength surveys.
- (g) Demonstration of equipment to prospective purchasers by persons engaged in the business of selling radio equipment.
- (h) Testing of equipment in connection with production or regulatory approval of such equipment.
- (i) Testing of medical devices that use RF wireless technology or communications functions for diagnosis, treatment, or patient monitoring.
- (j) Development of radio technique, equipment, operational data or engineering data, including field or factory testing or calibration of equipment, related to an existing or proposed radio service.
- (k) Product development and market trials.

(l) Types of experiments that are not specifically covered under paragraphs (a) through (k) of this section will be considered upon demonstration of need for such additional types of experiments.

§ 5.5 Definition of terms.

For the purposes of this part, the following definitions shall be applicable. For other definitions, refer to part 2 of this chapter (Frequency Allocations and Radio Treaty Matters; General Rules and Regulations).

Authorized frequency. The frequency assigned to a station by the Commission and specified in the instrument of authorization.

Authorized power. The power assigned to a radio station by the Commission and specified in the instrument of authorization.

Experimental radio service. A service in which radio waves are employed for purposes of experimentation in the radio art or for purposes of providing essential communications for research projects that could not be conducted without the benefit of such communications.

Experimental station. A station utilizing radio waves in experiments with a view to the development of science or technique.

Harmful interference. Any radiation or induction that endangers the functioning of a radionavigation or safety service, or obstructs or repeatedly interrupts a radio service operating in accordance with the Table of Frequency Allocations and other provisions of part 2 of this chapter.

Landing area. As defined by 49 U.S.C. 40102(a)(28), any locality, either of land or water, including airdromes and intermediate landing fields, that is used, or intended to be used, for the landing and take-off of aircraft, whether or not facilities are provided for the shelter, servicing, or repair of aircraft, or for receiving or discharging passengers or cargo.

Market trial. A program designed to evaluate product performance and customer acceptability prior to the production stage, and typically requires testing a specific product under expected use conditions to evaluate actual performance and effectiveness.

Open Area Test Site. A site for electromagnetic measurements that has a reflective ground plane, and is characterized by open, flat terrain at a distance far enough away from buildings, electric lines, fences, trees, underground cables, pipelines, and other potential reflective objects, so that the effects due to such objects are negligible.

Person. An individual, partnership, association, joint stock company, trust, corporation, or state or local government.

Product development trial. An experimental program designed to evaluate product performance (including medical devices in clinical trials) in the conceptual, developmental, and design stages, and typically requiring testing under expected use conditions.

Subpart B—Applications and Licenses**License requirements.****§ 5.51 Eligibility.**

(a) Authorizations for stations in the Experimental Radio Service will be issued only to persons qualified to conduct the types of operations permitted in § 5.3 of this part, including testing laboratories recognized by the Commission for radio frequency product testing.

(b) No foreign government or representative thereof is eligible to hold a station license in the Experimental Radio Service.

§ 5.53 Station authorization required.

No radio transmitter shall be operated in the Experimental Radio Service in the United States and its Territories except under and in accordance with a proper station authorization granted by the Commission.

§ 5.54 Types of authorizations available.

The Commission issues the following types of experimental authorizations:

(a)(1) *Conventional experimental radio license.* This type of license is issued for a specific research or experimentation project (or a series of closely-related research or experimentation projects), a product development trial, or a market trial. Widely divergent and unrelated experiments must be conducted under separate licenses.

(2) *Special temporary authorization.* When an experimental program is expected to last no more than six months, its operation is considered to be temporary and the special temporary authorization procedure outlined in § 5.61 must be used.

(b) *Broadcast experimental radio license.* This type of license is issued for the purpose of research and experimentation for the development and advancement of new broadcast technology, equipment, systems or services. This is limited to stations intended for reception and use by the general public.

(c) *Program experimental radio license.* This type of license is issued to qualified institutions and to conduct an ongoing program of research and experimentation under a single experimental authorization subject to the requirements of subpart E of this part. Program experimental radio licenses are available to colleges, universities, research laboratories, manufacturers of radio frequency equipment, manufacturers that integrate radio frequency equipment into their end products, and medical research institutions.

(d) *Medical testing experimental radio license.* This type of license is issued to hospitals and health care institutions that demonstrate expertise in testing and operation of experimental medical devices that use wireless telecommunications technology or communications functions in clinical trials for diagnosis, treatment, or patient monitoring.

(e) *Compliance testing experimental radio license.* This type of license will be issued to laboratories recognized by the FCC under Subpart J of this chapter to perform:

(i) product testing of radio frequency equipment, and

(ii) testing of radio frequency equipment in an Open Area Test Site.

(f) An experimental license is not required when operation of a radiofrequency device is fully contained within an anechoic chamber or a Faraday cage.

General Filing Requirements.

§ 5.55 Filing of applications.

(a) To assure that necessary information is supplied in a consistent manner by applicants, standard forms must be used, except for applications for special temporary authorization (STA) and reports submitted for Commission consideration. Standard numbered forms for the Experimental Radio Service are described in § 5.59.

(b) Applications requiring fees as set forth in part 1, subpart G of this chapter must be filed in accordance with § 0.401(b) of this chapter.

(c) Each application for station authorization shall be specific and complete with regard to the information required by the application form and this part.

(1) Conventional license and STA applications shall be specific as to station location, proposed equipment, power, antenna height, and operating frequencies.

(2) Broadcast license applicants shall comply with the requirements in Subpart D; Program license applicants shall comply with the requirements in Subpart E; Medical Testing license applicants shall comply with the requirements in Subpart F; and Compliance Testing license applicants shall comply with the requirements in Subpart G.

(d) Filing conventional, program, medical, and compliance testing experimental radio license applications:

(1) Applications for radio station authorization shall be submitted electronically through the Office of Engineering and Technology website <http://www.fcc.gov/els>.

(2) Applications for special temporary authorization shall be filed in accordance with the procedures of § 5.61 of this part.

(3) Any correspondence relating thereto that cannot be submitted electronically shall instead be submitted to the Commission's Office of Engineering and Technology, Washington, DC 20554.

(e) For broadcast experimental radio licenses, applications for radio station authorization shall be submitted in accordance with the provisions of §5.59 of this part.

§ 5.57 Who may sign applications.

(a) Except as provided in paragraph (b), applications, amendments thereto, and related statements of fact required by the Commission shall be personally signed by the applicant, if the applicant is an individual; by one of the partners, if the applicant is a partnership; by an officer or duly authorized employee, if the applicant is a corporation; or by a member who is an officer, if the applicant is an unincorporated association. Applications, amendments, and related statements of fact filed on behalf of eligible government entities, such as states and territories of the United States and political subdivisions thereof, the District of Columbia, and units of local government, including incorporated

municipalities, shall be signed by such duly elected or appointed officials as may be competent to do so under the laws of the applicable jurisdiction.

(b) Applications, amendments thereto, and related statements of fact required by the Commission may be signed by the applicant's attorney in case of the applicant's physical disability or of his/her absence from the United States. The attorney shall in that event separately set forth the reason why the application is not signed by the applicant. In addition, if any matter is stated on the basis of the attorney's belief only (rather than his/her knowledge), he/she shall separately set forth reasons for believing that such statements are true.

(c) Only the original of applications, amendments, or related statements of fact need be signed; copies may be conformed.

(d) Applications, amendments, and related statements of fact need not be submitted under oath. Willful false statements made therein, however, are punishable by fine and imprisonment, U.S. Code, title 18, Sec. 1001, and by appropriate administrative sanctions, including revocation of station license pursuant to Sec. 312(a)(1) of the Communications Act of 1934, as amended.

(e) "Signed," as used in this section, means an original handwritten signature; however, the Office of Engineering and Technology may allow signature by any symbol executed or adopted by the applicant with the intent that such symbol be a signature, including symbols formed by computer-generated electronic impulses.

§ 5.59 Forms to be used.

(a) *Application for conventional, program, medical, and compliance testing experimental radio licenses.*

(1) *Application for new authorization or modification of existing authorization.* Entities must submit FCC Form 442.

(2) *Application for renewal of experimental authorization.* Application for renewal of station license shall be submitted on FCC Form 405. Unless otherwise directed by the Commission, each application for renewal of license shall be filed at least 60 days prior to the expiration date of the license to be renewed.

(3) *Application for consent to assign an experimental authorization.* Application for consent to assign shall be submitted on FCC Form 702 when the legal right to control the use and operation of a station is to be transferred as a result of a voluntary act (contract or other agreement) or an involuntary act (death or legal disability) of the grantee of a station authorization or by involuntary assignment of the physical property constituting the station under a court decree in bankruptcy proceedings, or other court order, or by operation of law in any other manner.

(4) *Application for consent to transfer control of Corporation holding experimental authorization.* Application for consent to transfer control shall be submitted on FCC Form 703 whenever it is proposed to change the control of a corporation holding a station authorization.

(5) *Application for product development and market trials.* Application for product development and market trials shall be submitted on FCC Form 442.

(b) *Applications for broadcast experimental radio license.*

(1) *Application for new authorization or modification of existing authorization.* An application for a construction permit for a new broadcast experimental station or modification of an existing broadcast experimental station must be submitted on FCC Form 309.

(2) *Application for a license.* An application for a license to cover a construction permit for a broadcast experimental station must be submitted on FCC Form 310.

(3) *Application for renewal of license.* An application for renewal of station license for a broadcast experimental station must be submitted on FCC Form 311. Unless otherwise directed by the Commission, each application for renewal of license shall be filed at least 60 days prior to the expiration date of the license to be renewed.

§ 5.61 Procedure for obtaining a special temporary authorization.

(a)(1) An applicant may request a Special Temporary Authorization (STA) for operation of a conventional experimental radio service station during a period of time not to exceed 6 months.

(2) Applications for STA must be submitted electronically through the Office of Engineering and Technology website <http://www.fcc.gov/els> at least 10 days prior to the proposed operation. Applications filed less than 10 days prior to the proposed operation date will be accepted only upon a showing of good cause.

(3) In special situations, as defined in § 1.915(b)(1), a request for STA may be made by telephone or electronic media provided a properly signed application is filed within 10 days of such request.

(b) An application for STA shall contain the following information:

(1) Name, address, phone number (also e-mail address and facsimile number, if available) of the applicant.

(2) Explanation of why an STA is needed.

(3) Description of the operation to be conducted and its purpose.

(4) Time and dates of proposed operation.

(5) Class(es) of station (*e.g.* fixed, mobile, or both) and call sign of station (if applicable).

(6) Description of the location(s) and, if applicable, geographical coordinates of the proposed operation.

(7) Equipment to be used, including name of manufacturer, model and number of units.

(8) Frequency (or frequency bands) requested.

(9) Maximum effective radiated power (ERP) or equivalent isotropically radiated power (EIRP).

(10) Emission designator (see §2.201 of this chapter) or describe emission (bandwidth, modulation, etc.)

(11) Overall height of antenna structure above the ground (if greater than 6 meters above the ground or an existing structure, see part 17 of this chapter concerning notification to the FAA).

(c) Extensions of an STA may be granted provided that an application for a conventional experimental license that is consistent with the terms and conditions of that STA (*i.e.*, there is no increase in interference potential to authorized services) has been filed at least 15 days prior to the expiration of the licensee's STA. When such an application is timely filed, operations may continue in accordance with the other terms and conditions of the STA pending disposition of the application, unless the applicant is notified otherwise by the Commission.

§ 5.63 Supplemental statements required.

Applicants must provide the information set forth on the applicable form as specified in § 5.59 of this part. In addition, applicants must provide supplemental information as described below:

- (a) If installation and/or operation of the equipment may significantly impact the environment (see § 1.1307 of this chapter) an environmental assessment as defined in § 1.1311 of this chapter must be submitted with the application.
- (b) If an applicant requests non-disclosure of proprietary information, requests shall follow the procedures for submission set forth in § 0.459 of this chapter.
- (c) For conventional and broadcast experimental radio licenses, each application must include:
 - (1) A narrative statement describing in detail the program of research and experimentation proposed, the specific objectives sought to be accomplished; and how the program of experimentation has a reasonable promise of contribution to the development, extension, or expansion, or use of the radio art, or is along lines not already investigated.
 - (2) If the authorization is to be used for the purpose of fulfilling the requirements of a contract with an agency of the United States Government, a narrative statement describing the project, the name of the contracting agency, and the contract number.
 - (3) If the authorization is to be used for the sole purpose of developing equipment for exportation to be employed by stations under the jurisdiction of a foreign government, a narrative statement describing the project, any associated contract number, and the name of the foreign government concerned.
 - (4) If the authorization is to be used with a satellite system, a narrative statement containing the information required in § 5.64 of this part.
- (d) For program experimental radio licenses, each application must include:
 - (1) A narrative statement describing how the applicant meets the eligibility criteria set forth in subpart E of this part.
 - (2) If the authorization is to be used for the purpose of fulfilling the requirements of a contract with an agency of the United States Government, a narrative statement describing the project, the name of the contracting agency, and the contract number.
 - (3) If the authorization is to be used for the sole purpose of developing equipment for exportation to be employed by stations under the jurisdiction of a foreign government, a narrative statement describing the project, any associated contract number, and the name of the foreign government concerned.

(e) For medical testing and compliance testing experimental radio licenses, each application must include a narrative statement describing how the applicant meets the eligibility criteria set forth in Section 5.402(a) and Section 5.502 of this part, respectively.

§5.64 Special provisions for satellite systems.

(a) Construction of proposed experimental satellite facilities may begin prior to Commission grant of an authorization. Such construction is entirely at the applicant's risk and does not entitle the applicant to any assurances that its proposed experiment will be subsequently approved or regular services subsequently authorized. The applicant must notify the Commission's Office of Engineering and Technology in writing that it plans to begin construction at its own risk.

(b) Except where the satellite system has already been authorized by the FCC, applicants for an experimental authorization involving a satellite system must submit a description of the design and operational strategies the satellite system will use to mitigate orbital debris, including the following information:

(1) A statement that the space station operator has assessed and limited the amount of debris released in a planned manner during normal operations, and has assessed and limited the probability of the space station becoming a source of debris by collisions with small debris or meteoroids that could cause loss of control and prevent post-mission disposal;

(2) A statement that the space station operator has assessed and limited the probability of accidental explosions during and after completion of mission operations. This statement must include a demonstration that debris generation will not result from the conversion of energy sources on board the spacecraft into energy that fragments the spacecraft. Energy sources include chemical, pressure, and kinetic energy. This demonstration shall address whether stored energy will be removed at the spacecraft's end of life, by depleting residual fuel and leaving all fuel line valves open, venting any pressurized system, leaving all batteries in a permanent discharge state, and removing any remaining source of stored energy, or through other equivalent procedures specifically disclosed in the application;

(3) A statement that the space station operator has assessed and limited the probability of the space station becoming a source of debris by collisions with large debris or other operational space stations. Where a space station will be launched into a low-Earth orbit that is identical, or very similar, to an orbit used by other space stations, the statement must include an analysis of the potential risk of collision and a description of what measures the space station operator plans to take to avoid in-orbit collisions. If the space station operator is relying on coordination with another system, the statement shall indicate what steps have been taken to contact, and ascertain the likelihood of successful coordination of physical operations with, the other system. The statement must disclose the accuracy—if any—with which orbital parameters of non-geostationary satellite orbit space stations will be maintained, including apogee, perigee, inclination, and the right ascension of the ascending node(s). In the event that a system is not able to maintain orbital tolerances, *i.e.*, it lacks a propulsion system for orbital maintenance, a statement disclosing that fact shall be included in the debris mitigation disclosure. Such systems shall also indicate the anticipated evolution over time of the orbit of the proposed satellite or satellites. Where a space station operator requests the assignment of a geostationary-Earth orbit location, it shall assess whether there are any known satellites located at, or reasonably expected to be located at, the requested orbital location, or assigned in the vicinity of that location, such that the station keeping volumes of the respective satellites might overlap. If so, the statement shall identify those parties and describe the measures that will be taken to prevent collisions;

(4) A statement detailing the post-mission disposal plans for the space station at end of life, including the quantity of fuel—if any—that will be reserved for post-mission disposal maneuvers. For geostationary-Earth orbit space stations, the statement shall disclose the altitude selected for a post-mission disposal orbit and the calculations that are used in deriving the disposal altitude. The statement shall also include a casualty risk assessment if planned post-mission disposal involves atmospheric re-entry of the space station. An assessment shall include a statement as to the likelihood that portions of the spacecraft will survive re-entry and reach the surface of the Earth, and the probability of human casualty as a result.

§ 5.65 Defective applications.

(a) Applications that are defective with respect to completeness of answers to required questions, execution or other matters of a purely formal character may be found to be unacceptable for filing by the Commission, and may be returned to the applicant with a brief statement as to the omissions.

(b) If an applicant is requested by the Commission to file any documents or information not included in the prescribed application form, failure to comply with such request will constitute a defect in the application.

(c) Applications not in accordance with the Commission's Rules, regulations, or other requirements will be considered defective unless accompanied either by:

(1) a petition to amend any rule, regulation, or requirement with which the application is in conflict; or

(2) a request for waiver of any rule, regulation, or requirement with which the application is in conflict. Such request shall show the nature of the waiver desired and set forth the reasons in support thereof.

§ 5.67 Amendment or dismissal of applications.

(a) Any application may be amended or dismissed without prejudice upon request of the applicant. Each amendment to or request for dismissal of an application shall be signed, authenticated, and submitted in the same manner as required for the original application. All subsequent correspondence or other material that the applicant desires to have incorporated as a part of an application already filed shall be submitted in the form of an amendment to the application.

(b) Defective applications, as defined in § 5.65 of this part, are subject to dismissal without prejudice.

§ 5.69 License grants that differ from applications.

If the Commission grants a license or special temporary authority with parameters that differ from those set forth in the application, an applicant may reject the grant by filing, within 30 days from the effective date of the grant, a written description of its objections. Upon receipt of such objection, the Commission will coordinate with the applicant in an attempt to resolve issues arising from the grant.

(a) Applicants may continue operating under the parameters of a granted special temporary authority (STA) during the time any problems are being resolved when:

(1) An application for a conventional license has been timely filed in accordance with §5.61 of this part; and

(2) The application for conventional license is for the same facilities and technical limitations as the existing STA.

(b) The applicant, at its option, may accept a grant-in-part of their license while working to resolve any issues.

§ 5.71 License period.

(a) *Conventional experimental radio licenses.*

(1) The regular license term is 2 years. An applicant may request a license term up to 5 years, but must provide justification for a license of that duration.

(2) A license may be renewed for an additional term not exceeding 5 years, upon an adequate showing of need to complete the experiment.

(b) *Program, medical testing, and compliance testing experimental radio licenses.* Licenses are issued for a term of 5 years and may be renewed for up to 5 years upon an adequate showing of need.

(c) *Broadcast experimental radio license.* Licenses are issued for a one-year period and may be renewed for an additional term not exceeding 5 years, upon an adequate showing of need.

§ 5.73 Experimental report.

(a) The following provisions apply to conventional experimental radio licenses and to medical testing experimental licenses that operate under Part 15, Radio Frequency Devices; Part 18, Industrial, Scientific, and Medical Equipment, Part 95, Personal Radio Services Subpart H – Wireless Medical Telemetry Service; or Part 95, Subpart I – Medical Device Radiocommunication Service:

(1) The Commission may, as a condition of authorization, request that the licensee forward periodic reports in order to evaluate the progress of the experimental program.

(2) An applicant may request that the Commission withhold from the public certain reports and associated material and the Commission will do so unless the public interest requires otherwise. These requests should follow the procedures for submission set forth in § 0.459 of this chapter.

(b) The provisions in § 5.207 of this part apply to broadcast experimental radio licenses.

(c) The provisions in § 5.309 of this part apply to program experimental licenses and to medical testing experimental licenses that do not operate under Part 15, Radio Frequency Devices; Part 18, Industrial, Scientific, and Medical Equipment, Part 95, Personal Radio Services Subpart H – Wireless Medical Telemetry Service; or Part 95, Subpart I – Medical Device Radiocommunication Service.

§ 5.77 Change in equipment and emission characteristics.

(a) The licensee of a conventional or broadcast experimental radio station may make any changes in equipment that are deemed desirable or necessary provided:

(1) That the operating frequency is not permitted to deviate more than the allowed tolerance;

(2) That the emissions are not permitted outside the authorized band;

(3) That the ERP (or EIRP) and antenna complies with the license and the regulations governing the same; and

(b) For conventional experimental radio stations, the changes permitted in paragraph (a) of this section may be made without prior authorization from the Commission provided that the licensee supplements its application file with a description of such change. If the licensee wants these emission changes to become a permanent part of the license, an application for modification must be filed.

(c) Prior authorization from the Commission is required before the following antenna changes may be made at a station at a fixed location:

(1) Any change that will either increase the height of a structure supporting the radiating portion of the antenna or decrease the height of a lighted antenna structure.

(2) Any change in the location of an antenna when such relocation involves a change in the geographic coordinates of latitude or longitude by one second or more, or when such relocation involves a change in street address.

§ 5.79 Transfer and assignment of station authorization for conventional, program, medical testing, and compliance testing experimental radio licenses.

A station authorization, the frequencies authorized to be used by the grantee of such authorization, and the rights therein granted by such authorization shall not be transferred, assigned, or in any manner either voluntarily or involuntarily disposed of, unless the Commission decides that such a transfer is in the public interest and gives its consent in writing.

§ 5.81 Discontinuance of station operation.

In case of permanent discontinuance of operation of a station in the Experimental Radio Service prior to the license expiration date, the licensee shall notify the Commission. Licensees who willfully fail to do so may be subject to disciplinary action, including monetary fines, by the Commission.

§ 5.83 Cancellation provisions.

The applicant for a station in the Experimental Radio Services accepts the license with the express understanding that:

(a) the authority to use the frequency or frequencies permitted by the license is granted upon an experimental basis only and does not confer any right to conduct an activity of a continuing nature; and

(b) the grant is subject to change or cancellation by the Commission at any time without notice or hearing if in its discretion the need for such action arises. However, a petition for reconsideration or application for review may be filed to such Commission action.

§ 5.84 Non-interference criterion.

Operation of an experimental radio station is permitted only on the condition that harmful interference is not caused to any station operating in accordance with the Table of Frequency Allocation of part 2 of this chapter. If harmful interference to an established radio service occurs, upon becoming aware of such harmful interference the Experimental Radio Service licensee shall immediately cease transmissions. Furthermore, the licensee shall not resume transmissions until the

licensee establishes to the satisfaction of the Commission that further harmful interference will not be caused to any established radio service.

§ 5.85 Frequencies and policy governing frequency assignment.

(a) Stations operating in the Experimental Radio Service may be authorized to use any Federal or non-Federal frequency designated in the Table of Frequency Allocations set forth in part 2 of this chapter, provided that the need for the frequency requested is fully justified by the applicant, except that experimental stations may not use any frequency or frequency band exclusively allocated to the passive services (including the radio astronomy service). Stations authorized under Subparts E and F are subject to additional restrictions.

(b) Frequency or frequency bands are assigned to stations in the Experimental Radio Service on a shared basis and are not assigned for the exclusive use of any one licensee. Frequency assignments may be restricted to specified geographical areas.

(c) *Broadcast experimental radio stations.*

(1) The applicant shall select frequencies best suited to the purpose of the experimentation and on which there appears to be the least likelihood of interference to established stations.

(2) Except as indicated, only frequencies allocated to broadcasting service are assigned. If an experiment cannot be feasibly conducted on frequencies allocated to a broadcasting service, an experimental station may be authorized to operate on other frequencies upon a satisfactory showing of the need therefore and a showing that the proposed operation can be conducted without causing harmful interference to established services.

(d) *Use of Public Safety Frequencies.*

(1) Conventional experimental licenses. Applicants in the Experimental Radio Service shall avoid use of public safety frequencies identified in part 90 of this chapter except when a compelling showing is made that use of such frequencies is in the public interest. If an experimental license to use public safety radio frequencies is granted, the authorization will include a condition requiring the experimental licensee to coordinate the operation with the appropriate frequency coordinator or all of the public safety licensees using the frequencies in question in the experimenter's proposed area of operation.

(2) Program experimental licenses. A program licensee shall plan a program of experimentation that avoids use of public safety frequencies, and may only operate on such frequencies when it can make a compelling showing that use of such frequencies is in the public interest. A licensee planning to operate on public safety frequencies must incorporate its public interest showing into the narrative statement it prepares under Section 5.309(a)(1), and must coordinate, prior to operating, with the appropriate frequency coordinator or all of the public safety licensees that operate on the frequencies in question in the program experimental licensee's proposed area of operation.

(e) The Commission may, at its discretion, condition any experimental license or STA on the requirement that before commencing operation, the new licensee coordinate its proposed facility with other licensees that may receive interference as a result of the new licensee's operations.

(f) *Protection of FCC monitoring stations.*

(1) Applicants may need to protect FCC monitoring stations from interference and their station authorization may be conditioned accordingly. Geographical coordinates of such stations are listed in § 0.121(b) of this chapter.

(2) In the event that calculated value of expected field strength exceeds a direct wave fundamental field strength of greater than 10 mV/m in the authorized bandwidth of service (-65.8 dBW/m² power flux density assuming a free space characteristic impedance of 120π ohms) at the reference coordinates, or if there is any question whether field strength levels might exceed the threshold value, the applicant should call the FCC, telephone 1-888-225-5322 (1-888-CALL FCC).

(3) Coordination is suggested particularly for those applicants who have no reliable data that indicates whether the field strength or power flux density figure indicated in (f)(2) of this section would be exceeded by their proposed radio facilities (except mobile stations). The following is a suggested guide for determining whether coordination is needed:

(i) All stations within 2.4 kilometers (1.5 statute miles);

(ii) Stations within 4.8 kilometers (3 statute miles) with 50 watts or more average ERP in the primary plane of polarization in the azimuthal direction of the Monitoring Station;

(iii) Stations within 16 kilometers (10 statute miles) with 1 kW or more average ERP in the primary plane of polarization in the azimuthal direction of the Monitoring Station;

(iv) Stations within 80 kilometers (50 statute miles) with 25 kW or more average ERP in the primary plane of polarization in the azimuthal direction of the Monitoring Station.

(4) Advance coordination for stations operating above 1000 MHz is recommended only where the proposed station is in the vicinity of a monitoring station designated as a satellite monitoring facility in § 0.121(b) of this chapter and also meets the criteria outlined in paragraphs (f)(2) and (3) of this section.

§ 5.91 Notification to the National Radio Astronomy Observatory.

In order to minimize possible harmful interference at the National Radio Astronomy Observatory site located at Green Bank, Pocahontas County, West Virginia, and at the Naval Radio Research Observatory site at Sugar Grove, Pendleton County, West Virginia, any applicant for an Experimental Radio Service station authorization other than a mobile, temporary base, or temporary fixed station, within the area bounded by 39° 15' N on the north, 78° 30' W on the east, 37° 30' N on the south and 80° 30' W on the west shall, at the time of filing such application with the Commission, simultaneously notify the Director, National Radio Astronomy Observatory, P.O. Box NZ2, Green Bank, West Virginia, 24944, in writing, of the technical particulars of the proposed station. Such notification shall include the geographical coordinates of the antenna, antenna height, antenna directivity if any, frequency, type of emission, and power. In addition, the applicant shall indicate in its application to the Commission the date notification was made to the Observatory. After receipt of such applications, the Commission will allow a period of twenty (20) days for comments or objections in response to the notifications indicated. If an objection to the proposed operation is received during the twenty-day period from the National Radio Astronomy Observatory for itself or on behalf of the Naval Radio Research Observatory, the Commission will consider all aspects of the problem and take whatever action is deemed appropriate.

§ 5.95 Informal objections.

A person or entity desiring to object to or to oppose an Experimental Radio application for a station license or authorization may file an informal objection against that application. The informal objection and any responsive pleadings shall be submitted electronically consistent with the requirements set forth in §5.55 of this part.

Subpart C—Technical Standards and Operating Requirements**§ 5.101 Frequency stability.**

Experimental Radio Service licensees shall ensure that transmitted emissions remain within the authorized frequency band under normal operating conditions: Equipment is presumed to operate over the temperature range -20 to +50 degrees Celsius with an input voltage variation of 85% to 115% of rated input voltage, unless justification is presented to demonstrate otherwise.

§ 5.103 Types of emission.

Stations in the Experimental Radio Service may be authorized to use any of the classifications of emissions covered in part 2 of this chapter.

§ 5.105 Authorized bandwidth.

The occupied bandwidth of transmitted emissions from an Experimental Radio Service station shall not exceed the authorized bandwidth specified in the authorization. Each authorization will show, as the prefix to the emission classification, a figure specifying the necessary bandwidth. The application may request an authorized bandwidth that is greater than the necessary bandwidth for the emission to be used, if required for the experimental purpose. Necessary bandwidth and occupied bandwidth are defined and determined in accordance with § 2.1 and § 2.202 of this chapter.

§ 5.107 Transmitter control requirements.

Each licensee shall be responsible for maintaining control of the transmitter authorized under its station authorization, including the ability to terminate transmissions should interference occur.

- (a) Conventional experimental radio stations. The licensee shall ensure that transmissions are in conformance with the operating characteristics prescribed in the station authorization and that the station is operated only by persons duly authorized by the licensee.
- (b) Program experimental radio stations. The licensee shall ensure that transmissions are in conformance with the requirements in subpart E of this part and that the station is operated only by persons duly authorized by the licensee.
- (c) Medical testing experimental radio stations. The licensee shall ensure that transmissions are in conformance with the requirements in subpart F of this part and that the station is operated only by persons duly authorized by the licensee.
- (d) Compliance testing experimental radio stations. The licensee shall ensure that transmissions are in conformance with the requirements in subpart G of this part and that the station is operated only by persons duly authorized by the licensee.
- (e) Broadcast experimental stations. Except where unattended operation is specifically permitted, the licensee of each station authorized under the provisions of this part shall designate a person or

persons to activate and control its transmitter. At the discretion of the station licensee, persons so designated may be employed for other duties and for operation of other transmitting stations if such other duties will not interfere with the proper operation of the station transmission systems.

§ 5.109 Responsibility for antenna structure painting and lighting.

Experimental Radio Service licensees may become responsible for maintaining the painting and lighting of any antenna structure they are authorized to use in accordance with part 17 of this chapter. See § 17.6 of this chapter.

§5.110 Power limitations.

(a) The transmitting radiated power for stations authorized under the Experimental Radio Service shall be limited to the minimum practical radiated power necessary for the success of the experiment.

(b) For broadcast experimental radio stations, the operating power shall not exceed by more than 5 percent the maximum power specified. Engineering standards have not been established for these stations. The efficiency factor for the last radio stage of transmitters employed will be subject to individual determination but shall be in general agreement with values normally employed for similar equipment operated within the frequency range authorized.

§ 5.111 Limitations on use.

(a) Stations may make only such transmissions as are necessary and directly related to the conduct of the licensee's stated program of experimentation and the related station instrument of authorization, and as governed by the provisions of the rules and regulations contained in this part. When transmitting, the licensee must use every precaution to ensure that it will not cause harmful interference to the services carried on by stations operating in accordance with the Table of Frequency Allocations of part 2 of this chapter.

(b) A licensee shall adhere to the program of experimentation as stated in its application or in the station instrument of authorization.

(c) The radiations of the transmitter shall be suspended immediately upon detection or notification of a deviation from the technical requirements of the station authorization until such deviation is corrected, except for transmissions concerning the immediate safety of life or property, in which case the transmissions shall be suspended as soon as the emergency is terminated.

§ 5.115 Station identification.

(a) *Conventional experimental radio licenses.* A licensee, unless specifically exempted by the terms of the station authorization, shall transmit its assigned call sign at the end of each complete transmission: Provided, however, that the transmission of the call sign at the end of each transmission is not required for projects requiring continuous, frequent, or extended use of the transmitting apparatus, if, during such periods and in connection with such use, the call sign is transmitted at least once every thirty minutes. The station identification shall be transmitted in clear voice or Morse code. All digital encoding and digital modulation shall be disabled during station identification.

(b) *Broadcast experimental licenses.* Each experimental broadcast station must transmit aural or visual announcements of its call letters and location at the beginning and end of each period of operation, and at least once every hour during operation.

(c) *Program experimental radio licenses.* Program experimental radio licenses shall comply with either paragraph (c)(1) or (c)(2):

(1) Stations may transmit identifying information sufficient to identify the license holder and the geographic coordinates of the station. This information shall be transmitted at the end of each complete transmission except that: this information is not required at the end of each transmission for projects requiring continuous, frequent, or extended use of the transmitting apparatus, if, during such periods and in connection with such use, the information is transmitted at least once every thirty minutes. The station identification shall be transmitted in clear voice or Morse code. All digital encoding and digital modulation shall be disabled during station identification; or

(2) Stations may post information sufficient to identify it on the Commission's program experimental registration website.

§ 5.121 Station record requirements.

(a) For conventional, program, medical testing, and compliance testing experimental radio stations, the current original authorization or a clearly legible photocopy for each station shall be retained as a permanent part of the station records, but need not be posted. Station records are required to be kept for a period of at least one year after license expiration.

(b) For Broadcast experimental radio stations, the license must be available at the transmitter site. The licensee of each experimental broadcast station must maintain and retain for a period of two years, adequate records of the operation, including:

(1) Information concerning the nature of the experimental operation and the periods in which it is being conducted; and

(2) Information concerning any specific data requested by the FCC.

§ 5.123 Inspection of stations.

All stations and records of stations in the authorized under this part shall be made available for inspection at any time while the station is in operation or shall be made available for inspection upon reasonable request of an authorized representative of the Commission.

§ 5.125 Authorized points of communication.

Generally, stations in the Experimental Radio Service may communicate only with other stations licensed in the Experimental Radio Service. Nevertheless, upon a satisfactory showing that the proposed communications are essential to the conduct of the research project, authority may be granted to communicate with stations in other services and U.S. Government stations.

Subpart D—Broadcast Experimental Licenses

§ 5.201 Applicable rules.

In addition to the rules in this subpart, broadcast experimental station applicants and licensees shall follow the rules in subparts B and C of this part. In case of any conflict between the rules set forth in this subpart and the rules set forth in subparts B and C of this part, the rules in this subpart shall govern.

§ 5.203 Experimental authorizations for licensed broadcast stations.

(a) Licensees of broadcast stations (including TV Translator, LPTV, and TV Booster stations) may obtain experimental authorizations to conduct technical experimentation directed toward improvement of the technical phases of operation and service, and for such purposes may use a signal other than the normal broadcast program signal.

(b) Experimental authorizations for licensed broadcast stations may be requested by filing an informal application with the FCC in Washington, DC, describing the nature and purpose of the experimentation to be conducted, the nature of the experimental signal to be transmitted, and the proposed schedule of hours and duration of the experimentation. Experimental authorizations shall be posted with the station license.

(c) Experimental operations for licensed broadcast stations are subject to the following conditions:

(1) The authorized power of the station may not be exceeded more than 5 percent above the maximum power specified, except as specifically authorized for the experimental operations.

(2) Emissions outside the authorized bandwidth must be attenuated to the degree required for the particular type of station.

(3) The experimental operations may be conducted at any time the licensed station is authorized to operate, but the minimum required schedule of programming for the class and type of station must be met. AM stations also may conduct experimental operations during the experimental period (12 midnight local time to local sunrise) and at additional hours if permitted by the experimental authorization provided no interference is caused to other stations maintaining a regular operating schedule within such period(s).

(4) If a licensed station's experimental authorization permits the use of additional facilities or hours of operation for experimental purposes, no sponsored programs or commercial announcements may be transmitted during such experimentation.

(5) The licensee may transmit regularly scheduled programming concurrently with the experimental transmission if there is no significant impairment of service.

(6) No charges may be made, either directly or indirectly, for the experimentation; however, normal charges may be made for regularly scheduled programming transmitted concurrently with the experimental transmissions.

(d) The FCC may request a report of the research, experimentation and results at the conclusion of the experimental operation.

§ 5.205 Licensing requirements, necessary showing.

(a) An applicant for a new experimental broadcast station, change in facilities of any existing station, or modification of license is required to make a satisfactory showing of compliance with the general requirements of the Communications Act of 1934, as amended, as well as the following:

(1) That the applicant has a definite program of research and experimentation in the technical phases of broadcasting which indicates reasonable promise of substantial contribution to the developments of the broadcasting art.

- (2) That upon the authorization of the proposed station the applicant can and will proceed immediately with its program of research and experimentation.
- (3) That the transmission of signals by radio is essential to the proposed program of research and experimentation.
- (4) That the program of research and experimentation will be conducted by qualified personnel.

(b) A license for an experimental broadcast station will be issued only on the condition that no objectionable interference to the regular program transmissions of broadcast stations will result from the transmissions of the experimental stations.

(c) *Special provision for broadcast experimental radio station applications.* For purposes of the definition of “experimental authorization” in Section II.A.6 of the Nationwide Programmatic Agreement Regarding the Section 106 National Historic Preservation Act Review Process set forth in Appendix C to Part 1 of this chapter, an Broadcast Experimental Radio Station authorized under this Subpart shall be considered an “Experimental Broadcast Station authorized under Part 74 of the Commission’s Rules.”

§ 5.207 Supplemental reports with application for renewal of license.

A report shall be filed with each application for renewal of experimental broadcast station license which shall include a statement of each of the following:

- (a) Number of hours operated.
- (b) Full data on research and experimentation conducted including the types of transmitting and studio equipment used and their mode of operation.
- (c) Data on expense of research and operation during the period covered.
- (d) Power employed, field intensity measurements and visual and aural observations and the types of instruments and receivers utilized to determine the station service area and the efficiency of the respective types of transmissions.
- (e) Estimated degree of public participation in reception and the results of observations as to the effectiveness of types of transmission.
- (f) Conclusions, tentative and final.
- (g) Program of further developments in broadcasting.
- (h) All developments and major changes in equipment.
- (i) Any other pertinent developments.

§ 5.211 Frequency monitors and measurements.

The licensee of a broadcast experimental radio station shall provide the necessary means for determining that the frequency of the station is within the allowed tolerance. The date and time of each frequency check, the frequency as measured, and a description or identification of the method employed shall be entered in the station log. Sufficient observations shall be made to insure that the assigned carrier frequency is maintained within the prescribed tolerance.

§ 5.213 Time of operation.

(a) Unless specified or restricted hours of operation are shown in the station authorization, broadcast experimental radio stations may be operated at any time and are not required to adhere to a regular schedule of operation.

(b) The FCC may limit or restrict the periods of station operation in the event interference is caused to other broadcast or non-broadcast stations.

(c) The FCC may require that a broadcast experimental radio station conduct such experiments as are deemed desirable and reasonable for development of the type of service for which the station was authorized.

§ 5.215 Program service and charges.

(a) The licensee of a broadcast experimental radio station may transmit program material only when necessary to the experiments being conducted, and no regular program service may be broadcast unless specifically authorized.

(b) The licensee of a broadcast experimental radio station may make no charges nor ask for any payment, directly or indirectly, for the production or transmission of any programming or information used for experimental broadcast purposes.

§ 5.217 Rebroadcasts.

(a) The term *rebroadcast* means reception by radio of the programs or other transmissions of a broadcast station, and the simultaneous or subsequent retransmission of such programs or transmissions by a broadcast station.

(1) As used in this section, the word “program” includes any complete program or part thereof.

(2) The transmission of a program from its point of origin to a broadcast station entirely by common carrier facilities, whether by wire line or radio, is not considered a rebroadcast.

(3) The broadcasting of a program relayed by a remote broadcast pickup station is not considered a rebroadcast.

(b) No licensee of a broadcast experimental radio station may retransmit the program of another U.S. broadcast station without the express authority of the originating station. A copy of the written consent of the licensee originating the program must be kept by the licensee of the broadcast experimental radio station retransmitting such program and made available to the FCC upon request.

§ 5.219 Broadcasting emergency information.

(a) In an emergency where normal communication facilities have been disrupted or destroyed by storms, floods or other disasters, a broadcast experimental radio station may be operated for the purpose of transmitting essential communications intended to alleviate distress, dispatch aid, assist in rescue operations, maintain order, or otherwise promote the safety of life and property. In the course of such operation, a station of any class may communicate with stations of other classes and in other services. However, such operation shall be conducted only on the frequency or frequencies for which the station is licensed and the used power shall not exceed the maximum authorized in the station license. When such operation involves the use of frequencies shared with other stations, licensees are expected to cooperate fully to avoid unnecessary or disruptive interference.

(b) Whenever such operation involves communications of a nature other than those for which the station is licensed to perform, the licensee shall, at the earliest practicable time, notify the FCC in Washington, DC of the nature of the emergency and the use to which the station is being put and shall subsequently notify the same offices when the emergency operation has been terminated.

(c) Emergency operation undertaken pursuant to the provisions of this section shall be discontinued as soon as substantially normal communications facilities have been restored. The Commission may at any time order discontinuance of such operation.

Subpart E—Program Experimental Radio Licenses

§5.301 Applicable rules.

In addition to the rules in this subpart, program experimental applicants and licensees must follow the rules in subparts B and C of this part. In case of any conflict between the rules set forth in this subpart and the rules set forth in subparts B and C of this part, the rules in this subpart shall govern.

§ 5.302 Eligibility.

Program experimental licensees may be granted to the following entities: a college or university with a graduate research program in engineering that is accredited by the Accreditation Board for Engineering and Technology (ABET); a research laboratory; a hospital or health care institution; a manufacturer of radio frequency equipment; or a manufacturer that integrates radio frequency equipment into their end products, that meets the following requirements:

(b) The radiofrequency experimentation will be conducted in a defined geographic area under the applicant's control;

(c) The applicant has institutional processes to monitor and effectively manage a wide variety of research projects; and

(d) The applicant has demonstrated expertise in radio spectrum management or partner with another entity that has such expertise.

§ 5.303 Frequencies.

Licensees may operate in any frequency band, including those above 38.6 GHz, except for frequency bands exclusively allocated to the passive services (including the radio astronomy service) and any frequency or frequency band below 38.6 GHz that is listed in §15.205(a). Licensees shall avoid use of public safety frequencies pursuant to § 5.85(d).

§ 5.304 Area of operations.

Applications must specify, and the Commission will grant authorizations for, a geographic area that is inclusive of an institution's real-property facilities where the experimentation will be conducted and that is under the applicant's control. If an applicant wants to conduct experiments in more than one defined geographic area, it shall apply for a license for each location.

§ 5.305 Program license not permitted.

Experiments are not permitted under this subpart and a conventional experimental radio license is required when:

- (a) An environmental assessment must be filed with the Commission as required by § 5.63(a) of this part; or
- (b) An orbital debris mitigation plan must be filed with the Commission as required by § 5.64 of this part; or
- (c) The applicant requires non-disclosure of proprietary information as part of its justification for its license application; or
- (d) A product development or a market trial is to be conducted.

§ 5.307 Responsible party.

- (a) Each program experimental radio applicant must identify a single point of contact responsible for all experiments conducted under the license, including
 - (1) ensuring compliance with the notification requirements of § 5.309 of this part; and
 - (2) ensuring compliance with all applicable FCC rules.
- (b) The responsible individual will serve as the initial point of contact for all matters involving interference resolution and must have the authority to discontinue any and all experiments being conducted under the license, if necessary.
- (c) The license application must include the name of the responsible individual and contact information at which the person can be reached at any time of the day; this information will be listed on the license. Licensees are required to keep this information current.

§ 5.308 Stop buzzer.

A "Stop Buzzer" point of contact must be identified and available at all times during operation of each experiment conducted under a program license. A "stop buzzer" point of contact is a person who can address interference concerns and cease all transmissions immediately if interference occurs.

§ 5.309 Notification requirements.

- (a) At least ten calendar days prior to commencement of any experiment, program experimental licensees must provide the following information to the Commission's program experimental registration website:
 - (1) a narrative statement describing the experiment, including a description and explanation of measures taken to avoid causing harmful interference to any existing service licensee;
 - (2) contact information for the researcher-in-charge of the described experiment;
 - (3) contact information for a "stop buzzer"; and
 - (4) technical details including:
 - (i) the frequency or frequency bands;
 - (ii) the maximum equivalent isotropically radiated power (EIRP) or effective radiated power (ERP) under consideration;

- (iii) the emission designators to be used;
- (iv) a description of the geographic area in which the test will be conducted;
- (v) the number of units to be used; and
- (vi) a mitigation plan as required by § 5.311 of this part, if necessary.

(5) for program license experiments that may affect frequency bands used for the provision of commercial mobile services, emergency notifications, or public safety purposes, a list of those critical service licensees that are authorized to operate in the same bands and geographic area of the planned experiment.

(b) Experiments may commence without specific approval or authorization once ten calendar days have elapsed from the time of posting to the above website. During that ten-day period, the licensee of an authorized service may contact the program licensee to resolve any objections to an experiment. It is expected that parties will work in good faith to resolve such objections, including modifying experiments if necessary to reach an agreeable resolution. However, only the Commission has the authority to prevent a program licensee from beginning operations (or to order the cessation of operations). Therefore, if an incumbent licensee believes that it will suffer interference (or in fact, has experienced interference), it must bring its concerns to the Commission for action. In such an event, the Commission will evaluate the concerns, and determine whether a planned experiment should be permitted to commence as proposed (or be terminated, if the experiment has commenced).

(c) The Commission can prohibit or require modification of specific experiments under a program experimental radio license at any time without notice or hearing if in its discretion the need for such action arises.

(d) Within 30 days after completion of each experiment conducted under a program experimental radio license, the licensee shall file a narrative statement describing the results of the experiment, including any interference incidents and steps taken to resolve them. This narrative statement must be filed to the Commission's program experimental registration website and be associated with the materials described in paragraphs (a) and (b) of this section.

(e)(1) The Commission may ask licensees for additional information to resolve an interference incident, gain a better understanding of new technology development, or for auditing purposes to ensure that licensees are actually conducting experiments. Failure to comply with a Commission request for additional information under this section, or if, upon review of such information, the Commission determines that a licensee is not actually conducting experimentation, could result in forfeiture of the program license and loss of privilege of obtaining such a license in the future.

(2) All information submitted pursuant to this section will be treated as routinely available for publicly inspection, within the meaning of Section 0.459 of this title. Licensees are permitted to request that information requested by the Commission pursuant to this section be withheld from public inspection. The Commission will consider such requests pursuant to the procedures set forth in Section 0.459 of this chapter.

§ 5.311 Additional requirements related to safety of the public.

In addition to the notification requirements of § 5.309 of this part, for experiments that may affect frequency bands used for the provision of commercial mobile services, emergency notifications, or public safety purposes, the program experimental radio licensee shall, prior to commencing

transmissions, develop a specific plan to avoid interference to these bands. The plan must include provisions for:

- (a) providing notice to parties, including other Commission licensees that are authorized to operate in the same bands and geographic area as the planned experiment and, as appropriate, their end users;
- (b) rapid identification, and elimination, of any harm the experiment may cause; and
- (c) identifying an alternate means for accomplishing potentially-affected vital public safety functions during the experiment.

§ 5.313 Innovation zones.

(a) An innovation zone is a specified geographic location with pre-authorized boundary conditions (such as frequency band, maximum power, etc.) created by the Commission on its own motion or in response to a request from the public. Innovation zones will be announced via public notice and posted on the Commission's program experimental registration website.

(b) A program experimental licensee may conduct experiments in an innovation zone consistent with the specified boundary conditions without specific authorization from the Commission. All licensees operating under this authority must comply with the requirements and limitations set forth for program licensees in this part, including providing notification of its intended operations on the program experimental registration website prior to operation.

Subpart F—Medical Testing Experimental Radio Licenses

§5.401 Applicable rules.

In addition to the rules in this subpart, medical testing experimental applicants and licensees must follow the rules in subparts B and C of this part. In case of any conflict between the rules set forth in this subpart and the rules set forth in subparts B and C of this part, the rules in this subpart shall govern.

§5.402 Eligibility and usage.

(a) Eligibility for medical testing licenses is limited to health care facilities as defined in § 95.1103(b) of this chapter.

(b) Medical testing experimental radio licenses are for testing in clinical trials medical devices that use RF wireless technology for diagnosis, treatment, or patient monitoring for the purposes of, but not limited to, assessing patient compatibility and usage issues, as well as operational, interference, and RF immunity issues. Medical testing is limited to testing equipment designed to comply with the rules in Part 15, Radio Frequency Devices; Part 18, Industrial, Scientific, and Medical Equipment; Part 95, Personal Radio Services Subpart H – Wireless Medical Telemetry Service; or Part 95, Subpart I – Medical Device Radiocommunication Service.

§ 5.403 Frequencies.

(a) Licensees may operate in any frequency band, including those above 38.6 GHz, except for frequency bands exclusively allocated to the passive services (including the radio astronomy service). In addition, licensees may not use any frequency or frequency band below 38.6 GHz that is listed in § 15.205(a) of this chapter.

(b) Exception: Licensees may use frequencies listed in § 15.205(a) of this chapter if the device under test is designed to comply with all applicable service rules in Part 18, Industrial, Scientific, and Medical Equipment; Part 95, Personal Radio Services Subpart H – Wireless Medical Telemetry Service; or Part 95, Subpart I – Medical Device Radiocommunication Service.

§5.404 Area of operation.

Applications must specify, and the Commission will grant authorizations for, a geographic area that is inclusive of an institution's real-property facilities where the experimentation will be conducted and that is under the applicant's control. Applications also may specify, and the Commission will grant authorizations for, defined geographic areas beyond the institution's real-property facilities that will be included in clinical trials and monitored by the licensee. In general, operations will be permitted where the likelihood of harmful interference being caused to authorized services is minimal.

§5.405 Yearly report.

Medical testing licensees must file a yearly report detailing the activity that has been performed under the license. This report is to be filed electronically to the Commission's program experimental registration website and must, at a minimum, include:

- (a) A list of each test performed and the testing period; and
- (b) A Description of each test, including equipment tested; and
- (c) The results of the test including any interference incidents and their resolution.

§ 5.406 Responsible party, "stop-buzzer," and notification requirements, and additional requirements related to safety of the public.

(a) Medical testing licensees must identify a single point of contact responsible for all experiments conducted under the license and must also identify a "stop buzzer" point of contact for all experiments, consistent with Subpart E, §§ 5.307 and 5.308 of this part.

(b) Medical testing licensees must meet the notification and safety of the public requirements of Subpart E, §§ 5.309 and 5.311 of this part.

§ 5.407 Exemption from station identification requirement.

Medical testing experimental licensees are exempt from complying with the station identification requirements of § 5.115 of this part.

Subpart G—Compliance testing experimental radio licenses

§5.501 Applicable rules.

In addition to the rules in this subpart, compliance testing experimental applicants and licensees must follow the rules in subparts B and C of this part. In case of any conflict between the rules set forth in this subpart and the rules set forth in subparts B and C of this part, the rules in this subpart shall govern.

§ 5.502 Eligibility.

Compliance testing experimental radio licenses may be granted to those testing laboratories recognized by the FCC as being competent to perform measurements of equipment for equipment authorization.

§ 5.503 Scope of testing activities.

The authority of a compliance testing experimental license is limited to only those testing activities necessary for product certification (including antenna calibration, test site validation, proficiency testing, and testing in an Open Area Test Site); *i.e.*, compliance testing experimental licensees are not authorized to conduct immunity testing.

§ 5.504 Responsible party.

Compliance testing licensees must identify a single point of contact responsible for all experiments conducted under the license, including ensuring compliance with all applicable FCC rules:

- (a) The responsible individual will serve as the initial point of contact for all matters involving interference resolution and must have the authority to discontinue any and all experiments being conducted under the license, if necessary.
- (b) The name of the responsible individual, along with contact information, such as a phone number and e-mail address at which he or she can be reached at any time of the day, must be identified on the license application, and this information will be listed on the license. Licensees are required to keep this information current.

§ 5.505 Exemption from station identification requirement.

Compliance testing experimental licensees are exempt from complying with the station identification requirements of § 5.115.

Subpart H—Product Development and Market Trials**§ 5.601 Product development trials.**

Unless otherwise stated in the instrument of authorization, experimental radio licenses granted for the purpose of product development trials pursuant to § 5.3(k) of this part are subject to the following conditions:

- (a) All transmitting and/or receiving equipment used in the study shall be owned by the licensee.
- (b) The licensee is responsible for informing all participants in the experiment that the operation of the service or device is being conducted under an experimental authorization and is strictly temporary.
- (c) Marketing of devices (as defined in § 2.803) or provision of services for hire is not permitted.
- (d) The size and scope of the experiment are subject to such limitations as the Commission may establish on a case-by-case basis. If the Commission subsequently determines that a product development trial is not so limited, the trial shall be immediately terminated.

(e) Broadcast experimental station applicants and licensees must also meet the requirements of §5.205 of this part.

§ 5.602 Market Trials.

Unless otherwise stated in the instrument of authorization, experimental radio licenses granted for the purpose of market trials pursuant to § 5.3(k) of this part are subject to the following conditions:

(a) Marketing of devices (as defined in § 2.803) and provision of services for hire is permitted before the radio frequency device has been authorized by the Commission, subject to the ownership provisions in paragraph (d) and provided that the device will be operated in compliance with existing Commission rules, waivers of such rules that are in effect at the time of operation, or rules that have been adopted by the Commission but that have not yet become effective.

(b) The operation of all radio frequency devices that are included in a market trial must be authorized under this rule section, including those devices that are designed to operate under Parts 15, 18, or 95.

(c) If more than one entity will be responsible for conducting the same market trial *e.g.*, manufacturer and service provider, each entity will be authorized under a separate license. If more than one licensee is authorized, the licensees or the Commission shall designate one as the responsible party for the trial.

(d) All transmitting and/or receiving equipment used in the study shall be owned by the experimental licensees. Marketing of devices is only permitted as follows:

- (1) The licensees may sell equipment to each other, *e.g.*, manufacturer to service provider,
- (2) The licensees may lease equipment to trial participants for purposes of the study, and
- (3) The number of devices to be marketed shall be the minimum quantity of devices necessary to conduct the market trial as approved by the Commission.

(e) Licensees are required to ensure that trial devices are either rendered inoperable or retrieved by them from trial participants at the conclusion of the trial. Licensees are required to notify trial participants in advance that operation of the trial device is subject to this condition.

(f) The size and scope of the experiment are subject to limitations as the Commission shall establish on a case-by-case basis. If the Commission subsequently determines that a market trial is not so limited, the trial shall be immediately terminated.

(g) Broadcast experimental station applicants and licensees must also meet the requirements of §5.205 of this part.

16. The Authority section of Part 22 continues to read as follows:

Authority: 47 U.S.C. 154, 222, 303, 309, and 332.

17. Section 22.165 is amended by removing and reserving paragraph (d)(2).

18. Section 22.377 is revised to read as follows:

§ 22.377 Certification of transmitters.

Transmitters used in the Public Mobile Services, including those used with signal boosters, in-building radiation systems and cellular repeaters, must be certificated for use in the radio services regulated under this part. Transmitters must be certificated when the station is ready for service, not necessarily at the time of filing an application. The FCC may list as certificated only transmitters that are capable of meeting all technical requirements of the rules governing the service in which they will operate. The procedure for obtaining certification is set forth in part 2 of this chapter.

19. Part 22, Subpart D is removed and reserved.

20. Section 22.591 is amended by revising paragraph (a) to read as follows:

§ 22.591 Channels for point-to-point operation.

* * * * *

(a) The 72-76 MHz channels may be used in point-to-multipoint configurations. The 72-76 MHz channels are also allocated for assignment in the Private Radio Services (see part 90 of this chapter).

* * * * *

21. Section 22.599 is removed.

22. The authority section of Part 73 continues to read as follows:

Authority: 47 U.S.C. 154, 303, 334, 336 and 339.

23. Section 73.1510 is removed.

PART 74—EXPERIMENTAL RADIO, AUXILIARY, SPECIAL BROADCAST AND OTHER PROGRAM DISTRIBUTIONAL SERVICES

24. The Table of Contents of Part 74 is amended by removing and reserving Subpart A:

* * * * *

(Reserved)

* * * * *

25. The authority section of Part 74 continues to read as follows:

Authority: 47 U.S.C. 154, 303, 307, 309, 336 and 554.

26. Section 74.1 is revised to read as follows:

§ 74.1 Scope.

(a) The rules in this subpart are applicable to the Auxiliary and Special Broadcast and Other Program Distributional Services.

(b) Rules in part 74 which apply exclusively to a particular service are contained in that service subpart, as follows: Remote Pickup Broadcast Stations, Subpart D; Aural Broadcast STL and Intercity Relay Stations, Subpart E; TV Auxiliary Broadcast Stations, Subpart F; Low-power TV, TV Translator and TV Booster Stations, Subpart G; Low-power Auxiliary Stations, Subpart H; FM Broadcast Translator Stations and FM Broadcast Booster Stations, subpart L.

27. Section 74.5 is amended by revising the introductory text to read as follows:

§ 74.5 Cross reference to rules in other parts.

Certain rules applicable to Auxiliary, Special Broadcast and other Program Distribution services, some of which are also applicable to other services, are set forth in the following Parts of the FCC Rules and Regulations:

* * * * *

28. Section 74.15 is amended by removing and reserving paragraph (a) and revising paragraph (f) to read as follows:

§ 74.15 Station license period.

(a) (Reserved)

* * * * *

(f) The license of an FM translator or FM broadcast booster, TV translator or TV broadcast booster, or low power TV station will expire as a matter of law upon failure to transmit broadcast signals for any consecutive 12-month period notwithstanding any provision, term, or condition of the license to the contrary. Further, if the license of any AM, FM, or TV broadcasting station licensed under part 73 of this chapter expires for failure to transmit signals for any consecutive 12-month period, the licensee's authorizations under part 74, subparts D, E, F, and H in connection with the operation of that AM, FM, or TV broadcasting station will also expire notwithstanding any provision, term, or condition to the contrary.

29. Section 74.16 is revised to read as follows:

§ 74.16 Temporary extension of station licenses.

Where there is pending before the Commission any application, investigation, or proceeding which, after hearing, might lead to or make necessary the modification of, revocation of, or the refusal to renew an existing auxiliary broadcast station license or a television broadcast translator station license, the Commission in its discretion, may grant a temporary extension of such license: *Provided, however,* That no such temporary extension shall be construed as a finding by the Commission that the operation of any radio station thereunder will serve public interest, convenience, and necessity beyond the express terms of such temporary extension of license: *And provided further,* That such temporary extension of license will in no wise affect or limit the action of the Commission with respect to any pending application or proceeding.

30. Section 74.28 is revised to read as follows:

§ 74.28 Additional orders.

In case the rules contained in this part do not cover all phases of operation with respect to external effects, the FCC may make supplemental or additional orders in each case as may be deemed necessary.

31. Part 74, Subpart A is amended by removing and reserving it to read as follows:

Subpart A (Reserved)

32. Section 74.780 is revised by adding an entry for “Part 5 – Experimental authorizations” in numerical order and removing the entry for “Section 73.1510 – Experimental authorizations.”

PART 80—STATIONS IN THE MARITIME SERVICES

33. The authority citation of Part 80 continues to read as follows:

Authority: Secs. 4, 303, 307(e), 309, and 332, 48 Stat. 1066, 1082, as amended; 47 U.S.C. 154, 303, 307(e), 309, and 332, unless otherwise noted. Interpret or apply 48 Stat. 1064–1068, 1081–1105, as amended; 47 U.S.C. 151–155, 301–609; 3 UST 3450, 3 UST 4726, 12 UST 2377.

34. Section 80.25 is amended by removing paragraph (c).

35. Section 80.33 is removed.

36. Section 80.203 is amended by removing and reserving paragraph (j).

37. Section 80.211 is amended by removing paragraph (g).

38. Section 80.377 is revised in its entirety, to read as follows:

§ 80.377 Frequencies for ship earth stations.

The frequency band 1626.5–1645.5 MHz is assignable for communication operations and radiodetermination and telecommand messages that are associated with the position, orientation and operational functions of maritime satellite equipment. The frequency band 1645.5–1646.5 MHz is reserved for use in the Global Maritime Distress and Safety System (GMDSS).

39. Section 80.391 is amended by removing the title “Developmental Stations” above the section and removing the entire section.

PART 87—AVIATION SERVICES

40. The authority section of Part 87 continues to read as follows:

Authority: 47 U.S.C. 154, 303 and 307(e), unless otherwise noted.

41. Section 87.27 is revised in its entirety, to read as follows:

§ 87.27 License term.

Licenses for stations in the aviation services will normally be issued for a term of ten years from the date of original issuance, or renewal.

42. Section 87.37 is removed.

PART 90—PRIVATE LAND MOBILE RADIO SERVICES

43. The authority citation of Part 90 continues to read as follows:

Authority: Sections 4(i), 11, 303(g), 303(r), and 332(c)(7) of the Communications Act of 1934, as amended, 47 U.S.C. 154(i), 161, 303(g), 303(r), 332(c)(7).

44. Section 90.7 is amended by removing the definition for “Developmental Operation.”

45. Section 90.20 is amended by removing and reserving paragraph (e)(3).

46. Section 90.35 is amended by removing the entry for “8,400 to 8,500” from the table in paragraph (b) and by removing and reserving paragraphs (c)(75), (d)(6) and (e)(2).

47. Section 90.129 is amended by removing and reserving paragraph (f).

48. Section 90.149 is amended by removing paragraph (c).

49. Section 90.175 is amended by removing and reserving paragraph (j)(4).

50. Section 90.203 is amended by removing and reserving paragraph (b)(1).

51. Section 90.241 is amended by removing paragraph (e).

52. Section 90.250 is amended by revising paragraph (i) to read as follows:

§ 90.250 Meteor burst communications.

* * * * *

(i) Stations employing meteor burst communications must not cause interference to other stations operating in accordance with the allocation table. New authorizations will be issued subject to the Commission's experimental licensing rules in part 5 of this chapter. Prior to expiration of the experimental authorization, application Form 601 should be filed for issuance of a permanent authorization.

53. Part 90, Subpart Q removed and reserved.

PART 101—FIXED MICROWAVE SERVICES

54. The authority citation of Part 101 continues to read as follows:

Authority: 47 U.S.C. 154, 303.

55. Section 101.21 is amended by removing and reserving paragraph (b).

56. Section 101.129 amended by revising paragraph (a) to read as follows:

§ 101.129 Transmitter location.

(a) The applicant must determine, prior to filing an application for a radio station authorization, that the antenna site specified therein is adequate to render the service proposed. In cases of questionable antenna locations, it is desirable to conduct propagation tests to indicate the field intensity which may be expected in the principal areas or at the fixed points of communication to be served, particularly

where severe shadow problems may be expected. In considering applications proposing the use of such locations, the Commission may require site survey tests to be made pursuant to an experimental license under Part 5 of this Chapter. In such cases, propagation tests should be conducted in accordance with recognized engineering methods and should be made with a transmitting antenna simulating, as near as possible, the proposed antenna installation. Full data obtained from such surveys and its analysis, including a description of the methods used and the name, address and qualifications of the engineer making the survey, must be supplied to the Commission.

* * * * *

57. In Part 101, Subpart F is removed and reserved.

APPENDIX C

Final Regulatory Flexibility Analysis

As required by the Regulatory Flexibility Act of 1980, as amended (RFA)¹ an Initial Regulatory Flexibility Analysis (IRFA) was incorporated in the Notice of Proposed Rule Making (*NPRM*) in this proceeding.² The Commission sought written public comment on the proposals in the *NPRM*, including comments on the IRFA. The comments received are discussed below. This present Final Regulatory Flexibility Analysis (FRFA) conforms to the RFA.³

A. Need for and Objectives of the Report and Order

The *NPRM* sought to promote innovation and efficiency in spectrum use in the Commission's Part 5 Experimental Radio Service (ERS). The *NPRM* proposed specific steps to accelerate the rate at which innovative ideas transform from prototypes to consumer devices and services. These proposals were designed to contribute to advancements in devices and services available to the American public by enabling a quicker equipment development process and promoting greater spectrum efficiency over the long term.

The objective of the Report and Order is to provide increased opportunities for experimentation and innovation. To this end, the Report and Order establishes new program and testing experimental radio license that will eliminate administrative burdens on those who are engaged in ongoing programs of research, experimentation, and testing. The current rules allow for an experimenter to apply for and be issued a license to cover a single or a series of closely related experiments – referred to hereinafter as a conventional experimental license – which generally limits the scope of the experiment, frequencies, emissions, and power levels. If licensees want to vary any of their authorized parameters, they must apply for new or modified licenses. While the current process works well for those applicants who need to undertake only a single experiment, it can be cumbersome for applicants who wish to pursue ongoing research and can significantly delay the introduction of new technologies and services into the marketplace. The Report and Order allows the FCC to continue to issue conventional experimental licenses for specific types of experimentation, but also permits issuance of program and testing experimental licenses to promote ongoing research. The testing licenses are being created to advance the critical areas of medical and compliance testing. All of these new licenses will allow researchers and laboratories to conduct multiple non-related experiments under a single authorization over a longer period of time, thus eliminating regulatory delay and uncertainty.

The Report and Order also broadens opportunities for market studies by revising and consolidating the Commission's existing ERS Rules, promotes greater overall experimentation by streamlining those rules and procedures, and opens new opportunities for experimentation by making targeted modifications to those rules and procedures.

¹ See 5 U.S.C. § 603. The RFA, see 5 U.S.C. § 601-612, has been amended by the Small Business Regulatory Enforcement Fairness Act of 1996, (SBREFA) Pub. L. No. 104-121, Title II, 110 Stat. 857 (1996).

² See Promoting Expanded Opportunities for Radio Experimentation and Market Trials Under Part 5 of the Commission's Rules and Streamlining Other Related Rules, ET Docket No. 10-236; 2006 Biennial Review of Telecommunications Regulations – Part 2, Administered by the Office of Engineering and Technology (OET), ET Docket 06-155; *Notice of Proposed Rulemaking*, 25 FCC Rcd 16544 (2010); *Erratum*, 26 FCC Rcd 3828 (2011).

³ See 5 U.S.C. § 603(a).

B. Summary of Significant Issues Raised by Public Comments in Response to the IRFA

One commenting party, Stephen Crowley, responded directly to the IRFA. Crowley observes that the IRFA provided an estimate of the number of small businesses involved in a variety of radio services, but contends that the IRFA did not provide an analysis describing the impact of the proposed rules on small businesses. Crowley further contends that the IRFA omitted a class of small business that would be impacted if the proposals set forth in the *NPRM* were adopted – namely wireless technology developers. Crowley notes that such developers were precluded from obtaining research program experimental licenses under the proposed rules, and argues that this proposal would force wireless technology developers to obtain conventional experimental licenses, which would impose delays and increased costs on them. Crowley therefore recommends as a significant alternative to the proposed rules that the Commission permit wireless technology developers and other commercial entities to be eligible for research program experimental licenses.⁴

Regarding Crowley’s contention that the IRFA did not describe the impact of the proposed rules on small businesses, the IRFA solicited comment on that issue, as required by the RFA. Also, the IRFA solicited comment on the impact of the proposed rules on Wireless Telecommunications Carriers (Except Satellite), which includes wireless technology developers. Finally, a number of commenting parties expressed the same concern as Crowley did regarding the proposed exclusion of commercial entities from receiving program experimental licenses. Based on those comments, the Commission decided to modify its proposal to permit manufacturers that have demonstrated expertise in radio spectrum management to receive such licenses.

C. Response to Comments by the Chief Counsel for Advocacy of the Small Business Administration

Pursuant to the Small Business Jobs Act of 2010, the Commission is required to respond to any comments filed by the Chief Counsel for Advocacy of the Small Business Administration (SBA), and to provide a detailed statement of any change made to the proposed rules as a result of those comments. The Chief Counsel did not file any comments in response to the proposed rules in this proceeding.

D. Description and Estimate of the Number of Small Entities to Which the Rules Will Apply

The RFA directs agencies to provide a description of and, where feasible, an estimate of the number of small entities that will be affected by the proposed rules.⁵ The RFA generally defines the term “small entity” as having the same meaning as the terms “small business,” “small organization,” and “small governmental jurisdiction.”⁶ In addition, the term “small business” has the same meaning as the term “small business concern” under the Small Business Act.⁷ A small business concern is one which: (1) is independently owned and operated; (2) is not dominant in its field of operation; and (3) satisfies any additional criteria established by the SBA.

⁴ See Crowley Comments to *NPRM* at 8-9.

⁵ See 5 U.S.C. §§ 603(b)(3), 604(a)(3).

⁶ *Id.*, § 601(6).

⁷ See 5 U.S.C. § 601(3) (incorporating by reference the definition of “small business concern” in the Small Business Act, 15 U.S.C. § 632). Pursuant to 5 U.S.C. § 601(3), the statutory definition of a small business applies “unless an agency, after consultation with the Office of Advocacy of the Small Business Administration and after opportunity for public comment, establishes one or more definitions of such terms which are appropriate to the activities of the agency and publishes such definitions(s) in the Federal Register.”

Our action may, over time, affect small entities that are not easily categorized at present. We therefore describe here, at the outset, three comprehensive, statutory small entity size standards that encompass entities that could be directly affected by the proposals under consideration.⁸ As of 2009, small businesses represented 99.9% of the 27.5 million businesses in the United States, according to the SBA.⁹ Additionally, a “small organization” is generally “any not-for-profit enterprise which is independently owned and operated and is not dominant in its field.”¹⁰ Nationwide, as of 2007, there were approximately 1,621,315 small organizations.¹¹ Finally, the term “small governmental jurisdiction” is defined generally as “governments of cities, counties, towns, townships, villages, school districts, or special districts, with a population of less than fifty thousand.”¹² Census Bureau data for 2007 indicate that there were 89,527 governmental jurisdictions in the United States.¹³ We estimate that, of this total, as many as 88,761 entities may qualify as “small governmental jurisdictions.”¹⁴ Thus, we estimate that most governmental jurisdictions are small.

There is an overall trend of increasing experimental activity. For example, disposals (grants and dismissals) under the ERS increased from 1,067 in 2000 to 1,235 in 2005 to 1,553 in 2011.¹⁵ By contrast, much less activity has taken place under our developmental rules, which we are eliminating in the Report and Order. Since 1999 in the non-broadcast (wireless) radio services, ten developmental licenses were granted under Part 22 (Public Mobile Services), one was granted under Part 80 (Maritime Services), 37 were granted under Part 87 (Aviation Services), and eight were granted under Part 90 (Private Land Mobile Radio Services). None were granted since 1999 under Part 101 (Fixed Microwave Services).

⁸ See 5 U.S.C. § 601(3)–(6).

⁹ See SBA, Office of Advocacy, “Frequently Asked Questions,” available at <http://web.sba.gov/faqs/faqindex.cfm?areaID=24> (last visited Aug. 31, 2012).

¹⁰ 5 U.S.C. § 601(4).

¹¹ Independent Sector, *The New NonProfit Almanac & Desk Reference* (2010).

¹² 5 U.S.C. § 601(5).

¹³ U.S. Census Bureau, *Statistical Abstract of the United States: 2011*, Table 427 (2007).

¹⁴ The 2007 U.S. Census data for small governmental organizations are not presented based on the size of the population in each such organization. There were 89,476 local governmental organizations in 2007. If we assume that county, municipal, township, and school district organizations are more likely than larger governmental organizations to have populations of 50,000 or less, the total of these organizations is 52,095. If we make the same population assumption about special districts, specifically that they are likely to have a population of 50,000 or less, and also assume that special districts are different from county, municipal, township, and school districts, in 2007 there were 37,381 such special districts. Therefore, there are a total of 89,476 local government organizations. As a basis of estimating how many of these 89,476 local government organizations were small, in 2011, we note that there were a total of 715 cities and towns (incorporated places and minor civil divisions) with populations over 50,000. City And Towns Totals: Vintage 2011 – U.S. Census Bureau, *available at* <http://www.census.gov/popest/data/cities/totals/2011/index.html>. If we subtract the 715 cities and towns that meet or exceed the 50,000 population threshold, we conclude that approximately 88,761 are small. U.S. Census Bureau, *Statistical Abstract Of The United States 2011*, Tables 427, 426 (Data cited therein are from 2007).

¹⁵ These figures include all Part 5 experimental application types: new licenses, modifications of licenses, assignment of licenses, license renewals, transfers of control, and grants of Special Temporary Authorization. See <https://fjallfoss.fcc.gov/oetcf/els/reports/GenericSearch.cfm>.

Wireless Telecommunications Carriers (except Satellite). Since 2007, the Census Bureau has placed wireless firms within this new, broad, economic census category.¹⁶ Prior to that time, such firms were within the now-superseded categories of “Paging” and “Cellular and Other Wireless Telecommunications.”¹⁷ Under the present and prior categories, the SBA has deemed a wireless business to be small if it has 1,500 or fewer employees.¹⁸ Because Census Bureau data are not yet available for the new category, we will estimate small business prevalence using the prior categories and associated data. For the category of Paging, data for 2002 show that there were 807 firms that operated for the entire year.¹⁹ Of this total, 804 firms had employment of 999 or fewer employees, and three firms had employment of 1,000 employees or more.²⁰ For the category of Cellular and Other Wireless Telecommunications, data for 2002 show that there were 1,397 firms that operated for the entire year.²¹ Of this total, 1,378 firms had employment of 999 or fewer employees, and 19 firms had employment of 1,000 employees or more.²² Thus, we estimate that the majority of wireless firms are small.

Fixed Microwave Services. Fixed microwave services include common carrier,²³ private operational-fixed,²⁴ and broadcast auxiliary radio services.²⁵ At present, there are approximately 22,015 common carrier fixed licensees and 61,670 private operational-fixed licensees and broadcast auxiliary radio licensees in the microwave services. The Commission has not created a size standard for a small business specifically with respect to fixed microwave services. For purposes of this analysis, the Commission uses the SBA small business size standard for the category Wireless Telecommunications Carriers (except Satellite), which is 1,500 or fewer employees.²⁶ The Commission does not have data specifying the

¹⁶ U.S. Census Bureau, 2007 NAICS Definitions, “517210 Wireless Telecommunications Categories (Except Satellite)”; <http://www.census.gov/naics/2007/def/ND517210.HTM#N517210>.

¹⁷ U.S. Census Bureau, 2002 NAICS Definitions, “517211 Paging”; <http://www.census.gov/epcd/naics02/def/NDEF517.HTM>; U.S. Census Bureau, 2002 NAICS Definitions, “517212 Cellular and Other Wireless Telecommunications”; <http://www.census.gov/epcd/naics02/def/NDEF517.HTM>.

¹⁸ See 13 C.F.R. § 121.201, NAICS code 517210 (2007 NAICS). The now-superseded, pre-2007 C.F.R. citations were 13 C.F.R. § 121.201, NAICS codes 517211 and 517212 (referring to the 2002 NAICS).

¹⁹ U.S. Census Bureau, 2002 Economic Census, Subject Series: Information, “Establishment and Firm Size (Including Legal Form of Organization,” Table 5, NAICS code 517211 (issued Nov. 2005).

²⁰ *Id.* The census data do not provide a more precise estimate of the number of firms that have employment of 1,500 or fewer employees; the largest category provided is for firms with “1000 employees or more.”

²¹ U.S. Census Bureau, 2002 Economic Census, Subject Series: Information, “Establishment and Firm Size (Including Legal Form of Organization,” Table 5, NAICS code 517212 (issued Nov. 2005).

²² *Id.* The census data do not provide a more precise estimate of the number of firms that have employment of 1,500 or fewer employees; the largest category provided is for firms with “1000 employees or more.”

²³ See 47 C.F.R. §§ 101 *et seq.* for common carrier fixed microwave services (except Multipoint Distribution Service).

²⁴ Persons eligible under parts 80 and 90 of the Commission’s Rules can use Private Operational-Fixed Microwave services. See 47 C.F.R. Parts 80 and 90. Stations in this service are called operational-fixed to distinguish them from common carrier and public fixed stations. Only the licensee may use the operational-fixed station, and only for communications related to the licensee’s commercial, industrial, or safety operations.

²⁵ Auxiliary Microwave Service is governed by Part 74 of Title 47 of the Commission’s Rules. See 47 C.F.R. Part 74. This service is available to licensees of broadcast stations and to broadcast and cable network entities. Broadcast auxiliary microwave stations are used for relaying broadcast television signals from the studio to the transmitter, or between two points such as a main studio and an auxiliary studio. The service also includes mobile television pickups, which relay signals from a remote location back to the studio.

²⁶ See 13 C.F.R. § 121.201, NAICS code 517210.

number of these licensees that have no more than 1,500 employees, and thus are unable at this time to estimate with greater precision the number of fixed microwave service licensees that would qualify as small business concerns under the SBA's small business size standard. Consequently, the Commission estimates that there are 22,015 or fewer common carrier fixed licensees and 61,670 or fewer private operational-fixed licensees and broadcast auxiliary radio licensees in the microwave services that may be small and may be affected by the rules and policies proposed herein. We note, however, that the common carrier microwave fixed licensee category includes some large entities.

Unlicensed Personal Communications Services. As its name indicates, Unlicensed Personal Communications Services (UPCS) is not a licensed service. UPCS consists of intentional radiators operating in the frequency bands 1920-1930 MHz and 2390-2400 MHz that provide a wide array of mobile and ancillary fixed communication services to individuals and businesses. The Report and Order potentially affects UPCS operations in the 1920-1930 MHz band; operations in those frequencies are given flexibility to deploy both voice and data-based services. There is no accurate source for the number of operators in the UPCS. Since 2007, the Census Bureau has placed wireless firms within the new, broad, economic census category Wireless Telecommunications Carriers (except Satellite).²⁷ Prior to that time, such firms were within the now-superseded category of "Paging" and "Cellular and Other Wireless Telecommunications."²⁸ Under the present and prior categories, the SBA has deemed a wireless business to be small if it has 1,500 or fewer employees.²⁹ Because Census Bureau data are not yet available for the new category, we will estimate small business prevalence using the prior categories and associated data. For the category of Paging, data for 2002 show that there were 807 firms that operated for the entire year.³⁰ Of this total, 804 firms had employment of 999 or fewer employees, and three firms had employment of 1,000 employees or more.³¹ For the category of Cellular and Other Wireless Telecommunications, data for 2002 show that there were 1,397 firms that operated for the entire year.³² Of this total, 1,378 firms had employment of 999 or fewer employees, and 19 firms had employment of 1,000 employees or more.³³ Thus, we estimate that the majority of wireless firms are small.

Aviation and Marine Radio Services. There are approximately 26,162 aviation, 34,555 marine (ship), and 3,296 marine (coast) licensees.³⁴ The Commission has not developed a small business size standard

²⁷ U.S. Census Bureau, 2007 NAICS Definitions, "517210 Wireless Telecommunications Categories (Except Satellite)"; <http://www.census.gov/naics/2007/def/ND517210.HTM#N517210>.

²⁸ U.S. Census Bureau, 2002 NAICS Definitions, "517211 Paging"; <http://www.census.gov/epcd/naics02/def/NDEF517.HTM>; U.S. Census Bureau, 2002 NAICS Definitions, "517212 Cellular and Other Wireless Telecommunications"; <http://www.census.gov/epcd/naics02/def/NDEF517.HTM>.

²⁹ See 13 C.F.R. § 121.201, NAICS code 517210 (2007 NAICS). The now-superseded, pre-2007 C.F.R. citations were 13 C.F.R. § 121.201, NAICS codes 517211 and 517212 (referring to the 2002 NAICS).

³⁰ U.S. Census Bureau, 2002 Economic Census, Subject Series: Information, "Establishment and Firm Size (Including Legal Form of Organization)," Table 5, NAICS code 517211 (issued Nov. 2005).

³¹ *Id.* The census data do not provide a more precise estimate of the number of firms that have employment of 1,500 or fewer employees; the largest category provided is for firms with "1000 employees or more."

³² U.S. Census Bureau, 2002 Economic Census, Subject Series: Information, "Establishment and Firm Size (Including Legal Form of Organization)," Table 5, NAICS code 517212 (issued Nov. 2005).

³³ *Id.* The census data do not provide a more precise estimate of the number of firms that have employment of 1,500 or fewer employees; the largest category provided is for firms with "1000 employees or more."

³⁴ Vessels that are not required by law to carry a radio and do not make international voyages or communications are not required to obtain an individual license. See Amendment of Parts 80 and 87 of the Commission's Rules to Permit Operation of Certain Domestic Ship and Aircraft Radio Stations Without Individual Licenses, *Report and Order*, WT .

specifically applicable to all licensees. For purposes of this analysis, we will use the SBA small business size standard for the category Wireless Telecommunications Carriers (except Satellite), which is 1,500 or fewer employees.³⁵ We are unable to determine how many of those licensed fall under this standard. For purposes of our evaluations in this analysis, we estimate that there are up to approximately 62,969 licensees that are small businesses under the SBA standard.³⁶ In 1998, the Commission held an auction of 42 VHF Public Coast licenses in the 157.1875-157.4500 MHz (ship transmit) and 161.775-162.0125 MHz (coast transmit) bands. For this auction, the Commission defined a “small” business as an entity that, together with controlling interests and affiliates, has average gross revenues for the preceding three years not to exceed \$15 million dollars. In addition, a “very small” business is one that, together with controlling interests and affiliates, has average gross revenues for the preceding three years not to exceed \$3 million dollars.³⁷ Further, the Commission made available Automated Maritime Telecommunications System (“AMTS”) licenses in Auctions 57 and 61.³⁸ Winning bidders could claim status as a very small business or a very small business. A very small business for this service is defined as an entity with attributed average annual gross revenues that do not exceed \$3 million for the preceding three years, and a small business is defined as an entity with attributed average annual gross revenues of more than \$3 million but less than \$15 million for the preceding three years.³⁹ Three of the winning bidders in Auction 57 qualified as small or very small businesses, while three winning entities in Auction 61 qualified as very small businesses.

Public Safety Radio Services. Public Safety radio services include police, fire, local government, forestry conservation, highway maintenance, and emergency medical services.⁴⁰ There are a total of

³⁵ See 13 C.F.R. § 121.201, NAICS code 517210.

³⁶ A licensee may have a license in more than one category.

³⁷ *Amendment of the Commission's Rules Concerning Maritime Communications*, PR Docket No. 92-257, Third Report and Order and Memorandum Opinion and Order, 13 FCC Rcd 19853 (1998).

³⁸ See “*Automated Maritime Telecommunications System Spectrum Auction Scheduled for September 15, 2004, Notice and Filing Requirements, Minimum Opening Bids, Upfront Payments and Other Auction Procedures*,” Public Notice, 19 FCC Rcd 9518 (WTB 2004); “*Auction of Automated Maritime Telecommunications System Licenses Scheduled for August 3, 2005, Notice and Filing Requirements, Minimum Opening Bids, Upfront Payments and Other Auction Procedures for Auction No. 61*,” Public Notice, 20 FCC Rcd 7811 (WTB 2005).

³⁹ See 47 C.F.R. § 80.1252.

⁴⁰ With the exception of the special emergency service, these services are governed by Subpart B of part 90 of the Commission's Rules, 47 C.F.R. §§ 90.15-90.27. The police service includes approximately 27,000 licensees that serve state, county, and municipal enforcement through telephony (voice), telegraphy (code) and teletype and facsimile (printed material). The fire radio service includes approximately 23,000 licensees comprised of private volunteer or professional fire companies as well as units under governmental control. The local government service that is presently comprised of approximately 41,000 licensees that are state, county, or municipal entities that use the radio for official purposes not covered by other public safety services. There are approximately 7,000 licensees within the forestry service which is comprised of licensees from state departments of conservation and private forest organizations who set up communications networks among fire lookout towers and ground crews. The approximately 9,000 state and local governments are licensed to highway maintenance service provide emergency and routine communications to aid other public safety services to keep main roads safe for vehicular traffic. The approximately 1,000 licensees in the Emergency Medical Radio Service (“EMRS”) use the 39 channels allocated to this service for emergency medical service communications related to the delivery of emergency medical treatment. 47 C.F.R. §§ 90.15-90.27. The approximately 20,000 licensees in the special emergency service include medical services, rescue organizations, veterinarians, handicapped persons, disaster relief organizations, school buses, beach patrols, establishments in isolated areas, communications standby facilities, and emergency repair of public communications facilities. 47 C.F.R. §§ 90.33-90.55.

approximately 127,540 licensees in these services. Governmental entities⁴¹ as well as private businesses comprise the licensees for these services. All governmental entities with populations of less than 50,000 fall within the definition of a small entity.⁴² The small private businesses fall within the “wireless” category described *supra*.

E. Description of Projected Reporting, Recordkeeping and Other Compliance Requirements

The Report and Order establishes a new type of experimental radio license – the program experimental radio license – to permit qualified institutions to conduct an ongoing program of research and experimentation that would otherwise require the issuance of multiple individual experimental radio license authorizations under the Commission’s existing rules. Program experimental radio licensees will have new requirements to file notification of planned experiments to be conducted under the license, resolve interference concerns that are raised by other licensees, and file post-experiment reports with the Commission. The Report and Order also consolidates, clarifies, and streamlines existing rules to facilitate experimentation in the radio spectrum. These rules will permit qualified applicants to engage in additional marketing activities, while streamlining existing rules to eliminate burdensome regulations. We project that by creating a new license type and by revising our existing rules, reporting, recordkeeping and other compliance requirements associated with the issuance of an experimental radio licenses will be reduced.

F. Steps Taken to Minimize Significant Economic Impact on Small Entities, and Significant Alternatives Considered

The RFA requires an agency to describe any significant alternatives that it has considered in reaching its final rules, which may include the following four alternatives (among others): (1) the establishment of differing compliance or reporting requirements or timetables that take into account the resources available to small entities; (2) the clarification, consolidation, or simplification of compliance or reporting requirements under the rule for small entities; (3) the use of performance, rather than design, standards; and (4) an exemption from coverage of the rule, or any part thereof, for small entities.⁴³

We find that our rules in this proceeding will help alleviate burdens on small entities by simplifying procedures and reducing paperwork, and no alternative rules would be less burdensome. We do not find it appropriate to establish different rules for small entities, as we believe that the rules that we have adopted are not burdensome on any entities.

G. Federal Rules that Might Duplicate, Overlap, or Conflict with the Rules

None.

H. Report to Congress

The Commission will send a copy of the Report and Order, including this Final Regulatory Flexibility Analysis, in a report to be sent to Congress pursuant to the Congressional Review Act. In addition, the Commission will send a copy of the Report and Order, including this Final Regulatory Flexibility Analysis, to the Chief Counsel for Advocacy of the Small Business Administration. A copy of the Report and Order and Final Regulatory Flexibility Analysis (or summaries thereof) also will be published in the *Federal Register*.⁴⁴

⁴¹ See 47 C.F.R. § 1.1162.

⁴² See 5 U.S.C. § 601(5).

⁴³ See 5 U.S.C. § 603(c).

⁴⁴ See 5 U.S.C. § 604(b).

**STATEMENT OF
CHAIRMAN JULIUS GENACHOWSKI**

Re: *Promoting Expanded Opportunities for Radio Experimentation and Market Trials under Part 5 of the Commission's Rules and Streamlining Other Related Rules, ET Docket No. 10-236; 2006 Biennial Review of Telecommunications Regulations—Part 2 Administered by the Office of Engineering and Technology (OET), ET Docket No. 06-155*

For the U.S. to have strong economic growth, we need to have strong growth engines, sectors that hold real promise of major expansion.

Few sectors have more growth potential than the wireless sector. Our decision today is important because it helps drive growth in this sector.

The mobile “apps economy” has already created more than 500,000 jobs, and is on a major upward job-creation trajectory. Thanks to massive capital investment, the U.S. is leading the world in 4G infrastructure, making us the world’s testbed for LTE advanced wireless innovation. Wireless broadband is also key platform for innovation, investment and growth in verticals like education, health care, and energy.

Wireless innovation is a key to U.S. competitiveness in today’s flat global economy, in which capital and talent can flow anywhere, and in which our global competitors are intensely focused on becoming innovation and job-creation hubs.

One key tool for wireless innovation is experimental licensing. The more experiments, the more innovative products and services.

Streamlining our experimental licensing process will help stimulate R&D, which is essential to new innovation, and reduce the time it takes for an idea to get from the lab to the market.

FCC experimental licenses have helped the U.S. become the first country in the world to deploy what some call Super Wi-Fi, next-generation unlicensed use which can become a powerful new platform for wireless innovation. Experimental licenses have also enabled the development of mHealth innovations like patient monitoring equipment and Medical Micropower Networks, which could be used to restore functions to paralyzed limbs. They’ve also led to robotic technology for the military and rockets to support commercial space launches.

The National Broadband Plan recommended that the Commission start a proceeding to establish more flexible experimental licensing rules for spectrum and to facilitate the use of spectrum by innovators. We have taken a hard look at our rules since then, and are completing that regulatory reform process today. The new licensing regime will transform the FCC’s experimental program into a more modern structure, and ensure that experimental licensees have greater freedom to develop new products and services more rapidly and efficiently, while protecting incumbent services against harmful interference. Our new, more flexible rules, will stimulate R&D, drive innovation, and create jobs, keeping the U.S. at the forefront of the telecommunications industry, and leading the world in the development and use of new medical devices in particular.

Our new Program License structure will permit colleges, universities, research organizations, health care institutions, and manufacturers to conduct multiple RF experiments without needing prior approval for each experiment. Program Licenses will significantly expedite the approval process, and save experimenters anywhere from a few days to a few weeks, in addition to saving associated administrative costs.

We expect that these new rules will reduce the number of applications that must be filed with the Commission by up to 25 percent for large filers such as Boeing, Lockheed-Martin, Raytheon, and Motorola.

And the new Medical Testing License will allow healthcare institutions to test new RF-based medical devices in real world situations, including clinical trials involving patients in their homes, which will expedite the introduction of new life-saving devices into the marketplace.

Thank you to OET for your excellent, creative leadership on this item, and also to the Office of General Counsel, the Wireless Telecommunications Bureau, and the Media Bureau and the International Bureau for your valuable input.

**STATEMENT OF
COMMISSIONER ROBERT M. McDOWELL**

RE: *Promoting Expanded Opportunities for Radio Experimentation and Market Trials under Part 5 of the Commission's Rules and Streamlining Other Related Rules, ET Docket No. 10-236; 2006 Biennial Review of Telecommunications Regulations—Part 2 Administered by the Office of Engineering and Technology (OET), ET Docket No. 06-155*

I am pleased to support this order that modifies and streamlines our experimental licensing processes. By creating a new framework to promote research and development, our action today encourages the development of innovative next-generation technologies and hastens their introduction into the marketplace. Such efforts are critical to spur investment, economic growth and job creation. Furthermore, our actions today will help ensure that the U.S. remains the world leader in the wireless sector, as we have always been.

Among the many actions we take today, our order simplifies and harmonizes the FCC's rules for experimental licensing by moving all of the Commission's rules into one section. The ability to locate all of these rules in one place to provide clear and consistent guidance to innovators is the least we could do in the pursuit of government best practices.

I also appreciate that we are taking steps to modernize and streamline our rules. For instance, we will now apply the same limit on the number of devices that can be imported for testing regardless of whether the device contains licensed or unlicensed transmitters. Our move makes common sense in today's marketplace where many devices incorporate both licensed and unlicensed technologies.

Furthermore, we are promoting research and development by creating new categories of licenses to augment our conventional experimental licensing regime, including a program experimental license that will provide greater freedom and flexibility to qualified applicants and speed up the regulatory process. I recognize that some commenters have expressed concern that this new program license is more likely to cause harmful interference. These new program license rules, however, will impose sensible requirements to reduce the potential of harmful interference. Additionally, experimental licensees must stop testing if they cause harmful interference to an incumbent licensee's operations.

In formulating these rules, we have tried to balance the needs of experimental and incumbent licensees. I am hopeful that all affected licensees will work with the Commission – and particularly the dedicated staff of the Office of Engineering and Technology – to improve this process, if necessary.

I appreciate the Chairman's willingness to incorporate edits and I thank OET for their hard work on this order.

**STATEMENT OF
COMMISSIONER MIGNON L. CLYBURN**

Re: *Promoting Expanded Opportunities for Radio Experimentation and Market Studies under Part 5 of the Commission's Rules and Streamlining Other Related Rules, ET Docket No. 10-236, 2006 Biennial Review of Telecommunications Regulations—Part 2 Administered by the Office of Engineering and Technology (OET), ET Docket No. 06-155*

Research and development, or R&D, has always been an important pillar of a country's economy. It spurs innovation, which in turn, drives economic growth, and job creation. Last year, the Department of Commerce, estimated that R&D accounted for more than 16 percent of our nation's total growth. So I enthusiastically support this Order, which substantially advances a policy goal, critical to maintaining the United States' leadership in communications services and technology.

The evolution we are seeing in the communications field has underscored the importance of R&D to those services. When you consider that, in January 2008, there were no mobile apps on the market and now there are more than 1.3 million available, you come to terms with the fact that technological change in the communications industry is moving at a breathtaking pace. To promote our Nation's global competitiveness in communications, the federal government must do its part to encourage industry to invest more in research and development.

Today's Order furthers this goal by comprehensively updating and streamlining our experimental radio service rules. We are establishing three new types of experimental licenses and are changing other rules to create stronger incentives for industry to innovate in service and product offerings. The program experimental license will allow universities, research labs, health care facilities, and manufacturers of radio frequency equipment to plan more broadly and creatively as they design experiments requiring an FCC license. By giving these entities more flexibility, these licenses will allow them to follow their research wherever it leads them without the administrative constraints of a conventional experimental license. The compliance testing license will give laboratories authority to certify more products, which together with changes to our market trial rules, should accelerate the delivery of new products to consumers. The medical testing license will allow entities to conduct clinical trials, most notably, for those devices used for home care. This could lead to technologies and innovations that offer patients greater mobility and independence.

I also want to commend the staff of the Office of Engineering and Technology for the collaborative approach they took in arriving at the final rules for these new experimental licenses. Using their technical expertise, combined with decades of experience with experimental licensing, they presented us with creative proposals in the November 2010 NPRM that I and my colleagues unanimously praised. They also carefully considered comments filed in the proceeding and incorporated those ideas that would improve on the proposals in the NPRM. As a result, we are adopting a structure that will offer entities greater authorizations, reduced oversight, and more streamlined procedures, than our previous experimental license rules. In addition, this Order includes new practical notification rules that will further protect primary and secondary incumbent licensees from potential interference.

Special thanks are due to Julie Knapp, Ira Keltz, Bruce Romano, Rodney Small, and the other talented staff members in OET, for their excellent work throughout this proceeding.

**STATEMENT OF
COMMISSIONER JESSICA ROSENWORCEL**

Re: *Promoting Expanded Opportunities for Radio Experimentation and Market Trials under Part 5 of the Commission's Rules and Streamlining Other Related Rules, ET Docket No. 10-236; 2006 Biennial Review of Telecommunications Regulations—Part 2 Administered by the Office of Engineering and Technology (OET), ET Docket No. 06-155*

Our airwaves are infrastructure. Though they are invisible, they are a national resource that we must put to use in ways that are smart, efficient, and—true to statute—consistent with the public interest. But the demands on our airwaves are growing at breathtaking speed. Look around and the reasons why are obvious. We are a nation with more wireless phones than people. More than half of those phones are smartphones. One in four households now owns a tablet computer. We talk, write, read, listen, watch, and create on mobile devices. But what we do today with mobile is only the tip of the proverbial iceberg. Because what will emerge in the next few years is a mountain of 50 billion interconnected devices and a whole new world of the Internet of Things.

To respond successfully to this seismic shift and growing demand we must innovate. Innovation will take three forms—spectrum, topology, and technology.

With respect to spectrum, the Commission has new auctions, including the world's first incentive auctions, on the not-too-distant horizon.

With respect to topology, the Commission has taken steps to expand the use of small cells, including in the 3.5 GHz band.

Today, the Commission turns to the third component of wireless innovation—technology.

New technologies do not arrive on the scene without exhaustive study. Experimentation is important and necessary. So we are making changes to our rules to expedite wireless experimentation, providing more up front and early opportunity to innovate. We do this by creating a new type of license—a program license—to ease regulatory burdens that otherwise might slow down and shackle new studies. We also create a new medical experimentation license to help expand the ways wireless devices can improve healthcare. Finally, we facilitate downstream research by making market testing of new products less cumbersome.

In practice, what does all of this mean? It means more power to explore at research laboratories and universities, more ability to play with power levels, and more opportunity to dream big and create. Already we have seen what experimental licenses have produced—systems to support rocket launches, development of patient monitoring equipment, and new robotic technology for the armed forces. Simply neat stuff.

But there is more we can do on the technology front to further innovation and to manage the growing demand for our airwaves. That is why I want to briefly mention another action the Commission is considering, though not at today's meeting.

For the first time in over a decade, we are beginning to take a serious look at how new radio equipment is approved. We have in front of our offices a proposed rulemaking designed to expedite the equipment authorization process. Right now, new devices can take months to make it through our certification process. Because the number of devices in this process is expanding, our systems deserve an

update to meet this demand. By moving new devices through our approval process more quickly we can put them on the market sooner. This is an initiative I support and want to work with my colleagues to rapidly move forward.

Moreover, I think combining streamlined equipment authorization with new experimental licenses will provide a great jolt to wireless innovation. It is an exciting time for mobile technology—and I thank the Office of Engineering and Technology for its efforts on both of these items.

**STATEMENT OF
COMMISSIONER AJIT PAI**

Re: *Promoting Expanded Opportunities for Radio Experimentation and Market Trials under Part 5 of the Commission's Rules and Streamlining Other Related Rules, ET Docket No. 10-236; 2006 Biennial Review of Telecommunications Regulations—Part 2 Administered by the Office of Engineering and Technology (OET), ET Docket No. 06-155*

Experimentation is a hallmark of the American tradition. Indeed, one might argue that it is America itself. In 1831, Alexis de Tocqueville famously described this country as a “great experiment.”

In the communications context, the experimental spirit is reflected in laws and regulations. Section 303(g) of the Communications Act of 1934, for instance, directs us to “[s]tudy new uses for radio, provide for experimental uses of frequencies, and generally encourage the larger and more effective use of radio in the public interest.” Our longstanding Experimental Radio Service rules fulfill this mandate. These regulations have been an unquestionable success, enabling a broad range of experiments and testing throughout the radio spectrum while protecting incumbent licensees from interference. And these experiments have led to significant breakthroughs: from the Mayo Clinic’s development of patient monitoring equipment, to the development of direct sequence spread spectrum modulation techniques used by some Wi-Fi standards, to light-up bracelets that the band Coldplay distributed at the 2012 Grammy Awards.

Today’s item improves the existing experimental license process. It consolidates all the rules that experimenters must follow into one location: Part 5 of our rules. It also creates new opportunities for innovators to more easily conduct experiments that may lead to the next technological success. Overall, I believe that this order will encourage wireless research and development, and I am therefore pleased to support it.

To be sure, there is another side of the coin when it comes to experimental radio, and that is the interests of licensees and the hundreds of millions of Americans that use licensed wireless services. Licensees must be able to manage their spectrum without impingement, and consumers who rely on licensed services should not be subject to harmful interference. The common-sense safeguards embedded throughout the order protect these interests. For example, experimenters may not cause interference to any licensed users—primary or secondary—and must show their work in that regard prior to every experiment. Experimenters that seek to use critical service bands, such as those involving Commercial Mobile Radio Service and public safety, must notify potentially affected licensees. Experimenters must post the details of their proposed experiment on the Commission’s web-based registration system. They must provide a point of contact to enable an immediate shutdown of the experiment should a problem occur. We also may require an experimenter at any time to coordinate with an incumbent licensee. Finally, we require experimenters to report on the results of their experiments, including interference. These safeguards, and others applicable to holders of the new medical and compliance licenses, should promote the happy balance of robust experimentation and the unencumbered use of spectrum purchased at auction.

Of course, this prediction presumes general adherence to the old-fashioned virtue of good faith. The Office of Engineering Technology (OET) has informed us that the vast majority of experimental applications do not come close to threatening harmful interference. But experimentation, by definition, means trying something where the outcome is not always known. As Amazon CEO Jeff Bezos once put it, “It’s not an experiment if you know it’s going to work.” One unintended consequence of an experiment could be interference. To address this possibility, I hope that in the coming months OET will

establish a formal complaint procedure⁴⁵ so that any dispute about interference can be resolved fairly and expeditiously. And it goes without saying that we expect all parties involved to work together to identify and resolve any dispute before it gets to that point.

Finally, the thoughtfulness, institutional knowledge, and hard work that went into this item evince the extraordinary professionalism of OET. I especially would like to thank Julie Knapp, Bruce Romano, Rodney Small, and Ira Keltz for their dedication to this effort. I am excited to see what American innovation holds in store for us as a result of today's action.

⁴⁵ *Report and Order*, para. 83.