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	)	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

NOTICE OF PROPOSED RULEMAKING

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I. INTRODUCTION

1. Today, the Commission takes steps to promote innovation and efficiency in spectrum use in our Part 5 Experimental Radio Service (ERS). For many years, the ERS has provided fertile ground for testing innovative ideas that have led to new services and new devices for all sectors of the economy. We propose to leverage the power of experimental radio licensing to accelerate the rate at which these ideas

transform from prototypes to consumer devices and services. Our goal is to inspire researchers to dream, discover and deliver the innovations that push the boundaries of the broadband ecosystem. The resulting advancements in devices and services available to the American public and greater spectrum efficiency over the long term will promote economic growth, global competitiveness, and a better way of life for all Americans.

2. We target six areas in which we propose to provide increased opportunities for experimentation and innovation. In particular, we propose to: (1) create new opportunities for universities and researchers to use a wide variety of radio frequencies for experimentation under a broad research license that eliminates the need to obtain prior authorization before conducting individual experiments; (2) empower researchers to conduct tests in specified geographic locations with pre-authorized boundary conditions through the creation of new "innovation zones"; (3) promote advancement in the development of medical radio devices by creating a medical experimental authorization that would be available to qualified hospitals, Veterans Administration (VA) facilities, and other medical institutions; (4) broaden opportunities for market trials by revising and consolidating our rules; (5) promote greater overall experimentation by consolidating and streamlining our existing rules and procedures; and (6) open new opportunities for experimentation by making targeted modifications to our rules and procedures.

II. BACKGROUND

3. The Commission's rules contain numerous provisions for experimentation and development of new radio equipment and techniques that are scattered throughout Title 47 of the Code of Federal Regulations (CFR). The ERS rules, which are contained in Part 5 and permit a broad range of experiments in all services except for broadcast systems, 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.[1] In order to encourage innovation, the Part 5 rules provide great flexibility regarding allowable frequency range, power, and emissions. In exchange for the flexibility we give researchers to design and conduct experiments and tests, experimental operations are not protected from harmful interference from allocated services and they must not cause harmful interference to stations of authorized services, including secondary services.[2] Additionally, experimental stations can be required to immediately cease operation at our request, and are subject to revocation without notice.[3]

4. Our ERS program has a record of success. A variety of new technologies and services that began as experiments have been subsequently developed into services and technologies the American public relies on every day. For example, in the early 1990s, the Commission authorized experiments for innovative new radio equipment and devices[4] which ultimately led to establishing the Personal Communications Services (PCS) in the 1850-1990 MHz band.[5] More recently, the Commission issued an

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[1] *See, e.g.,* 47 C.F.R. §§ 5.1, 5.3 and 5.89.

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

[3] *See* 47 C.F.R. § 5.83.

[4] *See, e.g.*, experimental license granted to Qualcomm, Inc. for PCS testing in the 1850-1990 MHz band, valid from February 21, 1992 to July 1, 1994, File Number 2345-EX-PL-91; experimental license granted to Omni-Point Corporation for PCS testing in the 1850-2200 MHz band, valid from March 12, 1992 to July 1, 1994, File Number 2174-EX-PL-91.

[5] *See* Amendment of the Commission's Rules to Establish New Personal Communications Services, ET Docket No. 90-314, *Second Report and Order*, 8 FCC Rcd 7700 (1993); *Memorandum Opinion and Order*, 9 FCC Rcd 4957 (1994).

(continued....)

experimental license to the Alfred Mann Foundation, for development of wirelessly controlled implantable medical devices.[6] The success of these experiments has resulted in an ongoing rulemaking proceeding that seeks to allow up to 24 megahertz in the 413-457 MHz band such use.[7] Studies being conducted by the University of Maryland on the characteristics, use and applications of WiMAX and 4G technologies under the authority of an experimental license could lead to new advances in those fields.[8]

5. There are seven additional rule parts allow for developmental work within a particular service, and these rules are generally more restrictive than those contained in Part 5. Specifically, Parts 22, 73, 74, 80, 87, 90, and 101 of our rules provide for issuance of developmental licenses.[9] Like ERS licenses, developmental licenses are issued on a non-interference basis. However, they are limited to applicants eligible for licenses in that particular service and on frequencies that are allocated to that service.[10] Additionally, the developmental rules may require that applications be accompanied by a petition for rulemaking seeking changes consistent with the operation under investigation. Also, as noted above, experimentation with broadcast radio technologies is not permitted under the ERS rules but is instead allowed under separate provisions set forth in Parts 73 and 74 of our Rules.[11]

6. 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 a projected 1,481 in

(Continued from previous page)

[6] The Alfred Mann Foundation was granted an experimental authorization in 2004, valid from January 6, 2005 to November 16, 2009, for testing of implantable medical devices in the 216-224.9995 MHz and 400-470 MHz bands. This authorization was renewed in 2009, and is now valid until December 1, 2014. *See* File Numbers 0255-EX-PL-2004 and 0228-EXRR-2009.

[7] *See* Amendment of Parts 2 and 95 of the Commission's Rules to Provide Additional Spectrum for the Medical Device Radiocommunication Service in the 413-457 MHz band, ET Docket No. 09-36, *Notice of Proposed Rulemaking*, 24 FCC Rcd 3445 (2009).

[8] Call Sign WF2XJX (available for viewing through the Commission's Experimental Licensing System at https://apps.fcc.gov/oetcf/els/index.cfm).

[9] *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 the eight service rule parts. *See* 47 C.F.R. §§ 1.913(a)(1); 1.981; and 1.2003.

[10] *See, e.g.*, Fixed Microwave Services, Part 101, Subpart F, Developmental Authorizations.

[11] Part 5 permits a broad range of scientific and technical experimentation, whereas Part 74 is specifically limited to "research and experimentation for the development and advancement of new broadcast technology, equipment, systems or services which are more extensive or require other modes of transmission than can be accomplished by using a licensed broadcast station under an experimental authorization." In addition, section 73.1510 of the Commission's rules provides for experimentation by broadcasters, "directed toward improvement of the technical phases of operation and service, and ... may use a signal other than the normal broadcast service signal." *See* 47 C.F.R. §§ 5.3, 73.1510 and 74.102. Because broadcast radio technologies are fundamentally different from non-broadcast radio technologies and are not encompassed by the ERS, we do not solicit comment on the broadcast radio experimentation procedures as part of this proceeding.

2010.[12] By contrast, much less activity takes place under our developmental rules. Since 1999 in the non-broadcast (wireless) radio services ten developmental licenses have been granted under Part 22 (Public Mobile Services), one has been granted under Part 80 (Maritime Services), 37 have been granted under Part 87 (Aviation Services), and eight have been granted under Part 90 (Private Land Mobile Radio Services). None have been granted since 1999 under Part 101 (Fixed Microwave Services).[13]

7. To further provide flexibility, the Commission permits limited market studies so that developers can assess whether their equipment designs show promise in the marketplace. Just like the experimental rules, the rules for market studies can be found in multiple rule parts. Under Part 5, limited market studies are permitted for experimental operations provided that all transmitting and receiving equipment is owned by the licensee, the licensee informs all participants in the study that it is strictly temporary, and the size and scope of the study is limited.[14] For devices that are beyond the experimental stage, but have not yet been certified (*e.g.* a new mobile phone), rules in Part 2 allow exceptions to the general prohibition on marketing of radio frequency (RF) devices prior to equipment authorization, subject to disclosure and labeling requirements and other restrictions.[15] The restrictions on unauthorized RF equipment also limit the number of devices that may be imported to conduct tests or market studies. Generally, up to 2000 units are permitted to be imported within an authorized service for which an operating license is required, and up to 200 units are permitted to be imported for all other products.[16]

8. In August 2009, the Commission issued the *Wireless Innovation Notice of Inquiry*,[17] which, *inter alia*, solicited comment on the types of experimentation that would promote innovation in the wireless sector, ways to encourage more experimentation in pure research and whether the Commission should explore modifying its current rules for the issuance of experimental licenses under our Part 5 Rules. Among other things, the *Wireless Innovation NOI* asked whether research organizations such as universities should be permitted to operate experimental stations without coordination of individual frequencies,[18] and sought specific information as to how the restrictions on market studies affected innovation and whether the requirement that the experimenter own all of the transmitting and/or receiving equipment favors manufacturers over other entities.[19]

9. Commenters responding to the *Wireless Innovation NOI* generally support greater flexibility for experimental licensees. The Telecommunications Industry Association (TIA) supports streamlining the authorization process to enable experimentation and development with respect to innovative wireless technologies and services; *e.g.*, by reducing the need for duplicative filings when an authorization process

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[12] 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 Authority.

[13] *See infra* n. 137.

[14] *See* 47 C.F.R. § 5.93.

[15] *See* 47 C.F.R. § 2.803.

[16] *See* 47 C.F.R. § 2.1204.

[17] *See* Fostering Innovation and Investment in the Wireless Communications Market, GN Docket No. 09-157; A National Broadband Plan For Our Future, GN Docket No. 09-51; *Notice of Inquiry*, 24 FCC Rcd 11322 (2009) (Wireless *Innovation NOI*).

[18] *Id.*, 24 FCC Rcd at 11344, para. 66.

[19] *Id.*, 24 FCC Rcd at 11343-44, para. 65. For example, the *Wireless Innovation NOI* asked whether our rules limit the value of the experimental study in cases in which substantial marketing data is an essential component of determining the success or failure of the experiment.

involves the same applicant applying for authorization of consecutive iterations of the same technology.[20] AT&T supports Special Temporary Authority (STA) testing of new uses for spectrum and spectrum sharing and that it routinely coordinates STA applications to allow testing of systems and devices by third parties, but it cautions that such testing should be done in a way that does not harm commercial users.[21] Boeing supports limiting the ability of incumbent users to refuse to coordinate spectrum use with experimental licensees.[22] Similarly, Lockheed Martin requests that the Commission amend Part 5 to specify that incumbents may not refuse to coordinate spectrum use with experimental licensees unless the requested use will cause harmful interference.[23]

10. The *National Broadband Plan* (*Plan*),[24] which was released in March 2010, recommended that the Commission begin a rulemaking to explore ways to facilitate researchers' use of spectrum, including frequency bands above 20 GHz, by modifying the current Part 5 experimental license rules. It further recommended that such a rulemaking draw upon any relevant ideas from the *Wireless Innovation NOI*, and evaluate whether regulatory restrictions should be relaxed to permit research organizations to conduct broader market studies. Finally, the *Plan* recommended that the Commission consider changes to its rules to permit research organizations to operate experimental stations without individual coordination of frequencies, conditioned on not causing harmful interference to authorized stations. To facilitate the use of spectrum by researchers, the *Plan* recommended that the Commission work with the National Telecommunications and Information Administration (NTIA) to identify underutilized spectrum that may be suitable for conducting research activities.[25]

III. DISCUSSION

11. We propose, below, rule changes in six specific areas in which we can build on the experimental licensing program's record of promoting innovation and creating cutting-edge technologies. Our goal is to further accelerate innovation in this space. Given the immense spectrum challenges created by the tsunami of broadband demand, we seek to find ways to use the power of experimental licensing to shorten the time it takes to transform concepts into consumer products and to bring ideas from the lab to the marketplace.

12. We propose to create a new type of experimental license – a program experimental license – which would carry broad authority to conduct an ongoing program of research and experimentation under a single experimental authorization, and that would only be available to qualified institutions. In the first three sections, below, we describe in detail the three varieties of program experimental licenses we

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[20] *See* TIA Comments, GN Docket Nos. 09-51 and 09-157, at 5-6.

[21] *See* AT&T Comments, GN Docket Nos. 09-51 and 09-157, at 91.

[22] *See* Boeing Reply Comments, GN Docket Nos. 09-51 and 09-157, at 4.

[23] *See* Lockheed Martin Comments, GN Docket Nos. 09-51 and 09-157, at 5.

[24] *Connecting America: The National Broadband Plan*, Federal Communications Commission, March 2010 (available at http://www.broadband.gov/download-plan/).

[25] *Id.* at Recommendation 7.7, p. 125. The FCC and NTIA are co-regulators of the spectrum and work together to ensure that spectrum policy decisions promote efficient use of the spectrum consistent with both the economic interests and national security of the nation. A Memorandum of Understanding (MOU) has been established to formalize coordination processes between the two agencies. *See* Memorandum of Understanding Between the Federal Communications Commission and the National Telecommunications and Information Administration signed January 31, 2003. The MOU sets out a coordination framework between the two agencies in which each provides notice of proposed actions that could potentially result in interference to their regulated users. Based on this coordination, the Commission may place specific conditions on a license.

propose to offer: 1) the research program experimental radio license; 2) the innovation zone program experimental radio license; and 3) the medical program experimental radio license. Under our proposed rule revisions, we would continue to offer individual conventional experimental radio licenses to conduct research and experimentation related to the development of new radio technologies and techniques and for product development and market trials.[26] These conventional experimental radio licenses would be available to entities not qualified to hold a program experimental radio license, and for those experimental activities that would not be authorized under program licenses.

13. In the last three sections, below, we identify additional opportunities to streamline, consolidate, and modify our existing rules in ways that can promote greater experimentation. For example, we propose rule changes that can provide greater opportunities for equipment manufactures and service providers to conduct product development and market trials. Collectively, we believe that these proposed rule changes, together with a new effort to promote the opportunities for experimentation that the Commission offers and to highlight experimental licensing success stories, can help spark the next generation of innovations that will promote economic growth, global competitiveness, and a better way of life for all Americans.

A. Creating New Opportunities for Universities and Researchers

14. *Background.* The Nation's colleges, universities, and non-profit research organizations are a powerhouse for ideas that fuel major advances in communications and propel both fundamental research and applied development in the field.[27] Given the vital role of research and development as an engine of innovation and investment that delivers critical economic benefits, we propose new procedures by which qualified institutions would be permitted to conduct radiofrequency experiments without prior authorization of specific frequencies, subject to web-based registration and reporting requirements, avoidance of certain restricted frequencies, and other limitations.

15. Research institutions already use our experimental licensing program to deliver impressive results. Columbia University, for example, holds an experimental license that supports its work on advanced research in network experimentation through the Global Environment for Network Innovations (GENI) project, a unique virtual laboratory for at-scale networking experimentation.[28] This project is

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[26] The term conventional experimental radio license refers to the individual experimental radio licenses available under our current rules as opposed to the newly proposed program experimental license. Conventional experimental licenses are issued for the conduct of a specific or series of related research or experimentation projects related to the development and advancement of new radio technologies and techniques or a product development trial or a market trial.

[27] Gonzaga University's Smart Antenna Laboratory, which seeks to develop high performance, low-cost interference-filtering smart-antenna prototypes, enables innovations in the design, simulation, and testing of interference-reducing, high-performance communications radios, algorithms, and antenna systems in such areas as life-critical first responder communications and smart grid energy and natural resource management. See http://nsf.gov/awardsearch/showAward.do?AwardNumber=1040327. (describing a recent $1.175 million grant from the National Science Foundation). *See also* National Broadband Plan at 121 (noting how top research universities and laboratories are conducting experiments with very fast gigabit (1 Gbps) networks). We further acknowledge the many contributions of academics. As an example, Dr. Joseph Mitola of the Stevens Institute of Technology, who was a panelist in our September 7, 2009 spectrum workshop, was a pioneer of SDRs and coined the term "software radio" in 1991. See http://web.it.kth.se/~maguire/jmitola.

[28] Call Sign WF2XMW (available for viewing through the Commission's Experimental Licensing System at https://apps.fcc.gov/oetcf/els/index.cfm). The GENI project includes numerous leading colleges and universities, including the Univeristy of Colorado, Carnegie Mellon, Georgia Tech, Indiana University, Princeton, Rutgers, (continued....)

leading to vast advancements for a faster and more reliable internet. The Oklahoma University School of Meteorology relies on experimental authorizations to support its research of the marine boundary layer and landfalling hurricanes.[29] Advancements in this field will save the lives of many individuals and improve emergency response in the event of natural disasters. The fast pace of technology development today demands that the Commission strive to find further ways to support efforts to ensure that the United States remains a world leader in radio technology research and development. We believe that we can identify and successfully remove barriers that may be impeding more active research and experimentation.

16. The existing experimental rules are generally written to support discrete research projects,[30] require detailed documentation prior to approval,[31] and contain restrictions on how experiments can be modified once authorization is granted.[32] We believe that the current arrangement is an ill fit for the culture of inquiry and exploration at academic and research institutions, and that it is not nimble enough to account for the rapid changes and modifications typical of today's technological research. By limiting experiments to a narrowly defined inquiry, specific frequencies, emissions and power levels, our current rules can prevent researchers from using the results of experiments to try out new ideas and make innovative changes unless they obtain a new or modified authorization. The time and process for obtaining experimental authorizations can also be a roadblock to innovation. Diverse research projects are often conducted simultaneously under different experimental authorizations across separate organizational units within an institution or under different research partnerships with corporate partners. The need to obtain multiple authorizations can result in additional administrative burdens and inefficiencies, and serve to stifle the interaction of research ideas that can multiply their impact.[33] Moreover, the nature of the academic calendar, challenge of limited course lengths and constraints in securing funding serve to make it less attractive for research institutions to apply for, and await processing of, multiple new experimental authorizations. In sum, the limitations inherent in our existing rules may hinder research and innovation and retard the speedy transformation of ideas into marketable products – ultimately resulting in an unfavorable environment for conducting research in the United States.

17. Moreover, where our rules make provisions for additional flexibility in experimental licensing, we do not believe that those procedures are sufficiently robust to allow for the type of scientific innovation we seek to promote. While Section 5.75 of the Rules provides for the grant of a blanket license, this benefit is an exception to the general rule that "[a]n application … will normally require a separate license for each experiment," and is limited to "experiments [that] are related or conducted by the same manufacturer."[34]

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Stanford, Washington University in St. Louis, and University of Wisconsin-Madison. *See* http://www.geni.net/?page_id=2.

[29] Call Sign WA2XNA (available for viewing through the Commission's Experimental Licensing System at https://apps.fcc.gov/oetcf/els/index.cfm).

[30] *See* 47 C.F.R. § 5.55(c) (stating that "[e]ach application … shall be specific and complete with regard to station location, proposed equipment, power, antenna height, and operating frequency; and other information required by the application form and this part.")

[31] *Id. See also* 47 C.F.R. § 5.63, Supplementary statements required (mandating the submission of a narrative statement, in conjunction with an application, that details nature and objectives of the proposed research).

[32] 47 C.F.R. § 5.77, Changes in equipment and emission characteristics.

[33] *See National Broadband Plan* at 121, citing National Research Council.

[34] *See* 47 C.F.R. § 5.75.

18. To provide expanded opportunities for research institutions beyond the existing experimental authorization procedures, we draw on ideas set forth in the *National Broadband Plan* and the *Wireless Innovation NOI*. Recommendation 7.7 of the *Plan* suggests that the Commission start a rulemaking proceeding "to establish more flexible experimental licensing rules for spectrum and facilitate the use of this spectrum by researchers."[35] In addition, the *Wireless Innovation NOI* asked whether research organizations should be permitted to operate experimental stations without individual coordination of frequencies and, if so, whether such an arrangement would foster innovation and new wireless services and applications.[36] Commenters in the proceeding were generally supportive of the concept.[37]

19. *Proposal.* We propose to establish, under the program experimental license, a process by which qualified institutions will be permitted to use of a broad range of radio frequencies for research and experimentation on a non-interference basis without having to obtain prior authorization for the use of specific frequencies. Holders of the new research program experimental radio license will be given broad authority to conduct any experiments that further the goals of innovation and efficiency in spectrum use under such a license, subject to limitations discussed below and ongoing reporting requirements through, for example, narrative filings submitted via a Commission web page. These institutions would still be able to continue to apply for conventional experimental radio licenses, as appropriate to the needs of the institution and type of research being conducted. We seek to find a balance that allows research organizations the greatest level of flexibility to experiment – particularly in high-value 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.[38] As commenters address our proposals, we ask that they explain how their ideas address these overarching concepts and the tension between them.

20. This new research license will be limited to colleges, universities, and non-profit research organizations. These institutions typically have a record of generating the types of innovations and technological breakthroughs we seek to foster. We tentatively propose to limit applications under this rule to Accreditation Board for Engineering and Technology (ABET) accredited institutions with graduate research programs in place or existing industry partnerships and to nationally recognized non-profit research laboratories.[39] Further, we propose that these institutions must have defined campus settings and institutional processes to monitor and effectively manage a wide variety of research projects. We seek comment on this proposal. Specifically, we seek comment on what criteria we should use to define a "nationally recognized non-profit research laboratory." Are there any standards or certifications that we should require for such institutions? Additionally, if commenters believe we should incorporate a broader range of institutions, what criteria should we use for selection, and how does that more effectively balance the interests at stake here?

21. To be effective, the authorization must allow for experimentation within the largest range of frequencies practical. As an initial matter, Section 15.205(a) of our rules lists "restricted bands" that typically host sensitive or vital operations and that warrant special attention to prevent possible harmful

[35] *See National Broadband Plan* Recommendation 7.7, p. 125.

[36] *See Wireless Innovation NOI*, para. 66.

[37] *See, e.g.,* Comments of The Boeing Company at 12, Comments of Nickolaus E. Leggett at 3-4.

[38] We note that the flexibility we are proposing here would not absolve parties from complying with the requirements of other federal agencies (*e.g.*, FDA, FAA, etc.).

[39] For example, the Department of Energy has many laboratories with mechanisms in place to foster collaboration and partnerships with industry. *See, e.g.,* "Doing Business with the National Labs" available at: http://www1.eere.energy.gov/industry/financial/pdfs/doing_business_natl_labs.pdf.

interference.[40] Because it would not be appropriate to include these frequencies in a research program experimental radio license, we propose that the license not allow experiments on frequencies that are listed in Section 15.205(a). We recognize that Section 15.205 categorically excludes all frequencies above 38.6 GHz. The National Broadband Plan observed that frequencies above 20 GHz may be modestly used in urban areas and may be nonexistent in most other areas.[41] We conclude that it would be counterproductive to exclude spectrum in the 38-300 GHz range from the benefits of added innovation and research, but that it is also important to protect sensitive bands above 38.6 GHz. Many federal agencies use spectrum above 38.6 GHz for satellite communication and scientific research which use extremely low received signal levels.[42] Thus, we propose that a research program experimental radio license also allow experiments on those frequencies above 38.6 GHz except for those that are listed in footnote US246 of the Table of Frequency Allocations.[43] Under this proposal we would permit licensees to conduct experiments on all other frequencies. We seek comment on these proposals. Are there other frequencies that we should categorically exclude, and if so why?

22. For purposes of the research program experimental radio license, we propose to simply restrict all operations to the grounds of the licenseholder's campus.[44] In this regard, we propose that the applicant for a research license specify a geographic area that is inclusive of an institution's real-property facilities, and that the application may be returned or a license restricted to specify a smaller area if necessary to ensure adequate interference protection. We recognize that, for institutions located in dense urban areas or with compact campuses, this interference protection restriction may have the practical effect of limiting all research activity to a smaller subset of the campus, or even to an individual laboratory or other controlled environment. We also propose that emissions must not exceed non-interfering levels beyond the authorized geographical area. Should we rely on the licensee to meet this requirement by evaluating the radiofrequency use in the proximity of its campus, or should there be a specific measure, such as a maximum measured power flux density (pfd) limit a set distance from the boundary? If so, at what level should this pfd be set? Should there be different pfd limits for different bands? If so, how should the pfd vary by frequency band? And finally, we seek comment on whether a standard method needs to be specified for calculating the pfd. We seek comment on whether additional technical limits should be imposed. Should we restrict transmitters to specific sites? Should experiments be limited to terrestrial operations or can airborne operations also be permitted? If so, are there special requirements that should be imposed on airborne operations given the long line of site distances of these operations. Finally, should there be a threshold power limit above which we would always require an individual license under our traditional experimental authorization procedures, and if so, what should this power be – 100 watts, 10 watts, the limits specified for Part 15 unlicensed operations, or some other limit? Commenters who advocate a specific limit should also discuss how the levels of interference protection that such a limit would provide would also allow sufficient flexibility to conduct a wide range of experiments. We also seek comment on whether we should make special distinctions between indoor and outdoor use, either as part of the general terms of the research program experimental radio license grant or through distinct requirements associated with the testing and reporting requirements we discuss below.

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

[41] *See National Broadband Plan* at 125.

[42] These systems may be passive, such as radio astronomy, or active, such as satellite downlinks.

[43] *See* 47 CFR § 2.106, footnote US246.

[44] We recognize that many colleges also conduct valuable research activities outside the campus setting. For such work, an innovation zone program experimental radio license, discussed *supra,* will provide new opportunities for research and innovation.

23. Our proposal would give institutions greater opportunities to design and implement tests without the burdens associated with the existing prior approval process associated with individual experimental authorizations. In its comments to the *Wireless Innovation NOI*, Boeing described difficulties it has experienced in meeting specific requirements under its experimental licenses to coordinate and obtain the consent of existing licensees, and strongly supported the idea of permitting research organizations to operate experimental stations without individual coordination of frequencies.[45] Given the unique abilities of universities and research institutions to act as trusted stewards of the radio resource, they are prime candidates for a new type of license designed to permit a broad range of research and innovation in the radio spectrum. As an ultimate safeguard, we will not hesitate to revoke a research program experimental radio license in cases where we find that an institution has not properly managed the expanded privileges associated with the license.

24. We also propose to afford institutions much greater flexibility in choosing the frequency band(s) and technical characteristics associated with individual tests and experiments conducted under the authority of a research program experimental radio license. We recognize that some types of experiments have added filing requirements under our existing rules. For example, Section 5.53(c) requires the submission of an environmental assessment in certain cases, Section 5.63(e) requires applicants for an experimental authorization involving a satellite system not already authorized by the Commission to submit information regarding orbital debris mitigation plans, and Section 5.63(a) sets forth procedures for requesting non-disclosure of proprietary information.[46] These rules serve important legal and public interest purposes, and cannot be readily accommodated under the broad research license concept. We therefore propose to provide that a research program experimental radio license will not authorize any experiment that would require additional, specialized filings beyond the standard application requirements for an experimental radio license. Researchers proposing these types of experiments must apply for a conventional experimental radio license to obtain the necessary authorization for their tests. We seek comment on this proposal. In addition, are there other types of tests in addition to those we discuss above that require additional filings and, therefore, should not be authorized under a research program experimental radio license?

25. While we do not believe that it is necessary to impose overly prescriptive methods to control the potential for interference from experiments conducted under the broad authority of a research program experimental radio license, we emphasize that 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.[47] Before conducting tests, a licensee must evaluate the propagation characteristics of the frequencies to be used in individual experiments, the operational nature of the services normally operating on those and nearby frequencies, and the specific operations listed within the Commission's licensing databases.[48] On-line tools, such as the Commission's General Menu Reports system (GenMen), which allows users to search many different FCC licensing databases from one place, will facilitate these tasks.[49] Experiments must be designed to use the minimum power necessary and be restricted to the smallest practicable area needed to accomplish

[45] Comments of The Boeing Company in GN Docket No. 09-157 at 10-12 (describing, for example, the refusal to coordinate by licensees that have yet not built out facilities in the areas Boeing proposes to experiment).

[46] *See* 47 C.F.R. §§ 5.53(a), (c) and (e).

[47] Section 333 of the Communications Act, as amended, prohibits willful or malicious interference to authorized services. *See* 47 U.S.C. § 333.

[48] Access to these services is made available via web and other sources on the Commission website at http://www.fcc.gov.

[49] GenMen is available at http://fjallfoss.fcc.gov/General_Menu_Reports/.

the experiment's goals, *e.g.* an individual laboratory, specific campus building, or designated portion of the campus – in other words, they must be crafted to be consistent with the existing procedures under which experimental authorizations operate.[50] Researchers may also decide to reduce the frequencies used in the experiment, restrict the time of use (*e.g.* to overnight hours), limit the duration of tests, or employ other means to address potential interference concerns. We further propose to require that all experiments must comply with our existing experimental rules involving matters such as protected areas and antenna structure placement, but that these issues will not be routinely evaluated during the grant of the research license. In addition, we note that our existing experimental licensing rules require a licensee to transmit its assigned call sign unless it has been specifically exempted by the terms of its station authorization.[51] We believe that this requirement is important in that it makes it easier to identify signals from experiments, but we also recognize that not all experimentation lends itself to easy over-the-air station identification. We propose 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. Because of the nature of the research license, we propose to require the communication of information that is sufficient to identify the license holder and the geographic coordinates of the station. We are especially interested in comments regarding how we would structure the web-based reporting, and whether there are other notification methods that we should allow that do not require use of the actual experimental radio broadcast. We seek comment on these proposals.

26. Prior to a new spectrum user's commencement of operations, notification is generally conducted to ensure that harmful interference concerns can be identified and corrected. In many cases under our existing experimental licensing procedures, we issue grants that are conditioned on notifying or successfully coordinating with existing licensees. The Commission's diverse policies and procedures reflect the different operational, business, and engineering concerns posed by the many sharing scenarios of the multitude of spectrum uses possible under our rules.[52] Under the research program experimental radio license concept, we envision that the nature and scope of individual tests will vary greatly. Some experiments will be conducted with the support of and in conjunction with existing licensees as part of research to improve existing network devices and system designs. For others, experimenters may opt to use short-term leasing or other secondary market mechanisms to secure access to spectrum bands on which they want to experiment. Many experiments may be confined to laboratory settings, or be conducted in shielded environments, such as Faraday cages, where the interference environment is tightly controlled.[53] Because the appropriate level of notification to and coordination with incumbent licensees will necessarily vary for each of these experiments, we are not proposing to establish a specific coordination requirement for research program experimental radio licenses.

27. We nevertheless believe that we must make provisions for licensed users whose operations are geographically and/or spectrally near ongoing experiments. First, we propose to require that prior to commencement of any experiment or test, certain information be made publicly available via a

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[50] We would expect, for example, that large universities with sprawling campuses would need to design relatively few experiments that cover their entire geographic footprint.

[51] *See* 47 C.F.R. § 5.115.

[52] A complete discussion of the Commission's many coordination rules and procedures is unnecessary for current purposes, but many services require prior coordination with incumbent parties prior to application filing, coordination via the Interdepartmental Radio Advisory Committee (IRAC) for band shared by federal users, as well as real-time sharing rules and policies that rely on volunteer or licensee directed negotiations.

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

Commission developed web-based registration. We propose that such registrations contain contact information for the researcher in charge who can address concerns raised prior to testing as well as act as a "stop buzzer" in the event that a licensee reports an unanticipated interference incident during the actual testing phase. In addition, we propose that these registrations contain the frequencies or frequency bands under test, the maximum effective isotropically radiated power (EIRP) or effective radiated power (ERP) under consideration (as applicable to the proposed experiment) and a description of the geographic area in which the test will be conducted. Should other information also be collected? We propose that these registrations be completed at least seven calendar days prior to commencement of any test or experiment to ensure that interested parties have sufficient time to assess whether they believe harmful interference may occur to their systems. Unlike our existing rules, however, experimenters would not have to await specific approval or authorization to conduct the test once the seven days has elapsed. Before conducting the experiment, the experimenter must evaluate and account for interference concerns raised by interested parties, and it must obey any instructions from the Commission to delay, modify, or abandon the experiment. Specifically, if any licensee of an authorized service raises interference concerns, we propose that the service licensee must contact the research program experimental radio license responsible party and the service licensee must post its conerns along with supporting documentation to the web registration page. We propose that the experiment not be permitted to commence until the parties resolve the issue. We further propose that the service licensee will bear the burden of proof that the proposed experiment will cause harmful interference. It is expected that parties work in good faith to resolve such concerns, including modifying experiments if necessary to reach an agreeable resolution. In making this proposal, we seek to balance the interests of incumbent spectrum users with the ability to conduct tests in a timely manner. Is seven days a sufficient timeframe? Or is it too long such that it may constrain testers from being able to adjust on-the-fly as they analyze current test results? Will the proposed method for resolving interference concerns prior to experimentation result in an efficient and fair process for identifying and addressing such concerns? Should we require a specific dispute resolution process? At what point would we expect parties to raise their concerns directly with us?

28. We also note that, under our existing rules, experiments must avoid use of public safety frequencies except when a compelling showing can be made that such use is in the public interest.[54] Operation on public safety frequencies must also be coordinated. Should these provisions continue to apply to tests conducted under a research license? Will these requirements, in conjunction with the seven-day notice requirement we propose, be sufficient to protect public safety interests while encouraging important research and experimentation in this area? We seek comment on these proposals.

29. Additionally, we believe that the web-based registration can capture two reporting requirements that are currently part of our application process for conventional experimental radio licenses. In cases where the experiment is to be used for the purpose of fulfilling requirements of a contract with an agency of the United States government, or if the experiment 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, we propose that the registration contain the information currently required under Section 5.63(b) and (c) of our Rules.[55] We seek comment on this proposal.

30. We propose to implement additional measures that will make it easier for incumbent licensees and other interested parties to become aware of pending tests and make experimenters aware of their concerns, and seek comment on what those measures should be. Should we develop an automated

[54] *See* 47 C.F.R. § 5.85(d).

[55] *See* 47 C.F.R § 5.63(b) and (c).

process for distributing such information by RSS feeds or other means?[56] If so, should we further categorize this information by frequency band, geographic location, or other means? Would the Commission's Tower Construction Notification System (TCNS) serve as a useful model? TCNS allows companies to voluntarily submit notifications of proposed tower constructions to the FCC which in turn provides this information to federally-recognized Indian Tribes, Native Hawaiian Organizations (NHOs), and State Historic Preservation Officers (SHPOs) who can then respond directly to the companies if they have concerns about a proposed construction.[57] We seek comment on this proposal.

31. We further believe that we must make special provisions to prevent harmful interference on the frequency bands that are commonly used in a campus setting and that are vital for public safety purposes or are used for campus security operations. For example, experiments on bands assigned to mobile service providers (*e.g.* the Cellular Radiotelephone Service, broadband PCS, AWS, 700 MHz) could have the potential to disrupt mobile telephone use on campus – at a minimum inconveniencing one of the most active and engaged mobile device user communities, and at worst, impeding the ability to reach 911 or receive campus-wide emergency text alerts.[58] Television and radio broadcast bands are used in support of the Emergency Alert System (EAS).[59] In recognition of these vital interests, we propose to require that, for tests that affect bands used for the provision of commercial mobile services, emergency notifications, or public safety purposes on the institution's grounds,[60] the licensee first develop a specific plan that avoids interference to these bands. The plan would: 1) provide notice to those who might be affected by the test; 2) allow for the quick identification and elimination of any harm the experiment is causing users, and 3) in the case of vital public safety functions, provide an alternate means for accomplishing such tasks during the duration of the experiment. We further propose to require that the holder of the research program experimental radio license submit this plan to the Commission in conjunction with the registration it submits at least seven days prior to commencement of any test or experiment, as described above. We would routinely make the entire submission publicly available. Should we also require that a licensee be required to specifically notify the commercial carrier(s) or other entit(ies) listed as the licensee for the affected band(s) in all of these situations, or only in situations where specified conditions are met (such as when the experiment will be conducted outside of buildings or away from controlled venues where access can be restricted, such as laboratories)? If so, should we require the licensee's concurrence prior to the test? Ultimately, we want to establish a process which delivers the benefits of experiments conducted at universities and research institutions, but that also prevents interference to users of wireless services and frequencies used for emergency and public safety purposes. We seek comment on these proposals.

32. We seek comment on how we should address noncompliance with our rules and procedures, including the failure of a holder of a research program experimental radio license to address and resolve cases of harmful interference within a reasonable amount of time. We propose to modify the cancellation provisions of our rules to make it clear that we can both deny permission to conduct specific tests under a

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[56] RSS (Real Simple Syndication) is a type of web format for publishing frequently updated works and automatically syndicating them to interested subscribers.

[57] More information on TCNS is available at http://wireless.fcc.gov/outreach/index.htm?job=tower_notification.

[58] We note that, just as there are now fewer pay landline telephones available to consumers, many college dormitories no longer have in-room landline phones.

[59] The EAS is a national public warning system that permits the President to communicate to the public during a national emergency and for state and local authorities to deliver important emergency information, such as AMBER alerts and weather warnings. *See* http://www.fcc.gov/pshs/services/eas/.

[60] *See, e.g.*, 47 C.F.R. § 20.18 (E911 service on commercial bands); 47 C.F.R. Part 90, Subpart B (Public Safety Radio Pool).

research program experimental radio license and that we can revoke the research program experimental radio license at any time.[61] We seek comment on this proposal.

33. We note that many institutions have offices that conduct administrative functions and provide coordination and support on a campus-wide scale. We propose to require each institution to identify a single point of contact who is ultimately responsible for all experiments conducted under the research license – including that the reporting requirements we establish for this type of authorization are met and all applicable rules are observed. This individual will serve as the initial point of contact for all matters involving interference resolution, and must have the ability to discontinue any and all experiments being conducted under the license, if necessary. We propose to require a licensee to identify this 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, and to keep this information current. We seek comment on other requirements, such as whether this designated individual should be required to respond to inquiries within a set time period, or possess the ability to halt experiments within a certain period of time? We seek comment on these matters, as well as the overall concept of requiring a single point of contact with this level of responsibility.

34. We believe that in addition to the registration process described above, there should be a reporting requirement associated with the research program experimental radio license. We tentatively conclude that it should be as minimally burdensome as possible and should be narrowly tailored to ensure that experiments conducted under the license comply with the Commission's rules and procedures and to build a public record of active innovation in the field of radio communications that can be used to encourage and inspire further technological advancements.[62] Are there additional objectives we have overlooked? How can we meet these objectives? We propose to require that after completion of an experiment, the license holder file a brief narrative statement describing the results of the test, including any interference incidents and steps taken to resolve them. What should constitute a "test" and at what point has a test evolved sufficiently to require a supplemental filing? Should the holder of a research program experimental radio license be required to file periodic reports (*e.g.*, a yearly report) updating the status of ongoing tests, or summarizing the activity conducted under a research license? We seek comment on these matters.

35. We seek comment on the duration, terms, and scope of a research license. While such a license is intended to afford qualified institutions greater flexibility in how they conduct experiments, we intend to ensure that all other rules and limitations of our existing experimental procedures will continue to apply. For example, holders of a research license cannot deploy permanent facilities or offer services for sale.[63] Similarly, we propose to issue these licenses for a limited, five-year duration, which is consistent with the longest experimental license term our rules currently allow. We would permit license renewals. Is this an appropriate timeframe? In this context, would it make sense to issue initial research licenses for a lesser period (*e.g.* two years) and subsequently, upon sufficient showing of compliance with the rules we adopt, issue renewals for five-year periods? We also ask how research licenses should

[61] *See* 47. C.F.R. § 5.83.

[62] We distinguish this proposal from Section 5.73 of our Rules which provides for the filing of a report on the results of an experimental program, but does not require such a report unless it is specifically stated as a condition of the authorization. 47 C.F.R. § 5.73. Our intent here is to reduce the reporting requirements necessary prior to and during experimental research, and to reduce the overall reporting requirements necessary under research licenses versus our existing licensing process. We do not intend – or do we think it would serve the public interest – to eliminate reporting requirements entirely.

[63] *See* 47 C.F.R. §§ 5.53(a) and 5.93(b).

govern experiments conducted by multiple institutions conducted across different campuses.[64] We propose to require that each participating institution hold a research license (or obtain an individual license that would authorize the experiment), but that only one institution would be required to fulfill the reporting requirements associated with the research conducted across different campuses and that that institution be charged with identifying and making available the single point of contact with authority over the experiment. We also seek comment on how we should address specific licensing issues involving individual institutions. For example, if an institution has multiple campuses, should we issue one research program experimental radio license per institution that encompasses all campuses, or should we issue a separate license for each campus? Are situations where we should routinely issue more than one research program experimental radio license for a single campus, and if so, what are they? We expect to direct applicants for research licenses to use FCC Form 442 and attach a supplemental narrative that sets forth the information we need to assess the application (*e.g.* a showing that the applicant is a qualified institution, a description of the campus the license will cover, etc.).[65] As the Commission transitions to a new Consolidated Licensing System (CLS), we will assess whether there is a more effective way to collect the information we need to evaluate a research license application.[66] We seek comment on these proposals.

36. We also ask whether it would be appropriate to initiate the research license concept in the context of a pilot program, by which we would choose a limited number of institutions to which we would grant licenses and under which we would evaluate the program before expanding its scope. We recognize that while the research license concept holds great promise for promoting research investment and fostering wireless innovation, we also need to be sensitive to questions and concerns that commenters may raise in how to deploy this concept. Would a pilot program be an appropriate way to balance our interests in promoting innovation and flexibility while protecting against harmful or unanticipated interference? If so, would ten institutions be an appropriate number, and what criteria should be used to select them? Are there other provisions we should adopt that would make such a pilot program more successful? We seek comment on all of these proposals.

37. Finally, we note that the Commission's experimental licensing rules currently have a provision for school and student authorizations.[67] These rules, last updated in 1998,[68] are generally intended for use by students through high school for purposes such as science fairs, school projects, and participation in radio clubs. The rules provide for an informal application by letter and allow transmissions in limited frequency bands at low power levels.[69] Given the changes in both technology and the Commission's processes over the last twelve years including those proposed herein, we question whether these rules are still necessary. First, we are not aware that these rules have seen widespread use. In addition, we note that all applications are now required to be filed electronically[70] and that students

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[64] For example, the GENI project described *supra* n. 28 involves research conducted at numerous universities.

[65] Form 442 is the existing application form for new or modified experimental radio station authorization. It must be filed electronically, and is available at https://fjallfoss.fcc.gov/oetcf/els/forms/442Entry.cfm.

[66] The development of CLS is part of a long-term initiative to combine the functions of the current licensing and application systems, including the Experimental Licensing System. *See* http://reboot.fcc.gov/reform/systems/cls.

[67] *See* 47 C.F.R. § 5.89.

[68] *See* Amendment of the Commission's Rules to Revise the Experimental Radio Service Regulations, ET Docket. No. 96-256, *Report and Order,* 13 FCC Rcd. 21391 (1998).

[69] The rules allow for transmissions in the 27.23–27.28 MHz, 460–461 MHz, 462.525–467.475 MHz, 2402–2483.5 MHz and 10.00–10.50 GHz bands at up to 4 watts EIRP.

[70] *See* 47 C.F.R. § 5.55(b).

may want to experiment in more bands than those provided for in this rule. Thus, we propose to eliminate this rule and require that students desiring to experiment obtain a conventional experimental radio license using the electronic filing process. If there is a good reason to keep these special provisions for students, how can we provide for a streamlined process? Advocates for such a process should provide specific suggestions regarding how such streamlining should be implemented. Alternatively, we ask if these provisions should be maintained, but moved to Part 15 to allow for student use of approved equipment on an unlicensed basis. Advocates for such an action should also address whether certain safeguards need to be added to the rule to ensure proper radio usage.[71]

B. Establishing Innovation Zones

38. *Background.* A second way we can promote innovation through the program experimental license concept is by providing greater opportunities for testing and experimentation in specified geographic locations with pre-authorized boundary conditions. We envision that such zones, which could include isolated or protected areas, could become havens for enterprise and innovation because we would permit experimenters to explore a variety of technologies with reduced barriers to entry. Our research license proposal, above, balances the interest in providing the greatest level of opportunities for new research and discovery against increasing unwarranted risks of harmful interference to existing users by restricting licensing to trusted research institutions; here, we propose to make a carefully restricted set of locations available for a broader range of experimentation by all qualified applicants to achieve a similar result. The creation of innovation zone program experimental radio licenses provides a unique opportunity to foster robust wireless engineering experimentation and development that will lead to important contributions to both fundamental and applied research in the field

39. Recommendation 7.7 of the *National Broadband Plan* identified a need for more spectrum to be made available for researchers, suggesting that the Commission and other governmental stakeholders "identify underutilized spectrum that may be suitable for conducting research activities."[72] The licensing of innovation zones for experimentation would further this idea. A recent paper published by IEEE offers a practical illustration of how such zones might assist cutting-edge researchers. In describing the design and deployment of a building-wide cognitive radio network testbed, the authors described the challenges in meeting existing regulatory requirements.[73] Even though they had obtained multiple experimental licenses, researchers had to account for the risk that "extreme [radiofrequency] flexibility and reconfigurable components that exist in next-generation radios" could cause users to transmit on unauthorized bands. The researchers had to devise both software- and hardware-based methods that restricted transmissions to the testbed frequencies while not diminishing the quality of the research. An innovation zone licensing approach could have eliminated many of these design challenges and permitted testers to use a greater range of frequencies.[74]

40. We note that such zones would be different from, yet complementary to, such ideas as the FCC-NTIA Innovation Test-Bed designed to foster innovative concepts for sharing spectrum between

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[71] *See, e.g.*, 47 C.F.R. §§ 15.23 (Home-built devices) and 15.25 (Kits).

[72] *See National Broadband Plan*, at p. 125.

[73] Timothy Newman, S.M. Shajedul Hasan, Danial DePoy, Tamal Bose, Jeffrey H. Reed, *Designing and Deploying a Building-Wide Cognitive Radio Network Testbed*, IEEE Communications Magazine, Vol. 48, No. 9, (Sept. 2010) at 106-111.

[74] Under this example, which was set on the Virginia Tech campus, the researchers may also have met the qualifications we propose for a research program experimental radio license.

Federal and non-Federal users,[75] or Recommendation 7.6 of the *Plan*, which calls for a wireless test-bed designed to promote the science underlying spectrum policymaking on such issues as sharing among different spectrum users.[76] Consistent with our general experimental authorization rules, innovation zones would be designed to minimize the potential of interference to other users and, most likely, would be in places where researchers would find freedom from traditional sharing or interference concerns.

41. *Proposal.* We propose to create an innovation zone program experimental radio license that would give innovators greater flexibility to conduct and modify the terms of their experiments without having to secure the additional approvals that our traditional experimental authorization rules would require. Licensees nevertheless would still be bound by the general limitations that come with an experimental license and would be expected to limit individual experiments conducted under the license to the minimum scope and size necessary to accomplish the test's goals. These licenses would be structured similar to the research program experimental radio license model discussed above, but would have different eligibility and use restrictions. Specifically, we propose that each licensee must hold appropriate technical credentials demonstrating advanced technical competence in radio engineering, but emphasize that applicants will not necessarily have to be associated with a college, university, or non-profit research organization to be eligible for an innovation zone program experimental radio license. We envision that innovation zones would permit operations over large areas, and would not be appropriate for use by a single entity at its exclusive-use facility (such as within a large manufacturer's plant grounds). Innovation zones would, however, be ideal for universities and research institutions that wish to conduct research in off-campus settings.[77] We seek comment on this proposal generally, and whether there are additional technical qualifications that we should require of these licensees.

42. We seek comment on what criteria we should use to identify areas that are sufficiently isolated or protected to serve as innovation zones. What propagation, geographic or other wireless engineering characteristics should we look for? To be effective, the authorization for innovation zones must allow for access to the largest range of frequencies practical. We propose that the innovation zone program experimental radio license broadly permit experiments on any frequency that is not specifically listed in Section 15.205(a) of our rules, except that experiments could use frequencies above 38.6 GHz so long as they are not listed in footnote US246 of the Table of Frequency Allocations.[78] We recognize that in geographically remote areas it may not be necessary to impose limitations on the use of the restricted frequency bands. We seek comment on when and how we should impose restrictions on individual licenses and/or in particular innovation zones that are located in remote areas. We recognize that certain geographic areas offer great potential as innovation zones, but their use would raise additional considerations. For example, how should we treat geographic areas and frequencies that we consider, here, to be in the Commission's inventory because they are not licensed?[79] These large areas could provide an excellent opportunity for researchers to experiment on a wide scale with different network topologies and advanced communications systems without fear of encroaching on existing spectrum use.

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[75] *See* respectively, 23 FCC Rcd 1654 (2008) and NTIA Docket No. 080129095-8096-01, published in 73 Fed. Reg. 6710.

[76] *See National Broadband Plan*, Recommendation 7.6, at p. 124.

[77] As an example, we note that the University of Colorado has conducted extensive research and experimentation at NTIA's Table Mountain facility, which is located near Boulder, Colorado but outside boundaries of the university campus. Accordingly, experiments at this site could not be authorized under the terms of a research license.

[78] *See* para. 21, *supra.*

[79] These include areas that are not currently licensed, areas that did not receive the necessary minimum bids at auction and areas where the licensee has returned the license to the Commission.

However, such areas could be subject to re-auction, limiting long-term research opportunities.[80] We propose to permit such areas to be licensed as innovation zones, but to emphasize that experimental use is subject to discontinuance if the bands are re-auctioned prior to the end of the innovation zone license term. Similarly, should we tie the availability of an innovation zone to specific frequency bands in the Commission's inventory? We seek comment on these matters.

43. We seek comment on what requirements are necessary to allow for proper oversight of innovation zone program experimental radio licenses. We propose to delegate to the Office of Engineering and Technology the responsibility for establishing, maintaining, and routinely updating the list of available innovation zones. What additional provisions should we adopt? Should we first identify geographic areas that are suitable innovation zones and promote their use among researchers, or are there different ways to build the innovation zone inventory? Should we limit the number of applicants for a specific zone or otherwise manage the use of this resource among different parties? Should we provide a single license with a requirement to provide and manage access to all parties seeking to conduct an experiment at fair and reasonable terms? For example, a single licensee could assign different experiments to different areas within the larger geographic area or provide a means for time-sharing equipment or could manage a database providing access on an as-needed basis to parties.[81] Would this be a better approach than issuing multiple licenses within an innovation zone?[82] We point out that in the single licensee case there would be a single responsible party that could be contacted for gaining access or in instances where interference may be occurring. We ask that advocates of the single licensee model provide comment on criteria we could use to select such a licensee.

44. We tentatively propose to establish the same types of application and reporting requirements for innovation zone program experimental radio licenses that we require for research program experimental radio licenses, except where described differently, below. We propose to require the responsible party to file an application that describes the requested geographic area of operation, the frequencies to be used for testing, the maximum power levels associated with planned operations, and any other relevant technical characteristics pertaining to test equipment, antennas, etc., that would be necessary to identify and mitigate potential interference. An innovation zone licensee would then be permitted, under the terms of its license, to design and conduct any test that meets these criteria. The licensee would, however, be required to provide the Commission on a timely basis and through a web-based reporting system, an up-to-date list of the testing that is being conducted with at least a seven-day lead time before the tests are performed.[83] It would also have to report the conclusion of individual tests. Should the holder of an innovation zone program experimental radio license be required to file periodic reports (*e.g.*, a yearly report) updating the status of ongoing tests, or summarizing the activity conducted under its license? Are additional notification or coordination procedures warranted for experiments

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[80] The Commission could potentially announce a re-auction in a time frame as short as a few months to as long as several years after the prior auction.

[81] In this model, entities interested in using database access methods to provide opportunistic use could conduct research on optimizing various assignment algorithms as well as obtaining an understanding of how these methods would scale for a large system deployment. For more information on these techniques, *see* our companion item in ET Docket No. 10-237, Promoting More Efficient Use of Spectrum Through Dynamic Spectrum Use Technologies, *Notice of Inquiry*, released Nov. 30, 2010.

[82] A single licensee managing an enterprise zone would be similar to the band manager concept the Commission has used to manage interference among multiple users in the 746-764 and 776-794 MHz bands. *See* Service Rules for the 746-764 and 776-794 MHz bands, and Revisions to Part 27 of the Commission's Rules, WT Docket No. 99-168, *Second Report and Order*, 15 FCC Rcd 5299 (2000).

[83] As with the research program experimental radio license, we could explore the establishment of an RSS feed or other mechanism that would make interested parties aware of tests planned in an innovation zone.

conducted in certain bands, such as those used for public safety or EAS purposes? If so, should we apply the same pre-test notice process that we are proposing for the research license, above?[84] We tentatively conclude that innovation zone program experimental radio licenses should be granted for the same five-year duration we propose for research experimental licenses to encourage robust levels of experimentation by minimizing administrative burdens, and that we permit license renewals. We also propose to require the licensee to identify a single point of contact who has authority to stop any tests being conducted in the innovation zone, and to apply the same dispute resolution procedures we adopt for research program experimental radio licenses. We seek comment on these proposals.

C. Promoting Advancements in Health Care

45. *Background.* Recognizing that improving America's health is among the most important tasks for the Nation, the National Broadband Plan discussed how broadband-enabled solutions are a crucial component for fostering more innovative, efficient, and productive delivery of health care services.[85] As we look to further promote health care advances through devices that use radio communications, we seek the perspective of those who innovate and invest in this area. What can we do to promote research and innovation in the health care sciences while providing for adequate protection against unwanted consequences? The FCC and the Food and Drug Administration (FDA) share a common goal to facilitate the development of wireless technologies to improve public health. Our primary focus, for purposes of this Notice of Proposed Rulemaking, is on the process by which medical devices that rely on radio communications are developed and tested.

46. Recent Commission actions illustrate how the medical device marketplace is rapidly evolving to produce sophisticated new applications that promise to fundamentally alter health care treatment and advance patients' quality of life. Last year, we created the Medical Device Radiocommunication (MedRadio) service to authorize both body-worn and implanted medical devices within a five megahertz-wide spectrum band.[86] Pending rulemaking proceedings explore spectrum needs for networked medical devices that can, for example, restore mobility to paralyzed limbs and organs or create advanced body sensor networks.[87] In a July 2010 Memorandum of Understanding, the Commission and the FDA's Center for Devices and Radiological Health agreed to procedures designed to promote collaboration, provide clarity and improve the efficiency of the regulatory processes applicable to broadband and wireless enabled medical devices.[88] An accompanying joint statement recognizes that "the American

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[84] *See supra* para 31 (describing special procedures to prevent harmful interference to services in certain frequency bands).

[85] *See National Broadband Plan*, at Chapter 10.

[86] *See* "Investigation of the Spectrum Requirements for Advanced Medical Technologies Amendment of Parts 2 and 95 of the Commission's Rules to Establish the Medical Device Radiocommunication Service at 401-402 and 405-406 MHz," ET Docket No. 06-135, *Report and Order*, 24 FCC Rcd 3474; *Erratum*, 24 FCC Rcd 4689 (2009). (*MedRadio Report and Order*) The MedRadio rules built upon the former Medical Implant Communications Service (MICS) – which had limited operation to implanted medical devices.

[87] *See* Amendment of Parts 2 and 95 of the Commission's Rules to Provide Additional Spectrum for the Medical Device Radiocommunication Service in the 413-457 MHz band, ET Docket No. 09-36, *Notice of Proposed Rulemaking*, 24 FCC Rcd 3445 (2009), supra n. 7; Amendment of the Commission's Rules to Provide Spectrum for the Operation of Medical Body Area Networks, ET Docket No. 08-59, *Notice of Proposed Rulemaking*, 24 FCC Rcd 9589 (2009).

[88] *See Memorandum of Understanding Between the Federal Communications Commission and the Food and Drug Administration Center For Devices and Radiological Health*, July 26, 2010, available at http://www.fcc.gov/Daily_Releases/Daily_Business/2010/db0726/DOC-300200A2.doc.

public...should have clear regulatory pathways, processes, and standards to bring broadband and wireless-enabled medical devices to market."[89]

47. A landmark joint FCC/FDA meeting held on July 26-27, 2010 brought together health care, technology, government, and academic experts who began exploring ways that government can ensure the safety and reliability of wireless broadband-enabled medical devices while increasing their availability to consumers and health care providers.[90] One theme that arose from this meeting was the need for environments in which manufactures and developers could test wireless medical systems and devices. Such test-beds could shorten the time it takes to transform ideas to products by, for example, allowing testing of interoperability and RF immunity in an increasingly complex radiofrequency environment. Our proposal draws heavily on these ideas.

48. *Proposal.* We propose to create a new medical program experimental radio license, available to hospitals and other health care institutions, as a third type of program experimental license. We envision the creation of cutting-edge test-bed facilities, where manufacturers and developers could try out new wireless medical technologies and assess operational readiness. Researchers, educators and practitioners could partner with Veterans Affairs facilities and leading research and teaching hospitals, for example, to speed the development of new ideas and innovations. A medical experimental authorization would allow for 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 FCC's technical rules.[91] The FDA's investigational device exemption (IDE) may be applicable when these experiments involve patients.[92] In this regard, we note that the FDA in consultation with the FCC is exploring approaches to streamline IDEs for wireless medical devices, when an IDE is required. The medical experimental license program would be supervised by the FCC in consultation with the FDA

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[89] *See Joint Statement on Wireless Medical Devices, U.S. Food and Drug Administration/Federal Communications Commission* (FDA Commissioner Dr. Margaret Hamburg and FCC Chairman Julius Genachowski), July 26, 2010, available at http://www.fcc.gov/Daily_Releases/Daily_Business/2010/db0726/DOC-300200A1.doc.

[90] *See* "FCC Announces Agenda and Participants for July 26-27 Joint FCC/FDA Meeting on Wireless Medical Technology," July 26, 2010 advisory from FCC, available at http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-300091A1.doc. The transcript of the July 26-27 Joint Meeting is available at http://www.regulations.gov.

[91] The program proposed here includes experimentation for two types of medical devices: 1) Radio-frequency (RF) wireless medical devices which are medical devices that include at least one function that is implemented using RF wireless communications; examples of functions that may be implemented wirelessly 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). FCC regulation of these devices is generally accomplished under the Wireless Medical Telemetry Service in Part 95, subpart H of the Commission's rules; some devices may be regulated under the Private Land Mobile Radio Service rules in Part 90 or the unlicensed devices rules in Part 15 and are subject to equipment certification; and 2) Medical devices that use RF for ablation (*i.e.*, removal of a part of biological tissue usually by surgery. RF ablation can very precisely deliver RF energy to kill specific cells, such as cancer cells, without causing damage to nearby healthy cells). FCC regulation of these devices falls under the Industrial, Scientific, and Medical Equipment rules in Part 18 and are subject to equipment verification. The FDA also has regulatory authority over medical devices.

[92] An approved investigational device exemption (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. § 821.1. We note that the IDE procedures are not applicable when testing or experimentation is done in a laboratory setting where patients are not exposed to RF energy.

to determine the applicability and approval of the license to ensure that patient safety is considered. This program is not intended to replace the FDA's existing oversight and review programs.

49. The proposals herein are intended to shorten the time it takes manufacturers to develop devices and systems by streamlining the approval process – in particular, the process by which medical equipment must be approved under the Commission's equipment authorization procedures.[93] Consequently, this arrangement could lead to quicker development of medical breakthroughs that will help all Americans, including the brave men and women who were wounded in defense of our Nation and who deserve our best efforts to facilitate the creation of tools and services that could ease their transition to civilian life.

50. It is important that we limit eligibility of medical program experimental radio licenses to the right institutions. Should we restrict licensing to entities that meet specific criteria, such as accreditation by a particular certification body – or should we instead require an entity, as part of its submission, to make an affirmative showing that it is engaged in the health care field and that it has sufficient resources and expertise to oversee tests conducted under the authority of a blanket license? How might we include federal medical institutions such as those operated by the Department of Veterans Affairs or military services in this program, where the facility itself is under the jurisdiction of the Executive Branch and authorizations would ordinarily be granted by the NTIA, but certain tests might be conducted by non-federal entities? How could we structure the coordination process between these governmental entities to balance the interests of military services while at the same time expediting the development of new medical devices? We seek comment on this matter. We propose to require that, in all cases, facilities that seek a medical program experimental radio license demonstrate that they possess basic expertise in radio management. We seek comment on whether we should require baseline qualifications for demonstrating this expertise, or if it will be sufficient for applicants to make an affirmative showing that they hold these skills. For example, we believe it is important to have the ability to identify and correct RF related problems. In this regard, we recognize that some institutions may not be well versed in the FCC rules or spectrum management issues and may have to collaborate with an industry partner to develop new devices once a specific need is identified. In these instances, can the requirement for basic expertise in radio management be satisfied by the industry partner or should it reside with the host institution? Alternatively, could a third party be used to manage spectrum under the medical experimental authorization? For example, 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.[94] We seek comment on whether such an approach can work for medical research activities.

51. We tentatively conclude that the medical program experimental radio license should be granted to the institution that creates and manages the test bed environment in which the specific research activities will be conducted, as opposed to the manufacturers and experimenters who may be conducting the actual tests. We believe that this approach strikes the right balance between our goal of promoting robust radio experimentation and the necessity of providing safeguards against harmful interference, because institutions can establish a single point of contact with knowledge of and control over all testing that is being conducted, and because such institutions should have ultimate control over their facilities.[95]

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[93] The Commission's Equipment Authorization Procedures are specified in Part 2, Subpart J of our rules. In general, equipment using the radio frequency spectrum may not be imported and/or marketed until it has been shown to be in compliance with technical standards found in the various Commission rule parts that govern the service in which the equipment is to be operated. *See* 47 C.F.R. § 2.901 *et seq.*

[94] Information on wireless medical device registration is available on ASHE's website at: http://www.ashe.org/resources/WMTS/.

[95] Under such an arrangement, we could require the designation of a single person who would be able to respond to interference complaints and who holds the authority to stop any ongoing tests.

To the extent that we permit the requirement for basic expertise in radio management to be satisfied an industry partner or third-party manager, how should we structure the licensing process? Should we, for example, issue multiple licenses but require one party to identify itself as the responsible party?

52. As with the research program experimental radio license and innovation zone program experimental radio license proposals, above, we propose that a medical program experimental radio license will offer broad authority under which individual tests will be conducted, but that such tests should be limited in scope to what is necessary to meet a particular test's goals. For example, the tests conducted under a medical program experimental radio license will provide researchers an opportunity to assess the susceptibility of new devices to interference as well as whether they might cause interference to other devices. Such tests can be conducted in a controlled environment so that any electromagnetic interference issues can be identified and remedied prior to devices being distributed to the public. We propose the same limitation on use of frequencies for medical program experimental radio licenses as we do for research program experimental radio and innovation zone program experimental radio licenses. That is, researchers may use any frequency so long as it is not listed in Section 15.205(a), except that frequencies above 38.6 GHz may be used so long as they are not listed in footnote US242 of the Table of Frequency Allocations.[96]

53. We seek comment on what information we should require of an applicant, in addition to a demonstration of its qualifications to hold a license. We propose to follow the same general application procedures as those to be established for the other program experimental radio license types. We tentatively conclude that a licensee must specify the rule parts, frequencies, and geographic areas in which it plans to conduct tests. Is there additional information that we should require at the application stage? We propose that the license term be set for an initial five-year period, and that we permit license renewals. What other provisions should we incorporate into our rules?

54. How should we define the scope of permissible operations under a medical program experimental radio license? We tentatively conclude that experiments conducted under the medical experimental authorization should be limited to investigations and tests involving therapeutic, monitoring, and diagnostic medical equipment and that the institution be given broad leeway to choose the frequency band(s) and technical characteristics appropriate to each experiment without having to seek specific prior FCC approval.[97] We also take a fresh look at our existing experimental authorization rules as applied to medical equipment. Are there any rules that we should relax or modify due to the unique nature of or the importance of promoting advancements in the medical device field? As an initial matter, we propose that tests conducted under a medical experimental authorization not be subject to our traditional station identification rules. Our past experience in the medical device field suggests that such requirements are impractical for many of the devices we expect to be tested under the proposed new authorization, and that 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. Although we propose to require that operations must be tailored to comply with applicable FCC technical rules, should we also establish a method by which innovators can test devices that may not completely conform to the rules provided they have performed a risk assessment that includes an evaluation of how to protect the existing base of devices already in use in the medical facility? Are there any standards for risk assessment that should be used in this regard?[98] We ask because the test beds we hope to foster through medical

[96] *See* para. 21, *supra.*

[97] We note that all experiments must comply with the Commission's RF safety rules limiting human exposure to RF radiation. *See* 47 C.F.R. §§ 1.1307(b), 1.1310, 1.1091 and 2.1093.

[98] For example, ISO 14971is a medical device standard titled, "Application of Risk Management to Medical Devices." ISO 14971:2007 specifies a process for a manufacturer to identify the hazards associated with medical devices, including in vitro diagnostic (IVD) medical devices, to estimate and evaluate the associated risks, to control (continued....)

experimental authorizations appear to be ideal venues to conduct empirical testing to support assertions that devices and systems will operate successfully in real-world settings.[99] Should operations conducted under a medical experimental authorization be limited to a specific geographic area – such as the licensee's medical campus – or will the other proposed limitations on eligibility and operations provide sufficient protection against unanticipated consequences? More specifically can testing under a medical program experimental radio license be expanded to include body worn or implanted devices that travel with the patient, or should these types of tests be governed by the conventional experimental radio license? We seek comment on all of these matters.

55. We also seek comment on what reporting requirements we should impose under a medical program experimental radio license. In exchange for the flexibility to conduct these tests, we believe that a license-holding institution should bear an obligation to prepare and submit a report detailing the results of its findings for review by the FCC and for dissemination to the medical community at large. Thus, just as teaching hospitals provide a venue where new techniques can be developed and the knowledge shared, the medical experimental authorization would offer medical innovators fertile ground in which they could nurture and develop their ideas in a real-world setting, and where ideas and advancements can readily propagate throughout the medical community.[100] We propose to require that the licensee submit, through the same web site used for project registration, a report within 30 days after conclusion of the test that briefly summarizes its findings, and that the licensee also file a yearly report to the experimental licensing system of the activity that has been performed under the license.[101] Our intent with these reporting requirements is not to make public proprietary or company confidential information, but to provide a venue for sharing information that researchers would find beneficial in the goal of patient care.[102] We also propose that the licensee must provide the Commission on a timely basis an up-to-date list of the testing that is being conducted with at least a seven calendar day lead time before the tests are performed, and include such basic information as the frequencies and rule parts under which the medical device is intended to operate, the number of units that may be employed, the duration of the study, and the geographic scope of the experiment. Such information would make it easier to identify and remedy any unanticipated interference that may occur during the test. We also propose to apply the same dispute resolution procedures we adopt for research program experimental radio licenses. As with our other program experimental radio license proposals, we anticipate that reports would be filed via a Commission

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these risks, and to monitor the effectiveness of the controls. See http://www.iso.org/iso/catalogue_detail.htm?csnumber=38193. Also, the Joint Commission, an independent, not-for-profit organization that accredits and certifies health care organizations and programs in the United States, has several standards related to medical devices, including EC 6.10, "Management of the Environment of Care." *See* http://www.jointcommission.org/.

[99] Given the particular importance of advancing health care and the immense potential that many new medical device proposals hold, we want to find ways to avoid having to evaluate arguments that are based solely on paper filings and theoretical calculations. *See e.g., MedRadio Report and Order.*

[100] The National Institutes of Health in describing its policy for the sharing of research data, notes that sharing benefits the scientific community through such means as reinforcing open scientific inquiry and facilitating the education of new researchers. *See* http://grants.nih.gov/grants/policy/data_sharing/data_sharing_faqs.htm.

[101] Licensees have the capability to upload documents, including reports, to the license file in the experimental licensing system for any of their call signs.

[102] For example, a researcher may discover that a certain type of modulation should be avoided for body worn medical devices because it is susceptible to interference from devices that patients are likely to encounter on a daily basis, such as RF based anti-theft devices in many stores.

web page, and that filings would be posted in a public and easily accessible manner.[103] Because one of our objectives is to make available findings for review and dissemination to the medical community at large, we specifically seek comment on whether these proposed reporting requirements are sufficient to meet our goals. Specifically, are there other recognized reporting policies or protocols that are used within the medical community that we should be aware of?[104] Are there ways for us to align elements of our reporting requirements with those policies?

56. We believe that the medical experimental authorization will create a new path for bringing innovative broadband and wireless-enabled medical devices to market, and will foster tangible advancements in the vital area of health care. Such licenses will eliminate the need to obtain multiple experimental licenses and will encourage the creation of test beds for medical device innovation. Because medical research initiatives and grants are increasingly seeking opportunities to obtain profound advancements over present-day approaches, it is especially important to give innovators of medical radio devices opportunities to make the types of bold proposals that are more likely to attract widespread research funding and support.[105] By restricting licenses to qualified health care entities and for therapeutic, monitoring, and diagnostic medical equipment will provide protection against unanticipated harmful interference to other medical devices and existing radio services. As a practical matter, we observe that many medical devices typically operate on a shared, non-exclusive secondary basis and at low power levels. Moreover, because of the coordination of this program with the FDA, as well as with that agency's overall regulatory oversight of medical devices, we believe that the testing of new and innovative devices under medical experimental authorizations can be accomplished in a way that protects patient safety and health. We seek comment on our proposal, and encourage commenters to help us craft this concept into rules that will create test-beds for the rapid and robust development of new medical devices.

D. Broadening Opportunities for Market Trials

57. *Background.* Market studies and real-world trials can be vital to the transformation of prototypes to fully functional new products and services that meet consumer needs. As such, they are powerful tools that contribute to a greater understanding of the marketability of innovative technologies and services and provide crucial feedback for the process of developing new technologies. Our rules currently provide opportunities for researchers, manufacturers, service providers, and others to better understand the technical, business, or operational potential of new technologies. However, these rules are scattered over several rule parts and it can be confusing to understand which rules apply for different situations. To remedy this, we propose modifications of our rules and procedures that will bring clarity to the market trial process and encourage more robust market trial activities by a greater number of innovators.

58. As background, Commission rules generally prohibit devices from being marketed or operated prior to receiving a grant of equipment authorization. However, exceptions do exist. Section 2.803 of our rules allows for conditional sales, advertising and display, and outright sales to certain

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[103] As with the research license, we could explore the establishment of an RSS feed or other mechanism that would make interested parties aware of tests planned in an innovation zone.

[104] *See, e.g.,* National Institutes of Health Data Sharing Policy, *supra* n. 100.

[105] For example, the Quantum Program at the National Institute of Biomedical Imaging and Bioengineering at the National Institutes of Health seeks "to achieve a profound (quantum) impact on the prevention, diagnosis, or treatment of a major disease or national public health problem through the development and implementation of biomedical technologies," and anticipated making approximately $8,000,000 in fiscal year 2010 available to fund one to three awards. *See* http://grants.nih.gov/grants/guide/rfa-files/RFA-EB-09-003.html.

businesses of equipment not yet certified so long as proper notice is provided to the prospective buyer.[106] That rule section also provides for a manufacturer to operate its product for demonstration or evaluation purposes under the authority of a local FCC-licensed service provider.[107] Additionally, Section 5.3(j) of our rules permits licensees operating under experimental radio authorizations to conduct "limited market studies." Such studies are not defined in Part 5, but Section 5.93 of our rules restrict equipment ownership to the licensee, require notice to participants that the operation is temporary, and stipulate that the size and scope of the experiment be subject to the limitations that the Commission establishes on a case-by-case basis.[108]

59. We also note that recent reports and inquiries have recognized the benefits that would ensue if we were to provide greater opportunities for market trials. The *National Broadband Plan* suggested that we evaluate whether these regulatory restrictions should be relaxed to permit research organizations to conduct broader market studies.[109] Similarly, in the *Wireless Innovation NOI*, we sought comment on the benefits of revising our 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.[110]

60. *Proposal.* Building on these themes, we propose to bring more clarity to our rules regarding operating and marketing of RF devices prior to equipment approval and also to relax the conditions under which market trials can be conducted.[111] Taken together, the rules in Part 2 and Part 5 describe the range of operating and marketing that will be allowed as new RF devices move from concept through experimental, developmental and pre-production stages. These proposed rule changes will make it easier for a wide variety of entities to engage in market studies and certain types of testing. We envision that these modifications will make it easier to set up and conduct market trials in general, and that the rules

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[106] *See* 47 C.F.R. § 2.803(b) (allowing "...conditional sales contracts between manufacturers and wholesalers or retailers where delivery is contingent upon compliance with the applicable equipment authorization and technical requirements."); 47. C.F.R. § 2.803(c) (requiring this notice to be displayed with devices not yet certified: "This device has not been authorized as required by the rules of the Federal Communications Commission. This device is not, and may not be, offered for sale or lease, or sold or leased, until authorization is obtained."); 47 C.F.R. § 2.803(d) (stating, in part that "...the offer 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) of a radio frequency device that is in the conceptual, developmental, design or pre-production stage is permitted prior to equipment authorization ... provided that 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. If a product is marketed in compliance with the provisions of this paragraph, the product does not need to be labeled with the statement in paragraph (c) of this section.").

[107] 47 C.F.R. § 2.803(e)(3)(ii) states that "[i]nstead of obtaining a special temporary authorization or an experimental license, a manufacturer may operate its product for demonstration or evaluation purposes under the authority of a local FCC licensed service provider. However, the licensee must grant permission to the manufacturer to operate in this manner. Further, the licensee continues to remain responsible for complying with all of the operating conditions and requirements associated with its license."

[108] *See* 47 C.F.R. §§ 5.3(j) and 5.93.

[109] *See The National Broadband Plan*, Recommendation 7.7, at 125 (discussing the rules for market studies codified at 47 C.F.R. § 5.93).

[110] *See Wireless Innovation NOI*, at 24 FCC Rcd. 11343-44, para. 65.

[111] We note that in the case of medical devices, the FDA has regulations regarding their marketing. *See, e.g.*, U.S. Food and Drug Administration Guidance, "How to Market your Device" available at: http://www.fda.gov/MedicalDevices/DeviceRegulationandGuidance/HowtoMarketYourDevice/default.htm.

would no longer unduly favor manufacturers over others who could drive innovation and investment through the use of market trials.

61. Section 2.803 of our rules describes when radio frequency devices may be marketed or operated prior to equipment authorization and typically would apply during the later stages of product development and pre-production. We propose to split this rule into two separate rules for marketing and for operating such devices. Our goal is to maintain the general requirement that devices may not be marketed or operated prior to equipment authorization, but to clarify and simplify the existing exceptions to this rule.[112] Marketing of devices prior to equipment authorization is permitted limited purposes, such as making conditional sales contracts or in conjunction with trade show displays. Operation of devices prior to equipment authorization is conducted under the authority of a service license or a grant of special temporary authority, or under the rules for unlicensed devices in Part 15, 18 or 95. Additionally, both operation and marketing of radio frequency devices prior to equipment authorization is permitted pursuant to trials conducted under the authority of a Part 5 experimental radio service authorization. We propose to clearly state this as an exception to our general Part 2 rules.

62. We propose to cross-reference the definition of "marketing" as it is used in Section 2.803(e)(4) of our rules in the revised Part 5 market trial rules we ultimately adopt. Under Section 2.803(e)(4), marketing is defined to include 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.[113] We seek comment on whether this definition meets the needs of parties interested in conducting market trials and ask if there alternative definitions or additional categories that should be added. We will use the proposed definition as the basis for the remainder of our proposals, and make appropriate changes based on the record should the Commission move to adopt different market trial rules. Thus, we ask that commenters who propose to expand the existing definition of "marketing" also provide detailed information on how other related rules need to be similarly modified.

63. We propose to expand upon the existing concept of "limited market studies" as currently codified in our Part 5 rules.[114] Specifically, we propose to adopt a new subpart that contains provisions for two types of trials – product development trials and market trials. A product development trial would be defined as an experimental program designed to evaluate product performance in the conceptual, developmental, and design stages, and that typically requires testing under expected use conditions. A market trial would be defined as a program designed to evaluate product performance and customer acceptability prior to the production stage, and that typically requires testing under expected use conditions to evaluate actual performance and effectiveness. These trials would be conducted under the authority of a Part 5 license and, because they would typically involve equipment that has not yet been authorized, would operate as an exception to our Part 2 rules.

64. Our proposed rules for product development trials are designed to generally track the existing rules for limited market studies. We envision that such tests might include equipment that would not be able to be operated in compliance with existing Commission rules absent an experimental radio authorization. As such, we would explicitly prohibit the marketing of devices operated as part of a product development trial and retain the restrictions on ownership to the licensee and notification to users that are part of the existing limited market study rule. We seek comment on the proposed product development trial rules.

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[112] *See, e.g., supra* notes 106 and 107.

[113] *See* 47 C.F.R. § 2.803(e)(4).

[114] *See* 47 C.F.R. § 5.93.

65. The proposed market trial rules are designed to offer greater marketing opportunities to manufacturers, researchers, and innovators than what is currently permitted under our rules. A wide range of entities would be eligible to obtain an experimental authorization to conduct market trials, and we would grant multiple licenses in situations where more than one entity will be responsible for conducting the same market trial – such as when a manufacturer, system integrator, and service provider are testing consumer acceptance of a new device. Under our existing rules, a manufacturer may offer equipment for sale prior to certification but the prospective buyer is not authorized to operate the equipment; similarly, a manufacturer is authorized to operate the equipment at the prospective buyer's facilities but the licensee remains the responsible party.[115] Our proposed Part 5 rules would provide a simpler means for manufactures and prospective buyers to conduct market trials. Additionally, because these rules are specifically designed to provide for expanded marketing opportunities to consumers and other third parties, we propose that when a market trial involves a device that has not yet been authorized, that the device must 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. We seek comment on these proposals.

66. We recognize that a market trial often involves 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 and at what price. The proposed rules would permit us to issue Part 5 licenses to more than one party conducting a market trial together (*e.g.*, a manufacturer working in conjunction with a service provider) and allow licensees to sell equipment to each other.[116] Licensees would retain ownership of equipment and only be permitted to lease equipment to trial participants, such as consumer end users, for purposes of the trial. Licensees would have to ensure that trial devices are either rendered inoperable or are retrieved at the end of the trial. Thus, we do not propose to allow sales to consumers of equipment that has not yet been certified. While the benefits of allowing direct sales are clear from a marketing perspective, such a provision would put the ownership of uncertified equipment directly with consumers and complicate the Commission's efforts to enforce its rules. To the extent commenters discuss options that would provide for direct sales to consumers, they should provide detailed information regarding how such rules would be envisioned to function to enable valuable marketing information to be obtained, while ensuring that uncertified products do not flood the market without proper controls or create widespread interference. Specifically, what controls would need to be placed on such sales or on the operation of the devices marketed in this manner? Would it be feasible to transmit unique manufacturer codes to facilitate the resolution of interference issues? In the case of devices designed to be authorized under Parts 15, 19 or 95 of our rules, and which would not normally require a license prior to operation, we propose to require that when these devices are to be included in a market trial that they be authorized under a Part 5 license as would any other RF device. This approach would ensure that we have a licensee identified as the responsible party for conducting the market trial. We seek comment on this proposal.

67. 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. These kits typically consist of a component the 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. Under current rules, sales of these kits are not permitted before equipment authorization is granted for the component. This restriction delays the ability of

[115] *See* 47 C.F.R. §§ 2.803(b) and 2.803(e)(3)(ii).

[116] 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.

manufacturers and system integrators to develop hardware and software for use with the component. To remedy this situation, we propose to modify the Section 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. We seek comment on this proposal. Does our description of evaluation kits meet the needs of manufacturers or is too restrictive or not restrictive enough? Should we restrict such sales to developers and system integrators? If so, how should we define these entities? Should such sales be limited in number? For example, should we only allow a manufacturer to sell 1000 kits for a specific component per twelve month period? Are there any other considerations for which we need to account?

68. We also seek comment on compliance testing under our rules. Section 2.803 of our rules provides for the operation of radio frequency devices for purposes of compliance testing, but does not eliminate the requirement to obtain a station license for products that normally require a license to operate.[117] How should laboratories engaged in the testing of equipment, but that are not themselves manufacturers or licensed service providers, be authorized to conduct their work? Should we make specific provisions in our Part 5 experimental radio service rules to issue licenses to laboratories accredited by accreditation bodies that we recognize for RF product testing and consistent with their approved competencies? If so, should they be patterned after the program license model discussed above, or in a different manner? What would be an appropriate license term and renewal process for such a license? Is there a different way to authorize these entities to perform compliance testing? We seek comment on this matter.

69. An additional issue related to the ability to conduct effective market trials implicates our Part 2 rules that limit equipment importation for devices that have not yet been certified. Section 2.1204(a)(3) of our rules permits radio frequency devices to be imported in limited quantities "for testing and evaluation to determine ... suitability for marketing," but limits quantities to 2000 units for products designed solely for operation within a radio service which requires an operating license and 200 units for all other purposes (*e.g.*, Part 15 unlicensed devices, Part 18 Industrial, Scientific and Medical equipment, and Part 95 equipment that is licensed by rule).[118] Recognizing that the majority of equipment and devices today are manufactured in other countries, we believe that the current import restrictions may unduly constrain innovators from having the ability to conduct meaningful market studies and related tests. Practical experience, as measured by a steady stream of requests for waivers of this rule submitted to staff in our Office of Engineering and Technology, supports this observation.

70. In addition, we note that in response to a solicitation for comments for the 2006 biennial review of the telecommunication regulations pursuant to Section 11 of the Communications Act (2006 Biennial Review),[119] Hewlett-Packard (HP) submitted comments recommending that the 200 device limit for RF devices that do not require an individual station license be amended to allow the importation of up to 1200 units for product development purposes.[120] In addition, HP recommends that the importer be required to comply with rigorous reporting requirements, reflected in a quarterly report to the

[117] *See* 47 C.F.R. §§ 2.803(e)(1)(i) and 2.803 (e)(3).

[118] *See* 47 C.F.R. § 2.1204(a)(3).

[119] *See* 2006 Biennial Review of Telecommunications Regulations – Part 2, Administered by the Office of Engineering and Technology, ET Docket 06-155. *Public Notice,* 21 FCC Rcd 9422 (2006); 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."

[120] Comments of Hewlett-Packard Company in ET Docket 06-155, filed Sept. 1, 2006, at 4. Product development including such purposes as design refinement, software development, marketing and customer support program development, and any other related function.

Commission, for importations greater than 200 units. These reports would include: 1) a "waiver closure letter," that would provide a summary of all covered import events, stressing the key information requirement for reporting under FCC Form 740,[121] a summary of prototype unit allocation, and disposition or current situation, as appropriate; and 2) a copy of any additional importation records required by the Commission.[122] The Information Technology Industry Council (ITI) supports HP's recommendations, believing that they would reduce the burden on companies that have product development programs within the United States, but that utilize prototypes assembled outside of the United States.[123] In a Staff Report, the Office of Engineering and Technology concurred with HP's recommendation to raise the import limit and recommended that the Commission issue a Notice of Proposed Rulemaking to modify Section 2.1204 of the rules.[124]

71. In light of these comments and our proposals we make herein to provide more flexibility to the experimental process in general and the market trial process in particular, we believe that the time is ripe to increase the importation limit for devices that will not require an individual station license from 200 units to the 1200 units recommended by HP. This will better reflect current manufacturing, design, and marketing techniques and also decrease the administrative burden on both industry and the Commission. Is 1200 the correct ceiling? Should the limit be set higher to provide for more extensive market studies? Would a lower limit achieve an appropriate balance between easing the manufacturing process and our interest in maintaining appropriate controls on the importation of RF devices? Similar to our proposal above regarding the size of a market trial, we tentatively conclude here that we would treat devices that contain both licensed and unlicensed transmitters under the more liberal 2000 unit limit applicable for licensed devices. We seek comment on this proposal. We decline to propose HP's recommendation to implement a quarterly reporting system. We believe that the same benefit can be achieved in a less burdensome way by requiring importers to maintain records of their imports under these provisions, allowing the Commission to request this information if needed. We also are proposing to clarify that RF devices may be imported not only for testing and evaluation purposes, but also for product development purposes. We request comment on these proposals.

72. Finally, we discuss the parties who should be held responsible for market trials. In the case of a manufacturer, the responsible party is readily apparent as the entity that built the device is conducting the study. However, in other instances, it is not always so apparent. For example, if a commercial carrier were to conduct a study using a new, not yet certified handset built by a third party, is the carrier or the manufacturer the most logical responsible party? Similarly, manufacturers are increasingly incorporating one or more radio modules[125] into devices. These modules can be manufactured by different entities and may be different than the final product assembler. Accordingly, we have structured our proposed Part 5 market trial rules to specify that, in cases where separate licenses are issued because more than one entity is involved in conducting the same market trial, one party must be designated as the responsible party for

[121] *See* 47 C.F.R. § 2.1205.

[122] *See* HP Comments in ET Docket 06-155 at 4-5.

[123] *See* ITI's reply comments to the 2006 Biennial Regulatory Review, September 15, 2006.

[124] *See* Federal Communications Commission 2006 Biennial Regulatory Review – Office of Engineering and Technology Staff Report, ET Dkt. No. 06-155, DA 07-688 (rel. Feb. 14, 2007), 22 FCC Rcd 2930 (2007).

[125] A module generally consists of a completely self-contained transmitter that is missing only an input signal and power source to make it functional. A module is designed to be incorporated into another device, such as a personal computer, personal digital assistant (PDA) or utility meter. *See* Small Entity Compliance Guide: Part 15 Unlicensed Transmitter Modules, DA 08-314, rel. Feb. 11, 2008 available at: http://hraunfoss.fcc.gov/edocs_public/attachmatch/DA-08-314A1.pdf.

the trial. We seek comment on this proposal. We also invite comment on how and when to hold parties that are not designated as the responsible party for the trial liable for any rule violations.

73. We believe that our proposals will expand the availability of market 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. The changes we propose offer tremendous opportunities to unleash innovation and investment. At the same time, they are designed to maintain a balance between providing flexibility and respecting the fundamental requirement that our experimental licensing process avoid causing harm. We seek comment on our proposals.

E. Streamlining Existing Rules to Promote Greater Experimentation

74. *Background.* Innovation and inspiration flourish when spaces are governed by clear, consistent and easy-to-understand rules. In this section, we examine our existing experimental radio authorization regulations and seek ways to reduce duplicative and confusing requirements in our existing rules. The previous section described how the existing rules for market studies are scattered among various rule sections. An analogous situation exists for licenses suitable for performing experimentation and development of new innovative products and services. As mentioned above, the Commission currently has two mechanisms – experimental licensing and developmental licensing – for promoting advances in technology.[126] In spite of the differences between the rules for each of these, the developmental rules appear to be largely duplicative of the experimental license rules in Part 5. Therefore, as discussed further below, we propose eliminating the developmental rules.

75. Historically, the vast majority of applicants apply for experimental licenses under Part 5 of our rules and the remaining few apply for broadcast experimental licenses under Parts 73 and 74 or developmental licenses available under various other rule parts.[127] We observe that while the rules for these licensing regimes have subtle differences, their primary function is to provide opportunities for innovators to test new ideas and products. The main difference between them is that under Part 5 anyone can apply to experiment but under Part 74 and the various rule parts that provide for developmental licensing only entities eligible for a license under that rule part may apply. All of these rules generally stipulate that the license is to be used in a program that in some way contributes to the use of radio.[128] Looking more closely at these rules, it is apparent that many are duplicative and can lead to confusion among would-be innovators regarding which are the appropriate rules under which to apply, which rules should be followed, and how to apply for a license to develop new or improve on existing technology offerings available today. As with previous sections of this Notice of Proposed Rulemaking, our goal is to put forth proposals to simplify this process. We endeavor to make it easier to move products from the lab to the market – essentially accelerating the innovation that comes from experimental radio use. To achieve this goal, we envision a single "one stop shop" in Part 5 of our rules which makes our processes easier to understand, allows us to eliminate duplicative provisions, and ultimately encourages greater experimentation.

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[126] *See* para. 5, *supra.*

[127] 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.

[128] *See* 47 C.F.R. § 5.3 which describes the scope of service for experimental licenses including, development of radio technique, equipment or engineering data. *See also, e.g.,* 47 C.F.R. § 74.102 which states that that a license for an experimental broadcast station will be issued for the purposes of carrying on research and experimentation for the development and advancement of new broadcast technology, equipment, systems or services; and 47 C.F.R. §80.33(b) which states that a maritime developmental license must contribute to the use of maritime radio services.

76. *Proposal.* As an initial matter, we propose that Part 5 house the consolidated rules and that its title be changed accordingly to remove the distinction between broadcast and all other experimental licenses. Next, we propose to consolidate the plethora of developmental licensing rules that are scattered among various rule parts and that largely mirror the more general experimental licensing rules. Both sets of rules are designed to provide for research, development, and advancements in radio. In addition, both regimes only authorize operation on a non-interference basis[129] and they may be cancelled at any time without the opportunity for a hearing.[130] There are many differences too; whereas experimental applications require the submission of a narrative statement describing in detail the program of research and experimentation proposed,[131] developmental applications for some rule parts must also be accompanied by a Petition for Proposed Rulemaking requesting the FCC to amend its rules as may be necessary to provide for the establishment of the proposed service or technology[132] while others do not have this requirement.[133] In addition, we point out that the regular license term for an experimental license is 2 or 5 years,[134] but that a some developmental licenses are limited to one year or less[135] and others do not have any specified limitation.[136] We believe that the differences between these various rules coupled with the sometimes onerous requirement to submit a Petition for Rulemaking prior to even conducting the developmental program results in confusion and little desire for potential innovators to even apply for developmental operations. This hypothesis is bolstered by an examination of our licensing database which shows a dearth of developmental licenses. We also observe however, that the experimental licensing program is thriving. Since January 1, 2005, the Commission has granted 19 developmental licenses.[137] Over that same time period the Commission has granted 2339 new experimental licenses including special temporary authority, 1464 license renewals and 388 license modifications.[138]

77. We believe that there are enough similarities between the various Commission rules that allow for experimentation that the developmental licensing rules can be subsumed by the experimental licensing rules. Accordingly, we propose to eliminate the developmental rules and evaluate all future applications seeking any form of experimental or developmental authority under our Part 5 experimental

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[129] *See, e.g.,* 47 C.F.R. §§ 5.85(c), 22.403(c), 80.33(f)(3), and 90.511.

[130] *See, e.g.,* 47 C.F.R. §§ 5.83(b), 22.403(a), 87.37(d)(3), and 90.515.

[131] *See* 47 C.F.R. § 5.63(d).

[132] *See, e.g.,* 47 C.F.R. §§ 22.409(b) and 101.407(b).

[133] *See, e.g.,* Maritime Service Developmental License rules in 47 C.F.R. § 80.33, Aeronautical Service Developmental License rules in 47 C.F.R. § 87.37 and Private Land Mobile Radio Service Developmental Operation rules in 47 C.F.R. Part 90, Subpart Q.

[134] *See* 47 C.F.R. § 5.71(a).

[135] *See, e.g.,* 47 C.F.R. §§ 22.403(b) and 101.409(a).

[136] *See* n. 133, *supra.*

[137] Based on records in the Universal Licensing System (http://wireless.fcc.gov/uls), the Commission issued six developmental licenses in calendar year 2005, none in 2006, one in 2007, two in 2008, four in 2009, and six as of October 28, 2010 for a total of nineteen licenses.

[138] An examination of the Experimental Licensing System database (https://fjallfoss.fcc.gov/oetcf/els/reports/GenericSearch.cfm) shows that the Commission granted 409 experimental authorizations in calendar year 2005, 474 in 2006, 285 in 2007, 440 in 2008, 407 in 2009, and 324 as of October 28, 2010.

authorization rules.[139] We believe this will provide clear and consistent guidelines to all parties seeking to experiment and innovate.[140] In addition, because the Part 5 rules are generally more flexible than the various developmental rules, we believe that this will only increase opportunities for experimentation as it removes several barriers that currently exist under our rules. We also point out that the Commission has announced its intention to develop a consolidated licensing system as a long-term initiative to combine the functions of our current licensing and applications systems.[141] The purpose of this initiative is to develop a consolidated licensing system that is transparent, easy to use for the public and Commission staff, consistent with the FCC's data driven and fact-based rulemaking strategies, adaptable to evolving requirements, efficient, cost-effective and green. We believe that our proposals here will also advance the Commission's stated system development goals in this endeavor. We seek comment on our proposal to remove these developmental rules from the various service rule parts, and our observation that the types of operations permitted under developmental licenses can also be granted under our current Part 5 experimental rules.

78. We recognize that the developmental rules are not exact duplicates of our Part 5 rules, and ask if are there any particular requirements under the various developmental rule sections that we must migrate to our Part 5? For example, 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 is to be filed prior to the expiration of the developmental authorization.[142] We propose to retain the current structure of this rule when we move it to Part 5, but to replace the existing requirement that an entity must first obtain a developmental authorization with the requirement that it must obtain an experimental license. We seek comment on this proposal and, more generally, whether the "pre-license" concept embodied in the rule is even necessary. With respect to all of our existing developmental rules, Commenters should specifically identify the rules they believe must be retained, and describe why our Part 5 rules are inadequate by themselves.

79. Noting that there are currently ten active developmental licenses (four with pending renewal applications), we ask how to treat these existing developmental licenses. We propose to reissue these authorizations as experimental licenses under our Part 5 rules, but seek comment on alternate approaches, such as allowing them to run to term and reapply for an experimental license or cancelling them outright and requiring licensees to reapply for an experimental license.

80. As stated above, the Broadcast services have their own set of rules delineating experimentation in Parts 73 and 74 of our rules apart and separate from the more general Part 5 rules. Experiments in the Broadcasting services rely heavily on broadcasting-specific engineering and licensing knowledge, and are typically designed to support the operations of existing broadcasters. Accordingly, we do not propose to alter the process for conducting broadcast experiments under these rules, the ways these applications are filed or evaluated by the Media Bureau, or otherwise disturb existing practice. We do believe, however, that there is value in providing a single place within our rules where an applicant can see the entire breadth of what is permitted on an experimental basis. Thus, we propose to create a new subpart within Part 5 into which we would move the relevant portions of the existing rules that are now in Parts 73 and 74; where possible, we would take advantage of any similarities between existing Part 5

[139] *See* 47 C.F.R. §§ 5.1, 5.3 (setting forth the scope of the rule part).

[140] *Cf.* Streamlining the Commission's Rules and Regulations for Satellite Application and Licensing Procedures, *Report and Order*, IB Docket No. 95-117, 11 FCC Rcd 21581, 21602, para. 51 (1996) (eliminating Part 25 satellite developmental rules based on conclusion that those rules were duplicative of Part 5 and that more consistent policy would evolve for developmental satellite applications if handled under experimental licensing rules).

[141] *See supra* n. 66 and accompanying text.

[142] *See* 47 C.F.R. § 90.250(i).

rules and those currently in Parts 73 and 74 to ensure the removal of duplicative or unneeded rules.[143] One benefit of this unified approach is that we could provide clearer guidance than is available today regarding when an applicant should file for a broadcast experimental license as opposed to a more general experimental license, while retaining the necessary distinctions for broadcast-specific experimentation. We seek comment on this proposal and suggestions for any additional changes to these rules or other modifications necessary to accomplish our goals. Finally, by consolidating these regulations into Part 5 we do not intend to propose any change to the section 106 historic preservation review applicable to broadcast experimental radio stations authorized by the Commission. We seek comment on new section 5.205(c), governing the licensing of such stations, that would clarify that such stations do not qualify for the exclusion applicable generally to experimental authorizations simply because such authorizations are now issued under Part 5 of the rules.[144]

F. Modifying and Improving Rules and Procedures

81. *Background.* Finally, we recognize that by making targeted changes to our experimental rules and procedures, we can open new opportunities for experimentation and remove barriers that may have prevented timely and productive testing. Because experimenting with new devices is a necessary part of the process of innovation, we focus on two areas where we can clarify and modify our rules to make it easier for products and devices to be tested while still providing necessary protection against harmful interference. More generally, we seek comment on whether there are additional rules that we should modify or clarify in order to promote the overall goals of this proceeding.

82. *Anechoic Chambers and Faraday Cages.* The current experimental licensing rules do not address operation within an anechoic chamber[145] or Faraday cage.[146] This has led to many questions over the years regarding licensing requirements when operating RF equipment within either of these spaces. In addressing this situation, Commission staff has generally informed entities that for operations within anechoic chambers or Faraday cages, an experimental license was not needed because the potential for interfering with other radio services was practically non-existent. We now seek to codify this policy in our rules. Specifically, we propose 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. We seek comment on this proposal. Also, we ask commenters to address the following questions. Should we specify a minimum standard for the shielding effectiveness of the chamber? Is their an industry standard that we can reference in setting forth such qualifications? If so, should one be specified within our rules?

83. *Open Area Test Sites.* RF devices must meet certain technical requirements before they may be legally operated within the United States. Compliance with these requirements is ensured through the Commission's equipment authorization process which includes provisions for certification, verification

[143] Specifically, we are proposing to move 47 C.F.R. § 73.1510 and Part 74, Subpart A to Part 5.

[144] *See* 47 C.F.R. Part 1 (Appendix C) (Nationwide Programmatic Regarding the Section 106 National Historic Preservation Act Review Process). The Agreement, at III.C.5, excludes experimental authorizations issued by the Commission from Section 106 review in certain circumstances, but defines " experimental authorization," at II.A.6, not to include Experimental Broadcast Stations authorized under Part 74 of the Rules.

[145] 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.

[146] *See supra* n. 53.

and declaration of conformity.[147] Often the equipment approval process requires testing at an open area test site (OATS).[148] An OATS is typically located outside in areas free of reflective objects. Under our current rules, an experimental license is required for radiation emissions testing in conjunction with regulatory approval.[149] How should entities engaged in open area testing, but that are not themselves manufacturers or licensed service providers, be authorized to conduct their work? Should we make specific provisions in our Part 5 experimental radio service rules to issue licenses to these entities? If so, should the licenses be patterned after the program license model discussed above, or in a different manner? What would be an appropriate license term and renewal process for such a license? Is there a different way to authorize these entities to perform testing? Are there any limitations that we should place on outdoor open area test sites? We seek comment on this matter.

84. *Additional proposals.* Finally, we seek comment on whether there are other rules we should incorporate into a revised and streamlined Part 5, and whether there are specific provisions of Part 5 or related rules that should be modified, clarified, or even eliminated to foster greater innovation. As an initial matter, we ask whether we should modify our rules to permit operation of radio frequency devices that are not yet certified without the need for 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 our Part 15 rules. For example, we believe that it would be beneficial to permit a land mobile radio that has been modified to not operate in excess of the Part 15 power limits to be demonstrated without requiring an experimental authorization, given that our current rules allow demonstrations of devices designed to operate under the Part 15 rules.[150] Under such an approach, are there necessary limitations – such as restricting use to indoor environments or excluding the use of devices while in motion[151] – that we need to consider? We seek comment. We also find that there are several Part 5 rules that warrant additional review. For example, by eliminating the developmental rules, we can also delete Section 5.51(b) which directs potential applicants eligible for a service specific license seeking to develop an improvement in that service to apply for a developmental license rather than an experimental license. We note that Section 5.51(a) limits prospective applicants to persons qualified to conduct experimentation utilizing radio waves. Does this technical fitness test discourage potential innovators who wish to explore new ideas from seeking approval to conduct experiments and, if so, how could we modify or restate this requirement? We also seek comment on whether other provisions of our rules serve to create unnecessarily burdensome checks on robust experimentation. Does Section 5.125, which restricts communications to other experimental stations authorized under Part 5, stifle the potential

[147] *See* 47 C.F.R. Part 2, Subpart J, Equipment Authorization Procedures. Certification is an equipment authorization issued by the Commission based on test data submitted by the applicant. Verification is a procedure where the manufacturer makes measurements to insure that the equipment complies with the appropriate technical standards. Declaration of Conformity is a procedure where the responsible party makes measurements to insure that the equipment complies with the appropriate technical standards.

[148] 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. *See* https://sbwsweb.ieee.org/ecustomercme_enu/start.swe?SWECmd=GotoView&src=0&Join=n&SWEView=Catalog+View+%28eSales%29_Main_JournalMags_IEEE&mem_type=Customer&HideNew=N&SWEHo=sbwsweb.ieee.org&SWETS=1288719409.

[149] *See* 47 C.F.R. § 5.3(g).

[150] *See* 47 C.F.R. § 2.803..

[151] For example, manufacturers and service providers sometimes provide a bus in which they conduct product demonstrations of devices while moving at various speeds around a city.

for innovative technical solutions between experimental and developmental stages of product developments?

85. We seek comment on our proposals as discussed both within in this Notice of Proposed Rulemaking and in the accompanying appendix that sets forth our proposed rules, and on any related matter that is raised in this context. Commenters proposing a different course than we have proposed in either this text or the accompanying rules should provide specific information detailing how their proposals fit into our overall goals of providing more flexibility for innovation and providing clear, concise experimental guidelines to the public.

IV. PROCEDURAL MATTERS

A. Filing Requirements

86. *Ex Parte* Rules. This proceeding will be treated as a "permit-but-disclose" subject to the "permit-but-disclose" requirements under Section 1.1206(b) of our rules.[152] *Ex parte* presentations are permissible if disclosed in accordance with Commission rules, except during the Sunshine Agenda period when presentations, *ex parte* or otherwise, are generally prohibited. Persons making oral *ex parte* presentations are reminded that a memorandum summarizing a presentation must contain a summary of the substance of the presentation and not merely a listing of the subjects discussed. More than a one- or two-sentence description of the views and arguments presented is generally required.[153] Additional rules pertaining to oral and written presentations are set forth in Section 1.1206(b).

87. *Comments and Reply Comments*. Pursuant to sections 1.415 and 1.419 of our rules, 47 CFR §§ 1.415, 1.419, interested parties may file comments and reply comments on or before the dates indicated on the first page of this document. Comments may be filed using: (1) the Commission's Electronic Comment Filing System (ECFS), (2) the Federal Government's eRulemaking Portal, or (3) by filing paper copies.[154] *See Electronic Filing of Documents in Rulemaking Proceedings*, 63 FR 24121 (1998).

- Electronic Filers: Comments may be filed electronically using the Internet by accessing the ECFS: http://fjallfoss.fcc.gov/ecfs2/ or the Federal eRulemaking Portal: http://www.regulations.gov.

- Paper Filers: Parties who choose to file by paper must file an original and four copies of each filing. If more than one docket or rulemaking number appears in the caption of this proceeding, filers must submit two additional copies for each additional docket or rulemaking number.

  Filings can be sent by hand or messenger delivery, by commercial overnight courier, or by first-class or overnight U.S. Postal Service mail. All filings must be addressed to the Commission's Secretary, Office of the Secretary, Federal Communications Commission.

  - All hand-delivered or messenger-delivered paper filings for the Commission's Secretary must be delivered to FCC Headquarters at 445 12th St., SW, Room TW-A325, Washington, DC 20554. The filing hours are 8:00 a.m. to 7:00 p.m. All hand deliveries must be held together with rubber bands or fasteners. Any envelopes must be disposed of before entering the building.

[152] *See* 47 C.F.R. § 1.1206(b).

[153] *See id.* § 1.1206(b)(2).

[154] *See Electronic Filing of Documents in Rulemaking Proceedings*, 63 FR 24121 (1998).

- Commercial overnight mail (other than U.S. Postal Service Express Mail and Priority Mail) must be sent to 9300 East Hampton Drive, Capitol Heights, MD 20743.

- U. S. Postal Service first-class, Express and Priority mail must be addressed to 445 12th Street, S.W., Washington, DC 20554.

88. People with Disabilities: To request materials in accessible formats for people with disabilities (braille, large print, electronic files, audio format), send an e-mail to fcc504@fcc.gov or call the Consumer & Governmental Affairs Bureau at 202-418-0530 (voice), 202-418-0432 (tty).

89. Further Information: For further information, contact James Burtle at (202) 418-2445, Doug Young at (202) 418-2440, and James Miller at (202) 418-7351, Office of Engineering and Technology; or via the Internet at James.Burtle@fcc.gov, Douglas.Young@fcc.gov, and James.Miller@fcc.gov.

B. Initial Regulatory Flexibility Analysis

90. As required by the Regulatory Flexibility Act, *see* 5 U.S.C. § 603, the Commission has prepared an Initial Regulatory Flexibility Analysis (IFRA) of the possible significant economic impact on small entities of the policies and rules proposed in the Notice. An Initial Regulatory Flexibility Analysis is included in Appendix B.

C. Paperwork Reduction Act

91. This document contains proposed modified information collection requirements. The Commission, as part of its continuing effort to reduce paperwork burdens, invites the general public and the Office of Management and Budget (OMB) to comment on the information collection requirements contained in this document, as required by the Paperwork Reduction Act of 1995, Public Law 104-13. In addition, pursuant to the Small Business Paperwork Relief Act of 2002, Public Law 107-198, *see* 44 U.S.C. 3506(c)(4), we seek specific comment on how we might further reduce the information collection burden for small business concerns with fewer than 25 employees.

V. ORDERING CLAUSES

92. 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 Notice of Proposed Rulemaking IS ADOPTED.

93. IT IS FURTHER ORDERED, that the Commission's Consumer and Governmental Affairs Bureau, Reference Information Center, SHALL SEND a copy of this Notice of Proposed Rule Making, including the Initial Regulatory Flexibility Analysis, to the Chief Counsel for Advocacy of the Small Business Administration.

FEDERAL COMMUNICATIONS COMMISSION

Marlene H. Dortch
Secretary

APPENDIX A

Proposed Rules

For the reasons set forth in the preamble the Federal Communications Commission proposes to amend 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 (including market trials).* Part 5 deals with 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 (including market trials) are set forth in part 5 of this chapter.

* * * * *

5. Section 1.544 is amended by revising the entire section to read as follows:

§ 1.544 Application for broadcast station to conduct field strength measurements and for experimental operation.

See §§5.59 and 5.203.

6. 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.
* * *	* * *

* * * * *

7. 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.

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

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

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

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

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 devices 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 device unless:

(1) For devices subject to certification, the device has been authorized by the Commission in accordance with the rules in this chapter and is properly identified and labeled as required by §2.925 and other relevant sections in this chapter; or

(2) For devices subject to authorization under verification or Declaration of Conformity, the device complies with all applicable, technical, labeling, identification and administrative requirements; or

(3) For devices that do not require a grant of equipment authorization issued by the Commission, but which must comply with the specified technical standards prior to use, the device 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 F of this chapter.

(2) Limited marketing for devices 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 devices 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 device 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 device may be advertised or displayed, (e.g., at a trade show or exhibition) if accompanied by a conspicuous notice containing this language:

> This device has not been authorized as required by the rules of the Federal Communications Commission. This device 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.

(d) Importation. The provisions of subpart K of this part continue to apply to imported radio frequency devices.

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

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

(a) General rule. A radio frequency device may not be operated prior to equipment authorization.

(b) Exceptions. 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 devices operated under these provisions may not be marketed (as defined in Section 2.803(a) of this part):

(1) The radio frequency 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; and

(2) Operation is conducted under the authority of a service license or a grant of special temporary authority, or the radio frequency device is designed to operate under Parts 15, 18, or 95 of this chapter; and

(3) The radio frequency device will be operated for at least one of these purposes:

(i) Conducting compliance testing;

(ii) Demonstrations at a trade show provided a notice containing the wording specified in Section 2.803(c)(1)(iii) of this part is displayed in a conspicuous location on, or immediately adjacent to, the device;

(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 Section 2.803(c)(1)(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 FCC rules and that the equipment will comply with the appropriate rules before delivery to the buyer or to centers of distribution; or

(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)(1)(iii) of this part.

(c) 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 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 of this part continue to apply to imported radio frequency devices.

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

§ 2.1204 Import conditions.

(a) Radio frequency devices may be imported only if one or more of these conditions are met:

* * *

(3) The radio frequency device is being imported in limited quantities for testing and evaluation to determine compliance with the FCC Rules and Regulations, product development, or suitability for marketing. The devices will not be offered for sale or marketed. The phrase "limited quantities," in this context means:

(i) 2000 or fewer units, provided the product is designed, at least in part, for operation within one of the Commission's authorized radio services for which an operating license is required to be issued by the Commission; or

(ii) 1200 or fewer units for all other products.

* * * * *

14. Part 5 is amended by revising the entire part to read as follows:

PART 5—EXPERIMENTAL RADIO SERVICE (INCLUDING MARKET TRIALS)

Subpart A—General

Sec.

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§ 5.3 Scope of service.
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Subpart B—Applications and Licenses

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§ 5.331 Eligibility.
§ 5.333 Area of operations.

REQUIREMENTS SPECIFIC TO MEDICAL PROGRAM EXPERIMENTAL RADIO LICENSES

§ 5.341 Eligibility.
§ 5.343 Additional requirements.

Subpart F – Product Development and Market Trials

§ 5.401 Product Development Trials.
§ 5.403 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) 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) This part prescribes the manner in which parts of the radio frequency spectrum may be made available for experimentation as defined and provided for in this part.

(c) This part prescribes the manner for conducting 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) 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.

(j) Product development and market trials.

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

§ 5.5 Definition of terms.

For the purpose 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.

Fixed service. A radiocommunication service between specified fixed points.

Fixed station. A station in the fixed service.

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.

Land station. A station in the mobile service not intended for operation while in motion.

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

Mobile service. A radiocommunication service between mobile and land stations, or between mobile stations.

Mobile station. A station in a mobile service intended to be used while in motion or during halts at unspecified points.

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

Product development trials. An experimental program designed to evaluate product performance in the conceptual, developmental, and design stages, and typically requires testing under expected use conditions.

Public correspondence. Any telecommunication that offices and stations, by reason of their being at the disposal of the public, must accept for transmission.

Radio service. An administrative subdivision of the field of radiocommunication. In an engineering sense, the subdivisions may be made according to the method of operation, as, for example, mobile service and fixed service. In a regulatory sense, the subdivisions may be descriptive of particular groups of licensees, as, for example, the groups of persons licensed under this part.

Station authorization. Any license or special temporary authorization issued by the Commission.

Subpart B—Applications and Licenses

License requirements.

§ 5.51 Eligibility of license.

(a) Authorizations for stations in the Experimental Radio Service will be issued only to persons qualified to conduct experimentation (including product development and market trials) using radio waves in a manner not provided by existing rules.

(b) A station license shall not be granted to or held by a foreign government or a representative thereof.

§ 5.53 Station authorization required.

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

§ 5.54 Types of authorizations available.

The Commission will issue the following types of experimental licenses:

(a)(1) Conventional experimental radio license. A *conventional experimental radio license* will be issued for the conduct of a specific or series of related research or experimentation projects related to the development and advancement of new radio technologies and techniques or 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 shall be considered temporary and the special temporary authorization procedure outlined in §5.61 of this part shall apply.

(b) Broadcast experimental radio license. A *broadcast experimental radio license* will be issued for the purposes of carrying on 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. A *program experimental radio license* will be issued to qualified institutions and carry broad authority to conduct an ongoing program of research and experimentation under a single experimental authorization subject to the requirements of subpart E of this part. Three types of program experimental radio licenses are available.

(1) Research institutions. These experimental licenses are available to qualified colleges, universities, and non-profit research organizations.

(2) Innovation zones. These experimental licenses are available to entities with technical credentials demonstrating competence in radio engineering for experimentation within Commission defined geographic areas.

(3) Medical research. These experimental licenses are available to hospital and health care institutions that demonstrate basic expertise in radio management for the testing and operation of new medical devices that use wireless telecommunications technology for therapeutic and diagnostic purposes or patient monitoring functions

General Filing Requirements.

§ 5.55 Filing of applications.

(a) To assure that necessary information is supplied in a consistent manner by all persons, standard forms are prescribed for use in connection with applications, except for applications for special temporary authority (STA), and reports submitted for Commission consideration. Standard numbered forms applicable to the Experimental Radio Service are discussed 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 station location, proposed equipment, power, antenna height, and operating frequency; and other information required by the application form and this part.

(d) For conventional and program experimental radio licenses:

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

(2) Applications for special temporary authority 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 filed in accordance with the provisions of §5.59 of this part.

§ 5.57 Who may sign applications.

(a) Except as provided in paragraph (b) of this section, 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 and program experimental radio licenses.*

(1) *Application for new or modification.* 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 or modification.* 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 STA not to exceed 6 months for operation of a conventional experimental radio service station.

(2) Applications for STA must be filed 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 defined in §1.915(b)(1), a request for STA may be made by telephone or telegraph provided a properly signed application is filed within 10 days of such request.

(b) An application for special temporary authorization shall contain the following information:

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

(2) Description 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 (fixed, mobile, fixed and mobile) 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(ies) desired.

(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 a special temporary authorization will be granted provided that an application for a regular experimental license that is consistent with the terms and conditions of that temporary authority has been filed at least 15 days prior to the expiration of the licensee's temporary authority. When such an application is timely filed, operations may continue in accordance with the other terms and conditions of the temporary authority 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 a narrative statement describing how the applicant meets the eligibility criteria set forth in subpart E of this part.

§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 will be entirely at the applicant's risk and will 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, 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 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 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. In general, an assessment shall include an estimate as to whether portions of the spacecraft will survive re-entry and reach the surface of the Earth, as well as an estimate of the resulting probability of human casualty.

§ 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 not be accepted 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, a 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. Such dismissal will be without prejudice.

§ 5.69 License grants that differ from applications.

In cases when the Commission grants a license 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 request, the Commission will coordinate with the applicant in an attempt to resolve problems arising from the grant.

§ 5.71 License period.

(a) Conventional experimental radio licenses.

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

(2) A license may be renewed for up to 5 years upon an adequate showing of need to complete the experiment.

(b) Program experimental radio licenses. Licenses are issued for 5 years and may be renewed.

(c) Broadcast experimental radio license. Licenses for broadcast experimental radio stations will be issued for a maximum one-year period.

§ 5.73 Experimental report.

(a) Conventional experimental radio licenses.

(1) The Commission may, as a condition of authorization, may request the licensee to 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) Program and broadcast experimental radio licenses must follow the requirements in §§ 5.207 and 5.309, respectively.

§ 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 power output complies with the license and the regulations governing the same; and

(4) That the transmitter as a whole or output power rating of the transmitter is not changed.

(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 license 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 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, the licensee shall notify the Commission.

§ 5.83 Cancellation provisions.

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

(a) that 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) that said 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 basis.

Operation of an experimental radio station is permitted only on the condition that harmful interference will not be 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 develops, the licensee shall cease transmissions and such transmissions shall not be resumed until it is certain that harmful interference will not be caused.

§ 5.85 Frequencies and policy governing their assignment.

(a) Stations operating in the Experimental Radio Service may be authorized to use any government or non-government 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 be authorized the use of any frequency or frequency band exclusively allocated to the passive services (including the radio astronomy service).

(b) Each frequency or band of frequencies available for assignment to stations in the Experimental Radio Service is available on a shared basis only, will not be assigned for the exclusive use of any one applicant, and such use may also be restricted to specified geographical areas.

(c) *Broadcast experimental radio stations.*

(1) Frequencies best suited to the purpose of the experimentation and on which there appears to be the least likelihood of interference to established stations shall be selected.

(2) Except as indicated, only frequencies allocated to broadcasting service will be 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.* Applicants in the Experimental Radio Service must avoid use of public safety frequencies identified in part 90 of this chapter except when a compelling showing can be 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 be conditioned to require coordination between the experimental licensee and the appropriate frequency coordinator and/or all of the public safety licensees in its intended 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 harmful 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/m^2 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 consult with the FCC's Enforcement Bureau, telephone (202) 418–1210, to discuss any protection necessary.

(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 (e)(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 (e) (2) and (3) of this section.

§ 5.91 Notification of 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 a station authorization other than mobile, temporary base, temporary fixed, Personal Radio, Civil Air Patrol, or Amateur seeking a station license for a new station, or a construction permit to construct a new station or to modify an existing station license in a manner that would change either the frequency, power, antenna height or directivity, or location of such a station within the area bounded by 39 deg. 15' N on the north, 78 deg. 30' W on the east, 37 deg. 30' N on the south and 80 deg. 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 comply with the requirements set forth in §§1.41 through 1.52 of this chapter.

Subpart C—Technical Standards and Operating Requirements

§ 5.101 Frequency stability.

Licensees must use a frequency tolerance that would confine emissions within the band of operation, unless permission is granted to use a lesser frequency tolerance. 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.

Each authorization issued to a station operating in this service will show, as the prefix to the emission classification, a figure specifying the maximum necessary bandwidth for the emission used. The authorized bandwidth is considered to be the occupied or necessary bandwidth, whichever is greater. This bandwidth shall be determined in accordance with §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) 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 Inspection and maintenance of antenna structure marking and associated control equipment.

The owner of each antenna structure required to be painted and/or illuminated under the provisions of Section 303(q) of the Communications Act of 1934, as amended, shall operate and maintain the antenna structure painting and lighting in accordance with part 17 of this chapter. In the event of default by the owner, each licensee or permittee shall be individually responsible for conforming to the requirements pertaining to antenna structure painting and lighting.

§5.110 Power limitations.

(a) The operating power for all stations authorized under the experimental radio service shall be limited to the minimum practical radiated power.

(b) For broadcast experimental radio stations, the operating power shall not exceed more than 5 percent above 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 shall make 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.

(1) Research licenses and innovation zone licenses must comply with either:

(i) 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

(ii) Stations may post information sufficient to identify it on the web site

(2) Medical facility licenses. Stations authorized under a medical facility license are exempt from the station identification requirement.

§ 5.121 Station record requirements.

(a) For Conventional and program 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.

(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 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.

§ 5.203 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.

Technical Operation and Operators

§ 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

Requirements for all 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.

§ 5.303 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). In addition, licensees may not use any frequency or frequency band below 38.6 GHz that is listed in §15.205(a).

§ 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.

§ 5.307 Responsible party.

(a) Each program experimental radio license 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 rules; and

(b) The responsible individual will serve as the initial point of contact for all matters involving interference resolution and must have the ability to discontinue any and all experiments being conducted under the license, if necessary.

(c) 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 will be listed on the license. Licensees are required to keep this information current.

§ 5.309 Notification requirements.

(a) At least seven calendar days prior to commencement of any experiment under a program experimental radio license, licensees must provide the following information to the web site http://www.XXX.gov/????:

(1) a narrative statement describing the experiment;

(2) contact information for the researcher in charge; and

(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 as required by §5.311 of this part, if necessary; and

(vii) for medical program experimental radio licenses, the rule part for which the experimental device is intended.

(b) Experiments may commence without specific approval or authorization once the seven calendar days has elapsed. However, if any licensee of an authorized service raises interference concerns, it must contact the program license responsible party and it must post its complaint along with supporting documentation to the web page http://www.XXX.gov/????. The experiment shall not commence until the parties resolve the complaint. The complainant bears the burden of proof that the proposed experiment will cause harmful interference. It is expected that parties work in good faith to resolve such concerns, including modifying experiments if necessary to reach an agreeable resolution.

(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 web site http://www.XXX.gov/???? and be associated with the materials described in paragraphs (a) and (b) of this section.

(e) All information submitted pursuant to this section will be made publicly available.

§ 5.311 Additional requirements related to safety of the public.

For experiments that may affect 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 and end users, who might be affected by the experiment;

(b) providing for the quick identification and elimination of any harm the experiment may cause; and

(c) providing an alternate means for accomplishing potentially affected vital public safety functions during the experiment.

Requirements specific to research program experimental radio licenses

§ 5.321 Eligibility.

Research experimental licensees must:

(a) Be (i) an Accreditation Board for Engineering and Technology (ABET) accredited college or university with a graduate research program or existing industry partnership or (ii) a Nationally recognized non-profit research laboratory.

(b) Have a defined campus setting; and

(c) Have institutional processes to monitor and effectively manage a wide variety of research projects.

§5.323 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.

Requirements specific to innovation zone program experimental radio licenses

§ 5.331 Eligibility.

Each licensee must hold appropriate technical credentials demonstrating technical competence in radio spectrum management.

§ 5.333 Area of operations.

Innovation zone program experimental radio licenses are restricted to areas designated by the Commission as innovation zones, available for use by multiple parties, and will be listed on the Commission's web site.

Requirement specific to medical program experimental radio licenses

§ 5.341 Eligibility. Medical program experimental radio licenses may be granted to hospitals and health care institutions that have demonstrated expertise in radio spectrum management.

§ 5.343 Additional requirements.

(a) Experiments conducted under the authority of a medical program experimental radio license are limited to therapeutic and diagnostic medical equipment that is designed to meet the Commission's rules for such equipment.

(b) Licensees of medical program experimental radio licenses shall file a yearly report of the activity that has been performed under the license.

Subpart F – Product Development and Market Trials

§ 5.401 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(j) 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 limitations as the Commission shall 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.

§ 5.403 Market Trials.

Unless otherwise stated in the instrument of authorization, experimental radio licenses granted for the purpose of market trials pursuant to §5.3(j) 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, 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. A service provider shall be either a current FCC licensee or eligible for a license in the service that would eventually deploy the device being tested. If more than one licensee is authorized, one shall be designated as the responsible party for the trial.

(d) All transmitting and/or receiving equipment used in the study shall be owned by the 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.

PART 22—PUBLIC MOBILE SERVICES

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

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

16. Section 22.165 is amended by revising paragraph (d)(2) to read as follows:

§ 22.165 Additional transmitters for existing systems.

* * * * *

(d) * * *

(2) Additional transmitters in the 43 MHz frequency range operate under experimental authority pursuant to Part 5 of this chapter.

* * * * *

17. Section 22.377 is revised by removing and reserving paragraph (b) to read as follows:

§ 22.377 Certification of transmitters.

* * * * *

(b) (Reserved)

18. Part 22, Subpart D is revised by removing and reserving the D.

Subpart D (Reserved)

19. Section 22.591 is amended by revising the first sentence of paragraph (a) to read as follows:

§ 22.591 Channels for point-to-point operation.

* * * * *

(a) The 72–76 MHz channels may be assigned under experimental authority pursuant to Part 5 of this chapter and the requirements of Section 22.599, paragraphs (c) and (d) of this part. * * *

* * * * *

20. Section 22.599 is amended by revising paragraph (b) and adding a new paragraphs (c) and (d) to read as follows:

§ 22.599 Assignment of 72–76 MHz channels.

* * * * *

(b) 72–76 MHz channels may be assigned for use within 16 kilometers (10 miles) of a full service TV station transmitting on TV Channel 4 or 5 under an experimental authorization, pursuant to Part 5 of this chapter. However, for use within 50 meters (164 feet) of a TV station transmitting on TV Channel 4 or 5, 72–76 MHZ channels may be assigned under a regular authorization, rather than an experimental authorization.

(c) *Carrier responsibility*. Carriers so authorized shall operate the 72–76 MHz fixed station under experimental authority for a period of at least six months. During the experimental period, carriers must resolve any broadcast television receiver interference problems that may occur as a result of operation of the 72–76 MHz transmitter(s).

(d) *Exceptions*. The FCC may grant a regular authorization in the Paging and Radiotelephone Service for a 72–76 MHz fixed station under the following circumstances:

(1) After six months of operation under experimental authorization, and provided that broadcast TV interference complaints have been resolved by the carrier in a satisfactory manner. Licensees that hold an experimental authorization for a 72–76 MHz fixed station and wish to request a regular authorization must file an application using FCC Form 601 via the ULS prior to the expiration of the experimental authorization.

(2) In the case of the assignment of or a transfer of control of a regular authorization of a 72–76 MHz fixed station in the Paging and Radiotelephone Service, the FCC may grant such assignment or consent to such transfer of control provided that the station has been in continuous operation providing service with no substantial interruptions.

PART 73--RADIO BROADCAST SERVICES

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

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

22. Section 73.1510 is deleted:

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

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

* * * * *

Subpart A (Reserved)

* * * * *

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

Authority: 47 U.S.C. 154, 302a, 303, 307, 336(f), 336(h) and 554.

25. 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.

26. 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:

* * * * *

27. 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.

28. 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.

29. 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.

30. Part 74, Subpart A is amended by removing and reserving the entire subpart A.

Subpart A (Reserved)

31. 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

32. 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.

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

34. Section 80.33 is amended by deleting the entire section.

35. Section 80.203 is amended by removing and reserving paragraph (j) to read as follows:

§ 80.203 Authorization of transmitters for licensing.

* * * * *

(j) (Reserved)

* * * * *

36. Section 80.211 is amended by deleting paragraph (g).

37. Section 80.377 is amended by revising the entire section 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).

38. Section 80.391 is amended by removing the title "Developmental Stations" above the section and deleting the entire section.

PART 87—AVIATION SERVICES

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

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

40. Section 87.27 is amended 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.

41. Section 87.37 is amended by deleting the entire section.

PART 90—PRIVATE LAND MOBILE RADIO SERVICES

42. 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).

43. Section 90.7 is amended by removing the definition for "Developmental Operation."

44. Section 90.20 is amended by removing and reserving paragraph 90.20(e)(3) to read as follows:

§ 90.20 Public Safety Pool.

* * * * *

(e) * * *

(3) (Reserved)

* * * * *

45. Section 90.35 is amended by removing the entry for "8,400 to 8,500" from the table in section 90.35(b) and by removing and reserving paragraphs 90.35(c)(75), 90.35(d)(6) and 90.35(e)(2) to read as follows:

§ 90.35 Industrial/Business Pool.

* * * * *

(c) * * *

(75) (Reserved)

* * * * *

(d) * * *

(6) (Reserved)

* * * * *

(e) * * *

(2) (Reserved)

* * * * *

46. Section 90.129 is amended by removing reserving paragraph 90.129(f) to read as follows:

§ 90.129 Supplemental information to be routinely submitted with applications.

* * * * *

(f) (Reserved)

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47. Section 90.149 is amended by deleting paragraph 90.149(c).

48. Section 90.175 is amended by removing and reserving paragraph 90.175(j)(4) to read as follows:

§ 90.175 Frequency coordinator requirements.

* * * * *

(j) * * *

(4) (Reserved)

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49. Section 90.203 is amended by removing and reserving paragraph 90.203(b)(1) to read as follows:

§ 90.203 Certification required.

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(b) * * *

(1) (Reserved)

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50. Section 90.241 is amended by deleting paragraph 90.241(e).

51. Section 90.250 is amended by revising paragraph (i) to read as follows:

§ 90.250 Meteor burst communications.

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(i) Stations employing meteor burst communications shall 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.

52. Part 90, Subpart Q is amended by removing and reserving the entire subpart Q.

Subpart Q (Reserved)

PART 101—FIXED MICROWAVE SERVICES

53. The authority citation of Part 101 continues to read as follows:

Authority: 47 U.S.C. 154, 303.

54. Section 101.21 is amended by removing and reserving paragraph (b) to read as follows:

§ 101.21 Technical content of applications.

* * * * *

(b) (Reserved)

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55. 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.

* * * * *

56. Part 101, Subpart F is amended by removing and reserving the entire subpart F.

Subpart F (Reserved)

APPENDIX B

Initial Regulatory Flexibility Analysis

As required by the Regulatory Flexibility Act of 1980, as amended (RFA),[1] the Commission has prepared this present Initial Regulatory Flexibility Analysis (IRFA) of the possible significant economic impact on small entities by the policies and rules proposed in this Notice of Proposed Rule Making (NPRM). Written public comments are requested on this IRFA. Comments must be identified as responses to the IRFA and must be filed by the deadlines specified on the first page of this NPRM. The Commission will send a copy of this NPRM, including this IRFA, to the Chief Counsel for Advocacy of the Small Business Administration (SBA).[2] In addition, the NPRM and IRFA (or summaries thereof) will be published in the Federal Register.[3]

A. Need for and Objectives of the Proposed Rules.

In this NPRM the Commission takes steps to promote innovation and efficiency in spectrum use in our Part 5 Experimental Radio Service (ERS). For many years, the ERS has provided fertile ground for testing innovative ideas that have led to new services and new devices for all sectors of the economy. We propose specific steps to accelerate the rate at which these ideas transform from prototypes to consumer devices and services. These proposals will 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.

Six areas have been targeted which can provide increased opportunities for experimentation and innovation. In particular, our Notice of Proposed Rulemaking (NPRM) proposes to: (1) create new opportunities for universities and researchers to use a wide variety of radio frequencies for experimentation under a broad research license that eliminates the need to obtain prior authorization before conducting individual experiments; (2) empower researchers to conduct tests in specified geographic locations with pre-authorized boundary conditions through the creation of new "innovation zones"; (3) promote advancement in the development of medical radio devices by creating a medical experimental authorization that would be available to qualified hospitals, Veterans Administration (VA) facilities, and other medical institutions; (4) broaden opportunities for market studies by revising and consolidating our rules; (5) promote greater overall experimentation by streamlining our existing rules and procedures; and (6) open new opportunities for experimentation by making targeted modifications to our rules and procedures.

B. Legal Basis:

This action is authorized under Sections 4(i), 301, and 303 of the Communications Act of 1934, as amended, 47 U.S.C. §§ 154(i), 301, and 303.

C. Description and Estimate of the Number of Small Entities to Which the Rules May 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.[4] The RFA generally defines the term "small

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[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* 5 U.S.C. § 603(a).

[3] *See* 5 U.S.C. § 603(a).

[4] *See* 5 U.S.C. §§ 603(b)(3), 604(a)(3).

entity" as having the same meaning as the terms "small business," "small organization," and "small governmental jurisdiction."[5] In addition, the term "small business" has the same meaning as the term "small business concern" under the Small Business Act.[6] 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 Small Business Administration (SBA).[7]

Nationwide, there are a total of approximately 29.6 million small businesses, according to the SBA.[8] A "small organization" is generally "any not-for-profit enterprise which is independently owned and operated and is not dominant in its field."[9] Nationwide, as of 2002, there were approximately 1.6 million small organizations.[10] The term "small governmental jurisdiction" is defined generally as "governments of cities, towns, townships, villages, school districts, or special districts, with a population of less than fifty thousand."[11] Census Bureau data for 2002 indicate that there were 87,525 local governmental jurisdictions in the United States.[12] We estimate that, of this total, 84,377 entities were "small governmental jurisdictions."[13] 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 a projected 1,481 in 2010.[14] By contrast, much less activity takes place under our developmental rules. Since 1999 in the non-broadcast (wireless) radio services, ten developmental licenses have been granted under Part 22 (Public Mobile Services), one has been granted under Part 80 (Maritime Services), 37 have been granted under Part 87 (Aviation Services), and eight have been granted under Part 90 (Private Land Mobile Radio Services). None have been granted since 1999 under Part 101 (Fixed Microwave Services).

Wireless Telecommunications Carriers (except Satellite). Since 2007, the Census Bureau has placed wireless firms within this new, broad, economic census category.[15] Prior to that time, such firms were

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[5] *Id.*, § 601(6).

[6] *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."

[7] *See* 15 U.S.C. § 632.

[8] *See* SBA, Office of Advocacy, "Frequently Asked Questions," http://web.sba.gov/faqs/faqindex.cfm?areaID=24 (revised Sept. 2009).

[9] *See* 5 U.S.C. § 601(4).

[10] Independent Sector, The New Nonprofit Almanac & Desk Reference (2002).

[11] *See* 5 U.S.C. § 601(5).

[12] U.S. Census Bureau, Statistical Abstract of the United States: 2006, Section 8, page 272, Table 415.

[13] We assume that the villages, school districts, and special districts are small, and total 48,558. *See* U.S. Census Bureau, Statistical Abstract of the United States: 2006, section 8, page 273, Table 417. For 2002, Census Bureau data indicate that the total number of county, municipal, and township governments nationwide was 38,967, of which 35,819 were small. *Id.*

[14] 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 Authority. *See* https://fjallfoss.fcc.gov/oetcf/els/reports/GenericSearch.cfm.

[15] U.S. Census Bureau, 2007 NAICS Definitions, "517210 Wireless Telecommunications Categories (Except Satellite)"; http://www.census.gov/naics/2007/def/ND517210.HTM#N517210.

within the now-superseded categories of "Paging" and "Cellular and Other Wireless Telecommunications."[16] Under the present and prior categories, the SBA has deemed a wireless business to be small if it has 1,500 or fewer employees.[17] 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.[18] Of this total, 804 firms had employment of 999 or fewer employees, and three firms had employment of 1,000 employees or more.[19] 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.[20] Of this total, 1,378 firms had employment of 999 or fewer employees, and 19 firms had employment of 1,000 employees or more.[21] Thus, we estimate that the majority of wireless firms are small.

Fixed Microwave Services. Fixed microwave services include common carrier,[22] private operational-fixed,[23] and broadcast auxiliary radio services.[24] 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.[25] The Commission does not have data specifying the 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

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[16] 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.

[17] *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).

[18] 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).

[19] *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."

[20] 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).

[21] *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."

[22] *See* 47 C.F.R. §§ 101 *et seq.* for common carrier fixed microwave services (except Multipoint Distribution Service).

[23] 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.

[24] 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.

[25] *See* 13 C.F.R. § 121.201, NAICS code 517210.

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, 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 NPRM 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).[26] Prior to that time, such firms were within the now-superseded category of "Paging" and "Cellular and Other Wireless Telecommunications."[27] Under the present and prior categories, the SBA has deemed a wireless business to be small if it has 1,500 or fewer employees.[28] 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.[29] Of this total, 804 firms had employment of 999 or fewer employees, and three firms had employment of 1,000 employees or more.[30] 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.[31] Of this total, 1,378 firms had employment of 999 or fewer employees, and 19 firms had employment of 1,000 employees or more.[32] 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.[33] The Commission has not developed a small business size standard 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

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[26] U.S. Census Bureau, 2007 NAICS Definitions, "517210 Wireless Telecommunications Categories (Except Satellite)"; http://www.census.gov/naics/2007/def/ND517210.HTM#N517210.

[27] 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.

[28] *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).

[29] 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).

[30] *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."

[31] 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).

[32] *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."

[33] 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 Docket No. 96-82, 11 FCC Rcd 14849 (1996).

fewer employees.[34] 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.[35] 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.[36] Further, the Commission made available Automated Maritime Telecommunications System ("AMTS") licenses in Auctions 57 and 61.[37] 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.[38] 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.[39] There are a total of approximately 127,540 licensees in these services. Governmental entities[40] as well as private businesses

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[34] *See* 13 C.F.R. § 121.201, NAICS code 517210.

[35] A licensee may have a license in more than one category.

[36] *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).

[37] *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).

[38] *See* 47 C.F.R. § 80.1252.

[39] 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.

[40] *See* 47 C.F.R. § 1.1162.

comprise the licensees for these services. All governmental entities with populations of less than 50,000 fall within the definition of a small entity.[41] The small private businesses fall within the "wireless" category described *supra*.

D. Description of Projected Reporting, Recordkeeping and Other Compliance Requirement for Small Entities.

The Notice of Proposed Rulemaking proposes to create a new type of experimental radio license, the program experimental radio license, which will 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 our existing rules. We have proposed new license application rules for these licenses, and program experimental radio licensees would 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 Notice of Proposed Rulemaking also proposes to consolidate, clarify and streamline existing rules to facilitate experimentation in the radio spectrum. These proposed rules will, for example, permit entities to engage in additional marketing activities, but will more clearly specify when and how such marketing may take place, and what authorization is needed to operate radiofrequency equipment in conjunction with marketing activities. We project that by creating a new license type and by revising our existing rules, the proposed rules will serve to reduce the reporting, recordkeeping and other compliance requirements associated with the issuance of an experimental radio license.

E. 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 proposed approach, 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.[42]

We encourage comment regarding the possible alternatives to the approaches proposed, including any cost estimates. For instance, we note that we have considered and tentatively declined HP's recommendation to implement a quarterly tracking system.[43] Comments with proposed alternatives will assist in reaching the best outcomes.

F. Federal Rules that Might Duplicate, Overlap, or Conflict with the Proposed Rules.

None.

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[41] *See* 5 U.S.C. § 601(5).

[42] *See* 5 U.S.C. § 603(c).

[43] *See* Notice of Proposed Rulemaking at para. 71.

STATEMENT OF
CHAIRMAN JULIUS GENACHOWSKI

Re: *Promoting More Efficient Use of Spectrum Through Dynamic Spectrum Use Technologies*, ET Docket No. 10-237, Notice of Inquiry; *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, Notice of Proposed Rulemaking.

With these two items, we build on our efforts to use spectrum more efficiently and in ways that deliver the highest value for the American people, and to encourage groundbreaking innovation.

Earlier this year we took steps to unleash spectrum capacity for flexible use, including mobile broadband. We freed up 25 MHz of WCS spectrum, and are tackling 90 MHz in the mobile satellite service band. For the first time in 25 years, we freed up spectrum below 5 GHz for unlicensed use, launching a new platform for innovation that we hope will lead to new services and products as significant as Wi-Fi.

Super Wi-Fi – one of the applications we expect to see from the newly released white spaces spectrum – has been helped and accelerated by FCC experimental licenses.
So have new potentially life-saving anti-collision systems in cars. You may have seen the TV ads – this technology requires spectrum, and it was developed using an FCC experimental license. Experimental licensing has also led to important life-saving medical devices.

I'm pleased that today we take steps to improve and expand our experimental licensing program. We are proposing, for example, to ease testing restrictions on universities, research organizations, and other institutions that are developing new services and devices that utilize spectrum. We also propose Innovation Zone licenses, and a new program to speed development of new health related devices that use spectrum – an increasingly exciting area for investment and innovation and for improving health care and reducing costs.

The goal is to accelerate innovation – to reduce the time for an idea to get from the lab to the market. A more extensive experimental licensing program would also help the FCC make smarter, faster decisions, by giving us on-the-ground intelligence on interference issues, and insight into the development of new cutting edge technologies.

Encouraging research and development is vital to our objective of making the U.S. the spawning ground for the great technological advances of tomorrow. Past advances in technology, such as cellular networks and improvements in digital transmission techniques have led to vastly improved efficiency in spectrum use.

Consistent with our focus on maximizing the efficient use of spectrum, we are also beginning today an inquiry on how we can spur new technologies that share spectrum dynamically. Today, spectrum that is allocated can sit idle during time periods when the primary licensee is not using the airwaves. Same for geographic locations. This doesn't make sense given the growing demands on spectrum.

My goal is for these proceedings to be a vehicle for identifying steps we can take to unleash and accelerate new spectrally-efficiency policies and technologies. I'm interested in ideas, for example, to jumpstart secondary markets for dynamic spectrum access. I'm interested in how we can encourage

better information on spectrum use, building on our innovative spectrum dashboard, and concretely facilitating opportunistic or auxiliary spectrum uses.

Historically, the U.S. has led the world in spectrum policy innovation. Auctions of licensed spectrum and release of unlicensed spectrum are two key examples of groundbreaking spectrum policy innovation. I believe incentive auctions are a third.

I'd like to set a goal for these proceedings: that it leads to yet another historically significant spectrum policy innovation. I'd like to call for broad participation to meet that goal.

I don't assume that the spectrum management models and policies used today are those that will make the most sense tomorrow, especially given rapidly evolving technologies – both involving dynamic information-based markets and evolving spectrum sensing devices.

I think the opportunity here is not only for the development of new spectrum efficient policies – as important as that is – but also for the development of new spectrally-efficient technologies and products, which we would like to see developed and perfected here in the United States.

The spectrum proceedings today are all vital parts of ensuring that the U.S. leads the world in mobile in the 21st century – promoting economic growth, job creation, and our global competitiveness.

I'd like to thank the staff of the Office of Engineering and Technology, the Wireless Bureau, the Media Bureau, and the Office of General Counsel for their hard work on this item. I'd also like to thank our tireless CTO Doug Sicker for thinking outside the box and working both within the agency and with outside stakeholders to develop two outstanding items.

STATEMENT OF
COMMISSIONER MICHAEL J. COPPS

Re: *Promoting More Efficient Use of Spectrum Through Dynamic Spectrum Use Technologies*, ET Docket No. 10-237, Notice of Inquiry; *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, Notice of Proposed Rulemaking.

Today we launch two important proceedings aimed at maximizing the power and opportunity of our public spectrum resource. The demand for spectrum, as we all know, has never been greater. Unfortunately the laws of physics prevent us from being able to create more of this finite resource. That said, even as we look to free up existing spectrum to meet the needs for wireless broadband, we can and should explore ways to make more dynamic and opportunistic use of the spectrum we have. Given the technology breakthroughs I have witnessed over nearly a decade here at the Commission, I am a strong believer in the creative power of spectrum engineers and innovators—both inside and outside the agency—to help us use our spectrum resource more intensively and efficiently. We need hear from these experts as we move forward with our Notice of Inquiry—making sure we have a complete picture of the dynamic spectrum access tools available and doing what we can do to encourage their development and use.

We also propose today much-need improvements to our system for spectrum experimentation in a separate Notice of Proposed Rulemaking. Many of you have heard my not infrequent exhortations on the need to do more to encourage research and development in this country in order to ensure America's going-forward global competitiveness. Today we make concrete proposals that do just that. We propose to broaden experimental research authorizations for qualified academic and research institutions to afford them greater opportunities to design and implement experiments without the burdens of getting pre-approval each and every time. In a similar vein, we seek to create innovation zones for experimentation that would allow innovators greater flexibility to conduct and modify their spectrum experiments. Nowhere is the potential for RF innovation more exciting than in the area of promoting advances in health care technology—whether restoring mobility to paralyzed limbs or creating advanced body sensor networks. We therefore propose to create a new medical experimental program for hospitals and other healthcare institutions, supervised in conjunction with the U.S. Food and Drug Administration.

Over the years, our Experimental Radio Service program has been a tool that innovators have used to test new and exciting services, many of which we now take for granted. The improvements we propose today look to build upon that success.

Thank you to Julie Knapp and his truly excellent team in the Office of Engineering and Technology, as well as to Ruth Milkman and her impressive Wireless Telecommunications Bureau, for bringing these items to us. I look forward to working with them, as well as my distinguished colleagues, to bring these proceedings to sound and expeditious resolution. The country can reap solid benefits from such action and help us regain competitiveness—and that means jobs—in the global economy.

STATEMENT OF COMMISSIONER ROBERT M. MCDOWELL

Re: *Promoting More Efficient Use of Spectrum Through Dynamic Spectrum Use Technologies*, ET Docket No. 10-237, Notice of Inquiry; *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, Notice of Proposed Rulemaking.

I am delighted to support both of these actions, and I thank our talented and hard-working Office of Engineering and Technology and Wireless Telecommunications Bureau teams for your diligence and creativity. The American wireless marketplace is dynamic and explosive; it is a world leader in innovation and competition. And it certainly offers one of the brightest rays of growth and opportunity in the American economy.

Given this context, I am pleased that we are starting to do the heavy lifting today – to undertake longer term spectrum planning. As always, I look forward to working with Chairman Genachowski, and all of my colleagues here, to begin the process of putting more spectrum into the hands of consumers.

The notice of proposed rulemaking seeks comment on new ideas to promote innovation and efficiency in spectrum use in our Part 5 Experimental Radio Service (ERS) rules. Our ERS program is a wonderful example of success as evidenced by the variety of new technologies begun as experiments and subsequently deployed as valuable services relied upon by American consumers every day. These successes include: the Personal Communications Service, air-to-ground communications, and new life-changing medical devices, to name just a few.

As an overarching matter, I hope our updated rules will adhere to the Commission's more recent "flexible use" policy. Old style "command and control" (read: prescriptive) rules not only hamper creative entrepreneurs who are in the best position to understand and satisfy consumer demands, they cause spectral inefficiencies as well.

With respect to our notice of inquiry regarding ways to encourage dynamic spectrum use, I have long emphasized that spectral efficiency, and seeking new ideas for dynamic uses, when it comes to undertaking longer term spectrum planning, are crucial in light of the realities that are shaping America's wireless future. In practical terms, even if we could identify 500 megahertz of quality spectrum to reallocate today, the better part of a decade would pass by before we could write proposed auction rules and band plans, analyze public comment, adopt rules, hold an auction, collect the proceeds, clear the bands, and watch carriers build out and turn on their networks for their customers. So, in the meantime, helping innovators create and deploy new technologies to enhance more efficient use of the airwaves has to be a top priority for all of us.

While we sort through the complex issues associated with freeing up more spectrum for the longer term, I look forward to learning more about technologies that will allow wireless providers to take better advantage of the immediate fixes already available in the marketplace. These include more robust deployment of enhanced antenna systems; improved development, testing and roll-out of creative technologies such as cognitive radios; and heightened consideration of the use of femto cells. Each of these technological options augments capacity and coverage, which is especially important for data and multimedia transmissions.

We are at the very beginning of what will surely be a lengthy process. I look forward to giving these and other issues the careful and thoughtful consideration that they deserve.

STATEMENT OF
COMMISSIONER MIGNON L. CLYBURN

Re: *Promoting More Efficient Use of Spectrum Through Dynamic Spectrum Use Technologies*, ET Docket No. 10-237, Notice of Inquiry; *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, Notice of Proposed Rulemaking.

I commend the Chairman for his leadership in promoting the policies put forth in these companion items. If our Nation wants to more effectively compete, we must encourage greater research and development and more efficient spectrum use. Such R&D is not only necessary for the advancement of monumental communication innovations, such as the Internet and the World Wide Web, but it is also critically important to the success of individual businesses and to our overall National economy. A White House study, conducted in September 2009, found that research and development is one of the most important pillars in building a foundation for an economy that could create jobs and drive sustainable growth.

All of the initiatives in the experimental license NPRM encourage greater R&D, which will enable individual entities to do more with their experimental authorizations, facilitate collaboration among industry and academics, and streamline rules. The two initiatives I find particularly noteworthy are the research and medical program experimental radio licenses.

Universities and non-profit research institutions have proven they deserve the enhanced experimental authorizations, reduced oversight, and streamlined application process that the research program license would give. For example, using experimental licenses, research institutions have not only developed ultra-fast, 1 Gigabit per second, research and education broadband networks, but they have also demonstrated public service leadership by advocating that we help connect these networks to anchor institutions in low-income communities.

This recommendation can lead to important short-term and long-term economic benefits. Community connection projects are, by their nature, job intensive, so connecting these research and education networks to low-income communities, can lead to immediate job creation and investment opportunities. For instance, Rutgers University reports, that the Global Environment for Network Innovations (GENI) project, which involves 29 universities, has created hundreds of jobs in New Jersey alone.

The National Broadband Plan also explained how Case Western University's project to connect its ultra fast, 1 Gigabit per second network to homes, schools, libraries and museums in a low-income community in Cleveland, Ohio, is creating jobs. This project is also leading to software and service development for environmental efficiency, health, and many other applications. These are just a few examples of why we should do as much as we can, as quickly as we can, to encourage universities and research institutions to engage in more research and development of communications technologies.

Designing the medical program experimental authorization to promote more test bed facilities for new wireless medical devices could speed the development of important achievements in health care. I thank the Food and Drug Administration and the American Society for Healthcare Engineering for collaborating with us on this initiative. The item encourages researchers and physicians to work with Veterans Affairs facilities and military services, early in the development of these new devices, I am pleased to see. Our Wounded Warriors have made great sacrifices in defense of our Nation, and we owe

it to them to create an environment that can lead to faster medical breakthroughs, and help them make the best of their return to civilian life.

The medical program experimental license could also accelerate innovations in telemedicine to further empower both doctors and patients. Advances in video technology and medical broadband applications are allowing physicians to collaborate with their colleagues across the globe, in real time, on difficult cases. For those suffering from long term and chronic illnesses, remote patient monitoring offers greater mobility and independence. Our agency should continue to promote technologies and policies that will give those, in greatest need of medical care, more flexibility in finding the right treatment for them.

The scholarship in today's *Notice of Inquiry* on dynamic spectrum use technologies also sends the proper message that we must encourage more efficient use of spectrum. The *Notice* recognizes that, to best advance these technologies, the Commission must have a clear understanding of how the various parts of the spectrum are being used today. The item then asks detailed technical questions to ensure that we have a comprehensive record on the latest developments in dynamic spectrum technologies. In promoting flexible use policies – such as the leasing of licensed spectrum through the secondary market – the *Notice* presents a cogent analysis of the possible techniques our policies already permit.

I thank Doug Sicker, Julie Knapp, and the other technology evangelists in the Office of Engineering and Technology, the Office of General Counsel, and the Wireless Telecommunications Bureau, for their hard work on these items.

STATEMENT OF
COMMISSIONER MEREDITH ATTWELL BAKER

Re: *Promoting More Efficient Use of Spectrum Through Dynamic Spectrum Use Technologies*, ET Docket No. 10-237, Notice of Inquiry; *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, Notice of Proposed Rulemaking.

This holiday season kicks off a new cycle of fundamental change in the wireless device market. Consumers everywhere are choosing powerful new smartphones. Gartner reports that worldwide smartphone sales grew 96 percent from the third quarter last year, and SNL Kagan projects smartphones accounting for 30 percent of overall mobile phone subscriptions by the fourth quarter of 2010 in the US. Moreover, tablets that use hundreds of times more data than even the most advanced smart phones may well be the stars of this year's giving season. In fact, yesterday's *Wall Street Journal* cites a recent ChangeWave Research survey that found that 9% of holiday shoppers plan to buy an iPad in the next 90 days. I have little doubt that whether smartphone or tablet, these devices will challenge networks as much as they will delight their owners.

I am convinced that our efforts to find additional spectrum to power these devices—and all those that are going to follow—constitute only half the battle to meet the dramatically exploding needs of this country's wireless consumers. We must also promote greater innovation to help use the spectrum we have today—and the spectrum we will allocate tomorrow—as efficiently as possible. The two items we are considering today are a good place to start. In fact, the innovation they will support may well provide the tools we will need to unlock the full potential of the TV broadcast bands.

I am excited about today's item expanding opportunities for radio experimentation. I am a firm believer that we need to support research and development efforts whenever and however we can. Making it easier and more straightforward to conduct real-world research is a natural and straightforward step that we can take. Our action today offers practical support to our nation's inventors by enhancing their ability to test their theories and innovations and streamlining the procedures they must follow to do so. This should help shorten the innovation cycle, which will benefit consumers and operators across the country by reducing the time it will take to get new devices to the market. It will also help maintain our country's leadership in the development of wireless technologies, applications and services.

Dynamic spectrum access is thought by many to be a key technical advance that can substantially improve the way spectrum is used for both commercial and non-commercial services. It is an area where the Department of Defense has shown great leadership and innovation over the years. However, it has proven difficult to apply their research and development in the area of dynamic spectrum access to commercial radio systems. Technical issues have been too complex and costs have been too high.

It is my hope that in issuing the NOI on dynamic spectrum access, we can focus our collective attention on what it will take to overcome these challenges. If we are successful, dynamic spectrum access technologies could become one of the go-to tools operators rely upon to more efficiently manage their commercial spectrum resources. Coupled with an enhanced Spectrum Dashboard and potentially other ways to get information about available spectrum to prospective users, dynamic spectrum access might foster secondary markets for short term, "spot" spectrum transactions—another potentially useful way to manage congestion.

I want to thank the staff for their hard work, which I hope did not include too much time over the Thanksgiving weekend.