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**Speeding Innovation
Through the FCC**

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Your office phone rings. The caller tells you he runs a high-tech start-up. The company just developed a new kind of product that uses low-power radio signals. He wonders if it might need FCC approval.

Chances are, it does.

We're almost ready to ship, says the caller. How long will the approval take?

You ask some questions. Looking at the frequency, power, and so forth, you ascertain the device does not comply with any licensing category, nor with any known kind of unlicensed operation. You tell the caller that he will need a waiver of the rules or a rule change. You point out the downsides of a waiver – that they are hard to get, and even if it grants one, the FCC can pull it back at any time.

The client agrees a rule change is the way to go. How long will it take?

The answer: at least two years, probably three, and possibly four or five.

There is a long silence. The caller patiently relates what you already surmise. The company cannot go that long without revenue. Over that time the markets will change. Competitors will leapfrog the technology. And he makes a good case that the product cannot possibly cause radio interference. So why should the FCC care at all? Considering the lack of harm, he says, and the potential economic benefits, why should it take so long to okay the technology?

Good question.

The FCC has succeeded at expediting approvals for equipment that complies with its rules. It allows the manufacturer or importer to quickly self-approve not only products that emit radio waves unintentionally – this includes all digital devices – but even some intentional emitters, such as microwave ovens, with no need for filings or authorizations. Of the products that still need outside certification – primarily mobile, portable, and unlicensed radio transmitters – the FCC lets the large majority be approved by third-party Telecommunication Certification Bodies (TCBs), which specialize in speed. And even certifications that go through the FCC are much faster than they used to be, with the

median processing time currently down to about three weeks.

But if a device is sufficiently original – *i.e.*, if it fails to comply with the existing technical rules – its prospects for fast approval are bleak.

The unlicensed regime, which accounts for several recent radio-based innovations, and the various licensed services are both catalogues of mind-numbingly specific rules. Each frequency band, and sometimes each different application, has its own set of detailed technical requirements. These tend to grow by accretion, with the rules for each new technology grafting awkwardly onto those already in place. The FCC finished a heroic clean-up of the unlicensed rules back in 1989. But activity since then has made even that regime more complicated than ever.

Sometimes a new technology fits into an existing category of regulation. Bluetooth, for example, was designed around a pre-existing rule, enabling products to reach the U.S. market with no regulatory delay. But that strategy limited Bluetooth to what the rules already permitted, which may hinder it *vis-à-vis* newer technologies.

The biggest product improvements usually result from technical innovation. The more novel an idea, the less likely it is to conform to the existing FCC rules – which, after all, were written for the technologies that came before. But changing the rules to handle new technologies is a frustratingly slow process. Those delays have real-world economic consequences. Products that are authorized too late may miss a critical market window. And some products may not reach the market at all. Start-up companies occasionally go under while waiting for regulatory approval.

What Takes So Long?

Some of the delay in updating FCC rules stems from the Administrative Procedure Act (APA). This federal statute, passed in 1946, sought to make the regulatory process more transparent and open to public participation. It bars a federal agency from adopting rules until after it previews its intent in a Notice of Proposed Rulemaking (NPRM) and considers public comments on the proposal. A series of U.S. Supreme Court decisions further require the agency to respond publicly to those comments, and to explain the reasoning behind whatever rules it ultimately adopts.

The APA brought badly needed reforms to the regulatory process. But its procedures were established in the days of manual typewriters and carbon paper, and have not changed since. Transparency came at the cost of speed. Today, FCC technical rulemakings can take years. And that is becoming a serious drag on technological advance.

The FCC can arrive at an NPRM by a few different routes. One starts with a company filing a “petition for rulemaking.” Typically this asks for a rule change to suit a particular new technology. The FCC issues a public notice that identifies the petition and sets deadlines for comments and reply comments. Alternatively, the FCC can start the

process itself by publishing a Notice of Inquiry (NOI). This does not propose specific rules, but rather sets out relevant issues for discussion. The NOI likewise solicits comments and reply comments.

After studying the comments filed in response to the petition or NOI, the FCC issues an NPRM. More rarely, the FCC may issue an NPRM on its own, without prior public input, but usually it does so only for relatively minor rule adjustments. Whatever its origins, the NPRM proposes specific rules. Often it sets out alternative regulatory schemes, sometimes in each of several areas. The FCC tries to be thorough at this stage, because the APA allows it to adopt only those rules anticipated in the NPRM or their “logical outgrowth.” Anything else requires another NPRM. The proposed rules may include definitions of the new technology, frequency bands, operating power, bandwidth and modulation, permissible applications, licensing, eligibility, operating restrictions, and other issues particular to the technology. The NPRM solicits yet another cycle of comments and reply comments.

Eventually, the FCC promulgates a Report and Order (R&O) that responds to the comments, adopts and explains the new regulations, and makes them official. Parties can still ask the FCC to reconsider its decision, or can challenge the decision in court. The rules remain in effect pending any subsequent proceedings, unless the FCC or the court says otherwise (which they seldom do).

Ordinarily each cycle of comments and reply comments takes at least a year. That includes time for members of the public to research and write up their views, and for FCC staff to read and analyze the comments, and then to draft, review, and publish whatever document follows, such as an NPRM or R&O. The whole process – from petition or NOI, through an NPRM, to an R&O – entails two complete cycles of comments and reply comments, and hence usually takes at least two years.

Most rulemakings attract opposition. Because the radio spectrum is essentially full, novel uses of radio impinge on someone already operating. Those incumbents can be counted on to resist the rule changes needed to make the novel use possible. Each side typically submits engineering studies to support its view that the new technology will (or will not) cause harmful interference. The FCC has to sort out the differences and try to arrive at a set of rules that can let the new technology go forward while adequately protecting the incumbents.

In practice, the comments mandated by the APA are just the beginning. Even after comment deadlines have passed, interested parties can still make both written and oral presentations to the FCC Commissioners and staff, so long as they disclose the substance of what they say on the FCC's website. These are called “*ex parte*” presentations, a Latin phrase meaning “from one side.” But the other side reads the FCC website, and will visit or write to the FCC to counter its opponents. Often FCC staff uses the *ex parte* meetings to float proposals of their own and to mediate among the factions. These exchanges can go on for many months, sometimes years. The process is often useful in helping to arrive at rules that all sides can live with. But it is very time-consuming. And, although in

principle anyone can participate, in practice only the insiders even know the *ex parte* process exists.

The proceeding on ultra-wideband is one recent example of a long-running, *ex parte*-driven rulemaking. It was contentious from the start because ultra-wideband signals potentially overlap with a great many incumbents, including many categories of licensed users and several Federal agencies. The NOI appeared in September 1998. The R&O adopting rules did not take effect until July 2002, almost four years later, following scores of *ex parte* meetings and hundreds of written submissions. But even that was not the end. Since then, two major orders have responded to multiple petitions for reconsideration. One of these also incorporated a follow-up NPRM. Reconsideration proceedings relating to the most recent order are still open, so we have at least one more order to come. And there is talk of yet another NPRM. The proceeding could reach the ten-year mark.

Mechanisms for Improvement

The FCC has two options for speeding new technologies to the market, while continuing to protect incumbent users. One is to make the rules themselves more flexible, so they can accommodate new technologies without change. The other is to accelerate the process for changing the rules.

An example of the first approach comes from the history of “spread spectrum” radios. The FCC first authorized this technology in 1985. Now, twenty years later, it has become a mainstay of unlicensed commercial and consumer applications, including Wi-Fi, Bluetooth, and countless others. But the original technical rules were rigidly specific. Every minor tweak in the technology needed a full-scale proceeding. From 1981 until 2002, the FCC had one or another spread spectrum rulemaking in progress almost all the time, along with several mini-proceedings over authorization of particular spread spectrum devices. Around the time that each rulemaking wrapped up, yet another technical improvement arose, and a new proceeding began. The FCC finally called a halt in 2002 by authorizing “digital modulation,” a very general category that includes all forms of spread spectrum and many other modulations. Those rules effectively allow any form of digital signal on the original spread spectrum frequencies, subject only to very general power limitations. Manufacturers can now market products based on new forms of spread spectrum and successor technologies without the need for years-long proceedings at the FCC.

The FCC's other option is to speed up the rulemaking process. Even now, not all of its proceedings are slow. Proposals to adopt rules for Broadband Over Power Line, for example, were vigorously opposed, but still went from NOI to release of the R&O in 18 months. Ideally, though, this time scale should become the outer limit, rather than a best case.

These are a few suggestions for getting new technologies approved more quickly, yet in full compliance with the APA:

At the outset, the FCC should adopt an explicit policy that favors speed when enabling new technologies. While individual staff members and Commissioners understand how delay can cripple innovation, the FCC has a whole sometimes lets months slip by while markets bypass a promising technology and an entrepreneur's funding runs out.

Many proceedings can start with an NPRM. Ordinarily the FCC precedes the NPRM with a year-long comment-and-reply cycle on an NOI or a petition for rulemaking. And indeed, some proposals are so inchoate as to require public debate before an NPRM is possible. More often, however, the FCC could adequately address the uncertainties simply by including more alternative options in the NPRM.

Many NPRMs can be short. Nowadays a new-technology NPRM typically runs to tens of pages. It may describe the technology and its possible applications, explain the regulatory history, summarize and respond to previous comments, weigh competing policies, review legal authority, and lay out and explain the proposed rules. All of this takes time to research, draft, and review. But the APA requires far less: merely the “terms or substance” of the proposed rule *or* a description of the “subjects and issues involved,” and a citation to the statute. A minimal, APA-compliant NPRM could be just a few pages of proposed rules with the petition for rulemaking as an appendix. This could take months off the process.

Comment periods can be short. Some proceedings have periods as long as 75 or even 90 days for comments, plus another 30 days for reply comments. Few parties actually work on their filings all that time. Thirty or 45 days should usually be adequate for comments, and 15 or 30 days for reply comments.

Ex parte presentations can be limited to a set period of time. Some rulemakings drag on because both sides want to have the last word, and each side wants to surprise the other with late-filed research. The FCC could confine *ex parte* presentations to, say, 60 or 90 days after the comment periods close. Of course the FCC can always extend that period, if it sees a need. And, as now, the FCC can always request information from a party.

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The FCC has conflicting obligations. On the one hand, Congress requires it to “encourage the provision of new technologies and services.” On the other, it must make regulations to “prevent interference.” Opponents of a new technology – most often the spectrum incumbents – sometimes try to exploit the second obligation by exaggerating the threat of interference to their own operations. If they cannot kill off the new technology, their next best option is to drag out the proceeding as long as possible. For that reason, incumbents have a direct interest in keeping the mechanisms for rule change as cumbersome as possible. The years-long delays that sometimes result serve no constructive purpose, but only deny the public access to useful products and services.

New technologies, by their nature, need approval quickly. Authorization delayed is authorization denied. Of course the FCC must satisfy itself that proposed rules will not permit interference that unduly disrupts existing services. But it should reexamine its procedures with an eye to making that determination quickly, so as to avoid becoming a brake on innovation.