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Challenges in AM detuning of cellular towers include varying distance calculations, correspondence with affected broadcasters and federal regulation. Proper measurements *before* construction will save you from a world of headaches.

DETUNING: A NON-STANDARD AND SITUATIONAL DISCIPLINE

– by Rich Biby, P.E.

Describing the minutiae of detuning cellular towers to prevent them from attenuating the signals of nearby broadcasters (interfering with AM radiation patterns) can be a dry subject—if you let it be. So, in this case, it’s good to be the king. The nice thing about being the publisher of this magazine is that I can occasionally pull rank and get away with writing informal articles, like this one.

We received many responses and inquiries about my previous article on AM detuning (AGL, October 2006). I’ll try to answer questions raised by readers in this and subsequent articles. Most questions group around three particular topics: the distance requirement for action; “waiver letters” from the AM station; and the FCC Enforcement Bureau’s ability to understand and evaluate detuning issues.

Equal confusion under the law

First, a quick review: Depending on which section of the FCC’s rules a licensee operates under, different rules or policies apply. This is a long-standing concern (read, “peeve”) of mine, as well as many

other engineers and technicians who deal with compliance within the industry.

Why should a PCS carrier be any different from a cellular carrier, from the perspective of disturbance to an AM station? From a structural standpoint, they are absolutely the same. However, the cellular folks licensed under Part 22 have a specific rule that dictates what measurements must be made and, unfortunately, specifies a more-stringent measurement procedure documented in the Part 73 broadcast rules [47 CFR 73.154(a).]

To make things worse, some licensees have a rule governing their compliance with AM-pattern protection. Why? There is no good reason, actually. For example, public-safety licensees have no obligation to protect AM stations, although they might build new towers that could cause even more disturbance to an AM station than a cellular operator.

(Suggested action: The *appropriate* place for an AM pattern-protection rule is in either Part 1 or Part 2 of the rules, where it would apply equally to *all* licensees, not just some. Placing it in an early section would conform to the measure-

ment procedures for *all* licensees.)

Action thresholds

What is the distance threshold (nearness) for a licensee constructing or modifying a tower in the vicinity of an AM pattern that requires action? It is either 1 km (0.6 miles), for non-directional stations, or 3 km (1.9 miles) for directional AM stations—unless it is 3.2 km, instead.

Huh? Why are there two different thresholds, 3.0 km or 3.2 km?

Split personality is the simple reason. The FCC speaks with two different voices in this case. The FCC has separate and distinct bureaus to deal with regulation and control of different industry sectors within the telecommunications industry.

The Media Bureau deals with the mass media, such as cable systems, TV, direct-broadcast satellite and radio (AM and FM). In the conversion within federal agencies from English to metric measurement standards, different bureaus converted with different standards. When the 2.0- to 10.0-mile measurement standards are properly converted to metric, the distances would be 3.2 km to 16.1 km. How-

ever, some bureaus rounded those numbers to read “2.0 to 16.0 km.” The broadcast folks use 2.0 km, while others of us (say, those of us who know how to multiply) in the non-broadcast side of the house use the 3.2 km figure.

For the Part 22 licensees, the Media Bureau (or Mass Media Bureau, as it was called prior to 2002) had a heavy hand in having the rule adopted. Meanwhile, the Part 24 (Personal Communications Services) licensees only have a public notice to require their compliance, and use the 3.2 km standard.

“OK, Rich,” you say, “This is fun, but what should I *do*?” Well, I’ve made my living at being technically conservative and trying not to give lawyers too much unnecessary money. I would recommend that all licensees employ the 3.2 km distance threshold. You might end up doing work, in some particular instance, that is not absolutely necessary, but no one can *argue* with you. Unfortunately it is almost impossible to turn back the hands of time with any construction. If you don’t capture the radio-frequency environment *before* the construction, you will never be able to conclusively prove whether your construction or modification has a negative or a non-significant effect on an AM station.

Some consultants recommend protecting AM stations that are even further away than 3.2 km. Why? While everyone can agree that 3.2 km is the maximum distance to which a station should be protected by FCC standards, there is a solid engineering reason why construction could have a significant effect beyond 3.2 km. There is also some case history where construction has resulted in civil litigation. The risk is small; however, given the litigious nature of our society, we all appreciate due caution represented by the acronym “CYA.” There are some rare instances where significant negative effects can be predicted; however, I would consider them to be rare. Don’t be surprised to see recommendations for action where AM stations are further away than 3.2 km; however, it will be an exceptional situation where action is really necessary or appropriate.

Waiver letters

Most of us (consultants) believe that a



written concurrence from the AM station in question can eliminate the need for field measurements—even when the rules (or public notice) specifically state that *at least some* measurements shall be made. While I routinely recommend this, the industry has loosened its position on this in recent years. If you can get actual written concurrence from the AM station, then most carriers (even their legal divisions) appear to be conformable that field measurements can be skipped. However, written concurrence is becoming increasingly rare.

For minor changes or modifications on the tower, standard industry practice now is to send the AM station a letter that the change is about to occur and to state that no measurements will be taken. For simple changes, (e.g., changes in antennas, replacement of transmission lines and some other modifications—especially when the height of the tower does not change and other physical characteristics of the tower remain unmodified) the possibility for significant disruption of AM patterns is negligible. So while the rules say we need to “do” something, as a practical matter, every reasonable engineer (cellular and broadcast) knows that measurements only place unnecessary burdens on the AM stations and on the service provider.

Compliance and the FCC

The old “Compliance and Informa-

tion Bureau” had a much friendlier title before becoming the sterner-sounding “Enforcement Bureau” back in 1999. Regardless of what their business cards say, I’ve not been overly impressed with reports of the technical knowledge base among some—not all—of the folks in the field doing inspections. Admittedly, these poor folks have a job that requires them to deal with a lot of technologies and to know a little bit about *all* things wireless. (I know *I* would love the job, but we also know I’m not “normal”).

Enforcement action should be thought of in three distinct areas or disciplines: in the field, at the Commission and in the courtroom. One action can often lead to another, and the one you think you want is not necessarily the best one for you.

Field inspectors — Field-enforcement folks are typically from a local field office, and they investigate just about any kind of complaint. They supposedly run around “just checking” on things to make sure we’re all compliant with the rules. Nevertheless, I’ve found that field personnel often don’t have the background to understand a lot of the technical issues with problems that arise. They often seem to gather some information and refer things “to Washington.”

Commission staff — As a general rule, I’m usually happiest when the staff at the Portals gets involved. Washington (and by ex-

tension, the Gettysburg, PA, office) folks usually know pretty well what the real deal is. They often can take necessary and appropriate actions to solve issues or enable the right thing to be done by applying a little pressure in the right places. However, regarding AM detuning issues and many of the subtleties of AM facilities, there few members of the FCC staff have both the in-the-field experience and the theoretical knowledge to really understand the issues. Few are able to make helpful suggestions to defuse a situation or to take a concrete position supporting one side or the other in a dispute.

Nevertheless, there still remain some really excellent folks who have the background (and a few who were even AM-detuning consultants themselves). They can and will help with difficult situations. You should always feel comfortable calling the FCC staff and asking for help. Pose your problem as a hypothetical, if you think you might have made a “boo-boo” (or you’re just suspicious of bureau-

crats). Otherwise, feel free to share the details, particularly when you are comfortable that you are in the “clear” regarding liability.

Meanwhile, in the “People’s Court” — So many funny, interesting, insulting and accurate things have been written about attorneys that I will not even *try* to insert a cynical remark here. However, typically, by the time attorneys get involved, things are getting... complicated. AM detuning is not an easy subject, and because there are so many exceptions to any clear rule, it can be difficult to get a clear legal handle on it. I’ve never been involved in a civil suit over AM detuning; however, I have heard of some. I *have* been involved in cases where towers had to be removed, when constructed too close to an AM station, to clearly establish negative effect. As previously mentioned, this has typically been in cases when “before construction” measurements were not made (prior to my involvement with the site). Thus, the stance of the AM station always has been that the

cellular structure was financially responsible for substantial disturbance to the AM station’s pattern and therefore proportional financial compensation was appropriate. The cellular company determined it was less expensive to remove the tower and lose the investment than to continue to fight it. (I came into that project after the tower was built; what I would definitely call a “short” cycle to decommissioning.)

Avoiding the next level

So, how do these three things—consistent calculation, correspondence and regulation—interplay? Each is a higher-stakes level of complexity, cost and potential negative effect to your operation. If you can defuse a problem at each level before it advances to the next, you’ve definitely done yourself a favor. agl

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IS YOUR TOWER COMPLIANT?

New rules are coming...

A coalition of broadcasters, engineers and OEMs filed a Request for Further Rule Making to unsharl the FCC’s AM detuning rules. The Commission released the Request for comments, which have been received. Indications are that the rules changes and additions in the Request will be adopted, wholly or in part. These changes should facilitate AM detuning compliance and improve relations among broadcasters and tower owners and their tenants.

To learn more, go to www.waterfordconsultants.com and read the articles about the proposed rule changes and the impact these changes may have on you.

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