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# United States Court of Appeals

FOR THE DISTRICT OF COLUMBIA CIRCUIT

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Argued March 15, 2004

Decided May 4, 2004

No. 03-1043

AT&T WIRELESS SERVICES, INC., ET AL.,  
PETITIONERS

v.

FEDERAL COMMUNICATIONS COMMISSION AND  
UNITED STATES OF AMERICA,  
RESPONDENTS

AIRCELL, INC.,  
INTERVENOR

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On Petition for Review of an Order of the  
Federal Communications Commission

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*L. Andrew Tollin* argued the cause for petitioners. With him on the briefs were *Michael Deuel Sullivan*, *Douglas I. Brandon*, *Carol L. Tacker*, and *John T. Scott III*.

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Bills of costs must be filed within 14 days after entry of judgment. The court looks with disfavor upon motions to file bills of costs out of time.

*Roberta L. Cook*, Counsel, Federal Communications Commission, argued the cause for respondents. With her on the brief were *Robert H. Pate III*, Assistant Attorney General, *Robert B. Nicholson* and *Robert J. Wiggers*, Attorneys, *John A. Rogovin*, General Counsel, Federal Communications Commission, and *Daniel M. Armstrong*, Associate General Counsel.

*Michele C. Farquhar*, *Jonathan S. Franklin*, and *Lorane F. Hebert* were on the brief for intervenor.

Before: SENTELLE, ROGERS and GARLAND, *Circuit Judges*.

Opinion for the Court filed by *Circuit Judge* ROGERS.

ROGERS, *Circuit Judge*: In *AT&T Wireless Services v. FCC*, 270 F.3d 959 (D.C. Cir. 2001) (“*AirCell I*”), the court denied all challenges except one to an order of the Federal Communications Commission granting AirCell, Inc., a waiver to operate an aircraft-based analog cellular telephone system. The court remanded to the Commission for an explanation of its conclusion that AirCell’s system was unlikely to harmfully interfere with the rights of ground-based cellular telephone providers, specifically so that the Commission could explain its choice of a particular threshold signal strength above which AirCell would begin to cause such interference. In petitioning for review of the Commission’s more detailed explanation in *AirCell, Inc.*, 18 F.C.C.R. 1926 (2003) (“Remand Order”), AT&T Wireless Services, Inc., Cingular Wireless LLC, and CellCo Partnership contend that the Commission’s explanation on remand deviates from the reasoning in the initial order in *AirCell, Inc.*, 15 F.C.C.R. 9622 (2000) (“Initial Order”), and, in any event, is unreasonable. We hold that the petitioners misinterpret the Commission’s initial order and the breadth of the remand in *AirCell I*, that they have waived several of their challenges to the *Remand Order* by failing to seek rehearing by the Commission of its explanation on remand, and that their unwaived challenges are unpersuasive. Accordingly, we deny the petition.

## I.

The background to the Commission's decision to grant to AirCell, Inc. a waiver of the rules barring the use of analog cellular telephones in aircraft, *see* 47 C.F.R. § 22.925 (2004), is set forth in *AirCell I*, 270 F.3d at 961–63. A central dispute in the initial *AirCell* proceeding before the Commission was how to predict whether, and if so how significantly, AirCell would disrupt the networks of existing cellular telephone providers, such as the petitioners. Because the petitioners' licenses entitle them to protection from harmful interference within their geographic service areas, *see* 270 F.3d at 963–64; 47 C.F.R. § 22.911(d) (2004), any waiver allowing AirCell to operate depends upon a finding that such operation will not cause harmful interference to license-holders. The record contains data from several test flights, in which receivers on the ground measured the strength of AirCell's signal while an aircraft, placing a call from an AirCell telephone, flew overhead. The providers and AirCell, based on this data, advocated different conclusions about the likelihood of harmful interference from AirCell's operation.

The tests were conducted in rural areas, where such harmful interference is most likely because there is less background electromagnetic noise that a cellular call needs to overcome. This permits cellular calls in rural areas to be of acceptable quality even with a relatively weak signal, but those weak signals are then more susceptible to interference than calls in suburban or urban areas, which are required to transmit at a higher strength. For the one day of test flights the Commission considered representative of how AirCell would operate in practice, July 10, 1997, AirTouch Communications submitted an analysis by Dr. William C. Y. Lee, who concluded that AirCell's calls would cause harmful interference 30% of the time they were placed while flying over a ground-based call using the same channel. He based this prediction on the premise that harmful interference to a ground call on the same frequency would occur whenever AirCell's signal strength exceeded a threshold of 124 decibels below one milliwatt, i.e. –124 dBm. The Commission rejected Dr. Lee's –124 dBm threshold as “too conservative,” stated

that an interference threshold of 117 decibels below one milliwatt, i.e. -117 dBm, was “more realistic for typical analog systems,” and that “based on [ ] review of the evidence, it appears [ ] that use of the latter threshold would have led to a finding that AirCell would cause a significant level of harmful interference 0% of the time.” *Initial Order*, 15 F.C.C.R. at 9631 n.67. On that basis, the Commission affirmed the grant of the waiver to Aircell by the Bureau of Wireless Telecommunications.

In *AirCell I*, the court remanded on the harmful interference threshold determination, holding that the Commission had failed “to justify adequately its choice of an interference threshold,” 270 F.3d at 968, and that it had not shown how it “translate[d] the raw signal data from the July 10, 1997 field test into a finding that AirCell’s system ‘would cause a significant level of harmful interference 0% of the time’ in the real world” without conducting a probability study to determine how frequently the event studied, the simultaneous use of the same channel by an AirCell call and a terrestrial call at the same location, would occur. *Id.* at 968–69. The court noted that the Commission’s “explanation for its conclusion in AirCell’s favor may be relatively simple and briefly stated,” but that because the record contained conflicting explanations of the data, the court was unable to discern “why the Commission considered one interference threshold preferable to another.” *Id.* at 968.

On remand, the Commission reaffirmed its prediction that AirCell would not cause harmful interference with ground-based cellular systems and explained its rejection of Dr. Lee’s conclusion to the contrary. *See Remand Order*, 18 F.C.C.R. 1926. It explained that it had derived the -117 dBm figure by starting from the strength of the weakest ground-based call that could still be considered acceptable quality in a rural area, which the Commission claimed was -100 dBm, and subtracting a 17 dB “buffer,” which is the industry standard for the amount by which a cellular call must exceed other signals in order to be effective. It reasoned that the -124 dBm figure used by Dr. Lee had been derived by assuming a -129 dBm environmental noise floor in quiet locations and

stipulating that AirCell would cause interference with ground systems once it exceeded the noise floor by 4.76 decibels. The Commission stated that this method was erroneous because it assumed too low a noise floor and failed to justify its premise that interference to ground-based calls would become harmful at 4.76 decibels above the noise floor. The Commission also stated that even if Dr. Lee's conclusions about the relative signal strengths were correct, it would show at most that AirCell's systems could cause interference, but not necessarily harmful interference, because Dr. Lee had wrongly assumed that all interference above his  $-124$  dBm threshold would be harmful. The Commission reasoned that the 17 dBm buffer was "significantly more buffer than is necessary to prevent harmful interference," and that an AirCell signal would not cause harmful interference until it "seriously degrades, obstructs, or repeatedly interrupts" a ground-based call, which, the Commission stated, would not occur until a "very substantial (e.g., 7 dB or more) excess over an [interference threshold]." *Id.* at 1935-36.

Reviewing the test data from the July 10, 1997 test flights, the Commission on remand showed that AirCell's mean signal strength exceeded the  $-117$  dBm threshold on only on one of the 24 test flights, and then only trivially. *See id.* at 1936-37. The test data also "do not show AirCell received power sustained at anywhere near the  $-110$  dBm level that would constitute harmful interference." *Id.* at 1937. On the basis of the fact that AirCell's mean signal strength almost never reached  $-117$  dBm on the test flights, and that its sustained signal strength came nowhere close to  $-110$  dBm, the Commission explained that it was unnecessary to conduct a probability study. The July 10 test flights measured AirCell's signal under the conditions when it was most likely to cause interference (i.e., when an AirCell phone places a call while flying over a ground-based phone using the same channel). Therefore, because AirCell calls would not cause harmful interference even under the worst-case scenario, it was unnecessary to assess the probability of the worst-case scenario occurring. The petitioners did not seek rehearing of the Commission's *Remand Order*, *see* 47 U.S.C. § 405(a) (2004),

but filed this petition for review pursuant to 47 U.S.C. § 402(a), and a motion for summary reversal and vacatur of the *Remand Order* and the underlying waiver grant. The court denied summary reversal. *See AT&T Wireless, Inc. v. FCC*, No. 03–1043 (D.C. Cir. July 15, 2003) (per curiam).

## II.

The sole question now before the court is whether the Commission’s order satisfies the remand in *AirCell I*. The court is generally the authoritative interpreter of its own remand, *see FCC v. Pottsville Broad. Co.*, 309 U.S. 134, 141 (1940), and in light of its previous opinion, the court owes no deference to the Commission’s interpretation of its task on remand. *See City of Cleveland v. FPC*, 561 F.2d 344, 346–47 (D.C. Cir. 1977). To the extent the Commission’s explanation on remand encompasses technical predictions within its expertise, however, the court will defer to its judgment so long as it is “not contrary to law, is rational, has support in the record, and is based on a consideration of the relevant factors,” *NAACP v. FCC*, 682 F.2d 993, 997 (D.C. Cir. 1982), because “greater discretion is given administrative bodies when their decisions are based upon judgmental or predictive conclusions.” *Id.* at 1001; *see also FCC v. WNCN Listeners Guild*, 450 U.S. 582, 594–96 (1981). Because the petitioners did not seek rehearing of the Commission’s remand decision before filing their petition for review, the court reviews only whether the Commission has complied with the remand instruction by explaining its choice of an interference threshold and its conclusion, based on the administrative record for the initial order, that AirCell is unlikely to cause harmful interference with ground-based cellular calls. As this question was presented to the Commission by the remand itself, *see AirCell I*, 270 F.3d at 968–69, the Commission has had opportunity to pass on it and the petitioners had no obligation to seek rehearing before petitioning for review. *See Time Warner Entm’t Co. v. FCC*, 144 F.3d 75, 79–81 (D.C. Cir. 1998). By bypassing review by the Commission, however, the petitioners have waived any substantive challenges to the *Remand Order* that were not presented by the court’s re-

mand. See 47 U.S.C. § 405(a); *Time Warner Entm't Co.*, 144 F.3d at 81.

The Commission, on remand, provided what the court requested: an explanation of “why the Commission considered one interference threshold preferable to another.” *AirCell I*, 270 F.3d at 968. It explained that the -117 dBm threshold it considered “more realistic for typical analog systems” in the initial *AirCell* order, 15 F.C.C.R. at 9631 n.67; see also *AirCell I*, 270 F.3d at 968, was based on two premises. First, an acceptable call in a rural area must be at least 100 decibels below one milliwatt strong (-100 dBm) to be of acceptable quality. See *Remand Order*, 18 F.C.C.R. at 1931-32. Second, as the parties did not dispute in the original proceeding, a call, “to remain effective . . . must sufficiently exceed the electromagnetic noise floor of the location where the call is received, plus whatever interference may be generated by a concurrent AirCell signal” by a ratio of 17dB. See *AirCell I*, 270 F.3d at 966. Therefore, AirCell’s signal risks interference with ground-based cellular calls when it comes within seventeen decibels of -100 dBm, i.e., when it reaches a strength of -117 dBm. See *Remand Order*, 18 F.C.C.R. at 1931-32.

The Commission similarly explained its reason for rejecting the -124 dBm threshold proposed by AirTouch Communications in the report of Dr. Lee. Dr. Lee’s analysis was based on an environmental noise floor in rural areas of -129 dBm, -127 dBm when noise from AirTouch’s system is factored in, and assumed that AirCell would cause harmful interference if its signal exceeded that level by more than a “reliability factor” of 4.76 dB. Dr. Lee’s calculations showed that an AirCell signal would exceed the noise floor by the required amount if it reached a strength of -124 dBm. The Commission did not consider Dr. Lee’s premise of a -127 dBm noise floor credible; he assumed “zero environmental noise,” which the Commission found was “not reflective of the typical noise environment in which cellular carriers operate,” and his assumption of only two decibels of system noise relied on high-fidelity receiver equipment that was neither “universal or standard practice for the cellular industry, even in rural

areas.” *Remand Order*, 18 F.C.C.R. at 1933–34. Second, the Commission explained that the premise behind Dr. Lee’s analysis — that AirCell would cause interference whenever it exceeded the level of background noise by a 4.76 dB “reliability factor” — had not been shown to have “any link” to cellular call quality. *See id.* at 1935. Under the Commission’s reasoning, what matters is the ratio between AirCell’s signal strength and the signal strength of terrestrial calls. *See id.* AirCell’s signal might be undetectable if it falls below the noise floor, but it does not need to; it can exceed the noise floor without causing interference so long as it remains at least seventeen decibels less powerful than any acceptable ground-based call on the same channel.

Nothing in the explanation in the *Remand Order* deviates impermissibly from the Commission’s reasoning in the *Initial Order*. The petitioners contend that the –117 dBm threshold was initially predicated, as was Dr. Lee’s –124 dBm threshold, on reasoning “up” from the electromagnetic noise floor, and that the Commission’s explanation on remand, which reasons “down” from the strength of an acceptable ground-based call, is an attempt to evade record evidence that the noise floor at the test site was –127 dBm, such that reasoning “up” would have resulted in an interference threshold less permissive than –117 dBm. Petitioners misread the initial order, however, for it does not suggest that the Commission derived the –117 dBm figure by reasoning “up” from the noise floor. Indeed, the court remanded because the Commission did not explain the origin of the –117 dBm figure, which the initial order simply stated was “more realistic for typical analog systems.” 15 F.C.C.R. at 9631 n.67. While counsel for the Commission at oral argument in *AirCell I* did represent to the court that the –117 dBm figure was chosen because it was the “average noise level in a quiet rural area,” the Commission is not bound to the post-hoc representations of counsel. The court remanded on the interference threshold determination because it could not locate an explanation within the four corners of the Commission’s order; on remand the Commission has supplied one. Put otherwise, the Commission’s initial order did not mention the noise floor except in the



context of urban areas, as to which the Commission explained that AirCell would not cause any interference because “the higher noise floor in urban areas will ensure that the AirCell units’ signal remains substantially below a detectable level.” 15 F.C.C.R. at 9637. There, the Commission explained, “very marginal quality calls in quiet rural areas may be affected” notwithstanding the fact that the noise floor would mask AirCell’s signal elsewhere. *Id.* at n.106. This discussion contemplates that AirCell’s signal might exceed the noise floor in rural areas, and is therefore consistent with the Commission’s position on remand. But as it leaves unexplained the basis of the conclusion that AirCell will not cause rural interference, it does not bind the Commission to the petitioners’ insistence that the Commission previously concluded that the noise floor would also mask AirCell’s signal in rural areas.

The petitioners also challenge the merits of the Commission’s explanation on remand for the  $-117$  dBm threshold. First, they point out that the record showed an actual noise floor of  $-127$  dBm at the test site, confirming Dr. Lee’s figure that the Commission considered too conservative. If there was any such error, it was harmless. As explained, the actual location of the electromagnetic noise floor is mostly irrelevant to the interference threshold under the Commission’s reasoning; rather, what matters is the ratio between terrestrial cellular calls and AirCell’s signal.

Second, the petitioners object to the Commission’s use of  $-100$  dBm as the starting point acceptable call from which to reason “down” to the interference threshold. The Commission explained its choice of the  $-100$  dBm figure on the basis that some petitioners in the initial AirCell proceeding used the  $-100$  dBm figure, and that technical literature uses  $-100$  dBm as the signal strength at which a call becomes so weak that cellular sites in rural areas will “attempt to continue carrying a call only if there were no cell site with better reception to which to hand it off.” *Remand Order*, 18 F.C.C.R. at 1932. The petitioners, however, dispute the relevance of the technical literature cited by the Commission, and contend that record data show that many ground-based

cellular calls at the test site were weaker than  $-100$  dBm, and that absent any interference from AirCell, these calls would function properly so long as they remain at least 17 decibels above the measured noise floor, i.e.,  $-110$  dBm. Thus, the Commission's  $-100$  dBm starting point effectively denies interference protection to these weaker calls.

Whatever the merits of these objections might be, they are not properly before the court. The only issue before the court is to determine whether the Commission has complied with the remand, not to review generally the merits of the remand order where petitioners failed to petition for rehearing, for the court may not consider any argument that “relies on questions of fact or law upon which the Commission, or designated authority within the Commission, has been afforded no opportunity to pass.” 47 U.S.C. § 405(a). The petitioners’ objections to the  $-100$  dBm figure do not address whether the Commission on remand explained its decision based on the record. Indeed, their counsel conceded at oral argument that the petitioners, by failing to seek rehearing, have waived any objection that the Commission’s *Remand Order* is arbitrary and capricious. While the court still must ensure that the Commission’s decision on remand is explained and has a basis in the record — both of which the Commission’s choice of a  $-100$  dBm figure satisfies — the petitioners have waived the right to challenge the substance of the Commission’s determination beyond compliance with the remand.

The petitioners also contend that the Commission’s explanation on remand, despite lip service to the  $-117$  dBm figure, actually relies on a  $-110$  dBm threshold. This misunderstands both the purpose of the remand and the Commission’s response. The court remanded so that the Commission could explain “why [it] considered one interference threshold preferable to another,” *AirCell I*, 270 F.3d at 968, not so that it could defend the  $-117$  dBm figure specifically. In rejecting the challenges to the waiver on the grounds that the petitioners’ licenses had been modified by the waiver and that the Commission had denied them the interference protection to which they are entitled under 47 C.F.R. § 22.911(d), the

court's remand was not dependent on the Commission's reaching the conclusion that AirCell would not expose petitioners to harmful interference by any specific technical means: the court remanded because of the absence of a satisfactory explanation for the Commission's finding of non-interference. *See id.* The terms of the court's remand, which focused only on the legal error of failing to provide an adequate explanation, thus would not have prevented the Commission from adopting a different interference threshold on remand, provided the choice was based on the record and adequately justified. *Cf. Pottsville Broadcasting*, 309 U.S. at 145. In any event, the Commission's determination that AirCell's calls would not cause harmful interference was based, as stated, on a threshold of -117 dBm. While the Commission also discussed a more permissive -110 dBm threshold, it did so to illustrate what it considered to be an additional error in AirTouch Communications' proposed -124 dBm threshold. *See Remand Order*, 18 F.C.C.R. at 1935-36.

The Commission's review on remand of the July 10 test flight data showed that AirCell's mean signal strength exceeded -117 dBm only on one of the 24 test flights, and then only by .62 decibels, a trivial amount. It concluded, therefore, that AirCell was unlikely to cause harmful interference. *See id.* at 1937. This reasoning aligns with, and further elaborates upon, the Commission's conclusion in the initial order. It differs only in the acknowledgment that one of the test flights did show a signal strength slightly exceeding -117 dBm, as contrasted with its conclusion in the initial order that AirCell would cause harmful interference "0% of the time." *Initial Order*, 15 F.C.C.R. at 9631 n.67. Later in the order, the Commission also noted that even if AirCell had exceeded the -117 dBm threshold, the interference it would cause would not necessarily become harmful until it reached a higher level somewhere close to -110 dBm. *See Remand Order*, 18 F.C.C.R. at 1935-36. But the Commission explained that AirCell's signal would not exceed the -117 dBm level in the first place. *See id.* at 1937. The context of the Commission's discussion makes clear that it is discussing a hypothetical. Dr. Lee's -124 dBm threshold assumed that

AirCell would cause harmful interference as soon as its signal, by rising above the electromagnetic noise floor, was strong enough to be detectable. The Commission was explaining that Dr. Lee's analysis provided more buffer than was necessary because not all detectable interference is so severe that it can be considered harmful. *See id.* at 1935–36.

The petitioners point out that a –117 dBm interference threshold can only lead to a finding of noninterference if one considers AirCell's mean signal strength, rather than its peak signal strength, and that a finding of noninterference that looks to AirCell's peak signal strength during the test flights can only be reached using a more permissive –110 dBm threshold. The Commission relied upon mean signal strength, under which the test flight data showed an AirCell signal weaker than –117 dBm, and hence under the interference threshold. The petitioners contend that this is erroneous, and that the Commission instead should have relied on peak signal strength, which would have shown AirCell's signal to frequently exceed the –117 dBm threshold. This objection is not properly before the court. Whether the average or peak signal strength is what matters to an interference analysis is the type of question that 47 U.S.C § 405(a) requires parties to give the Commission opportunity to pass upon before seeking judicial review, and the petitioners failed to do so. Again, their counsel conceded at oral argument that any objection that the use of mean signal strength was arbitrary and capricious has been waived

The petitioners have not, however, waived their related contention that the Commission's use of mean signal strength disregards the terms of the court's remand, but that objection is easily disposed of. They contend that irrespective of whether it was arbitrary and capricious, use of mean rather than peak signal strength is an attempted end-run around the court's instruction that the Commission demonstrate "how it was able, in the absence of a probability study, to translate the raw signal data from the July 10, 1997, field test" into a determination of non-interference. *See AirCell I*, 270 F.3d at 968. The petitioners overread the court's use of the phrase "raw signal data." The context makes clear that the court

was using “raw signal data” to mean “actual data” from the test flights as opposed to engineering theory and technical literature, not taking sides in any dispute, which was nonexistent on the first petition for review, as to the proper means of interpreting the signal strength measured during the test flights. To the extent the Commission on remand has made a showing of which data it relied upon and how it interpreted it, it has satisfied the court’s instruction to use “raw” data.

Finally, there was nothing “counterintuitive,” Petitioners’ Br. at 32, much less an abuse of discretion, in the Commission’s decision to rely on the record in the original proceeding and to reject for filing the petitioners’ comments on the court’s remand instruction. The Commission rejected a filing of comments by AT&T Wireless, Cingular Wireless and CellCo addressing the remand instruction, explaining that it “need not consider” the comments because it “neither solicited nor granted leave to file additional pleadings” in the case, and that the existing record was “a sufficiently adequate base on which to rest the Commission’s decision” because the Commission was “merely explain[ing]” its earlier decision. 18 F.C.C.R. at 1927. This is consistent with the court’s remand, which sought an explanation from the Commission based on the administrative record of the initial order. *See AirCell I*, 270 F.3d at 968. The petitioners acknowledge that all of the data cited by their comments was already in the record, but fail to appreciate that the time to submit comments was after, not before, the Commission issued its remand order.

Accordingly, because the *Remand Order* provides an adequate explanation in response to the remand in *AirCell I*, 270 F.3d at 968, we deny the petition for review of the *Remand Order* and the motion for vacatur of the orders granting waivers to AirCell.