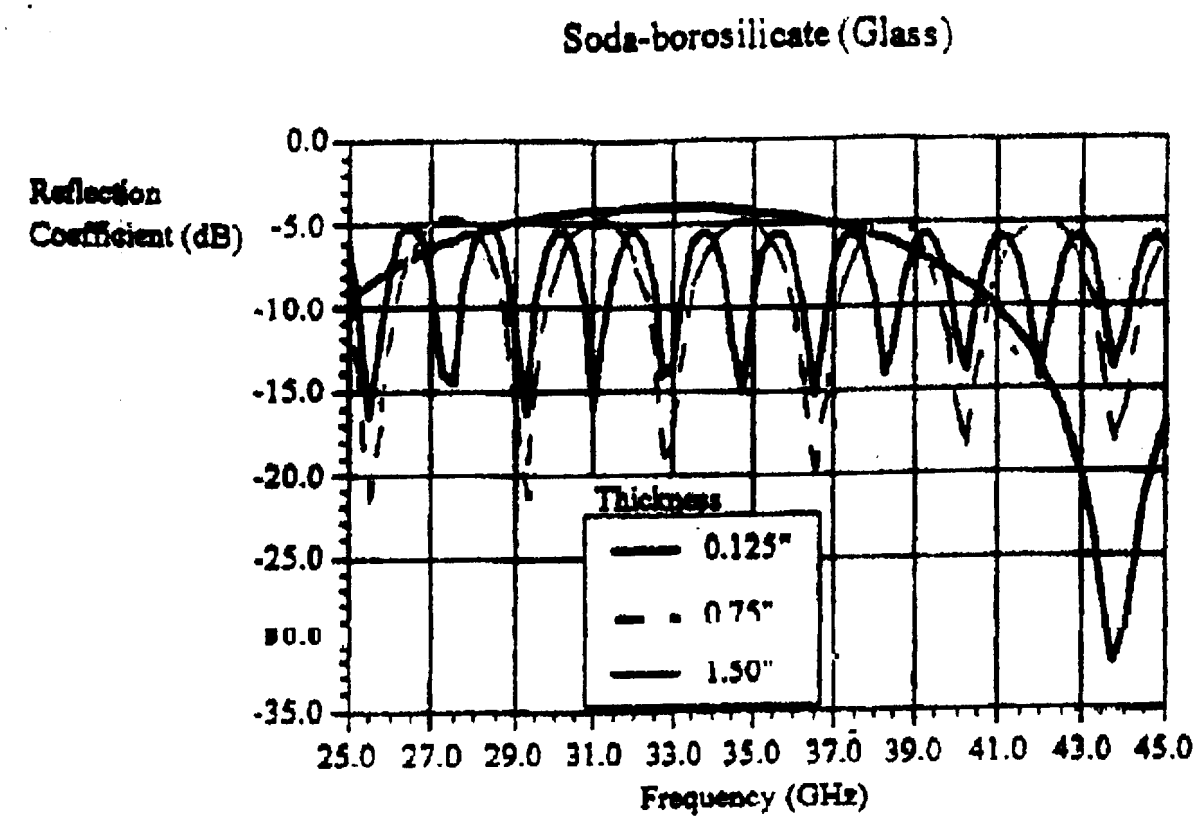


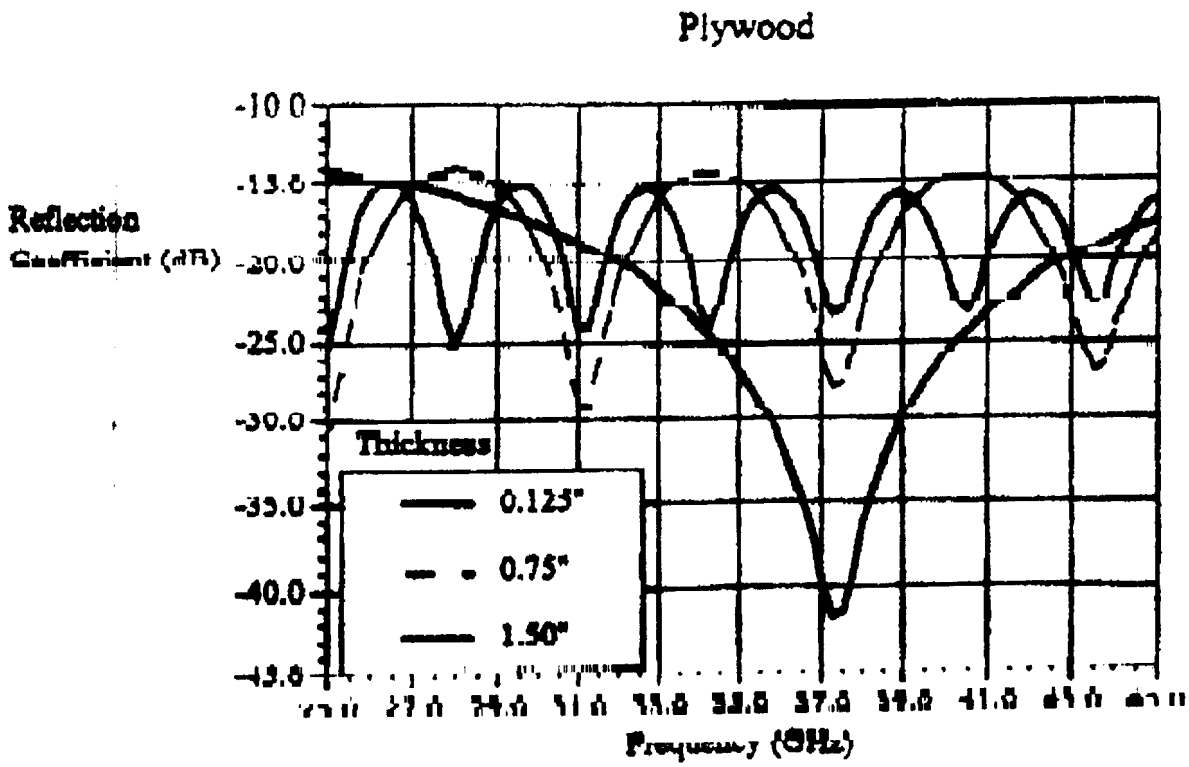


Figure 3. Reflection Coefficient as a Function of Material Thickness and Frequency. Zero Degree Angle of Incidence.

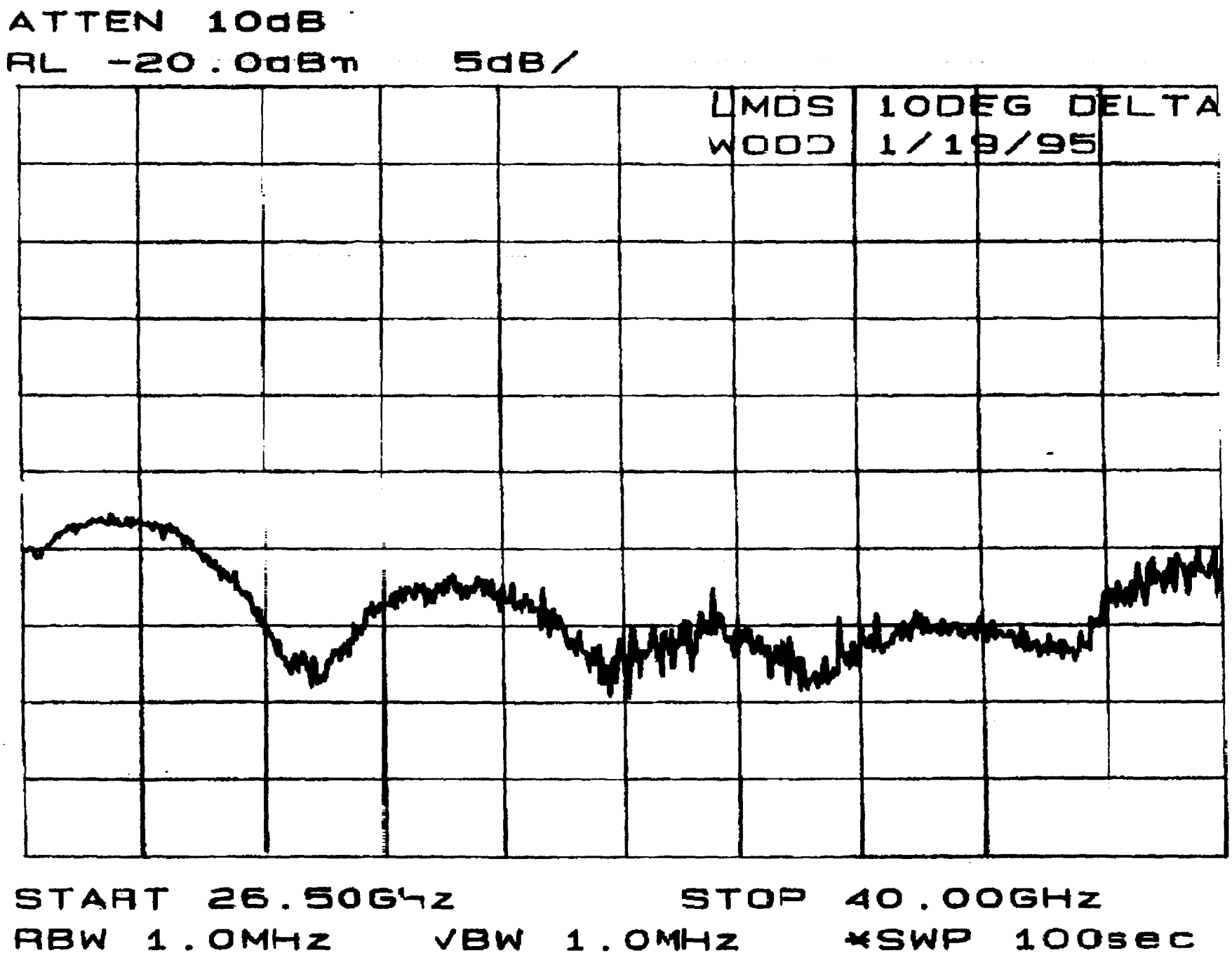
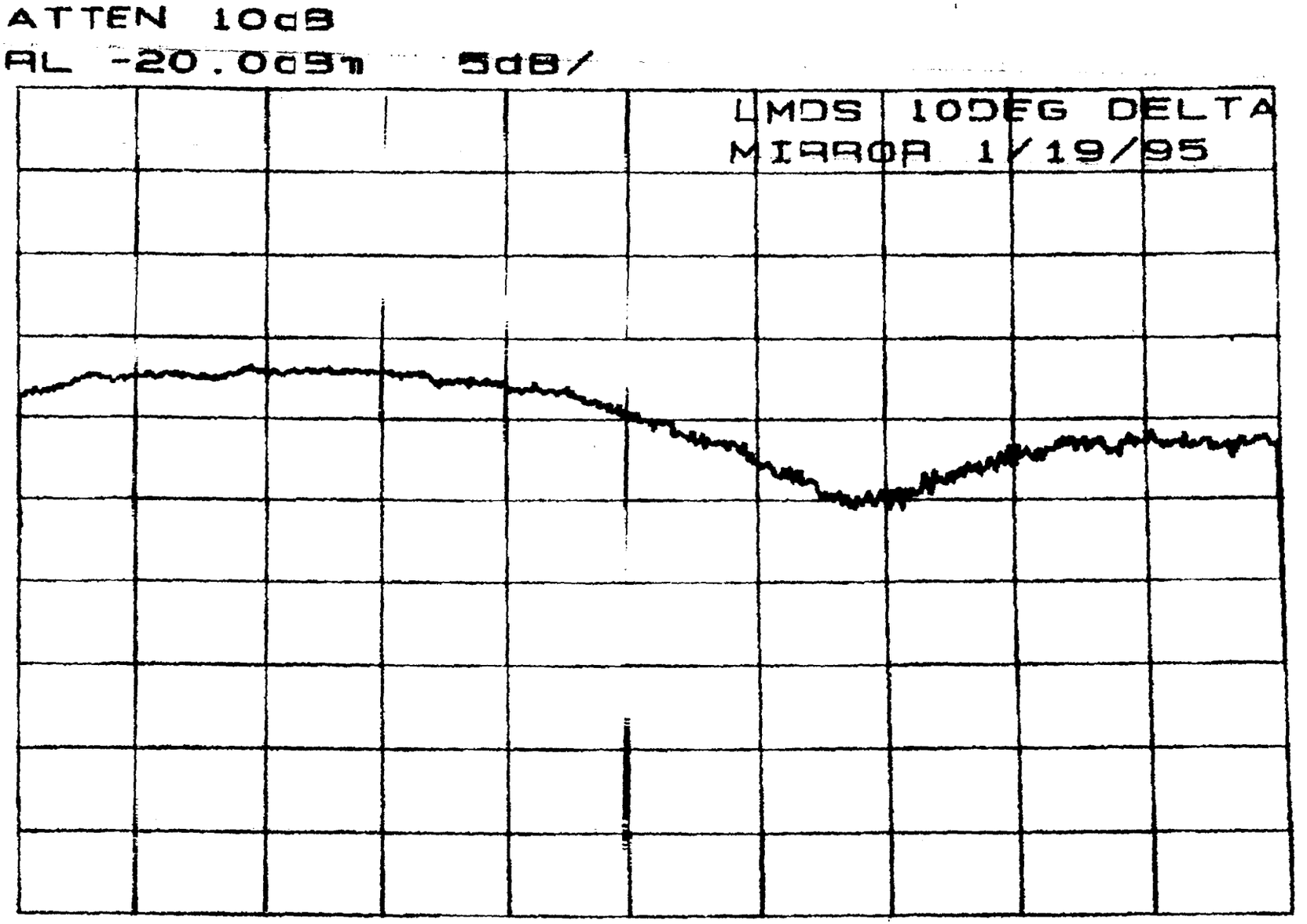
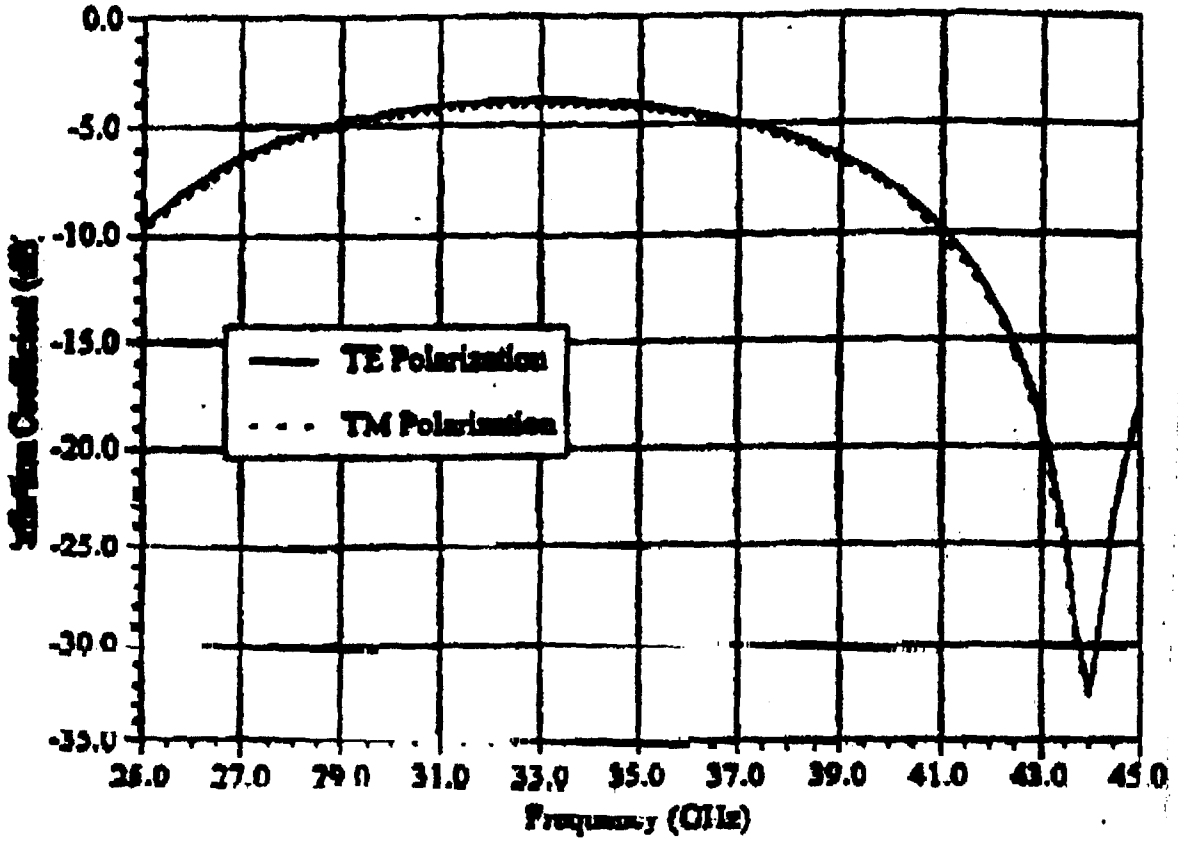


Figure 5. Measured reflection for wood at a 10° incident angle.

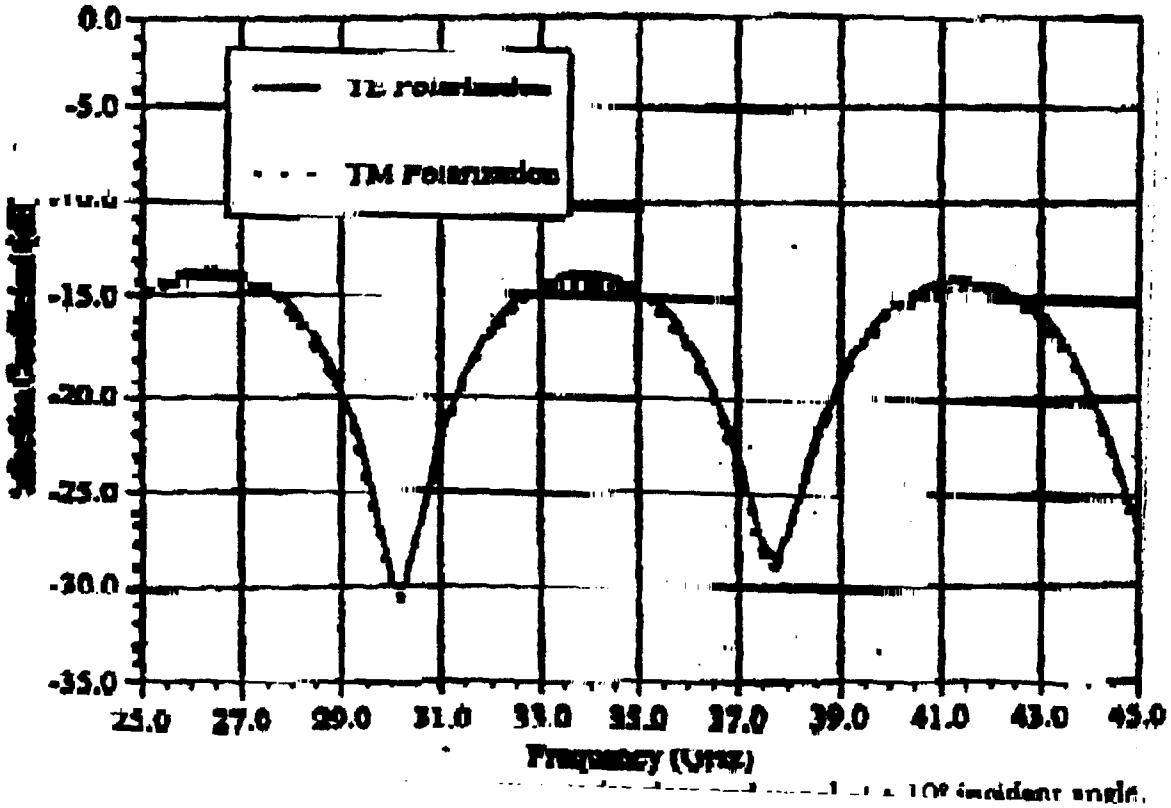


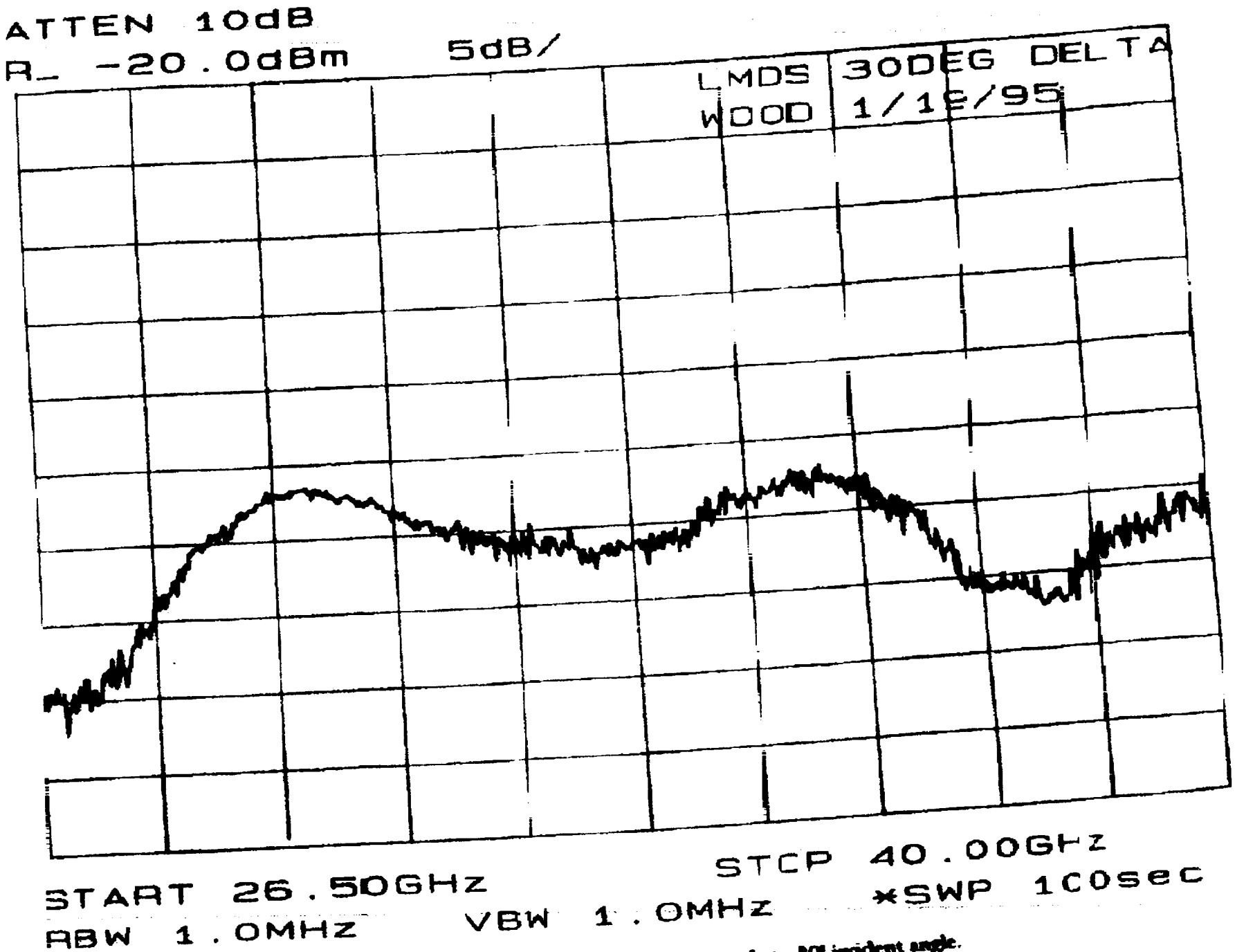
[illegible] reflection for mirror at a 10° incident angle

1/8" of Soda-borosilicate (Glass) at 10 Degrees



5/8" of Plywood at 10 Degrees





[illegible] for wood at a 30° incident angle.

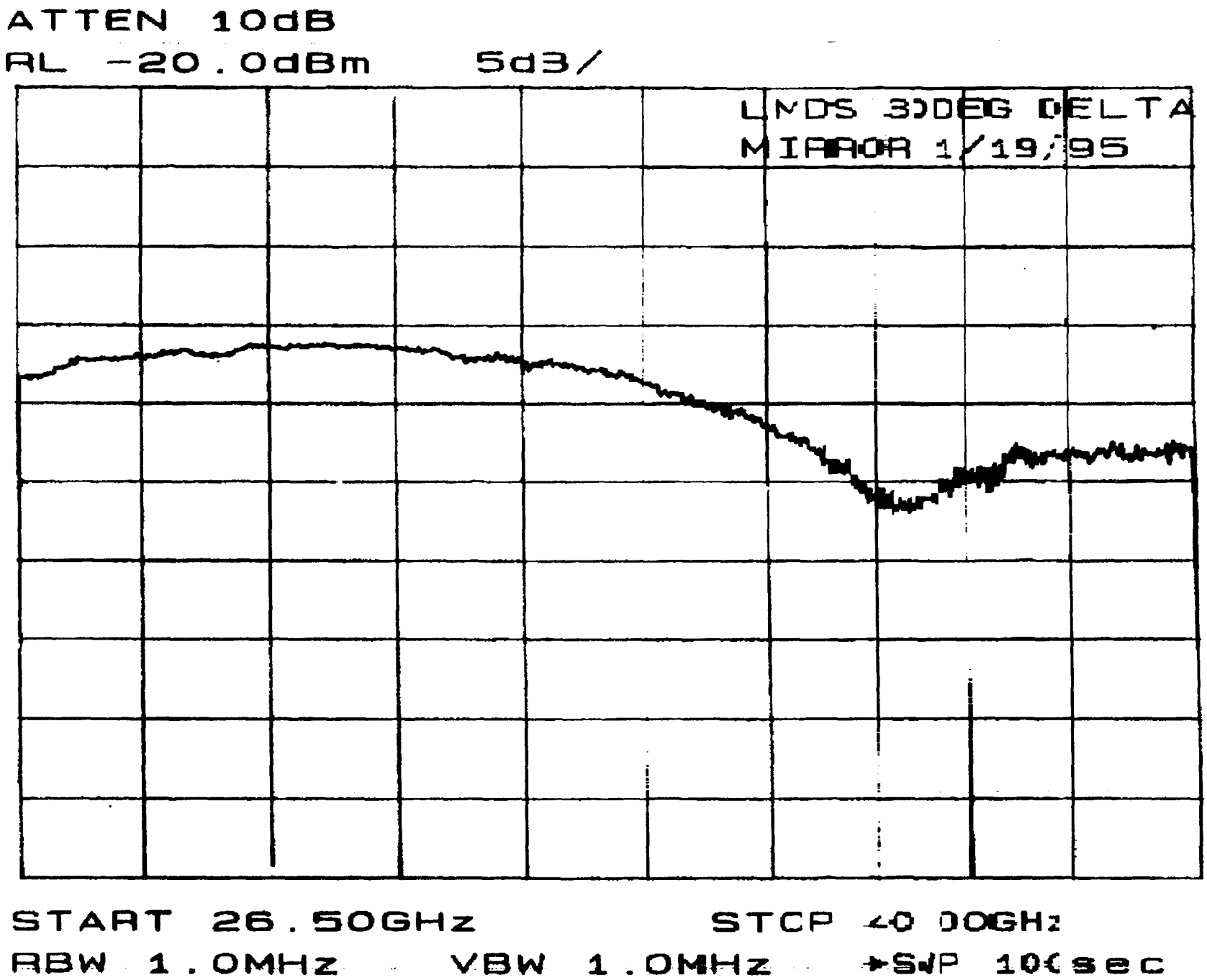
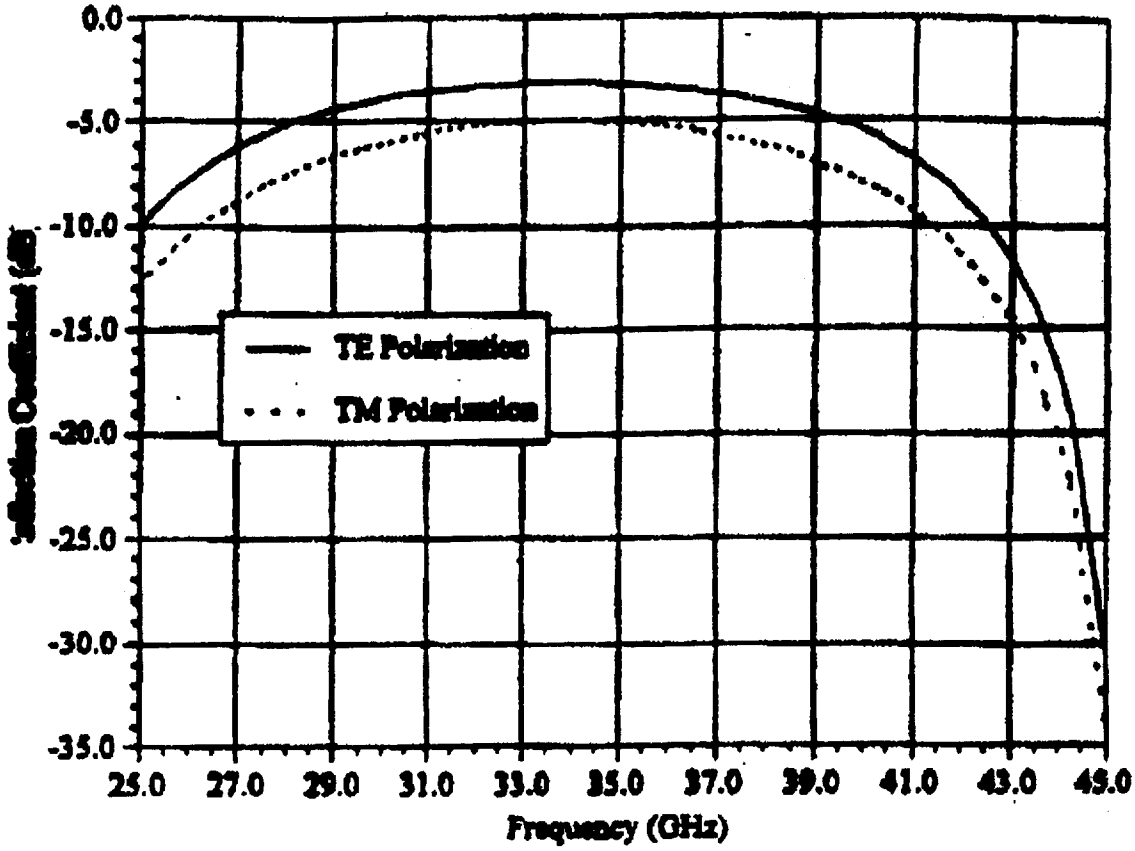
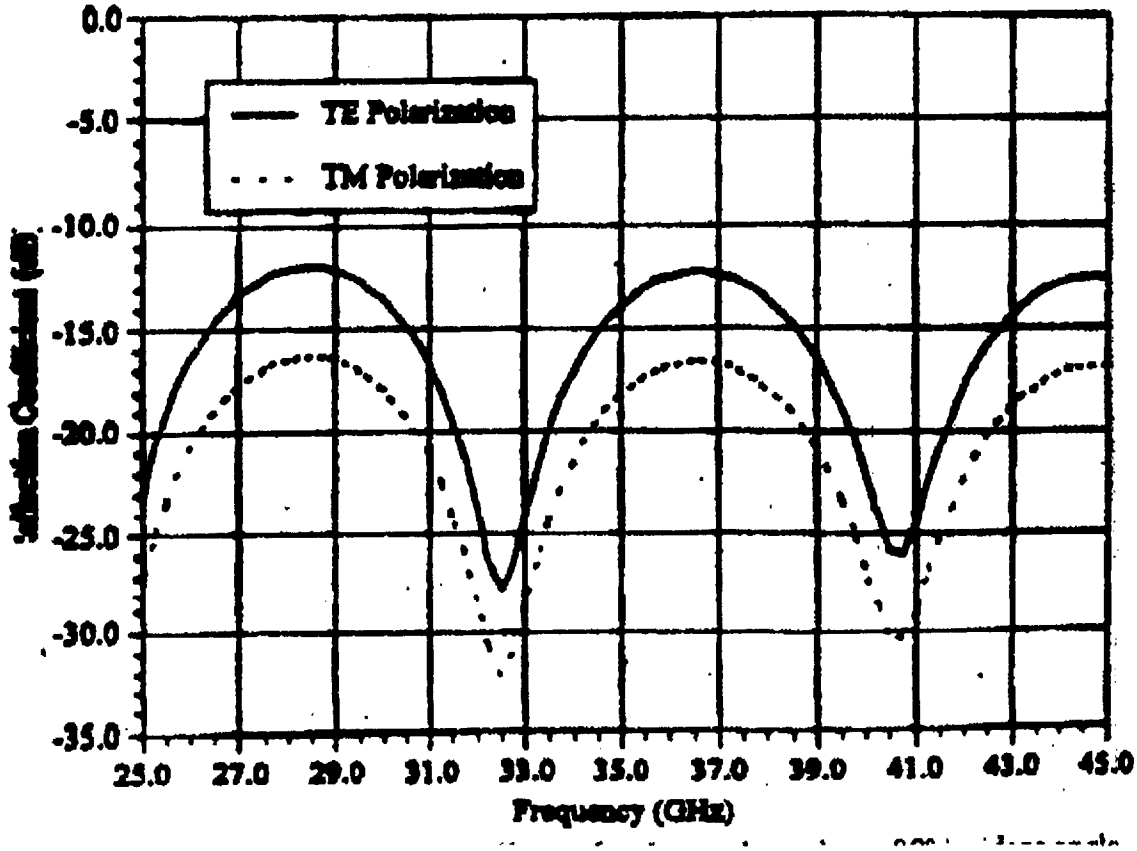


Figure 10. Measured reflection for mirror at a 30° incident ang.

1/8" of Soda-borosilicate (Glass) at 30 Degrees



5/8" of Plywood at 30 Degrees



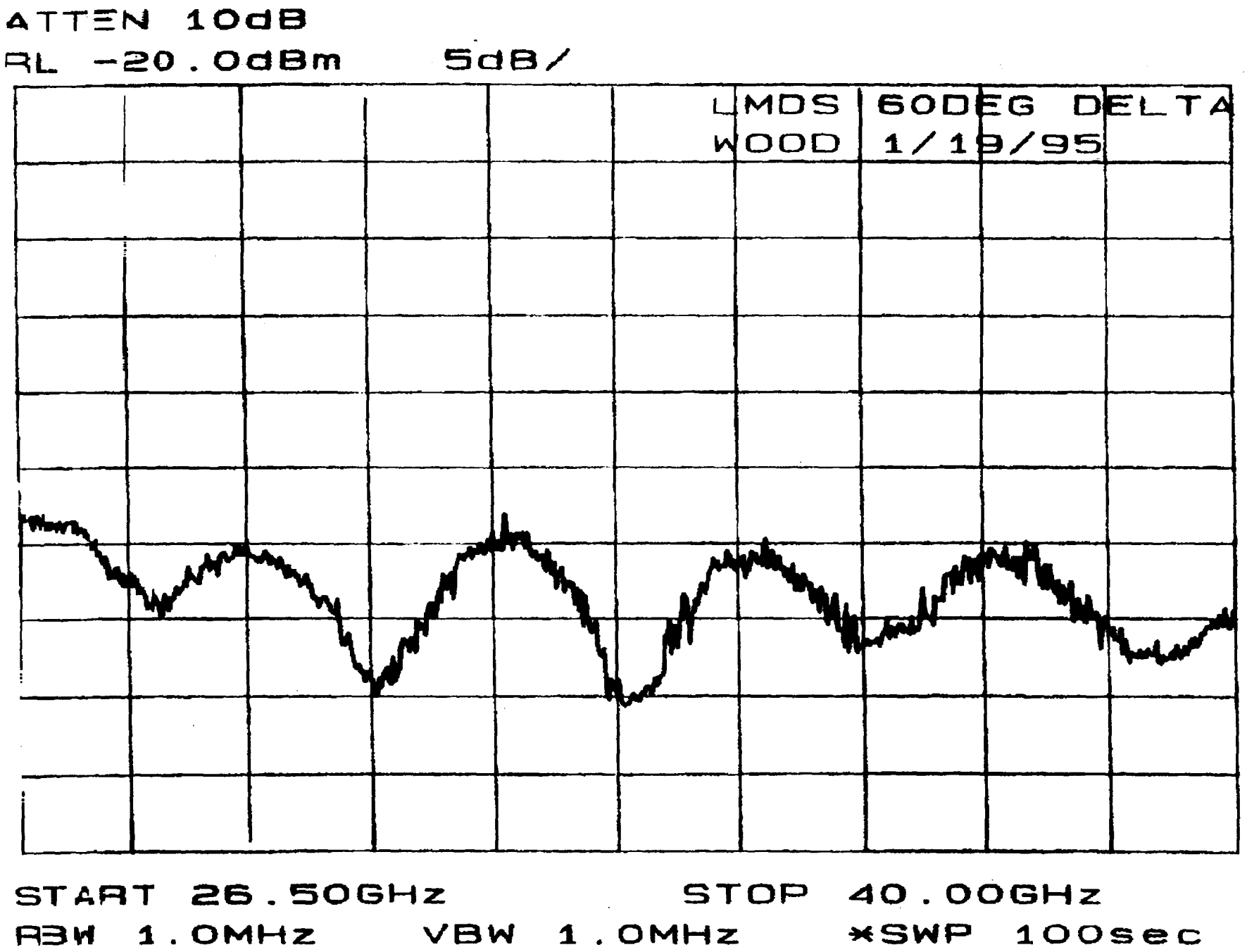


Figure 12. Measured reflection for wood at a 60° incident angle.

Exhibit 7

Petitions of Reconsideration pertaining to ET Docket 93-62, Rule and Order in FCC 96-326 Petitions of AT&T Wireless Services, Inc.("AT&T") and Personal Communications Industry Association ("PCIA") emphasize how difficult it will be, stating,

"determining the power and frequency of operation of a particular nearby transmitter may be impossible."

This further argues that the Commission cannot presume compliance if its own licensees indicate that it may be impossible for them to ensure compliance.

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Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of	)	
	)	ET Docket No. 93-62
Guidelines for Evaluating the Environmental	)	
Effects of Radiofrequency Radiation	)	

PETITION FOR RECONSIDERATION AND CLARIFICATION OF THE PERSONAL COMMUNICATIONS INDUSTRY ASSOCIATION

The Personal Communications Industry Association ("PCIA"),[1] by its attorneys, hereby requests clarification and reconsideration of the Report and Order adopted in the above-captioned rulemaking.[2] The *Order* alters the Commission's existing regulation of the environmental effects of electromagnetic energy emissions ("EME") by adopting maximum permissible exposure ("MPE") limits based on the 1982 NCRP Report No. 86,[3] combined with some aspects of the ANSI/IEEE C95.1-1992 guidelines on exposure to radiofrequency

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[1]PCIA is an international trade association created to represent the interests of both the commercial and the private mobile radio service communications industries. PCIA's Federation of Councils includes: the Paging and Narrowband PCS Alliance, the Broadband PCS Alliance, the Specialized Mobile Radio Alliance, the Site Owners and Managers Association, the Association of Wireless System Integrators, the Association of Communications Technicians, and the Private System Users Alliance. In addition, as the FCC-appointed frequency coordinator for the 450-512 MHz bands in the Business Radio Service, the 800 and 900 MHz Business Pools, the 800 MHz General Category frequencies for Business Eligibles and conventional SMR systems, and the 929 MHz paging frequencies, PCIA represents and serves the interests of tens of thousands of licensees.

[2]Guidelines for Evaluating the Environmental Effects of Radiofrequency Radiation, ET Docket No. 93-62, RCC 96-326 (Aug. 1, 1996) ("*Order*").

[3]National Council on Radiation Protection and Measurements, *Biological Effects and Exposure Criteria for Radiofrequency Electromagnetic Fields*, NCRP Report No. 86 (1986).

radiation.[4] In so doing, the *Order* substantially curtails the applicability of the categorical exclusions for many services, creating new "routine environmental evaluation" obligations.

As discussed below, PCIA does not believe that carriers' compliance obligations are sufficiently delineated in the *Order*. While PCIA recognizes that a revised OST Bulletin No. 65 is forthcoming, PCIA is requesting clarification of the *Order* to the extent that the revised Bulletin does not address certain key issues related to area-wide compliance by carriers. Moreover, since carriers' substantive obligations and rights will be, in large part, dictated by OST Bulletin No. 65, PCIA urges the Commission to provide public notice of the document in draft form and allow public comment, even on a expedited basis. Furthermore, because the compliance obligations of carriers cannot be fully assessed until the new Bulletin is released, PCIA requests the Commission defer the transition date for one year after OST Bulletin No. 65 is issued. As a final matter, PCIA is seeking modification of the one percent threshold triggering area-wide compliance obligations, due to the burden imposed by area-wide compliance and the minimal potential for certain previously categorically excluded services to result in field strengths in excess of the MPE limits. Each of these points is detailed below.

I. INTRODUCTION AND SUMMARY

Until recently, the Commission's regulations on the environmental effects of EME were based on the 1982 ANSI guidelines. In 1992, however, ANSI and IEEE approved a

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[4]American National Standards Institute and Institute of Electrical and Electronic Engineers, *Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz*, ANSI/IEEE C95.1-1992 (1992).

revised version of the guidelines and, as a result, the Commission initiated this proceeding to update its own rules. Under the new regulations, which are a blend of the 1992 ANSI/IEEE and 1982 NCRP guidelines, the Commission has substantially increased the burden imposed upon mobile communications carriers. Indeed, in view of the radical changes in site compliance requirements, the Commission has provided a delayed transition date of January 1, 1997, for the new rules and indicated that it will be receptive to waivers in cases of hardship. Despite the delayed transition to the new regulatory scheme, carriers are already wrestling with the task of developing procedures that will allow them to make the appropriate statement of compliance in future applications. Unfortunately, a number of issues are undefined in the *Order*, especially with respect to area-wide compliance.

Under the old regulatory scheme, paging and cellular carriers regulated under both Part 22 and Part 90 were "categorically" exempted from compliance evaluations due to the low probability that such facilities would exceed the applicable MPEs specified in the ANSI report. Now, however, these carriers must first utilize Table 1 in Section 1.1307(b)(1) of the Commission's rules to determine, on a site-specific basis, whether or not new or modified facilities remain categorically excluded. If a proposed facility is categorically excluded under Table 1, no further evaluation is required.

If a proposed facility is not categorically excluded, however, carriers are obligated to undertake a "routine" evaluation to determine whether the facility produces energy densities consistent with the MPEs in Table 1 of Section 1.1310 of the Commission's rules. If the MPEs in that table are exceeded, the carrier is required to file an Environmental Assessment

("EA"), a long and complex process.[5] In addition, if the carrier's facility produces energy densities in excess of one percent of the limits in Table 1 of Section 1.1310 for the carrier's type of transmitter, the carrier must also ensure that the entire area surrounding the carrier's facility is also in compliance with the applicable limits. If these calculations demonstrate compliance with the MPE limits, the carrier is required to file a statement of compliance with the application and the supporting calculations and data must be made available to the Commission upon request.

While these procedures appear facially simple, carriers have struggled with applying the process to real world circumstances, especially with respect to area-wide obligations. Specifically, PCIA requests clarification of what constitutes the appropriate "area" for purposes of area-wide compliance and clarification of the procedures used to determine whether the one percent trigger for area-wide compliance obligations is met. PCIA understands that the forthcoming OST Bulletin No. 65 may resolve some of these practical problems, and thus requests clarification of these issues only to the extent they are not addressed in OST Bulletin No. 65. However, inasmuch as it appears the bulk of the information needed for carriers to ascertain their compliance obligations will be contained in OST Bulletin No. 65, PCIA believes this document should be subject to public notice and comment procedures.

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[5]PCIA observes that, while the regulations do not *per se* establish a "compliance" requirement, as the Commission notes, "the preparation of a costly and time-consuming EA" "leads to a *de facto* compliance requirement." *Order*, Appendix A at IV.

As previously noted, carriers have not been able to ascertain the full extent of their new compliance obligations in the absence of needed clarifications to OST Bulletin No. 65. Under the circumstances, carriers will have only the period between the release of that document and January 1, 1997 to not only determine how to meet their obligations, but also to evaluate their transmitter facilities. Because this period could be as short as one month, compliance would be rendered impossible, requiring the filing of waiver requests by virtually every carrier in the country. Instead, PCIA urges the FCC to reconsider the transition date and allow a period of one year following the release of OST Bulletin No. 65 for transition to the new regulations.

PCIA also believes the Commission should reconsider the one percent trigger adopted for area-wide compliance obligations. In light of the restrictions imposed on the use of categorical exclusions, continued use of a one percent threshold appears to be too low. PCIA believes that a trigger of 10 percent, or even higher, would meet the Commission's regulatory objectives and significantly minimize unnecessary and burdensome obligations on licensees.

The modifications and clarifications requested by PCIA are intended to facilitate the process of achieving compliance with the new EME rules. Absent the requested reconsideration, carriers cannot even size the magnitude of the compliance task at hand, much less make rational judgments as to whether relief under the waiver procedures is necessary. Moreover, because PCIA believes that aspects of its reconsideration request may be mooted by OST Bulletin No. 65, PCIA urges the Commission to expedite the release of this vital document, subject to the constraints of public notice and comment obligations.

II. THE COMMISSION SHOULD CLARIFY THE AREA-WIDE COMPLIANCE OBLIGATIONS OF CARRIERS

Under the *Order*, certain area-wide compliance obligations are triggered if a proposed facility exceeds a percentage of the MPE specified for that type of transmitter. These obligations include sharing in the responsibility for achieving compliance at the area and the filing of EAs for such facilities, if necessary. In effect, upon reaching the rather low threshold of one percent, carriers are required to assess not only the environmental effect of their facilities, but also the facilities of nearby transmitters that are, in all likelihood, not part of that carriers' network. While PCIA believes that the reasonable spreading of compliance obligations is in the public interest, carriers have been not been able to discern fully the extent of these obligations for several reasons.

First, carriers are unsure what constitutes a "area" for purposes of determining area-wide compliance. Obviously, there judgments that must be made regarding whether there is a likelihood of a transmitter contributing significantly to the energy density at a particular location. In cases where there are several groups of antennas on the same property or adjacent rooftops with groups of antennas, however, the extent of carriers' obligations are not defined. Because legal liability will be imposed on carriers based upon their ability to determine what constitutes a particular "area," and because the responsibility for compliance may depend upon the definition of a "area," PCIA urges the Commission to enumerate with specificity what factors should be considered in these evaluations.

While PCIA is still researching this issue from a technical perspective, PCIA believes that an approach warranting consideration would be to define carriers' obligations through the

use of a power- and frequency-dependent area delineation. This approach would meet the Commission's policy goals while providing a needed "bright line" for carriers. For example, the energy density generally drops off at a rate related to the inverse square of the distance from the transmitter. Because the MPEs are proportional to the frequency of the transmitter, the Commission could define a radius around a transmitter proportional to the square root of the power divided by the frequency and require assessment of the combined effect of only those facilities physically located within that radius. This would provide predictability for carriers while meeting the Commission's policy goals and minimizing unnecessary burdens.

Second, carriers are unsure of how to measure the threshold for determining whether area-wide compliance obligations are triggered. As noted, the energy density attributable to a particular transmitter is proportional to the inverse square of the distance to the transmitter. Thus, at an arbitrarily close distance to an antenna, virtually any transmitter will produce energy densities that eventually reach the "one percent" threshold. Again, it is apparent some rule of reasonability should apply, and PCIA urges the Commission to further clarify the application of the rule. Specifically, PCIA believes it may be appropriate to adopt a fixed distance test where the threshold should be evaluated; *e.g.*, at a point 10 meters from center of radiation of the antenna.

Finally, PCIA seeks confirmation of carriers' interpretation of the note to Table 1 of Section 1.1307. Specifically, the note indicates that in the case of cellular, PCS, and some other services, "the phrase 'total power of all channels' in column 2 of Table 1 means the sum

of the ERP or EIRP of all co-located simultaneously operating transmitters of the facility."[6] PCIA, and carriers, have interpreted this definition to require adding together the transmit power of each individual channel for multichannel base stations, not as requiring aggregating the power of all transmitters operating at a site. In other words, PCIA seeks clarification that "facility," as used in the definition, is intended to refer to the co-located transmitters owned and operated by a single carrier, not intended to refer to all transmitters at an antenna farm or on a rooftop, regardless of who operates the facility. Thus, if a cellular applicant proposes a facility using 16 channels at 50 Watt ERP each at a rooftop location with a pre-existing 800 Watt ERP paging transmitter, the cellular applicant's "total power" is 800 Watts ERP (16 x 50 W), *not* 1600 Watts ERP (16 x 50 W + 800 W).

III. THE SUBSTANTIVE IMPACT OF OST BULLETIN NO. 65 WARRANTS THE USE OF PUBLIC NOTICE AND COMMENT PROCEDURES

Because the compliance obligations of carriers will depend, in large part, on the clarifications and procedures detailed in the forthcoming OST Bulletin No. 65, PCIA believes that document should be subject to public notice and comment procedures. Inasmuch as the Commission already intends "to solicit comments on the draft from individuals and organizations who are active and knowledgeable in this area,"[7] providing full public notice and comment periods would not appear to delay the adoption of revised rules. At the same time,

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[6] 47 C.F.R. §1.1307.

[7] *Order*, ¶114.

allowing greater public comment on OST Bulletin No. 65 could serve to highlight areas where guidance is needed from those within the industry that must follow OST Bulletin No. 65.

The *Order* recognizes that "information on evaluating compliance, in the form of a revised version of OST Bulletin No. 65, would provide significant assistance to those attempting to comply with these new guidelines."[8] PCIA believes the information that will be contained in OST Bulletin No. 65 is critical to discharging licensees' obligations -- the *Order* indicates, for example, that OST Bulletin No. 65 will provide both "further instructions on the application of [the controlled/occupational and uncontrolled/general public] definitions"[9] and "a detailed discussion of . . . [the] topic [of] various ways to accomplish compliance, including restrictions on access, implementation of appropriate work procedures for personnel, incorporation of RF shielding, mounting of warning signs, control of time of exposure and reduction of power during periods when personnel or the public are present."[10] PCIA also implicitly assumes that the revised bulletin will provide guidance on defining the geographic scope of licensees' area-wide compliance obligations, instructions for determining whether the threshold for compliance with area-wide obligations is met, and guidelines for the sufficiency of mathematical models and field measurements supporting compliance statements.

The tremendous importance of OST Bulletin No. 65 requires that carriers -- and other entities that are subject to compliance obligations -- be allowed the opportunity to provide

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[8]*Order*, ¶114.

[9]*Order*, ¶45.

[10]*Order*, ¶88.

input on areas where clarification and elaboration is necessary. Given that the Commission intends for the document to be subject to some limited review, affording the procedures for all interested parties to comment on the document would not appear to delay the finalization of the document and would allow for a more responsive guide for carriers and others seeking to fulfill their environmental obligations.

IV. THE COMMISSION SHOULD REVISE THE TRANSITION DATE TO BE ONE YEAR FOLLOWING THE ISSUANCE OF OST BULLETIN NO. 65

Because the *Order* recognizes that the "relatively short transition period may cause some difficulties for certain applicants," the *Order* states that:

> [F]or a period of one year from the date this Order is adopted, we will allow our Bureaus to address under delegated authority the specific needs of individual parties that make a good cause showing that they require additional time to meet the new RF guidelines.

Given the magnitude of the compliance task at hand,[11] PCIA does not believe that even these efforts by the FCC provide sufficient time for carriers to certify that their facilities are in compliance with the new regulations. Accordingly, PCIA believes the Commission should reconsider the transition date, instead adopting a transition date one year from the issuance of OST Bulletin No. 65.

If the Commission is requiring that carriers be capable of certifying that all pre-existing transmitters, whether or not previously categorically excluded, comply with the new regulations, the transition date is unreasonable. Carriers cannot, as discussed above, even size the task of determining whether a transmitter is in compliance without needed clarifications that will ostensibly be included in OST Bulletin No. 65. Once that document is released, as the Commission recognizes, "applicants may need to undertake significant analysis and study in order to comply with the new regulations."[12] Carriers will need time to understand the

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[11]PCIA believes the Commission's regulatory impact statement severely underestimates the burden on carriers. In paging, for example, the Commission indicates it receives only 10,000 applications a year, and calculates that only 1,176 will be subject to routine environmental evaluation. PCIA notes, however, that many paging facilities can be constructed without prior Commission authorization, and therefore significant numbers of facilities are built annually that are not included in the 10,000 count. Moreover, at least some of those 10,000 applications are renewal applications that may cover hundreds of sites. Furthermore, assuming that only 11 percent of the applications will require routine evaluation does not appear accurate. Initial feedback from carriers indicates a substantially higher number of applications will require routine evaluation, and these situations will also generally trigger "area-wide" compliance obligations. Finally, estimating only one hour per routine assessment is unrealistic. In order to determine the geometry of a site, and therefore to figure out minimum distances for general public and occupation exposure, a site visit will generally be required. In most cases, as PCIA notes, a field measurement is also likely to be necessary, a process that can take an entire 24 hour period.

[12]*Order*, ¶114.

procedures, definitions, and requirements for transmitter evaluations. Based upon this understanding, carriers will then be required to survey all of their sites to determine which transmitters do and do not qualify for a categorical exclusion. Because many carriers do not have consolidated site databases, this task itself may be a tremendous undertaking. Indeed, even if a carrier has a unified site database, it is unlikely to have any information on whether sites are rooftop or tower-based, since that information was never before relevant.

Once the carrier has been able to identify and categorize its sites, only then can it determine how many sites will require "routine evaluations." Given the current, very low, threshold for area-wide compliance, it appears likely that the large majority of the sites requiring routine evaluation will also require area-wide compliance assessments, a time-consuming and burdensome task. Moreover, because, as a practical matter, the information is unlikely to be available to conduct mathematical modeling for area-wide compliance checks, each of these sites will, in all probability, require a field measurement.[13] Unless procedures for such field measurements are defined, a field measurement will probably require at least a day because a carrier will have no way of determining peak loading conditions for the transmitters in the area.[14]

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[13]Although the Commission's regulatory impact statement indicates that all representatives at the site could cooperate to divide the costs of a field measurement engineer, the practical reality is that the other licensees will not be known to a prospective site applicant. Moreover, pre-existing licensees have no incentive to cooperate with the licensee, unless the site is actually shown to exceed MPE limits.

[14]Because peak loading may not be evidenced except on a weekly, monthly, or even seasonal basis, OST Bulletin No. 65 should provide some practical guidance on the what reasonable assumptions carriers are permitted to make.

PCIA does not believe that it is reasonable or feasible for carriers to complete all of these tasks in the short period between the release of OST Bulletin No. 65 and January 1, 1996. Even if the revised bulletin was released on October 1, 1996, carriers would have only three months to complete these tasks. Unfortunately, it is much more likely that the revised bulletin will not be released until mid-November or December, providing only 4 to 6 weeks for carriers to undertake this massive compliance task. Based upon the limited time available for transitioning to the new regulations, PCIA believes the Commission will precipitate a flood of waiver requests immediately prior to the January 1, 1997 date, resulting in an inefficient drain on FCC staff resources.

Furthermore, PCIA notes that providing a more extended transition time period is fully consistent with the Commission's obligations under the National Environmental Policy Act. In particular, because the facilities in question are those that were previously categorically excluded from compliance, there is "little potential" for these facilities to cause exposures in excess of the guidelines in any event.[15] Moreover, ANSI/IEEE have explicitly reaffirmed the safety of facilities conforming to prior ANSI standards, and therefore a slight delay in transitioning to the updated regulations would not implicate any policy concerns under NEPA.[16]

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[15]*Order*, ¶75; *see also Second Report and Order Erratum* 2 FCC Rcd 2526 (1987) (stating that for categorically excluded services, "the likelihood of the protection guides actually being exceeded is slight," even if "hypothetically, RF radiation limits could be exceeded in a few instances, such situations apparently seldom occur in actual operation.").

[16]*See* ANSI/IEEE C95.1-1992 at 23 (stating "[n]o verified reports exist of injury to human beings or of adverse effects on the health of human beings who have been exposed to electromagnetic fields within the limits of frequency and SAR specified by . . . ANSI C95.1-

Under the circumstances, PCIA believes the Commission should defer the transition date. Specifically, PCIA urges the Commission to adopt a transition date keyed to the release of OST Bulletin No. 65, with a period of at least one year for carriers to complete their appointed tasks. At a minimum, the Commission should extend the period where liberal waivers are available for a period of one year following the release of OST Bulletin No. 65 and establish a presumption that such waivers are deemed granted unless otherwise denied.[17]

V. THE COMMISSION SHOULD RAISE THE THRESHOLD FOR AREA-WIDE COMPLIANCE OBLIGATIONS TO TEN PERCENT OR MORE

As previously noted, the *Order* imposes certain area-wide compliance obligations on carriers filing applications for facilities that exceed one percent of the MPE specified for that type of transmitter. These obligations include filing EAs in the event the area, as a whole, does not meet the MPE limits and sharing in the responsibility for bringing the area into compliance. The one percent threshold, however, is never discussed in the text of the *Order*, and apparently is derived from the Commission's prior EME regulations for non-categorically excluded facilities. As discussed below, however, in light of the changes to the categorical exclusions and the burdens seemingly imposed by area-wide compliance obligations, a one percent threshold no longer appears appropriate. Under the circumstances, PCIA believes a trigger of ten percent -- or even higher -- is warranted.

1982").

[17]Given the legal ramifications of failure to comply with safety regulations, and the high probability that the Commission will not be able to act on the large number of waivers that will be filed, establishing a presumption of grant until denial is critical.

While performing a routine evaluation for a specific transmitter will require time and engineering expertise, carriers fully understand the need to ensure a safe environment through compliance with the EME limits established by the Commission. The additional burden of determining the EME from a potentially large number of transmitters in an undefined area, however, is an arduous task that should not be imposed absent compelling justification. As an initial matter, determining the licensee of nearby facilities may prove challenging, especially for smaller carriers, and determining the power and frequency of operation of a particular nearby transmitter may be impossible. There are numerous facilities, for example, where no filings are required at the FCC at all, and no publicly available, verifiable documentation of the facility's characteristics may exist. Even if official records of the facility exist, some relevant information, such as the transmitter duty cycle, is unlikely to be shown. If the licensee cannot be located, or is uncooperative, applicants may not be able to determine the technical characteristics they need to assess the EME from a critical facility in the area. Even if all engineering documentation on nearby sites can be obtained, the difficulty of determining whether the area, as a whole, meets the applicable MPE limits is considerably greater than determining the effects of a single transmitter. Indeed, the only means for ascertaining compliance may, in practical effect, be obtaining field measurements at the site, an expensive and potentially lengthy process.

As a practical matter, the difficulties of obtaining the information necessary to model overall area compliance will effectively require carriers to perform on-site field measurements for every multi-transmitter site. Absent clarifications in OST Bulletin No. 65 standardizing the procedures used for field assessments, monitoring of at least 24 hours would appear to be