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THE APPLICATION PROCESS AND THE USE OF NON-DISCRETE POWER LEVELS FOR AM STATIONS

By Commission Report and Order dated April 24, 1985, changes were made in the FCC Rules which eliminated the requirement that AM stations file for facilities using power levels at a limited number of discrete values (e.g : 0.25kW, 1.0kW, 5.0kW, etc.). These modifications were intended to provide greater flexibility for AM applicants. However, details regarding implementation of certain provisions of the new rules need to be further addressed.

Under the new rules, a single value will be designated for the nominal power and the antenna input power (excluding the directional antenna supplement allowed under Section 73.51 (b)(1) and (b)(2)). In the past, a radiation value less than the theoretically predicted amount could be achieved by applying a power level less than the nominal value to the antenna to provide compensation and both the nominal and antenna input powers would be licensed. With the removal of the discrete power level requirement, the power actually delivered to the antenna becomes the licensed nominal power, barring the above-mentioned exclusion. Several examples of how the application process will operate under these new rules are discussed below.

Consider first, applications which propose non-directional antennas. In the case of a new station, the power will be directly derived from the proposed radiation for that allocation. The radiation will be first extracted from Figure 8 of Section 73.190 of the FCC Rules (based upon antenna height and ground system), and then, that value adjusted by the square root of the proposed power to produce the proposed radiation. Alternatively, the proposed power will be derived from the square of the ratio of the proposed radiation to the Figure 8 predicted value. For an existing station proposing a change of facilities, these same methods apply. This is a departure from the former treatment where, if, for instance, an AM antenna height was being increased to accommodate an FM antenna and the AM radiation was to be maintained at the licensed value, then the station would retain its nominal power but reduce its antenna input power and would be licensed with a restricted radiation. Under the new rules, restricted radiations are being eliminated as they are encountered in formal applications that propose changes in the antenna systems. Thus, any such application must specify the actual power to be applied to the antenna and the end result will be a licensed operation with an apparent power reduction, but, in reality, coverage and radiation equivalent to the previous operation.

For directional operations involving a new station or a proposal utilizing a new antenna system (in particular, site relocations), the provisions of Section 73.150(b)(1)(i) shall be observed and the pattern RMS shall be

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developed using an assumed loss of one ohm per tower and the power adjusted to meet that RMS value. Patterns proposed under these circumstances that do not meet this criterion will result in a request to the applicant for a corrective amendment.

Directional applications that propose only slight modifications of existing arrays may have a sufficient history of antenna performance and measurement data which can, in many cases, be used to demonstrate whether a particular system operates with an inherently greater loss than the one ohm method may approximate. For these specific systems, when the application proposes to modify only the theoretical parameters of the existing operation and leaves the overall system geometry unchanged, exemption from the RMS/power relationship based upon one ohm loss can be entertained. Should it become apparent after filing of the license application that a reduction of the input power is necessary to meet the pattern requirements, then that new power level will become the licensed power and any reference to the old nominal power will be deleted.

Additionally, there may be situations where a newly constructed directional antenna has been completed, and a license application has been submitted and it is demonstrated, based upon proof data, that the antenna system, due to its intrinsic shortcomings, does not perform to the level expected by use of the one ohm per tower loss assumption. In such cases, an upward power adjustment can be affected at the time of license application. Such adjustment is to be made based upon a direct mathematical escalation applied to the measured values of inverse distance field while providing assurance that no adjusted value in any direction shall exceed the authorized standard pattern limitation. Requests for augmentation of the standard pattern to accommodate additional expansion once the requirements of Section 73.151(a) [regarding minimum RMS (85%)] have been met will be categorically denied. In no event will a power adjustment be allowed that would result in a power level in excess of the maximum value specified for that class of station. Upon Commission approval of the adjusted power, such value will become the licensed value and appropriate domestic and international notification procedures and data base updating will be initiated by the FCC staff. Also, at such time, the new power will be placed on FCC Public Notice. In most cases, the increase of power would normally affect the calculation of the standard pattern 'Q' factor as defined by Section 73.150(a)(1)(i) of the FCC Rules. However, since the purpose of the power adjustment is to allow for the actual performance of a constructed antenna system within the constraints of the proposed pattern, the original array design parameters should not require reconsideration. Therefore, the value of 'Q' as authorized in the construction permit will be retained and will subsequently be carried on the station license along with the modified value of nominal power. Similarly, this unchanged, but now non-standard, 'Q' value will undergo the proper international notification and data base updating processes.

Therefore, with the preponderant consideration given under the new Rules to the pattern RMS values and radiation efficiencies and their relationship to expected coverage area, no loss of service should be experienced, even though unfamiliar power levels begin to appear upon station licenses.

Related to the methods described within this Notice, examples are presented which depict some of the more frequently experienced applicational scenarios. These are included as an appendix to this document.

Further information on the matters discussed in this Notice may be obtained from James G. Ballis (202) 632-7010, or Henry A. Straube (202) 632-7010 both at the AM Branch of the Audio Services Division of the Mass Media Bureau.

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Attachment

EXAMPLES

Situation 1: An existing non-directional station with a nominal power of 5 kilowatts, an antenna input power of 5 kilowatts, and an effective field of 300 mV/m/kW at one kilometer increases its antenna height while restricting radiation to the present value instead of achieving an effective field of 325 mV/m/kW at one kilometer for the new height. When the CP is issued, the nominal and antenna input power will be 4.3 kilowatts. $[(300/325)^2 \times 5]$

Situation 2: A permittee for a new directional station with a nominal power of 5 kilowatts, a standard RMS of 700 mV/m at one kilometer, and a Q of 25.0 mV/m at one kilometer determines via the proof of performance that the measured RMS is actually 800 mV/m at one kilometer. When the covering license is issued, the nominal power will be 3.8 kilowatts, the antenna input power will be 4.1 kilowatts, the standard RMS will remain at 700 mV/m, and the Q will remain at 25.0 mV/m. $[(700/800)^2 \times 5]$ with an 8 percent adjustment pursuant to Section 73.51(b)(1) of the Rules]

Situation 3: A permittee for a new Class II directional station with a nominal power of 5 kilowatts, a standard RMS of 750 mV/m at one kilometer, and a Q of 25.0 mV/m at one kilometer determines via the proof of performance that the measured RMS is actually 630 mV/m at one kilometer. When the covering license is issued, the nominal power will be 7.1 kilowatts, the antenna input power will be 7.5 kilowatts, the standard RMS will remain at 750 mV/m, and the Q will remain at 25.0 mV/m. $[(750/630)^2 \times 5]$ with a 5.3 percent adjustment pursuant to Section 73.51(b)(2) of the Rules]

Situation 4: A permittee for a new Class III directional station with a nominal power of 5 kilowatts, a standard RMS of 750 mV/m at one kilometer, and a Q of 25.0 mV/m at one kilometer determines via the proof of performance that the measured RMS is actually 630 mV/m at one kilometer. The permittee must apply for a modification of construction permit to reduce the standard RMS to 630 mV/m so that the power to be authorized does not exceed 5 kilowatts.