Before the
Federal Communications Commission
Washington, D.C.

In the matter of:

	)	
Revitalization of the AM Radio Service	)	**MB Docket No. 13-249**
Further Notice of Proposed Rule Making	)	**FCC 15-142**

COMMENTS OF CARL T. JONES CORPORATION

Carl T. Jones Corporation, an engineering consulting firm, hereby submits comments responding to the Commission's October 23, 2015 Further Notice of Proposed Rule Making ("FNPRM") in the above-captioned proceeding. Carl T. Jones Corporation ("CTJC") provides technical assistance to AM broadcasters, supporting development of new and improved transmission facilities. CTJC has been engaged in these endeavors continuously since 1935.

This FNPRM is the second part of a major revision to the technical standards intended to revitalize the use of the AM broadcast band to better serve the needs of the listening public. The first part of this revitalization effort has been achieved by several Rule changes adopted in this proceeding's First Report and Order. We have reviewed the Commission's FNPRM and offer the following comments.

Change Nighttime and Critical Hours Protection to Class A AM Stations

In the FNPRM, the Commission proposes changing the protected nighttime contour for Class A stations from the 0.5 mV/m - 50% skywave contour to the 0.1 mV/m groundwave contour. It also proposes changing the nighttime co-channel interfering contour from the 0.025 mV/m - 10% skywave contour to the 0.005 mV/m groundwave contour. Since the Rule changes proposed in Appendix B of the FNPRM continue to afford skywave protection to Class B stations during

nighttime hours, we believe that the proposal to protect Class A stations with a groundwave contour, as indicated by 73.182(q) [redesignated as (o)] of Appendix B, may be in error. However, if the Commission is indeed considering the nighttime groundwave interfering contour as the only nighttime interference protection criterion for Class A stations, CTJC performed studies to demonstrate the adverse effect this would have on four Class A stations

Since the facilities of potential interfering stations on the Class A channels can range from 0.25 kW to 50 kW, for this study we chose hypothetical co-channel stations using non-directional quarter wave antennas, and powers ranging from 0.25 kW and 50 kW. To satisfy the proposed nighttime protection requirements each hypothetical station was, in turn, placed at a distance such that its 0.005 mV/m groundwave contour was just tangent to the 0.1 mV/m groundwave contour of the relevant co-channel Class A station. To determine resultant nighttime interference from each hypothetical interfering station, a single site-to-site skywave night limit was calculated for the affected Class A station. The results are tabulated below.

	Hypothetical 0.25 kW Station		Hypothetical 50 kW Station	
Class A Station	**Required Distance Separation (km/miles)**	**Nighttime Interference Limited Field Strength (mV/m)**	**Required Distance Separation (km/miles)**	**Nighttime Interference Limited Field Strength (mV/m)**
WSM, 650 kHz Nashville, TN	890.1 / 553.1	1.54	1375.5 / 854.7	10.61
WLS, 890 kHz Chicago, IL	769.9 / 478.4	1.70	1035.2 / 643.2	14.66
KDKA, 1020 kHz Pittsburgh, PA	614.2 / 381.6	2.41	866.3 / 538.3	20.07
WHAM, 1180 kHz Rochester, NY	549.5 / 341.4	2.62	690.1 / 428.8	26.44

Table 1. Predicted Nighttime Skywave Interference from Hypothetical Interfering Stations that Comply with the Proposed Groundwave to Groundwave Nighttime Interference Protection Criterion

These results demonstrate that groundwave only nighttime interference protection to Class A stations would cause a devastating and unacceptable reduction of the Class A station's nighttime interference-free coverage area. Therefore, based on previous experience, these and other studies, CTJC would support proposed Rule changes affecting Class A station protection **only** if the Rules will ultimately provide all Class A stations with 10% skywave interference protection to their groundwave protected contour during nighttime hours.

To better understand the Class A station interference situation during nighttime hours, CTJC performed RSS night limit studies on all of the Class A stations located in the 48 contiguous states. In all cases, the RSS night limits of the Class A stations were found to be greater than 0.5 mV/m. The night limits ranged from just over 0.5 mV/m to 3.1 mV/m with a median value of 1.1 mV/m. Based on the results of the RSS night limit studies, CTJC supports a 0.5 mV/m protected groundwave contour for Class A stations instead of the proposed 0.1 mV/m contour based on the present level of predicted nighttime interference from domestic and foreign co-channel stations. We further propose that the Class A protection criterion specify that there can be no overlap of the Class A station's nighttime 0.5 mV/m protected groundwave contour from a potential interfering station's 0.025 mV/m - 10% skywave contour. It is believed that this protection criterion will limit new nighttime interference to the Class A station's present service area while at the same time providing some relief to other stations operating on the Class A channel that desire a new nighttime service, in the case of Class D stations or an improvement to their existing nighttime service in the case of Class B stations.

Critical Hours protection is presently afforded to the daytime Primary groundwave service area of the Class A stations during the "transitional period" of the daytime hours of operation. The technical provisions adopted in the late 1950's limits a Class B facility's radiated field in the direction of the co-channel Class A station's primary service area based on the frequency, distance and azimuth to the 0.1 mV/m contour of the Class A station. This "daytime skywave" prediction uses a substantially reduced ionospheric reflection coefficient for the period 2 hours after sunrise and 2 hours prior to sunset when compared to the normal nighttime, second hour after sunset

prediction. While the FNPRM does not propose to alter the protected daytime service contour, it does propose to eliminate the Critical Hours protection entirely. CTJC opposes this proposed change.

Change Nighttime RSS Calculation Methodology

CTJC supports the proposal to roll back the 1991 rule changes as it pertains to calculation of nighttime RSS values of interfering field strengths and nighttime interference-free service by amending Section 73.182(k) of the Rules to return to predicting the nighttime interference-free coverage area by using only the interference contributions from co-channel stations and the 50% exclusion method.

Change Daytime Protection to Class B, C and D Stations

CTJC supports the Commission's proposals to: change the first adjacent channel D/U protection ratio from 2-to-1 (6 dB) to 1-to-1 (0 dB); change the second adjacent channel protection criterion to prohibit overlap of the desired and undesired station's 25 mV/m signal contours; and eliminate the third adjacent channel protection requirement. We also support the Commission's proposal to increase the daytime protected contour of Class B, C and D stations. However, we suggest an increase to the 1 mV/m protected contour rather than the proposed 2 mV/m protected contour.

The National Radio Systems Committee in its Summary Report, NRSC-R101, Dec. 2006, states that objective measurements have established that the majority of current analog AM receivers have audio bandwidths of less than 5 kHz. If fact, with only a few exceptions, the frequency response of individual receivers begins to fall off just above 1 or 2 kHz.[1] This fact supports the selection of a D/U ratio of 1-to-1 (0 dB) for first adjacent channel stations at the desired station's protected signal contour.

[1] This was pointed out in the Comments of du Treil, Lundin and Rackley, Inc. in response to the Revitalization of the AM Radio Service, Notice of Proposed Rule Making, 28 FCC Rcd 15221 (2013) ("NPRM").

The Commission's proposals to change the second adjacent channel protection criterion and eliminate the third adjacent channel protection criterion are designed to allow station licensees greater flexibility to increase power or modify their directional patterns in order to overcome manmade noise and better serve their communities. In addition, these changes will allow greater flexibility in siting new stations and in relocating existing stations. In the absence of receiver performance data to the contrary, it is our opinion that the proposed changes will not cause material interference in the AM band.

The FNPRM proposes to change the daytime protected contour of Class B, C and D stations from the 0.5 mV/m contour to the 2 mV/m contour. This is an increase of 12 dB. There is no doubt that environmental noise has, over time, increased substantially, however, an increase of 12 dB is, in our opinion, extreme. This would be equivalent to a noise power increase of approximately 16 times. If such a change to the Rules were adopted, those stations in non-urban environments where the noise power is considerably lower could lose a substantial portion of their audience that reside outside of the 2 mV/m contour but within the area that is not currently noise limited. Further in rural areas there can be far fewer aural services available to listeners than in urban areas and therefore the importance of the loss of service beyond the 2 mV/m contour takes on significantly greater importance.

We believe that selection of a new daytime protected signal contour should strike a balance between overcoming noise in urban environments and maintaining coverage and listenership in non-urban environments where the noise power in the AM band is considerably lower. Therefore we support increasing the daytime protected contour to 1 mV/m corresponding to a 6 dB increase over the current 0.5 mV/m contour.

Once a change to the daytime protected contour is adopted, a station could, depending on its allocation situation, increase power to overcome manmade noise. However, most existing Class C stations are already operating at the maximum power for their Class and would have no way to take advantage of the new Rule change. In fact, these stations would likely receive additional interference from first adjacent channel Class B and D stations, taking advantage of the

fact that the Class C station's protected contour had increased. This is another reason to adopt a less extreme change to the daytime protected contour than that proposed in the FNPRM. Class B and D stations that are currently operating with a daytime power of 50 kW would also not be able to increase power to overcome manmade noise and would likely receive additional interference from both co-channel and first adjacent channel stations should these other stations increase power under the new Rules as proposed.

For many Class B and D stations, an increase to the daytime protected contour would allow the opportunity to increase power in order to overcome manmade noise. The question of how many stations might take advantage of such a Rule change was evaluated by randomly selecting a sample of fifteen Class B and D stations and evaluating the potential for a power increase under the assumption of both a 1 mV/m and 2 mV/m protected contour. For this study we also assumed that the proposed changes to the Rules regarding adjacent channel protections were also adopted. To limit the magnitude of the study, we assumed that each station would use its existing daytime pattern and all other co-channel and adjacent channel stations would remain at their current licensed power level. Table 2 below tabulates each studied station's Class and current licensed facilities; the power level that would be possible under the assumption of both a 1 mV/m and 2 mV/m daytime protected contour; and the populations within those two protected contours.

Reference No.	Station Facilities	Power (kilowatts)	1 mV/m Population	Power (kilowatts)	2 mV/m Population
1	Class D 10 kW-D, ND	50	3,222,192	50	2,520,363
2	Class B 5 kW-D, 1 kW-N, DA-2	12	1,204,683	50	1,229,183
3	Class D 10 kW-D, 0.18 kW-N, DA-D	10	982,113	15	726,486
4	Class D 5 kW-D, 0.036 kW-N, ND	5	318,913	13	287,338
5	Class B 10 kW-D, 5 kW-N, DA-N	50	950,284	50	710,016
6	Class B 2 kW-D, 0.37 kW-N, DA-N	2	80,472	2	51,044
7	Class D 10 kW-D, 0.1 kW-N, DA-2	50	618,229	50	492,060
8	Class B 10 kW-D, 10 kW-N, DA-2	50	597,310	50	469,223
9	Class B 5 kW-D, 0.5 kW, DA-N	6.9	3,394,426	38	3,715,822
10	Class B 5 kW-D, 5 kW-N, DA-N	5	545,180	5	303,636
11	Class B 5 kW-D, 5 kW-N, DA-N	5	4,313,284	12	3,969,239
12	Class D 5 kW-D, 0.11 kW-N, DA-2	5	1,389,729	10	1,145,706
13	Class B 15 kW-D, 20 kW-N, DA-2	15	734,919	15	455,128
14	Class B 5 kW-D, 1 kW-N, DA-2	5	5,376,376	24	5,737,168
15	Class D 5 kW-D, 0.17 kW-N, DA-2	5	2,790,341	5	1,209,774

Table 2. Potential Power Increase for Fifteen Class B and Class D Stations

The study results indicate that from a power perspective, six of the fifteen stations studied could potentially increase power under the assumption of a 1 mV/m daytime protected contour while eleven stations could increase power under the assumption of a 2 mV/m protected contour. From a population perspective however, twelve of the fifteen stations would have a greater population within their protected contour under the assumption of a 1 mV/m protected contour when compared to the populations within the protected contour under the assumption of a 2 mV/m protected contour. This of course assumes that the reception within the 1 mV/m contour is not noise limited. Further, those stations that cannot increase power under either the 1 mV/m or 2 mV/m protected contour scenarios would receive far less interference from other co-channel and

first adjacent channel stations under the 1 mV/m assumption and therefore benefit from a lower protected contour.

REVISE RULE ON SITING OF FM CROSS-SERVICE FILL-IN TRANSLATORS

CTJC peripherally addressed this subject in Reply Comments to the earlier NPRM and continues to support a modification to the Rules to allow a translator's 60 dBu contour to be wholly within the AM station's 2 mV/m daytime contour or within a specified radius of the AM station's transmitter site whichever is **greater.** Further evaluation leads us to agree with the Commission's current proposal to modify Section 74.1201(g) of the Rules to provide that the coverage contour (1 mV/m) of an FM translator station rebroadcasting an AM radio station as its primary station must be contained within the **greater** of either the 2 mV/m daytime contour of the AM station or a 25 mile (40 km) radius centered at the AM transmitter site, but that in no event may the translator's 1 mV/m coverage contour extend beyond a 40 mile (64km) radius centered at the AM transmitter site.

MODIFY PARTIAL PROOF-OF-PERFORMANCE RULES

CTJC supports the Commission's proposal to modify Section 74.154(a) of the Rules to require that partial proof of performance measurements be made only on radials which contain a monitor point. In most cases, radials that contain a monitor point correspond to the directions of the pattern minima. The field strengths along these radials are the most sensitive to parameter changes, or other changes that may occur at the antenna site that may affect the directional pattern and therefore represent the best indication of the condition of the directional pattern. We therefore conclude that measurements of the field strengths only along radials that contain a monitor point are sufficient to verify pattern compliance when performing a partial proof of performance.

MODIFY RULES FOR METHOD OF MOMENTS PROOFS

CTJC n supports the Commission's proposals in part to modify the Rules for Method of Moments proofs of performance. We agree with the Commission's proposal to retain the requirement for reference field strength measurements and also support elimination of the requirement to re-measure the reference field strengths during recertification of a station's directional pattern(s). We do not support the complete elimination of the sample system recertification measurement requirements for the reasons stated below, but rather would support a relaxation of the time interval between recertification measurements to 48 months instead of the current 24 month time interval.

This firm has performed sample system recertification measurements for eighteen stations after the initial 24 month interval, twelve stations after the second 24 month interval and 2 stations after the third 24 month interval. The performance of two out of eighteen sample systems tested was determined to be noncompliant after the initial 24 month interval, corresponding to approximately 11% of the systems tested.[2] The performance of one out of twelve systems tested was determined to be noncompliant after the second 24 month interval corresponding to approximately 8% of the systems tested during the second time interval.[3]

Therefore, based on this firm's experience in performing recertification measurement, roughly 10% of the systems have been found to be noncompliant after each 24 month time interval. Using this data to evaluate extending the time interval between recertification measurements, one would expect that 20% of the systems would be noncompliant assuming a 48 month (4 year) recertification interval[4], 30% of the systems would be noncompliant assuming a 72 month (6 year) interval, and 40% of the systems would be noncompliant assuming a 96 month (8

[2] During the initial 24 month interval, the performance of one antenna monitor was determined to be noncompliant and the unit was returned to the manufacturer for calibration; and the performance of one toroidal current transformer was determined to be noncompliant and it was replaced.

[3] During the second 24 month interval, the performance of one antenna monitor was determined to be noncompliant and the unit was returned to the manufacturer for calibration.

[4] In the case of the 12 sample systems measured by this firm for both the initial and second 24 month period, 25% of the systems were determined to be noncompliant assuming a 48 month recertification interval.

year) interval. Based on this analysis and the fact that little data is available for the third 24 month recertification interval and no data exists for the fourth 24 month interval, we would support increasing the time interval between recertification measurements to no more than 48 months. We realize that the data sample is relatively small and we will be interested to see whether or not the experience of others supports the statistics presented here.

CTJC supports eliminating the requirement to remove base current and voltage sampling devices for performance testing during the recertification process provided that the requirement to measure the sample line impedance with the sampling device connected is maintained. Removal and reinstallation of the base sampling devices for testing, in most cases, is the most labor intensive portion of the sample system recertification process and, as pointed out in previous comments in this proceeding, repeated removal and replacement has some potential to cause damage to the sample line connector. Failure or out of tolerance performance of the sample device can in most cases be detected by the measurement of the impedance of the sample line with the sample device connected. We note that this is the same performance verification procedure that is currently used when tower mounted loop sampling devices are employed.

CTJC supports the proposal to expand the application of the exemption from the requirement to submit a surveyor's certification to include those stations that propose modifying their directional pattern(s) provided that the tower geometry remains unchanged and there are no new towers added to the array. The Commission's present policy with regard to the submission of a surveyor's certification is to exempt licensed stations applying to re-license under the MoM procedures in the Rules from the requirement to submit a certification, provided that there is no change to the authorized theoretical pattern or patterns. In adopting the present policy, the Commission understood that a certain small subset of stations that would re-license under the MoM Rules would have tower arrays that did not comply with the 1.5 electrical degree tower location tolerance as a result of errors in the original survey at the time the towers were constructed.

Since the time that the MoM Rules were adopted in 2009, nearly 250 stations have been licensed under these Rules with the vast majority of those stations being exempt from submitting a surveyor's certification. To our knowledge there has been no complaint of additional interference resulting from the relicensing of these exempt stations. In light of the lack of observed interference to date from the large number of stations that have relicensed under the MoM Rules, it seems reasonable, with a low risk of creating any material harmful interference, to expand the application of the surveyor's certification exemption to include stations that propose to modify their patterns with the provision that the array geometry remain the same and that there be no new towers added to the array.

CTJC supports the proposal to clarify Section 73.151(c)(1)(viii) of the Rules to specify that the present requirement in the Rules that limits the total capacitive reactance to no less than five times the magnitude of the tower base operating impedance only applies to cases where the total base capacitance is greater than 250 pF. Further, this limitation should only apply to systems that employ base current sampling.

We have reservations with regard to permitting the use of MoM modeling when skirt-fed towers are used in directional antenna systems. We have had only limited success in accurately modeling directional antenna systems comprised of skirt-fed towers and this is likely attributable to limitations of the MoM model's ability to handle antenna structures that have wires of vastly different radii connected to, or in close proximity of, each other. We are not absolutely opposed to the proposed Rule change but believe that an expanded set of procedures and limitations would have to be developed and applied when modeling these types of antennas.

With regard to minor modifications to a tower in a directional antenna system that has been licensed under the Method of Moments procedures in the Rules, CTJC supports the proposal to limit the requirement for re-proofing to only those cases where the measured base impedance of the affected tower has changed to the degree that it is outside of the allowable tolerance with respect to the modeled impedance as specified in the license application.

CTJC supports the proposal to eliminate the requirement for current distribution measurements to be performed for top-loaded or other unusual antenna configurations when MoM or other numerical analysis methods are used to determine the antenna's characteristics. This firm's experience is that current distribution measurements are unreliable and are difficult to analyze due to the influence in the measurement from fields generated from current flowing in nearby structural guy wires and the even greater influence from fields generated from current flowing in the top loading guy wires for measurements performed near the top of the tower. Further, Method of Moments analysis of the current distribution prior to construction of the tower provides an accurate means to determine the required physical length of the top loading wires eliminating the requirement to modify the length after the tower has been erected.

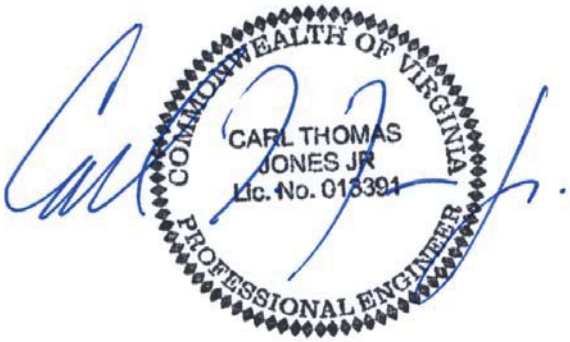
REQUIRE SURRENDER OF LICENSES BY DUAL EXPANDED BAND/STANDARD BAND LICENSEES

CTJC proposes that under some limited circumstances it would be reasonable and equitable for dual band licensees to be permitted to retain both standard band and expanded band authorizations. In some instances the two stations are operated in a simulcast mode which contributes little value to serving the public interest. Such licensees should be required to select one of the stations and return that license for cancellation.

However, there are some licensees who have developed their stations into two distinct entities which individually provide separate program streams, and therefore two options for the benefit of the listening public. In such a scenario, if the licensee can meet the ownership limits for the subject market with both stations deemed attributable then the licensee should be able to retain both stations, provided that the license of neither station could be separately assigned for a period of three years.

A dual band licensee that has invested in developing separate station operations, and two individual program services, deserves some consideration to avoid stranding his investment by not being forced to divest with no opportunity for recovery.

Respectfully Submitted, March 21, 2016



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