

MULLANEY ENGINEERING, INC.

9049 SHADY GROVE COURT
GAITHERSBURG, MD 20877



**Before the
Federal Communications Commission
Washington, DC 20554**

In the Matter of:)
) MB Docket No. **99-325**
Digital Audio Broadcasting Systems and)
Their Impact on the Terrestrial)
Radio Broadcast Service)

To the Commission:

REPLY TO OPPOSITIONS

Mullaney Engineering, Inc. (“MEI”), hereby submits Reply to Oppositions filed by various parties to the several petitions for reconsideration, review or stay filed by parties in MB Docket 99-325 (commonly referred to as “**RECONS**”). The Commission has adopted an across the board increase which would permit every FM station to increase its IBOC power level from the currently authorized 1% or -20 dBc to 4% or -14 dBc and potentially even to 10% or -10 dBc.

The majority of the oppositions dealt with the legal question of whether the RECONS were properly filed or if Section 307(b) is applicable to the adoption of an across the board increase of IBOC power. Some even argue it is too late. However, the oppositions were conspicuous in the absence of technical arguments, attempting to document **their claim** that an IBOC power increase will not result in interference to the existing Analog 60 dBu coverage of many FM stations.

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Certainly, **it would truly be a monumental travesty of justice**, if the Commission or its Staff avoids a review of this IBOC decision **on a technicality**. The consequences of avoiding a review (doing nothing) & continuing forward with an across the board IBOC power increase could devastate individual Analog coverages of many FM radio stations and could in-fact truly bring to fruition the dreaded **“AMization of the FM radio band”** that the NAB worried about in the late 1980s when Class A FMs requested an across the board increase of the Gigantic 3 dB increase (from 3 to 6 kW), much less the 6 to 10 dB increase now being discussed.

While the NAB professes to represent the interests of “all” broadcasters before the FCC, I state this is not so. The NAB consistently represents the interests of the largest broadcasters since they are the ones that contribute the most money to the NAB. I personally have no problem with a lobbyist representing special interests but request they refer to themselves as the **NABB** - the **National Association of BIG BROADCASTERS** so that no one is confused.

In the past, the NAB opposed the adoption of contour protection since they felt the use of the FCC’s F(50,50) & F(50,10) curves in conjunction with a measured pattern from the antenna manufacturer would be inaccurate and lead to faulty protection of the station being short spaced. The NAB took

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this position despite the fact that the existing FCC's minimum separation table is directly derived from these same curves.

The **NAB opposed the 3 dB** Class A power increase from 3 to 6 kW. Keep in mind that Class A FM stations represent approximately 50% of all commercial FM stations, however, the vast majority **are not members** of the NAB. The NAB argued that the FCC should mandate that every Class A increasing its power be required to serve all "affected stations" by certified mail and document that they obtain consent of those stations. The NAB also want the FCC to consider, in its public interest assessment, whether there is a loss of service inconsistent with Section 307(b) so that the consent procedure cannot be used as a means to "negotiated interference". The NAB is on record in several Commission proceedings opposing the concept of negotiation of interference rights. See NAB comments in Doc 87-267, February 1, 1988.

It is very curious to note that the **NAB apparently has no problem** with the adopted across the board 6 to 10 dB IBOC power increase without the need of an individual 307(b) analysis and not withstanding the fact that the "joint parties" (NPR and iBiquity) redefined the definition of "objectionable interference". This new definition of "objectionable" reduces

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the protected contour of Class B FM facilities from their current 54 dBu to the 60 dBu contour (**a 36% reduction in potential Analog service area**) and not to mention that many stations will receive interference **within the 60 dbu** contour itself. **The NAB must certainly be proud that they remain true to their core** value that the FCC **must not permit “negotiated interference”**. After all, the victims or the stations receiving the IBOC interference were **NOT PART OF THE NEGOTIATIONS**. But unlike the 6 kW Class A proceeding, the BIG broadcasters can now receive a benefit.

The NAB has also **opposed the pending proposal** to re-allocate TV Channels 5-6 for use as a Digital Radio Band. Their opposition is in-spite of the fact that low band VHF TV channels have tremendous difficulties achieving replication of their analog service area. The NAB has also been silent on the STAs issued to Ch. 6 DTV stations for significant increases (up to 7 dB) in DTV power despite the fact that Ch. 6 TV operations have the potential of impacting NCE FM facilities in the lowest part of the FM band. The FCC rules require DTVs to evaluate this potential impact to NCE FM stations but we have not yet been able to locate this required analysis.

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Certainly, the NAB position is not based only on the fact that ABC owns WPIV-TV in Philadelphia and it operates on DTV Channel 6.

Again, we applaud the NAB's tireless lobbying in front of the FCC. But only ask that they clearly point out who's interests they are representing.

There is no doubt that the current 1% IBOC power level is **insufficient** to provide replication of the FM stations analog service area, however, **it was never intended to do so** since IBOC receivers are specifically designed to blend back to Analog when the Digital signal is unable to provide quality service. The original 1% power limit was specifically set to avoid causing objectionable interference to the Analog FM service of stations operating on 1st adjacent channels. It should be understood that IBOC - In Band On Channel is really a misnomer since the Digital signal really occupies half of the bandwidth of the adjacent channel on the lower side and also on the upperside. Thus, a more accurate description is **IBAC - In Band Adjacent Channel**.

We believe the potential interference within the Analog 60 dbu contour has been significantly understated. Our conclusion of this understated interference is based upon analysis of the results on page 29 (including Figure 26) of the NPR report of November 2009. That report provides D/U ratios for IBOC power levels of 1%, 4% and 10% as 14 dB, 16.9 dB and 18 dB respectively (in terms of F(50,50) signal levels).

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Attached hereto are “white paper maps” (Figures A, B, C & D) which illustrate the resulting contour overlap these D/U protection ratios have on the protected 60 dBu contours if the two 1st adjacent stations **are at minimum required separations** specified in the rules.

Figure A analyzes the **impact to a Class B by Class A** facilities operating at the minimum separation with maximum Class B & A facilities (both 3 & 6 kW). The overlap clearly penetrates the 54 dBu contour and even slightly inside the 60 dBu of the Class B facility at 10% IBOC power. If full protection of the 54 dBu Class B contour is to be achieved then the required separation of a 6 kW facility at 10% IBOC power must be increased by some 12 km from the current 113 km to 125 km. The separation of 113 km is sufficient at 4% or less IBOC power.

Figure B analyzes the **impact to a Class A by Class B** facilities operating at the minimum separation with maximum Class B & A facilities (both 3 & 6 kW). The overlap of the Class A facility operating with 1% IBOC power clearly penetrates the 60 dBu contour of the **3 kW** Class A by 2.9% of its area, at 4% IBOC by 14.0% and at 10% IBOC by 19.9% of its area. The overlap of the Class A facility operating with 4% IBOC power clearly penetrates the 60 dBu contour of the **6 kW** Class A by 5.0% of its area and

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at 10% IBOC by 8.8% of its area. If full protection of the 60 dBu Class A 6 kW contour is to be achieved then the required separation of a 50 kW facility must be increased at 4% IBOC power by some 6 km from the current 113 km to 118 km and at 10% by 9 km to 122 km.

Figure C analyzes the **impact to a 6 kW Class A by another 6 kW Class A** facilities operating at the minimum separation with maximum facilities. The overlap of the Class A facility operating with 1% IBOC power clearly penetrates the 60 dBu contour of the **6 kW** Class A by 11.7% of its area, at 4% IBOC by 22.0% and at 10% IBOC by 27.3% of its area. If full protection of the 60 dBu Class A 6 kW contour is to be achieved then the required separation of a 6 kW facility at 1% IBOC must be increased by some 11 km from the current 72 km to 83 km, at 4% by 17 km to 89 km and at 10% by 20 km to 92 km.

Figure D analyzes the **impact to a 3 kW Class A by another 3 kW Class A** facilities operating at the minimum separation with maximum facilities. The overlap of the Class A facility operating with 1% IBOC power clearly penetrates the 60 dBu contour of the **3 kW** Class A by 10.6% of its area, at 4% IBOC by 22.3% and at 10% IBOC by 28.0% of its area. If full protection of the 60 dBu Class A 3 kW contour is to be achieved then the required

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separation of a 3 kW facility at 1% IBOC must be increased by some 9 km from the current 64 km to 73 km, at 4% by 14 km to 78 km and at 10% by 17 km to 81 km.

At the very least the **FCC must resolve these differences presented herein** that 60 dBu protection is not achieved in many instances where the two 1st adjacent facilities operate at or below (short spaced) the minimum required separations. Clearly, **an across the board power increase above 1% is not justified** since at minimum separations a significant reduction in 60 dBu coverage will occur. Herein we have analyzed A to B, B to A and A to A (3 & 6 kW). More analysis is needed to determine potential impacts to other combinations of station Classes.

Interference can be avoided by **increasing the required minimum separations** for a facility that wishes to operate with more than 1% IBOC power. There is also the option of asymmetrical modulation or use of a directional antenna.

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Conclusion: Mullaney Engineering hopes that the FCC will at a minimum investigate its recent decision in approving an across the board increase in IBOC power.

MEI does not oppose the improvement of the new IBOC service unless it is at the expense of the Analog FM service that has served the public interest for well over 50 years. In fact, MEI hopes that the FCC moves forward **with the creation of an all digital radio service by reallocating TV channels 5 & 6 for such use**. IBOC is at least a compromise to create this new Digital service but it should not be permitted to expand at the expense of massive interference to Analog FM.

Respectfully submitted,

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9 June 2010

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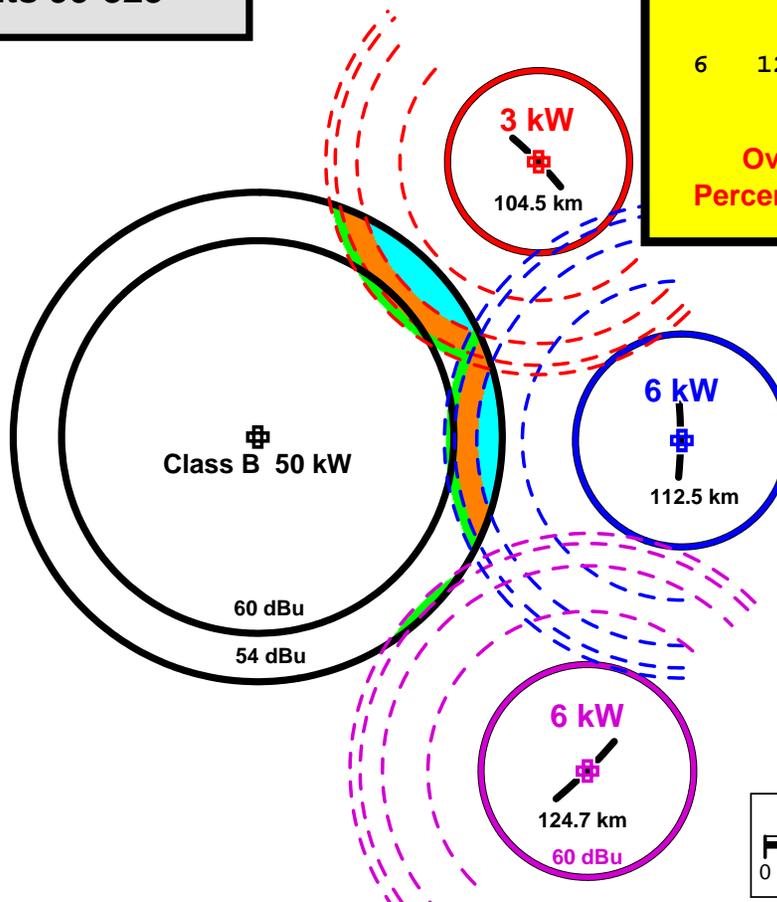
FIGURE A
IBOC CONTOUR OVERLAP
to Class B FM
from 1st Adjacent Class A FM

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Overlap
1% IBOC

Overlap
4% IBOC

Overlap
10% IBOC



OVERLAP TO CLASS B 54 dBu COVERAGE
FROM CLASS A IBOC STATION

ERP kW	Dist km	1% IBOC	4% IBOC	10% IBOC	IBOC OVERLAP sq.km
3	104.5	257 3.0%	559 6.5%	715 8.4%	sq.km of Total
6	112.5	178 2.1%	471 5.5%	633 7.4%	sq.km of Total
6	124.7	-	-	68 0.8%	sq.km of Total

Overlap based upon 60 dBu D/U
Percent would be much larger if 54 dBu D/U

1st Adj. Protection
of 60 dBu Contour

IBOC	D/U dB	F5050 dBu
0%	8.0	52.0
1%	14.0	46.0
4%	16.8	43.2
10%	18.0	42.0

Fig 26
NPR Report
November 2009

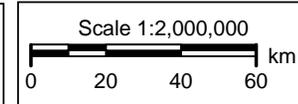
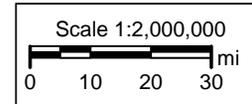


FIGURE B
IBOC CONTOUR OVERLAP
to Class A FM
from 1st Adjacent Class B FM

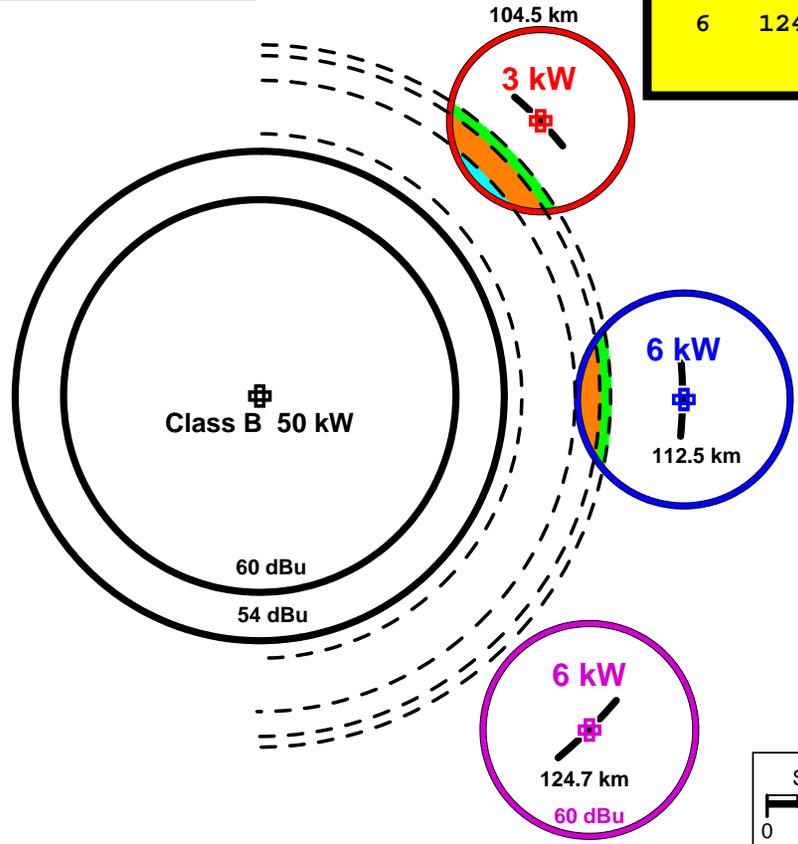
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OVERLAP TO CLASS A 60 dBu COVERAGE					
FROM CLASS B IBOC STATION					
ERP kW	Dist km	1% IBOC	4% IBOC	10% IBOC	IBOC OVERLAP sq.km
3	104.5	54	257	366	366 sq.km
		2.9%	14.0%	19.9%	of Total
6	112.5	0	126	221	221 sq.km
			5.0%	8.8%	of Total
6	124.7	NO OVERLAP RECEIVED			0 sq.km
					of Total

Overlap
1% IBOC

Overlap
4% IBOC

Overlap
10% IBOC



1st Adj. Protection of 60 dBu Contour

IBOC	D/U dB	F5050 dBu
0%	8.0	52.0
1%	14.0	46.0
4%	16.8	43.2
10%	18.0	42.0

Fig 26
NPR Report
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**FIGURE C - 6 kW
IBOC CONTOUR OVERLAP
to Class A FM
from 1st Adjacent Class A FM**

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**OVERLAP TO CLASS A 60 dBu COVERAGE
FROM CLASS A IBOC STATION**

ERP kW	Dist km	1% IBOC	4% IBOC	10% IBOC OVERLAP
6	71.5	293	553	688 sq.km
		11.7%	22.0%	27.3% of Total

**TO AVOID ANY OVERLAP
IBOC SEPARATION**

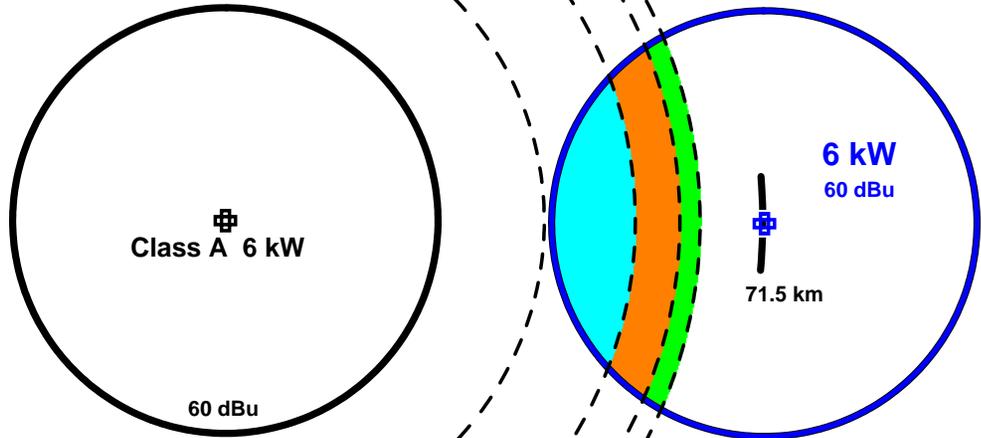
0% #	71.5 km
1%	82.8 +11.3
4%	88.8 +17.3
10%	91.5 +20.0

- Analog Only

Overlap
1% IBOC

Overlap
4% IBOC

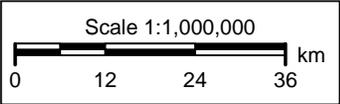
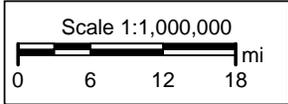
Overlap
10% IBOC



**1st Adj. Protection
of 60 dBu Contour**

IBOC	D/U dB	F5050 dBu
0%	8.0	52.0
1%	14.0	46.0
4%	16.8	43.2
10%	18.0	42.0

**Fig 26
NPR Report
November 2009**



**FIGURE D - 3 kW
IBOC CONTOUR OVERLAP
to Class A FM
from 1st Adjacent Class A FM**

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**OVERLAP TO CLASS A 60 dBu COVERAGE
FROM CLASS A IBOC STATION**

ERP kW	Dist km	1% IBOC	4% IBOC	10% IBOC OVERLAP
3	63.5	194	410	516 sq.km
		10.6%	22.3%	28.0% of Total

**TO AVOID ANY OVERLAP
IBOC SEPARATION**

0% #	63.5 km
1%	72.5 + 9.0
4%	78.3 +14.8
10%	80.8 +17.3

- Analog Only

**1st Adj. Protection
of 60 dBu Contour**

IBOC	D/U dB	F5050 dBu
0%	8.0	52.0
1%	14.0	46.0
4%	16.8	43.2
10%	18.0	42.0

**Fig 26
NPR Report
November 2009**

Overlap
1% IBOC

Overlap
4% IBOC

Overlap
10% IBOC

