

**Before the  
Federal Communications Commission  
Washington, D.C. 20554**

In the Matter of	)	
	)	
Expanding the Economic and Innovation Opportunities of Spectrum Through Incentive Auctions	)	GN Docket No. 12-268
	)	
Office of Engineering and Technology Releases and Seeks Comment on Updated OET-69 Software	)	ET Docket No. 13-26
	)	
Office of Engineering and Technology Seeks To Supplement the Incentive Auction Proceeding Record Regarding Potential Interference Between Broadcast Television And Wireless Services	)	ET Docket No. 14-14
	)	

**COMMENTS OF THE  
NATIONAL ASSOCIATION OF BROADCASTERS**

January 21, 2015

## TABLE OF CONTENTS

I.	THE COMMISSION CAN AVOID THE COMPLEX TASK OF PREDICTING AND PREVENTING INTER-SERVICE INTERFERENCE BY ABANDONING A VARIABLE BAND PLAN. ....	2
II.	IT IS INCUMBENT UPON THE COMMISSION TO MINIMIZE THE POTENTIAL FOR INTERFERENCE AFTER THE AUCTION. ....	4
A.	The FCC Sets the Correct Goal for Preventing Interference. ....	4
B.	The FCC Should Adopt Rules that Minimize the Potential for Harmful Interference in Practice. ....	5
C.	OET-74 Must Be Modified to Be Consistent With the Preservation Mandate of the Spectrum Act. ....	7
III.	CONCLUSION. ....	10

## Summary

Throughout the incentive auction proceeding, NAB has strongly advocated for keeping the auction as simple as possible in order to ensure its best chance for success. The virtues of this approach are no more apparent than when it comes to the band plan, which should be nationwide to avoid what would otherwise amount to decades-long interference disputes between TV broadcasters and wireless operators. The ISIX Public Notice, along with the subsequent procedures Public Notice, make clear that the FCC's choice not to have a nationwide (or even near-nationwide) band plan, will make the already complex auction exceedingly so, threatening its long-term viability.

Fortunately, the Commission's current AWS-3 auction provides another great opportunity for the FCC to take a step back and re-evaluate its intent to unleash a band plan that will lead to inherent problems for years to come. The AWS-3 auction has raised an incredible amount of money, and has demonstrated that the FCC's fear of a lack of participation from wireless companies is misguided.

Moreover, Auction 97 has provided us with a number of lessons that should be heeded. Auction 97 offers a nationwide band plan, rather than one varying from market to market. Auction 97 provides bidders with a straightforward proposition with simple bidding on licenses, as opposed to introducing complex categories of licenses based on inter-service interference.

Inter-service interference is so complicated that it has spawned a new draft OET Bulletin. It is so complex that the Commission has had to develop separate methodologies for predicting it: one methodology for use during the auction; and another methodology for after the auction, which dictates what wireless carriers will actually be able to deploy. According to the Commission, it is so complex that calculating inter-

service interference at a granular level during the auction is infeasible due to computing limitations. As a result, the Commission is asking bidders in the forward auction to make multi-billion dollar investment decisions based on estimates of a license's utility that may prove inaccurate. Indeed, for those potential bidders, the key takeaway from the current notice on inter-service interference must be: *caveat emptor*. The notice makes clear that whatever predictions the FCC makes for purposes of offering licenses during the auction ultimately will not govern how wireless carriers are actually able to deploy facilities using those licenses.

There is no need for this complexity and uncertainty. There is still time for the Commission to say yes to a \$45 billion blueprint for success, absorb the lessons of Auction 97 and incorporate them into planning for the incentive auction. The Commission could make its own job simpler, reduce the number of points of potential failure during the auction, present clearer, more attractive offers to bidders, and avoid an unnecessarily jumbled post-auction interference environment by pursuing a nationwide band plan.

If the FCC insists nonetheless on introducing variability into an already complicated auction, certain of its proposals for inter-service interference rules following the auction are fundamentally sound. The Commission must modify other proposals, however, to comply with the Spectrum Act's mandate that coverage area and population served be preserved for stations remaining on the air after the auction, and to protect against service disruptions for viewers.

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**COMMENTS OF THE  
NATIONAL ASSOCIATION OF BROADCASTERS**

The National Association of Broadcasters (“NAB”)<sup>1</sup> submits these comments in response to the Commission’s Further Notice of Proposed Rulemaking in the above proceedings.<sup>2</sup>

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<sup>1</sup> The National Association of Broadcasters is a nonprofit trade association that advocates on behalf of free local radio and television stations and broadcast networks before Congress, the Federal Communications Commission and other federal agencies, and the courts.

<sup>2</sup> *Expanding the Economic and Innovation Opportunities of Spectrum Through Incentive Auctions, Office of Engineering and Technology Releases and Seeks Comment on Updated OET-69 Software, Office of Engineering and Technology Seeks to Supplement the Incentive Auction Proceeding Record Regarding Potential Interference Between Broadcast Television and Wireless Services, Second Report and Order and Further Notice of Proposed Rulemaking, GN Docket No. 12-268, ET Docket No. 13-26, ET Docket No. 14-14, FCC 14-157 (rel. Oct. 17, 2014) (“ISIX NPRM”).*

I. **THE COMMISSION CAN AVOID THE COMPLEX TASK OF PREDICTING AND PREVENTING INTER-SERVICE INTERFERENCE BY ABANDONING A VARIABLE BAND PLAN.**

It should not be lost that, following the tremendous success of the AWS-3 auction, the FCC seems committed to making the incentive auction as dissimilar to the AWS-3 auction as possible. Whereas Auction 97 features a nationwide band plan with a consistent amount of usable spectrum nationally, the incentive auction will feature a so-called “near-nationwide” plan that covers only 80 percent of the country (actually, 80 percent according to an extraordinarily complex weighting process) – with unlimited variability in the remaining 20 percent. Whereas in Auction 97, buyers knew what they were getting as they made billion dollar decisions, in the incentive auction, buyers will be purchasing from different “buckets” of impaired licenses. Indeed, even licenses in the same categories will be subject to varying degrees of impairment. Bidders will only learn, for example, whether they can acquire a license that is 15 percent impaired or zero percent impaired following a subsequent assignment round in the auction. Thus, bidders will logically discount their bids in the forward auction, assuming the highest degree of impairment possible for a given category of license.

As an initial matter, the ISIX NPRM is devoted to solving an entirely unnecessary problem: how to protect television stations operating on channels used by wireless carriers in other markets. The FCC has taken the time to develop a new OET Bulletin for purposes of calculating inter-service interference. Indeed, the FCC has had to develop *two* methodologies for predicting inter-service interference, one for use in the auction and

one for use afterwards, because the problem is so complex it bumps up against computational limitations.<sup>3</sup>

Adding additional complexity, to address inter-service interference, the FCC has, in its public notice on auction procedures, developed different license categories, rather than simple fungible blocks, on which forward auction participants will be bidding. As a result, forward auction bidders will be bidding on licenses in Category 1 (with up to 15 percent impairment) or Category 2 (with up to 50 percent impairment) – but they must also factor into their decisions the fact that the licenses they win based on the ISIX methodology used in the auction *may not ultimately be usable to the extent that methodology predicted*. Indeed, the biggest takeaway from the ISIX NPRM for forward auction bidders is *caveat emptor*.<sup>4</sup>

All of this complexity, and all of this effort, is necessary *solely* due to the commitment to allow market variation in the auction. This is perplexing. The FCC, rightly, is hailing the success of Auction 97, which has raised nearly \$45 billion based on a nationwide band plan of 65 MHz of spectrum, where it is simple for bidders to

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<sup>3</sup> See *Office of Engineering and Technology Seeks To Supplement The Incentive Auction Proceeding Record Regarding Potential Interference Between Broadcast Television And Wireless Services*, Public Notice, 29 FCC Rcd 712, 725 n. 12 (rel. Jan. 29, 2014) (adopting a hypothetical 10-kilometer spacing for base station transmitting sites because it “approaches a practical limit on computation.”); see also *Comment Sought on Competitive Bidding Procedures for Broadcast Incentive Auction 1000, Including Auctions 1001 and 1002*, Public Notice, AU Docket No. 14-252, GN Docket No. 12-268, FCC 14-191, ¶ 81, n. 81 (rel. Dec. 17, 2014) (aggregating ISIX data to a county level because at a more granular level “the number of decision variables and constraints that must be considered would increase to an unsolvable number.”)

<sup>4</sup> ISIX NPRM at ¶ 68 (“Because there is the potential for impairments in any license that is co-channel or adjacent channel with a broadcast television station, we propose to apply these requirements to all wireless operations within the culling distance that are co-channel or adjacent channel to a broadcast television station, regardless of whether the wireless licensee’s spectrum block was identified as ‘impaired’ in the auction.”)

understand what they are bidding on and how they will be able to use it. **That is a blueprint for how to conduct a successful auction: simple bidding on consistent, nationally available spectrum.** To translate this success to the incentive auction, the Commission should keep the auction rules as simple as possible. The money raised in the AWS-3 auction should put to rest the Commission's fears about "lowest common denominator" markets sending the spectrum recovery downwards. In addition, Industry Canada's recent consultation seeking to harmonize its spectrum plan with the United States helps reduce some of the more dire concerns about lower-clearing markets. This approach will also reduce the number of points of potential failure in the Commission's conduct of the auction; certainly no stakeholder is served by an auction that is delayed or interrupted by software failures.

**II. IT IS INCUMBENT UPON THE COMMISSION TO MINIMIZE THE POTENTIAL FOR INTERFERENCE AFTER THE AUCTION.**

**A. The FCC Sets the Correct Goal for Preventing Interference.**

In the event the Commission remains committed to a risky, confusing and unnecessary variable band plan, we strongly support the Commission's proposal to allow no harmful interference from wireless operations to the reception of broadcast television service.<sup>5</sup> The Spectrum Act envisions a voluntary, market-based auction – not one that appropriates spectrum for wireless use directly at the expense of television service by broadcasters who remain on the air following the auction. Further, we agree with the Commission that this first application of its proposed methodology for preventing inter-service interference warrants a conservative approach. We respectfully ask the

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<sup>5</sup> *Id.* at ¶ 65.

Commission to clarify that the limit for predicted interference is, in fact, zero persons, rather than some fraction of the population that rounds to zero percent.

Should wireless operations actually cause harmful interference to broadcast service, NAB also agrees that wireless providers must take action to eliminate this interference, even if no interference is predicted.<sup>6</sup> The goal is not merely to predict zero interference, it is to cause zero interference and prevent harm to viewers.

**B. The FCC Should Adopt Rules that Minimize the Potential for Harmful Interference in Practice.**

In accordance with that goal, NAB supports the Commission's proposal to require wireless operators to perform an interference analysis prior to deploying a base station for co- or adjacent-channel operations with television stations within the set culling distances.<sup>7</sup> We agree that a wireless carrier should retain the latest copy of its interference analysis for each co- or adjacent-channel license area and make the analysis available to the FCC in the event of interference complaints.<sup>8</sup> However, carriers should also be required to submit their analyses, when updated, to broadcast stations that are potentially affected. This will help reduce potential interference complaints and resolve conflicts before they begin.

We also support the proposal to restrict wireless user equipment (*i.e.* mobile and portable devices) operating on co-channel or adjacent-channel frequencies to areas outside the separation distances from the DTV station contours adopted in the Second Report & Order.<sup>9</sup> That is, for co-channel operations, not to allow wireless user equipment

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<sup>6</sup> *Id.* at ¶ 74.

<sup>7</sup> *Id.* at ¶ 72.

<sup>8</sup> *Id.* at ¶ 72.

<sup>9</sup> *Id.* at ¶ 73.

to operate within the television station's contour and within five kilometers of that contour. And, for adjacent channel operations, to disallow user equipment operation within the contour of the television station and within one-half kilometer of that contour. We believe that these requirements will help to prevent significant interference between wireless and broadcast operations.

Consistent with the goal of preventing actual, not merely predicted, interference, we agree with the Commission that carriers should use actual operating parameters of their base stations, not merely theoretical parameters, to predict impairments.<sup>10</sup> We also appreciate the Commission's proposal to incorporate the root sum square (RSS) method in predicting the potential for aggregate interference to a television station from multiple wireless base stations.<sup>11</sup> While we continue to believe that the RSS method should have been incorporated into the methodology used to identify impairments for the purpose of the auction, it is vital to consider aggregate interference from multiple base stations given the real-world density of carrier deployments.

However, we respectfully submit that the Commission should place a lower limit on elevation pattern relative field values, as manufacturer published elevation patterns, based on theoretical calculations, may suggest unrealistically superior performance compared to practical, real-world installations. Additionally, carriers routinely adjust or "tune" their installations, particularly with regard to the electrical or mechanical beam tilt, to manage coverage and interference conditions as their network deployments mature and change. These adjustments are often made remotely and can be made on a daily

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<sup>10</sup> *Id.* at ¶ 68.

<sup>11</sup> *Id.* at ¶ 70.

basis or even more frequently. We believe that it unrealistic and perhaps unreasonable to expect that carriers will re-calculate inter-service interference levels every time these parameters are adjusted. Similarly, the alignment of antennas during installation is often imprecise, resulting in dramatically increased interference levels into DTV service areas above predicted values. Thus, imposing a lower limit on the assumed radiation from an antenna will help ensure that errors during installation and adjustments during operation will not adversely affect DTV reception. NAB recommends that azimuth patterns have a lower relative field limit of 0.1 (corresponding to 1 percent of the maximum radiated power in any compass direction). NAB further recommends that elevation patterns assume maximum radiation (relative field of 1.0) from 0 to 10 degrees below the horizontal with a lower relative field limit of 0.1 at other elevation antennas. If the published antenna patterns specify greater levels, of course, those higher levels would be used.

**C. OET-74 Must Be Modified to Be Consistent With the Preservation Mandate of the Spectrum Act.**

As discussed above, the Commission is introducing significant, and unnecessary complexity in the auction through the use of a variable band plan. Even if the Commission does not revisit this decision, however, it is still bound by the Spectrum Act's plain requirement that the Commission preserve stations' coverage area and population served following the auction. As the Commission is well aware, Section 6403(b)(2) of the Spectrum Act dictates the means by which the Commission must preserve both coverage area and population served:

In making any reassignments or reallocations ..., the Commission shall make all reasonable efforts to preserve, as of the date of the enactment of this Act, the coverage area and population served of each broadcast television

licensee, as determined using the methodology described in OET Bulletin 69 of the Office of Engineering and Technology of the Commission.<sup>12</sup>

Unfortunately, OET-74 is not OET-69. The Spectrum Act emphatically does *not* direct the FCC to protect stations from losses due only to other television stations. In fact, the Act is silent on the potential sources of any losses. The ISIX NPRM proposes a new and novel methodology for predicting interference between television stations and wireless services. Although OET-69 was not used as of February 22, 2012 to predict interference between broadcast television and wireless services, it was used to predict coverage area and population served for television broadcasters. And, because interference levels—regardless of their source—directly affect calculations of the populations served by specific television stations,<sup>13</sup> OET-69 (and its implementing software) continues to be the relevant standard for predicting interference. The FCC is required to use OET-69 to protect *both* coverage area *and* population served in reassigning television stations – including in reassigning those stations to portions of the 600 MHz band where they may be subject to interference from wireless operators. Consistent with this requirement, the Commission cannot use TVStudy to calculate coverage area and population served of broadcast stations, for this, or any other calculation that will actually affect service following the auction. The Commission also

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<sup>12</sup> Middle Class Tax Relief and Job Creation Act of 2012, Pub. L. 112-96, 126 Stat. 156, § 6403(b)(2) (Feb. 22, 2012) (codified at 47 U.S.C. § 1452(b)(2)).

<sup>13</sup> See, e.g., 47 C.F.R. § 73.616(e) (addressing DTV station applications and noting that “population served . . . does not include portions of the population within the noise-limited service contour of that station that are predicted to receive interference from the [other stations]”); *id.* § 73.623(c)(2) (“interference to populations served is to be predicted based on the procedure set forth in OET Bulletin No. 69”).

cannot consider interference only to portions of a station's coverage area that are populated, as OET-74 proposes.<sup>14</sup> Further, the Commission should also not use a global 2-kilometer grid for evaluating service for Class A TV stations. Instead, consistent with current practice, Class A stations should be evaluated based on a 1-kilometer grid.

Finally, we agree with the Commission that, in predicting Case 3 interference, a different treatment of "error code 3" messages is appropriate. As the Commission notes, merely assuming service in the presence of an error warning would treat the cell in question as having interference-free service under all circumstances, meaning that potential inter-service interference would be ignored. This would result in a failure to check for inter-service interference at locations where the DTV signal could be subject to interference.<sup>15</sup> Accordingly, the ISIX methodology evaluates service and potential interference in flagged cells just as it would in non-flagged cells. However, such an approach, in fact, also ignores interference to cells where the error code results in a predicted field strength below threshold but service is deemed to be available. NAB therefore respectfully requests that in those instances a value equivalent to service be assumed, e.g., threshold of service or threshold + 3dB could be used. This will ensure that inter-service interference is taken into account in all cells where there is DTV service predicted and all error code cells are assigned a field strength value.

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<sup>14</sup> ISIX NPRM at Appendix E, p. 77 ("Interference is considered harmful if any of the D/U ratios determined by the previous step are less than the appropriate minimum D/U threshold in any of the *populated cells* on the global 2-kilometer grid within the TV station's service area.")

<sup>15</sup> ISIX NPRM at ¶ 54.

### III. CONCLUSION.

The Commission's pursuit of a variable band plan adds immeasurable complexity both to its conduct of an already complicated auction and to the co-existence of television and wireless operations following that auction. Rather than adopt an ISIX Order, an ISIX NPRM, a new OET Bulletin, two distinct methodologies for predicting inter-service interference (one for use in the auction and one afterwards) and multiple categories of impaired licenses that may not reflect real-world impairments, the Commission can follow the blueprint laid out in an auction that has already raised close to \$45 billion. That blueprint includes a nationwide band plan and simple, rather than complex, bidding choices for forward auction participants. There is still time for the Commission to change course in this regard, but the window of opportunity to craft a simpler auction will not stay open forever. We urge the Commission to take the first step as soon as possible, and commit to a nationwide band plan.

Respectfully submitted,

**NATIONAL ASSOCIATION OF  
BROADCASTERS**  
1771 N Street, NW  
Washington, DC 20036  
(202) 429-5430



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Rick Kaplan  
Jerianne Timmerman  
Patrick McFadden

Bruce Franca  
Robert Weller

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