

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

In the Matter of)
)
Auction of Licenses in the 747-762 and 777-792 MHz) DA 00-1075
Bands Scheduled for September 6, 2000)

Comments of Dr. David J. Salant.

National Economic Research Associates, Inc.
444 Market Street
Suite 910
San Francisco, CA 94111
(415) 291-1000

June 8, 2000

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

In the Matter of)
)
Auction of Licenses in the 747-762 and 777-792 MHz) DA 00-1075
Bands Scheduled for September 6, 2000)

Comments of Dr. David J. Salant.

I. INTRODUCTION

In *Public Notice* DA 00-1075,¹ the Federal Communications Commission (“FCC” or “Commission”) seeks comment on modifying the auction design to allow combinatorial (package) bidding. The allowance for combinatorial bidding is highly lauded, but should not be invoked without allowing time for bidders to carefully review the proposed rules. The transition to combinatorial bidding significantly influences the appropriate selection of an overall auction design. Several questions raised by the Commission regarding combinatorial auction design are addressed herein.

II. POTENTIAL BIDDERS HAVE NOT BEEN GIVEN ADEQUATE NOTICE TO PREPARE FOR A PACKAGING AUCTION.

On January 7, 2000, the FCC announced an auction of licenses within the 700 MHz bands. At that time, the Commission made it clear that implementation of the more complex

¹ See Auction of Licenses in the 747-762 and 777-792 MHz Bands Scheduled for September 6, 2000, *Public Notice*, DA 00-1075, (rel. May 18, 2000).

auction rules required by a combinatorial auction was not feasible in the time allowed, although a combinatorial auction would have desirable properties.² With the delay of the auction, the FCC has decided to review the introduction of combinatorial or package bidding.³ The adoption of new auction rules will require potential bidders to completely review their auction strategy. While the bidders may experience some benefits from package bidding, the Commission should consider the additional burden of auction preparation when revising its rules.

The *Public Notice* with the proposed auction rules is not an adequate document for an evaluation of such significant rule changes. Many of the analyses of individual rule proposals are contingent upon the adoption of other, seemingly unrelated, rule proposals. Complicating the issue even further is the introduction of “or” bidding. Without a complete set of proposed rules, it is impossible to make meaningful comments on how the ultimate auction structure should be designed. It certainly would be desirable and may be necessary to delay the auction further in order to undergo a complete examination of package bidding.

² See Services Rules for the 746-764 and 776-794 MHz Bands, and Revisions to Part 27 of the Commission’s Rules, WT Docket NO. 99-168, *First Report and Order*, FCC 00-5 (rel. Jan. 7, 2000) at ¶ 124, 15 FCC Rcd 476, 526-27 (2000) (“700 MHz First Report & Order”).

³ See Auction of Licenses in the 747-762 and 777-792 MHz Bands Scheduled for September 6, 2000, Comment Sought on Modifying the Simultaneous Multiple Round Auction Design to Allow Combinatorial (Package) Bidding, DA 00-1075 (rel. May 19, 2000) AUC-00-31-G (“*Proposed Modifications*”).

III. BIDDERS SHOULD KNOW ALL THE REQUIRED CLEARANCE FEES IN ADVANCE OF THE AUCTION.

The 30 MHz spectrum available via the 700 MHz Band Auction coincides with existing Ultra High Frequency (“UHF”) broadcast services. Congress has ordered that the sale of this spectrum block be completed six years before television broadcasters are required to vacate this portion of the spectrum. The procedural rules for dealing with dual claims to the spectrum are decidedly vague. The procedural guide states that “the Commission will consider specific regulatory requests needed to implement voluntary agreements reached between incumbent licenses and new licenses in these bands.”⁴ The new licensee will have no prior knowledge of the specific restrictions placed upon the license or the financial cost of easing any applicable restrictions.

Most problematic is the inherent uncertainty built into the design of the 700 MHz allocation. Parties bidding for licenses in Auction 31 will not know what fees might be required to clear or create a compromise with existing broadcasters to obtain full use of an unencumbered spectrum license. This uncertainty could be detrimental to the bidders and to the success of Auction 31. For example, a bidder with a private valuation of \$1 million for an unencumbered license might successfully win the license for \$950,000. If the clearance fee is set at \$100,000, the bidder will incur a net loss. The uncertainty of clearance fees and uncertain usage restrictions will deter bidders from offering full valuation for the available licenses.

⁴ Auction of Licenses in the 747-762 and 777-792 MHz Bands, Auction Notice and Filing Requirements for 12 Licenses in the 700 MHz Bands, Auction Scheduled for May 10, 2000, Minimum Opening Bids and Other Procedural Issues, (DA-00-292) AUC-00-31-C (“*Procedures*”) p. 8.

Efficiency of license allocation and revenue may be diminished. The proposed spectrum exchange for license clearing does not solve this problem as not all bidders will have the same need for clearing each metropolitan area within an economic area. Otherwise, it should allow bidders to negotiate the appropriate clearance arrangements on an as needed basis.

The most reasonable solution is for the FCC to pay for spectrum clearance. The proceeds from the 700 MHz auction should cover the required expense. This solution will remove the allocation distortions caused by requiring winning bidders to pay an unknown fee in addition to the cost of winning the license. With the uncertainty removed, bidders will be undeterred from posting bids based upon the full valuation of the license.

IV. PREDETERMINED PACKAGES MAY IGNORE COMPLEMENTARITIES.

The proposed rules for Auction 31 limit bidding to the twelve singleton licenses and to nine predetermined packages. Citing the introduction of a subset of packages into the auction framework, the Commission's proposal calls for the elimination of bid withdrawal.⁵ There is no evidence to suggest that these limited packages encompass the full range of complementarities. The restriction on packages means that exposure problems are not eliminated. If the Commission allows only these select packages, the rules should continue to allow a limited number of bid withdrawals to mitigate the problems associated with license aggregation.

⁵ See *Proposed Modifications*, pp. 9-10.

Limiting the set of packages on which bidders can submit bids can bias the outcome in favor of bidders seeking those packages over those seeking smaller packages. For example, suppose one bidder is seeking licenses covering regions 1 through 4, while another bidder wants a national license. The bidder seeking regions 1 through 4 has to deal with an exposure problem not faced by the national bidder. This suggests that the national bidder will have an advantage. Furthermore, if there is a third bidder seeking regions 5 and 6, the two regional bidders will face both exposure and threshold problems.

Twelve licenses amount to 4,095 ($2^{12}-1$) potential license combinations. While this number may seem computationally intractable, the auction would not be prohibitively complex. First, it is highly unlikely that bidders would consider all potential combinations of licenses for actual bidding. In addition to the nine license combinations proposed, additional packages are logically some combination of licenses that provide a regional footprint. Second, the FCC has run auctions in the past with large numbers of items. The 39 GHz Auction, closing on May 8, 2000, distributed 2,173 licenses.

If the Commission chooses to limit bidding to predetermined packages, at the very least, it should include additional packages as bidders may want to develop or expand upon regional footprints. For example, a bidder with existing service in the Mid Atlantic area might be anticipating an expansion of service in both the Great Lakes and Northeast areas. The current packages would force this bidder to risk exposure by bidding separately for each region. The easiest way to address this problem would be to add combinations of regional packages. In addition to the singleton and national bids, the bidders would be able to create a package of 10

MHz blocks composed of two to five regions. This would result in an additional 56 packages (2⁶-1-1-6). Similarly, the 20 MHz regions also could be composed into 56 additional packages. The total number of packages and singletons would be 133 under this scenario.

V. ACTIVITY CALCULATIONS SHOULD REFLECT ALL LICENSES FOR WHICH BIDS ARE TENDERED.

The proposed activity rules do not accurately reflect bidder demand in each round. The proposal states that:

a bidder's activity in a round is the number of bidding units associated with the set of the bidder's retained bids from the previous round and the bidder's acceptable bids in the current round that maximizes the number [of] bidding units without provisionally assigning the bidder any bids that cannot simultaneously be part of a provisional winning set.⁶

Consider an auction with six available items, A, B, C, D, E, and F. Each item is associated with one bidding unit. A bidder submits the following bids: ABCDE, DEF, BCDEF. Under the proposed activity rules, only one of these bids can be part of a provisionally winning set. The maximum number of activity credits would come from ABCDE or BCDEF; hence, the maximum activity accorded to the bidder is five units. However, the bidder clearly expressed an interest in six items. The proposed activity rule could unduly limit bidder options. Further, if these bids are all potentially winning bids, they would become retained bids.

The proposed bidding rule counts the maximum eligibility from the combination of bids that could simultaneously be part of the provisional winning set. An alternative to the proposed

bidding rule would be to count eligibility from the union of all licenses included among the bidders' submissions. In the example above, the bidder entered bids encompassing all six licenses, A, B, C, D, E, and F. Six units of activity would be credited to the bidder. In this scenario, the bidder does not receive extra activity credits for bidding on the same license more than once in the same round, regardless of the total number of bids made.

The caveat to using the union of licenses included in the bids for calculating eligibility is one opportunity for bidders to safely maintain eligibility without making serious bids. Suppose the bidder held the standing high bid for package ABCDE. That bidder could safely bid on package EF being fully aware that his bid on that package has little chance of becoming a provisionally winning bid. The solution to this dilemma is to limit the number of rounds in which a bid failing to become a standing high bid can count towards activity. A five-round limitation would allow bidders the flexibility to make the additional bids without providing an open window for manipulation. The bidders can retain eligibility by raising their offer on a retained bid, which is not a provisional winning bid.

It is not clear from the proposed rules that the activity rule will be modified to account for mutually exclusive bids.⁷ The Commission must make this modification if this auction is to be successful. The only acceptable alternative is to require eligibility each time an item is bid on within a round. In the six-license scenario above (ABCDE, DEF, and BCDEF), the bidder would need thirteen units of eligibility in order to bid on only six licenses. This would require

⁶ *Proposed Modifications*, p. 7.

⁷ *Proposed Modifications*, p. 6.

that initial eligibility allocations be calculated to reflect all possible combinations of bids that may be made over the course of the auction. However, this methodology would be prohibitively complicated to implement. It will be extremely difficult for bidders to contemplate, in advance of the auction and in advance of subsequent rounds, just how many combinations of bids they need to make. Bidders also would be encouraged to make multiple repetitive bids simply to maintain eligibility. This behavior could increase the length of the auction with no apparent gain. In addition, if bidders failed to successfully maintain eligibility under this complicated set of rules then the auction efficiency will be diminished.

VI. THE PROPOSED ELIGIBILITY RULES REQUIRE EXAMINATION.

The proposed eligibility rule is to calculate subsequent eligibility as the minimum of current eligibility and twice the round activity. This rule would be constant throughout all stages of the auction. The proposed alternative is to use a tapered eligibility where the auction is divided into stages with increasing activity requirements. Tapered eligibility may create complications for bidders with large amounts of standing or retained bids at the end of a stage. Those bidders may suddenly find themselves with little free eligibility. Tapered eligibility is therefore not advisable. If, however, tapering is introduced then the absolute minimum activity factor should be set at or above 1.5. Experimental results show that in super-additive environments, an activity factor of 1.5 versus 1 increases auction efficiency by three percent.⁸

⁸ An Experimental Analysis of the Federal Communications Commission's Eligibility Rules, Submitted to the Federal Communications Commission, by Cybernomics, Inc. With Assistance From the Automated Credit Exchange and LECC. Contract Number C-9854019, November 10, 1999.

Although these same experiments show an increase in the auction length, the efficiency gains far outweigh the costs from increased auction lengths.

VII. BIDDING INCREMENT RESTRICTIONS SHOULD APPLY EQUALLY TO SINGLETON AND PACKAGE BIDS.

The proposed rules would allow singleton bids to increase by one to nine increments. Package bids would be limited to a single increment increase per round. The stated purpose is that “this limitation is designed to prevent bids on packages from rising too quickly for bidders on individual licenses to overcome the threshold problem.”⁹ The proposed increment rules completely ignore the fact that not only will bidders’ singleton bids attempt to overcome packages, bidders’ small package bids may attempt to overcome large packages. The limitation on bid increases for packages places bidders for small packages at an unnecessary disadvantage.

An additional problem to limiting package bids to one increment increases is that it increases the probability of tied bids. The only way package bidders will have to compete for the standing high bid is to be the first to enter a bid during the round. Encouraging bidders to be the first out of the gate at the start of each round could discourage carefully educated bids and certainly does nothing to promote efficiency. If the Commission adopts disparate increments for singletons and packages, a mitigating solution would be to allow multiple increment increases on package bids, but an even greater range of increment increases among the singleton bids.

⁹ *Proposed Modifications*, p. 7.

VIII. MINIMUM BID PRICE CALCULATIONS SHOULD BE STRAIGHTFORWARD.

Determining minimum bid prices for individual lots based on prices of packages containing those lots is inherently problematic. For example, suppose a 10 MHz lot, lot C, has a retained bid of \$40 million and a 20 MHz lot in the same economic area grouping, lot D, has a retained bid of \$80 million. Further, suppose that there is a package bid of \$240 million on both C and D. It could be that the lot C bidder and the lot D bidder place values on lots C and D proportional to the amount of spectrum in each lot. In which case, setting minimum prices of those lots at \$80 million plus an increment of 5 to 10 percent, and \$160 million plus 5 to 10 percent would be appropriate. Alternatively, it could be the case that the 20 MHz lot D is worth nearly the same as the 30 MHz package CD. In which case a minimum bid on lot C of \$40 million plus 5 or 10 percent and a minimum bid on lot D of \$200 million plus 5 or 10 percent would be appropriate. The FCC really has no way of knowing the right answer and there really is no need to allocate the price of the package in setting the minimum bids for the components. The FCC can set the minimum bid on the components based purely on the previous bids on those components and the minimum opening bids.

IX. BIDDERS HAVE LEGITIMATE REASONS TO BID UPON SUBSETS OF PACKAGES.

A proposed solution to the threshold problem is the Milgrom-McAfee bid composition restriction. This restriction prevents a bidder from submitting a bid for a subset of items for which the bidder has an active bid. In the upcoming 700 MHz auction, this could mean that a

bidder with an active bid for the 20 MHz national package would not be allowed to enter a subsequent bid for the 20 MHz Pacific Region license.

The proposed restriction ignores natural restrictions limiting a bidder's ability to bid strategically on larger packages. First, the minimum acceptable bid on a larger package may be significantly larger than the minimum acceptable bid on a subset of a package. A bidder strategically bidding on a large package risks actually winning and obtaining items that may not have been totally desired. Second, if there is significant demand among other bidders for the elements of the larger package, those bidders likely will supplant the package bidder, given a sufficient amount of time and flexibility.

The proposed Milgrom-McAfee bid composition restriction prevents bidders with legitimate reasons from bidding on subsets of packages. For example, a bidder might initially bid for the 20 MHz national license but, on observing bidder demand, realize that it would be more profitable to obtain just five of the six 20 MHz blocks. By bidding on a subset of the larger package, the bidder could attempt to obtain the five blocks even if the larger package bid was the standing high bid. Overall efficiency could even be improved by the bidder obtaining the five 20 MHz blocks with the sixth going to another bidder. Under the Milgrom-McAfee restriction, the bidder would be locked into the national license and the opportunity to divide the six blocks among multiple bidders might be lost.