

Comments on
Public Notice DA 00-1075,
“COMMENT SOUGHT
ON MODIFYING THE SIMULTANEOUS MULTIPLE ROUND
AUCTION DESIGN TO ALLOW COMBINATORIAL (PACKAGE)
BIDDING”
Report No. AUC-00-31-G (Auction No. 31)

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In Public Notice DA00-1075 the Wireless Telecommunications Bureau of the Federal Communications Commission (FCC) outlines its proposal for modifying its existing auction methodology to allow for package bidding for the upcoming 700 MHz auction (Auction No. 31). Allowing bids to be placed on packages of licenses instead of only single licenses is a very important and beneficial addition to the FCC's auction process and should be encouraged. However, some of the specific rules proposed by the FCC possess problems that could cause significant damage to the auction process if implemented without alteration.

There are several problems with the proposed versions of the rules. The rules allow for a wide range of bidding strategies that include the ability for sophisticated bidders to take advantage of other bidders as well as the system itself. The rules also force bidders to face significant exposure risks of the kind that a package bidding design is supposed to eliminate. Some of the more problematic rules include the proposed activity rules that give full activity credit for any "retained" bids, the practice of not allowing bidders to remove non-provisionally winning bids and the proposal to limit bids on packages to single increments. The problems with these rules can be summarized as follows:

1. Activity Rules: The rules proposed in the public notice give full activity credit to all retained bids defined as those bids that are the highest received on a particular package or license. This rule gives bidders who have non-provisionally winning bids no incentive to raise their bid to maintain their eligibility. This also provides opportunities to "park" eligibility to the degree that it is possible to have an eligibility ratio equal to 10 with no bidders being forced by the activity rule to place a bid¹. Further, with the proposed versions of these rules, the FCC has no tools in place for significantly increasing the pressure of the activity rules to induce more activity and speed the pace of the auction. The likely result of implementing these rules unchanged will be a very long auction with the FCC powerless to increase the pace.
2. Not allowing Bid Cancellation: This rule opens up several opportunities for bidders to "game" the system and limits their flexibility to pursue their goals while leaving them open to exposure problems similar to those that a package bidding system is intended to eliminate.
3. "Click-box bidding": The FCC has experienced the effects of click-box bidding in previous auctions and knows first hand that this causes auctions to take a very long time to complete. This is especially problematic here due to the package bidding environment. Further, the "threshold" problem that this is proposed to eliminate has not been shown an issue in laboratory tests of well designed package bidding auctions. Consequently, there is no demonstrated need for such a rule and it should be expected to have detrimental effects if implemented.

There are also problems with many of the alternative rules proposed in the public notice. The one alternative that should be singled out as especially damaging is the Milgrom-McAfee bid composition restriction. This rule reintroduces the same exposure problems that package bidding is intended to eliminate and it is proposed as a solution for a problem that has not been shown to cause difficulties in laboratory experiments of well designed package bidding auctions. Consequently, there is no indication that a rule such as this should be used as it cripples the flexibility of bidders and reintroduces the exposure problem.

Below are more detailed suggestions on how to modify the existing proposal to eliminate the problems identified in these comments. Also included below is a more in depth and detailed analysis of the problems inherent in the version of the rules proposed in the public notice.

I. ALTERNATIVE RULES.

These rules are modifications that overcome some of the difficulties of the rules listed in the Notice while maintaining their simplicity. They also give the FCC the tools needed to speed the auction and end it.

¹ This is due to the fact that there can be in effect five bids placed on every item in the auction yielding full activity credit to each bidder and that bidders are only required to be active on half of their bidding units.

- A. The pre-defined packages used in this alternative set of rules are the same as those outlined in the Notice.
- B. All bids that are above their "maximum valued cover" are retained unless cancelled. Dominated bids are removed from the system. Provisional winners cannot be cancelled. This means that any bid that is on a single or is among the high bids on any package will be retained. Any bid that is not a provisional winner can be cancelled by the bidder. The concept of a cover of a bid is a set of bids whose union is a subset of the package of the bid in question. (Strictly speaking, it should be referred to as a partial cover.)
- C. Increment requirements are based on a percentage increase over the cover.
- D. The sum of the bidding units on all licenses that appear in some package (consisting of one or more license) tendered or retained by the bidder in a round cannot exceed eligibility of that bidder for that round.
- E. Eligibility in a round is the minimum of eligibility the previous round or two times that activity credit of the previous round.
- F. For purposes of activity credits two types of bids are identified: Win Level and Retained Level. Win Level bids are those that are sufficiently high to become provisional winning bids given the bids that were in the system at the beginning of the round (but might not be provisional winners because of other bids that were submitted during the round). Retained Level bids are bids that were either retained bids at the beginning of the round or bids that met the increment requirements (but are not in the Win Level category).

Phase 1: The sum of bidding units on all licenses that appear in a Win Level bid get activity weight of 1 and the sum of bidding units on all licenses that do not appear in a Win Level bid but do appear in a Retained Level bid get activity weight of 1.

Phase 2: The sum of bidding units on all licenses that appear in a Win Level bid get activity weight of 1 and the sum of bidding units on all licenses that do not appear in a Win Level bid but do appear in a Retained Level bid get activity weight of .8.

Phase 3: The sum of bidding units on all licenses that appear in a Win Level bid get activity weight of 1 and the sum of bidding units on all licenses that do not appear in a Win Level bid but do appear in a Retained Level bid get activity weight of .5.

Phase 4: The sum of bidding units on all licenses that appear in a Win Level bid get activity weight of 1 and the sum of bidding units on all licenses that do not appear in a Win Level bid but do appear in a Retained Level get activity weight of .3.

Notice that in Phase 2 extra eligibility begins to be removed for Retained Level bids. In Phase 3 the bidder who is bidding at the Retained Level only will only maintain sufficient eligibility to continue to bid on the licenses he is bidding on. All extra eligibility will be lost. In Phase 4 bidding on the current number of licenses cannot continue unless a bidder bids at the Win Level.

- G. The rules should allow bidders to engage in a continuous phase. This will speed the overall auction and allow small bidders to coordinate to overcome a large package much easier than with only sealed bid rounds. Continuous implementations of the rules are easy to implement.

II. COMMENTS ON RULES LISTED IN THE NOTICE

1. Experimental work demonstrates that the “threshold problem” is easily overcome within the rules that have been tested. If undue, flexibility limiting constraints are not placed on small bidders, adequate bids remain in the system to allow the formation of combinations of small bidders and if overall pressures to bid exist then the sequential nature of the process allows small bidders to appropriately coordinate and win over large bids. Some of the rules listed in the notice actually hurt this process by limiting bidder flexibility rather than help.

2. One of the most important things that can happen in the rule making is that the door be left open for continuous bidding. The efficiency gains, speed gains and the ability of small bidders to overcome large bidders (because they can easily identify the strategies) are most dramatic here as demonstrated by all tests. A continuous stage is easy to implement by simply allowing bids in a session to be submitted early, let them be publicly displayed as they come in and changed in light of the new bids. Activity and eligibility have very natural interpretations in light of this.

3. If the FCC uses the software developed by Computerized Market Systems, which the FCC already has in house, then the limitation on packages to regionals and to nationals plus the global is unnecessary. However, for a first auction of the suggested limitations on packages is good way to get started. If bidders want other packages as expressed in the comments, then the FCC should consider adding them to the allowable packages and the rules should be developed to include this possibility. The rules as they are stated in the Notice do not allow for such modifications. In fact, a logical exercise testing whether or not this extension to more complex packages can be done under proposed rules is a good test for the rules. Some aspects of the proposed rules will not pass such a test.

4. The use of the concept of a "cover for a package bid" (the bids in the system the union of which equal the package) is appropriate. Bidding increments, expressed as a percentage of the cover of a package, is the rule that should be used. It is easy to compute. It extends itself to all levels of non-provisional winning bids. It is always advantageous for threshold issues since the sum of covers of subpackages can never be greater than a bid on a package and in a sense creates an incentive for smaller packages. For example, consider a global provisional winner. The covers for the two nationals cannot be more than the global bid so the sum of the increment requirements on the nationals cannot be more than the increment requirement on the global. Furthermore an admissible bid on the global must be at least as great as the bids on the two nationals so its increment must be at least as great.

Increments that attempt to allocate based on some accounting allocation of the increment on provisional winners have no inherent advantages over the above and because of the asymmetries in the licenses, can become the source of bias.

5. The rule requiring that some non-provisional winning high bids (on regional and national packages) be retained without possibility of being cancelled and that others be cancelled automatically creates bias, inefficiencies and traps that large firms can strategically deploy. Cancellation of non-provisional winners should be bidder's choice.
- a. To the extent that there is an advantage in being retained, the rule is unfair and inefficient. Under these rules there can be an advantage in being retained because one gets activity credit forever without making new bids. Ties are resolved by first bid, which places some bidders at an advantage over others depending on network speed, internal business organization, etc. These are features of bidders that have nothing to do with efficient allocation of the license. This problem is dramatically exacerbated by the maximum click rule since ties are always the case every round as long as there is competition at a package level.
 - b. As a system of rules the forced retention of non-provisional winning bids creates inefficiencies. A firm can have the high bid on a National (but not a provisional winner) and might discover that it is best to go for a single instead (winning the national might look very unlikely). It cannot do so without exposure. Under these rules the bid on the national cannot be canceled even though it has little chance of winning. The bidder might end up with more than it wants or more than it is able to pay for at existing prices.
 - c. As a system of rules it can also create traps (depending on the activity rules). An individual who has the high bid on regional packages but is also a contender for a national license can become blocked from competition by a competitor. As an example, the firm as eligibility for a national license but given the prices found it advantageous to try for two regional licenses instead. The bids are high bids but not provisional winners because a competitor bid on a national. Now the original firm cannot bid on the national because eligibility is tied up and unless there happened to be partners on other regionals the firm cannot get back into the auction and compete. It is out.
6. Limitations on the number of increment clicks create potential problem for those it is designed to help, potentially slows down the auction and causes inefficiency. Consider the problem of regional package bidders coordinating to overcome a national package bidder. To understand the problem assume that strategically placed bids on singles within three of the regionals has increased price to the maximum of the bidders wishing the region (say 100 on each of three regions). The other three regions have very low bids on singles so the high bidder in the region bids much less (Say 10 in each of 3 regions). Now a national bid places a minimum increment bid (of 346.50) and becomes a provisional winner. If only one of the regional bidders has the incentive to push the regionals into the provisional winning position how long would it take under the one click rule? One click maximum means that approximately 70 rounds would be needed for a single regional to attain a sufficiently high bid to become a provisional winner with the other regional bidders. Even if the single regional bidder was willing and able to do what it takes to win over the global, it could not do so quickly.
7. The activity rules create no incentives for non-provisional winners to become aggressive. A bidder wishing only to keep the auction open by bidding the minimum

increment on small, non-winning packages can do so almost indefinitely and the FCC has no tools to stop it.

8. For activity calculations, use the union criteria as the tool as opposed to the maximum bidding units that could be in a provisional win set. The "maximum set" criteria is used then the relationship between a single bid and its effect on activity cannot be isolated and thereby limits the tools available to the FCC to speed the auction by preventing focus on certain types of bids to encourage and discourage.

9. The bid composition rule can cause exposure problems and even inefficiency creating traps - even strategic traps. It should not be used. Notice that if implemented it creates a trap. An individual has a value of 10 on each of two singles and 50 on the regional of the two. He has the high bid of 2 on one of them and has been outbid on the other at 25 so bids on the package at 28 (the increment requirement being only 1). Notice that if the individual had bid only on the second license at 26 an exposure problem would have been experienced since if the low price license became bid (perhaps due to a national) over 10 the individual could have a loss on the second. So, the individual bids the package only to discover that a national including the high priced license pushes the regional out of range. But now, the bidder is trapped because he cannot go back to the low priced license (which now goes for only 3) even though it would be profitable. The exposure problem created by the rule creates traps that can be incorporated into the strategic considerations of all bidders when considering how to eliminate competition. In the context of this auction the bid composition rule is not a good rule.

10. Care should be exercised in adding "or" rules. Such rules have implications for computability, consistency and uniqueness of the auction outcomes. The user interface can also be a problem. In a sequential auction the concept of "or" automatically exists since the bid can change as rounds proceed. The FCC should not declare its intention to add this feature until after it is tested in the software.

11. The default bid equal to the cover is o.k.

12. Do not allow duplicate bids.