

Final, sealed-bid round – examples

700 MHz and 2.1 GHz auction

22 May 2019

The auction rules for the lot assignment stage of the 700 MHz and 2.1 MHz auction allow for the possibility that, under extraordinary circumstances, Nkom might schedule a final, sealed-bid round. The mechanics for submission and evaluation of bids in this round are different to those applied for the ascending price rounds. In particular, as the final, sealed-bid round would provide a last opportunity for bidders to make their best offers for the available lots, Nkom will allow bidders to make offers for lots in a category (e.g. A) but without linking those to specific lots (e.g. A1, A2, A3 and A4). In addition, Nkom will allow bidders to make mutually exclusive bids for the different lot categories in the 700 MHz band, so that bidders can improve their chances of winning spectrum across these categories. This is achieved by allowing bidders to bid in excess of their eligibility and/or spectrum cap when bidding across different categories in this band but imposing the restriction that a bidder cannot win more bids than permitted given their respective eligibility and/or what they are permitted to acquire within the caps when determining the standing high bids at the end of the round (which become the winning bids).

This note provides some simple illustrative examples of the bid evaluation process for the final sealed-bid round.

General setup

Suppose that there are four bidders in the auction (W, X, Y, and Z). For simplicity suppose that these bidders are only interested in 700 MHz spectrum and that each of the bidders could acquire two lots under the spectrum caps. Suppose that bidder X has one eligibility point for the final, sealed-bid round, whilst the remaining bidders have two eligibility points each.

Suppose that the standing high bids at the start of the round are as follows:

Lot	Standing High Bid (NOK)	Highest bidder
A1	137,813,000	X
A2	137,813,000	Y
A3	131,250,000	Z
A4	131,250,000	Z
R	30,000,000	Y
M	-	n/a

Example 1

Suppose that none of the bidders submit any new bids, so that only the standing high bids at the start of the round are considered for the evaluation of bids. The standing high bids at the end of the round are the same as at the start of the round.

Example 2

Suppose that:

- Bidder X maintains its standing high bid for A1 (which now becomes a bid for an A lot in general) and makes an additional bid for lot M at reserve
- Bidder Y maintains its standing high bids (for A2, which now becomes a bid for an A lot in general, and R)
- Bidder Z increases one of its standing high bids to NOK 137,813,000 and maintains its other standing high bid (both become bids for A lots in general)
- Bidder W makes two bids for A lots, both with a bid amount of NOK 135,000,000.

Therefore, the bids to be considered are as follows:

Bidder	Lot Category	Amount (NOK)
X	A	137,813,000
X	M	55,000,000
Y	A	137,813,000
Y	R	30,000,000
Z	A	137,813,000
Z	A	131,250,000
W	A	135,000,000
W	A	135,000,000

The standing high bids at the end of the round are as follows:

Lot	Standing High Bid (NOK)	Highest bidder
A1	137,813,000	X
A2	137,813,000	Y
A3	137,813,000	Z
A4	135,000,000	W
R	30,000,000	Y
M	-	n/a

Notice that the standing high bids do not include the bid from bidder X for lot M, as bidder X has one eligibility point for this round and thus can win at most one lot. Also notice that the total value of standing high bids could have been greater if we had accepted this bid alongside a second bid from W instead of X's bid on an A lot, but that this would have violated the requirement that the standing high bids at the start of the round may only be displaced by (strictly) higher bids,¹ and thus this is not a possible outcome.

¹ Specifically, point (ii) in the requirement that:

Example 3

As a slight variant of example 2, suppose now that:

- Bidder X increases its standing high bid for A1 to NOK 140,000,000 (which now becomes a bid for an A lot in general) whilst still making an additional bid for lot M at reserve
- All other bidders bid as described in example 2.

Therefore, the bids to be considered are as follows:

Bidder	Lot Category	Amount (NOK)
X	A	140,000,000
X	M	55,000,000
Y	A	137,813,000
Y	R	30,000,000
Z	A	137,813,000
Z	A	131,250,000
W	A	135,000,000
W	A	135,000,000

The standing high bids at the end of the round are as follows:

Lot	Standing High Bid (NOK)	Highest bidder
A1	140,000,000	X
A2	137,813,000	Y
A3	137,813,000	Z
A4	135,000,000	W
R	30,000,000	Y
M	-	n/a

Notice that the standing high bids still do not include the bid from bidder X for lot M (even if assigning lot M to bidder X and A1 to bidder W would yield a higher total value of standing high bids), as the only bid that can outbid bidder X's standing high bid for A1 at the start of the round is bidder X's own bid of NOK 140,000,000 for an A lot. Therefore, the requirement that the standing high bids at the start of the round may only be displaced by higher bids can only be satisfied by selecting bidder X's bid for an A lot as the standing high bid on A1.

it is possible to map each of the bids selected for A lots to one of the lots A1, A2, A3 or A4 in a way that satisfies the requirements that:

- at most one bid is assigned to each lot, and*
- if a lot had a standing high bid at the start of the round, then the bid mapped to this lot is either greater than the standing high bid on the lot at the start of the round, or exactly this standing high bid;*

(See section 10.2.7.7 of the auction rules).

Example 4

Consider a variant of example 3, where:

- Bidder Z increases one of its standing high bids to NOK 141,000,000 whilst maintain its other standing high bid (now both bids are for A lots in general)
- All other bidders bid as described in example 3.

Therefore, the bids to be considered are as follows:

Bidder	Lot Category	Amount (NOK)
X	A	140,000,000
X	M	55,000,000
Y	A	137,813,000
Y	R	30,000,000
Z	A	141,000,000
Z	A	131,250,000
W	A	135,000,000
W	A	135,000,000

The standing high bids at the end of the round are as follows:

Lot	Standing High Bid (NOK)	Highest bidder
A1	141,000,000	Z
A2	137,813,000	Y
A3	135,000,000	W
A4	135,000,000	W
R	30,000,000	Y
M	55,000,000	X

In this example, the standing high bids include the bid from bidder X for lot M. The reason for this is that there is now another bid that is capable of outbidding the standing high bid on A1 at the start of the round, namely the bid from bidder Z of NOK 141,000,000, as this bid is strictly higher than the standing high bid on A1 at the start of the round. The bid from bidder X (of NOK 140,000,000) for an A lot is the second highest bid for A lots; however, we do not select this as a standing high bid for an A lot, as accepting bidder X's bid for the M lot yields a greater total value of standing high bids.

Example 5

Finally consider a slightly different variant of example 3, where:

- Bidder Z increases one of its standing high bids to NOK 139,000,000 whilst maintaining its other standing high bid (now both bids are for A lots in general)
- All other bidders bid as described in example 3.

Therefore, the bids to be considered are as follows:

Bidder	Lot Category	Amount (NOK)
X	A	140,000,000
X	M	55,000,000
Y	A	137,813,000
Y	R	30,000,000
Z	A	139,000,000
Z	A	131,250,000
W	A	135,000,000
W	A	135,000,000

The standing high bids at the end of the round are as follows:

Lot	Standing High Bid (NOK)	Highest bidder
A1	139,000,000	Z
A2	137,813,000	Y
A3	135,000,000	W
A4	135,000,000	W
R	30,000,000	Y
M	55,000,000	X

In this example, the standing high bids include the bid from bidder X for lot M, even if bidder X has made the highest bid for an A lot. The reason for this is that it is still possible to replace the standing high bid on A1 at the start of the round with the higher bid from bidder Z of NOK 139,000,000 as accepting this bid instead of bidder X's higher bid (of NOK 140,000,000) for an A lot allows us to also accept bidder X's bid for the M lot; together, this yields a greater total value of standing high bids.