

Appendix 19 – Additional Information Concerning ZRC Maximum Willingness to Supply for Capacity Products

I. Description and Examples of ZRC Maximum Willingness to Supply

A Bid includes a price, in \$/MW-day, for ZRCs for a given Season of a Planning Year for which ZRCs are procured or for an Annual Combination for which ZRCs are procured. A Bid also includes the number of ZRCs to which the price applies and for a MISO-Delivered ZRC only, the Source Zone of the ZRCs. A Bid for ZRCs for a given Season of a Planning Year must be for at least four (4) ZRCs. There is no minimum quantity requirement for a Bid for an Annual Combination. The price in a Bid must be displayed in \$/MW-day rounded to the nearest cent. A Bid must be displayed as a price, in \$/MW-day rounded to the nearest cent. A Bidder may provide a maximum willingness to supply for each Season of a Planning Year. The information related to the maximum willingness to supply provided in this document applies to Bids for each Planning Year separately; the term “Product” should be interpreted to mean “Season of a Planning Year”.

Unless a maximum willingness to supply for a Product is specified by the Bidder, it will be assumed that a Bidder is willing to supply up to the minimum of: (i) the number of ZRCs bid across MISO-Delivered ZRCs and Financially-Settled ZRCs for that Product and across ZRCs bid on that Product individually and the Annual Combination that includes that Product; and (ii) the ZRC Target for that Product. This is the “ZRC Default Maximum Willingness to Supply” or “ZRC Default MWS”. If a Bidder specifies a ZRC maximum willingness to supply (or “ZRC MWS”) for a Product that is greater than the ZRC Default MWS for that Product, the ZRC MWS submitted by the Bidder will be ignored and discarded. The ZRC MWS for a Product must be an integer number of ZRCs and must be at least four (4) ZRCs. The Bidder cannot win, across all Products and Annual Combinations, more ZRCs of a Product than the Bidder has specified as its ZRC MWS for that Product.

This section explains further the concept of the ZRC MWS by using illustrative Bids. We consider the Bids placed on MISO-Delivered ZRCs only by Bidder A for the 2027-2028 Planning Year. (We will omit the year specification for the remainder of this section of the document). The Bids are presented in Table 1 below.

Please note that this Table 1 does **NOT** follow the format of the Bid Form exactly and has been designed for the purposes of this example. Due to row constraints, not all rows are shown.

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Table 1 below has each Season as a set of three columns. The Bids on individual Products (i.e., the Bids for each specific Season) are placed in rows 4-17 of Table 1, followed by the Bids on the Annual Combination in rows 20-30.

Table 1. Illustrative Bids and ZRC Maximum Willingness to Supply

	A	B	C	D	E	F	G	H	I	J	K	L	M
1		Summer			Fall			Winter			Spring		
2		Price	# ZRCs	Source Zone	Price	# ZRCs	Source Zone	Price	# ZRCs	Source Zone	Price	# ZRCs	Source Zone
3	MISO-Delivered ZRCs bid on Seasons												
4	1				10.00	4	4	10.00	4	4	10.00	4	4
5	2				20.00	10	4	20.00	10	4	20.00	10	4
6	3				30.00	20	4	30.00	20	4	30.00	20	4
7	4				40.00	30	4	40.00	30	4	40.00	30	4
8	5				50.00	40	4				50.00	41	4
9	...				60.00	50	4						
10	...												
11	...												
12	176												
13	...												
14	...												
15	...												
16	...												
17	223												
18	MISO-Delivered ZRCs bid on Annual Combination												
19		Price			# ZRCs			Source Zone					
20	1	55.00			1			4					
21	2	56.00			20			4					
22	3	57.00			20			4					
23	4	58.00			30			4					
24	5												
25	6												
26	...												
27	...												
28	...												
29	...												
30	176												
31													
32	Number of ZRCs bid	71			225			135			176		
33	ZRC TARGETS	213			215			223			176		
34													
35	ZRC Max Willingness to Supply (Default)	71			215			135			176		

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The ZRC Default MWS is the minimum of (i) the number of ZRCs bid across MISO-Delivered ZRCs and Financially-Settled ZRCs for that Product and across ZRCs bid on that Product individually and the Annual Combination that includes that Product; and (ii) the ZRC Target for that Product. The ZRC Default MWS is labeled “ZRC Max Willingness to Supply (Default)” in the table above and appears in row 35.

Examples of the ZRC Default MWS are as follows:

- *Season of Summer:* The Bidder has bid for 71 ZRCs for Summer, which is the sum of zero (0) ZRCs bid on the Season of Summer alone and the 71 ZRCs bid on the Annual Combination. The ZRC Target for Summer is 213 ZRCs. The ZRC Default MWS for Summer is 71 ZRCs.
- *Season of Fall:* The Bidder has bid for 225 ZRCs for Fall, which is the sum of the 154 ZRCs bid on the Season of Fall alone and the 71 ZRCs bid on the Annual Combination. The ZRC Target for Fall is 215 ZRCs. The ZRC Default MWS for Fall is 215 ZRCs.
- *Season of Spring:* The Bidder has bid for 176 ZRCs for Spring, which is the sum of the 105 ZRCs bid on the Season of Spring alone and the 71 ZRCs bid on the Annual Combination. The ZRC Target for Spring is 176 ZRCs. The ZRC Default MWS for Spring is 176 ZRCs.

Taking Fall as an example, 215 ZRCs are needed to fill the ZRC Target so that the evaluation will only consider the packages that contain at most 215 of the 225 ZRCs placed (considering the ZRCs on Fall and the ZRCs on the Annual Combination). The evaluation could consider a combination of ZRCs from the Season of Fall and the Annual Combination.

Bidder A may specify a ZRC MWS. Table 2 below provides illustrative entries that specify a ZRC MWS less than the ZRC Default MWS.

Table 2. Illustrative Bids and Bidder-Determined ZRC Maximum Willingness to Supply

	A	B	C	D	E	F	G	H	I	J	K	L	M
1		Summer			Fall			Winter			Spring		
2		Price	# ZRCs	Source Zone	Price	# ZRCs	Source Zone	Price	# ZRCs	Source Zone	Price	# ZRCs	Source Zone
3	MISO-Delivered ZRCs bid on Seasons												
4	1				10.00	4	4	10.00	4	4	10.00	4	4
5	2				20.00	10	4	20.00	10	4	20.00	10	4
6	3				30.00	20	4	30.00	20	4	30.00	20	4
7	4				40.00	30	4	40.00	30	4	40.00	30	4
8	5				50.00	40	4				50.00	41	4
9	...				60.00	50	4						
10	...												
11	...												
12	176												
13	...												
14	...												
15	...												
16	...												
17	223												
18	MISO-Delivered ZRCs bid on Annual Combination												
19		Price			# ZRCs			Source Zone					
20	1	55.00			1			4					
21	2	56.00			20			4					
22	3	57.00			20			4					
23	4	58.00			30			4					
24	5												
25	6												
26	...												
27	...												
28	...												
29	...												
30	176												
31													
32	Number of ZRCs bid	71			225			135			176		
33	ZRC TARGETS	213			215			223			176		
34													
35	ZRC Max Willingness to Supply	71			215			60			100		

The ZRC Default MWS for Spring in Table 1 above is 176 ZRCs. In Table 2, Bidder A specifies a ZRC MWS for Spring of 100 ZRCs. The evaluation would then consider at most 100 ZRCs of the 176 ZRCs placed (considering the ZRCs on Spring and the ZRCs on the Annual Combination). Note that, in this instance, the highest 5 ZRCs of the 105 ZRCs that the Bidder placed for the Season of Spring are irrelevant

and cannot possibly be part of the least-cost package because the Bidder has also specified that it is only willing to supply a maximum of 100 ZRCs.

The ZRC Default MWS for Winter in Table 1 above is 135 ZRCs. In Table 2, Bidder A specifies a ZRC MWS for Winter of 60 ZRCs, which is strictly less than the ZRC Target of 223 ZRCs and strictly less than the total number of 135 ZRCs bid. The evaluation would then only consider packages that contain at most 60 of the 135 ZRCs placed (considering the ZRCs on Winter and the ZRCs on the Annual Combination). The evaluation could consider, for example, 25 ZRCs bid for the Annual Combination and 35 ZRCs bid for the Season of Winter alone. The evaluation could also consider, for example, the 60 lowest priced ZRCs for the Annual Combination. Note that, in this instance, the highest 11 ZRCs of the 71 ZRCs that the Bidder placed for the Annual Combination are irrelevant and cannot possibly be part of the least-cost package because the Bidder has also specified that it is only willing to supply a maximum of 60 ZRCs. The Bidder cannot win, across MISO-Delivered ZRCs and Financially-Settled ZRCs, and across all Products and Annual Combinations, more ZRCs of a Product than the Bidder has specified as its ZRC MWS for that Product.

II. Additional Information in the Bid Form

For a given planning year, the Bid Form for Capacity Products includes a tab, as shown below:



that provides, for the convenience of Bidders:

- the components of the calculation of the ZRC Default MWS for each Product;
- to the extent that a Bidder has entered a ZRC MWS for a Product, a comparison of the ZRC MWS that will be used in the evaluation to: (i) the number of ZRCs bid across MISO-Delivered ZRCs and Financially-Settled ZRCs for that Product; (ii) the number of ZRCs bid across MISO-Delivered ZRCs and Financially-Settled ZRCs for the Annual Combination that includes that Product; and (iii) the ZRC Default MWS.
- a comparison of the ZRC Target for a Product to: (i) the number of ZRCs bid across MISO-Delivered ZRCs and Financially-Settled ZRCs for that Product; and (ii) the number of ZRCs bid across MISO-Delivered ZRCs and Financially-Settled ZRCs for the Annual Combination that includes that Product.

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This section of Appendix 19 describes this tab and these calculations using the 2027-2028 Planning Year as an example. The tabs operate in the same manner for all Products.

Details of ZRC Default MWS

The “Details of ZRC Default MWS” section displays the components of the calculation of the ZRC Default MWS, as explained in the previous section of this Appendix. An illustration is provided below.

Checks and Flags:

Details of ZRC Default MWS

	Products				Annual Combination
	Summer 2027-2028	Fall 2027-2028	Winter 2027-2028	Spring 2027-2028	2027-2028
ZRCs Bid on Product	-	154	64	105	71
+ ZRCs Bid on Annual Combination	71	71	71	71	ZRCs Bid on Annual Combination
(A) Total ZRCs Bid on Product	71	225	135	176	
(B) ZRC Target for Product	213	215	223	176	
ZRC Default MWS Calculation = min[(A), (B)]	71	215	135	176	
ZRC MWS	71	215	135	176	

For Fall 2027-2028, the Bidder has placed 225 ZRCs, which is the sum of 154 ZRCs on the Season of Fall alone, and 71 ZRCs on the 2027-2028 Annual Combination. The ZRC Target for Fall is 215 ZRCs. Thus, the ZRC Default MWS for Fall is 215 ZRCs (the minimum of the ZRC Target and the number of total ZRCs bid).

Comparisons to Bidder-Determined ZRC Maximum Willingness to Supply

Directly under the “Details of ZRC Default MWS” table of the tab is found the “ZRC MWS Checks” section where a number of comparisons are performed between: the Bidder-determined ZRC MWS for the Product; and: the ZRCs bid across MISO-Delivered ZRCs and Financially-Settled ZRCs on the Product as well as the ZRCs bid across MISO-Delivered ZRCs and Financially-Settled ZRCs on the Annual Combination that includes the Product. An illustration is provided below.

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Checks and Flags:

Details of ZRC Default MWS

	Products				Annual Combination 2027-2028	ZRCs Bid on Annual Combination
	① Summer 2027-2028	② Fall 2027-2028	③ Winter 2027-2028	④ Spring 2027-2028		
ZRCs Bid on Product	-	154	64	105	71	
+ ZRCs Bid on Annual Combination	71	71	71	71		
(A) Total ZRCs Bid on Product	71	225	135	176		
(B) ZRC Target for Product	213	215	223	176		
ZRC Default MWS Calculation = min[(A), (B)]	71	215	135	176		
ZRC MWS	-	71	68	180		

ZRC MWS Checks

ZRC MWS = 0 but ZRCs Bid					None of the ZRCs bid for the highlighted Season (ZRCs bid on the Season or on the Annual Combination) will be evaluated because the ZRC MWS specified for that Season is zero.
ZRC MWS < #ZRCs Bid on Product					Some of the ZRCs bid for the highlighted Season will not be evaluated because the ZRC MWS specified for that Season is less than the number of ZRCs bid for that Season. Lower priced Bids up to the ZRC MWS will be evaluated.
ZRC MWS < #ZRCs Bid on Annual Combination					Some of the ZRCs bid on the Annual Combination will not be evaluated because the ZRC MWS specified for that Season is less than the number of ZRCs bid on the Annual Combination. Lower priced Bids up to the ZRC MWS will be evaluated for the Annual Combination.
ZRC MWS > ZRC Default MWS					The ZRC MWS specified exceeds the ZRC Default MWS. The ZRC MWS will be discarded and the ZRC Default MWS will be used in the evaluation.

❶ The first row (“ZRC MWS = 0 but ZRCs bid”) indicates whether the Bidder has entered a ZRC MWS of zero for a Product but has submitted Bids for ZRCs of that Product (either for the Season alone or for the Annual Combination that includes that Season). If this is the case, the cell in the column for that Season is shaded red (Summer 2027-2028 in the example above). In this example, the ZRC MWS that will be used in the evaluation is zero. Thus, none of the ZRCs bid for that Season will be evaluated. A warning that states this fact will appear on the right-hand side of the table. The warning is general and does not address the specific number of ZRCs bid by the Bidder.

❷ The second row (“ZRC MWS < #ZRCs Bid on Season”) indicates whether the Bidder has entered a ZRC MWS for a Product strictly less than the number of ZRCs bid on that Season alone. If this is the case, the cell in the column for that Season is shaded yellow (Fall 2027-2028 in the example above). In this example, the ZRC MWS that will be used in the evaluation is 71 ZRCs. Thus, only 71 of the 154 ZRCs that the Bidder bid on Fall alone will be evaluated. A warning that states this fact will appear on the right-hand side of the table. The warning is general and does not address the specific number of ZRCs bid by the Bidder.

❸ The third row (“ZRC MWS < #ZRCs Bid on Annual Combination”) indicates whether the Bidder has entered a ZRC MWS for a Product strictly less than the number of ZRCs bid for the Annual Combination that includes the Product. If this is the case, the cell in the column for that Season is shaded yellow (Winter 2027-2028 in the example above). In this example, the ZRC MWS that will be used in the evaluation is

68 ZRCs. Thus, only 68 of the 71 ZRCs that the Bidder bid on the Annual Combination will be evaluated. A warning that states this fact will appear on the right-hand side of the table. The warning is general and does not address the specific number of ZRCs bid by the Bidder.

④ The fourth row (“ZRC MWS > ZRC Default MWS”) evaluates whether the Bidder has entered a ZRC MWS for a Product that is greater than the ZRC Default MWS. If this is the case, the cell in the column for that Season is shaded grey (Spring 2027-2028 in the example above). In that example, the ZRC MWS entered by the Bidder will be ignored and discarded; the ZRC Default MWS will be used in the evaluation. For a Bidder-determined ZRC MWS to be used in the evaluation, it must be strictly less than the ZRC Default MWS. A warning that states this fact will appear on the right-hand side of the table. The warning is general and does not address the specific number of ZRCs bid by the Bidder.

Comparisons to ZRC Targets

Directly under the “ZRC MWS checks” are the ZRC Target checks. This row evaluates whether the number of ZRCs bid across MISO-Delivered ZRCs and Financially-Settled ZRCs for a Product is greater than the ZRC Target for that Product and whether the number of ZRCs bid across MISO-Delivered ZRCs and Financially-Settled ZRCs for an Annual Combination is greater than the ZRC Target for that Annual Combination. If this is the case, the cell corresponding to the Product or Annual Combination is shaded yellow (Winter in the example below). In that example, 230 ZRCs are placed on the Season of Winter alone, which exceeds the ZRC Target for Winter of 223 ZRCs. In that case, the evaluation discards the highest priced ZRC Bids and the number of ZRCs considered does not exceed the ZRC Target. A warning that states this fact will appear below the table. The warning is general and does not address the specific number of ZRCs bid by the Bidder.

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Checks and Flags:

Details of ZRC Default MWS

	Products				Annual Combination	
	Summer 2027-2028	Fall 2027-2028	Winter 2027-2028	Spring 2027-2028	2027-2028	
ZRCs Bid on Product	-	154	230	105	71	ZRCs Bid on Annual Combination
+ ZRCs Bid on Annual Combination	71	71	71	71		
(A) Total ZRCs Bid on Product	71	225	301	176		
(B) ZRC Target for Product	213	215	223	176		
ZRC Default MWS Calculation = min[(A), (B)]	71	215	223	176		
ZRC MWS	-	71	68	180		

ZRC Target Check

ZRC Target < #ZRCs Bid					
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Some of the ZRCs bid on the highlighted Season will not be evaluated because the ZRC Target is less than the number of ZRCs bid. Lower priced ZRCs up to the ZRC Target will be evaluated.