MEMORANDUM

To: NECPUC Representatives

From: Randall Speck
Miles Bidwell

Date: April 8, 2008

Re: Draft White Paper, "Updated Proposal for Allocating Scarce Interconnection Queue Positions in Forward Capacity Auctions."

Updated Proposal for Allocating Scarce Interconnection Queue Positions in Forward Capacity Auctions

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I. Introduction and Summary

A. INTRODUCTION

In November 2007, on behalf of the Connecticut Department of Public Utility Control, we presented a proposed solution for allocating scarce interconnection rights to generation resources through the Forward Capacity Auctions ("FCAs") so that the most efficient resource receives the interconnection. Since then, others have suggested modifications or raised questions that led to refinements and clarifications. In this White Paper we will review the allocation problem and our recommended approach, incorporating or addressing many of the comments made to date. This iteration is not yet a definitive mechanism, however, and we welcome proposed improvements that will address likely real-world scenarios.

FERC approved ISO-NE's current queue procedures well before the FCA in order to provide rational, orderly priorities for allocating rights to interconnection studies and obligations for interconnection costs. In general, ISO-NE studies projects in the order in which they made their interconnection applications, and when there are overlapping impacts among two or more projects, the project with the superior queue position is entitled to priority for the lower-cost connection. Many projects in the queue are never completed, but they may be able to block more viable projects with inferior queue positions.

The FCA is designed to facilitate competition among all resources to assure the lowest reasonable price for capacity. This competition will be stifled, however, if some potential new entrants are excluded from the auction based not on their efficiency and costs but on the basis of their position in the interconnection queue. As a temporary measure, ISO-NE disqualified any potential FCA bidder with a lower queue position when there were overlapping interconnection impacts that would preclude all of the potential projects from supplying their proposed capacity. This meant that more efficient projects could be precluded from FCA participation simply because they made their interconnection applications later than a less efficient project. This outcome will inflate capacity prices unnecessarily and

provide less than optimal use of the transmission system. Virtually all parties agree that this approach should be changed.

B. SUMMARY

In developing a solution, we have been cognizant of six concerns. ***First***, projects with long lead times need a mechanism that assures their ability to connect at the end of a lengthy planning and construction period and after substantial investments. Base-load and intermediate units with larger capital costs must be able to assure their interconnection rights or they will not risk making the investment. The system needs a mix of resources, so the interconnection system must accommodate their needs. ***Second***, while the FCA will undoubtedly be attractive to most new entrants, the interconnection process should provide for projects that intend to participate only in the energy market or to export their capacity. ***Third,*** bilateral trading of connections should be allowed, but this bilateral trading of queue positions will not replace the sub-auction but should function in tandem with the sub-auction. The ability to trade existing queue positions will depend on the disposition of the next concern. ***Fourth***, there are existing queue holders who have made investments to obtain and hold their positions. While there may be questions about the formal legal rights that attach to a queue position, projects arguably have equitable rights if they relied on the existing interconnection queue rules and made investments accordingly. Those rights need to be recognized in any new approach. ***Fifth***, potential plants of different size must be able to contend for the same connection in a way that produces the allocation that is most beneficial to the system. ***Sixth***, multiple connections may be available at a specific site at steeply increasing incremental cost. These connections need to be allocated in an equitable and efficient manner when the number of plants wishing to connect is equal to or less than the number of possible connections, and when the number of plants wanting to connect exceeds the number of possible connections.

II. Proposal for Using the FCA to Allocate Interconnection Rights

A. The Basic Structure

The proposed sub-auction component of the FCA provides a mechanism for granting interconnection rights without regard to the existing queue and should eventually displace the need for the queue. The fundamental premise is that the FCA, including the sub-auction, should select the project that can use the interconnection most efficiently. To accomplish this, all projects that meet the FCA qualification requirements may participate in the auction without regard to queue position. ISO-NE will identify potentially overlapping interconnection impacts and notify the prospective bidders that they may have to compete with other projects to obtain their interconnection. Each project will rely on its own analysis of its interconnection costs based on ISO-NE's system studies.

ISO-NE will only count the maximum amount of capacity that can be interconnected as contributing to meeting the ICR. For instance, if three projects of 100 MW each seek an interconnection that can only accommodate 100 MW, ISO-NE will only include 100 MW toward satisfying ICR, not the full 300 MW that is bid. There will be no risk that too little or too much capacity will clear in the FCA.

As the auction clock descends, some projects may drop out above the Capacity Clearing Price, thus also dropping out of the competition for the interconnection position. If multiple projects with overlapping interconnection impacts remain at the clearing price, the sub-auction will continue for these projects only. The project that can use each interconnection most efficiently should be willing to pay the highest price for it, above and beyond the actual interconnection costs. Thus, as the price descends below the clearing price, the less efficient projects will drop out. When only the projects that can be interconnected for the Commitment Period remain, the sub-auction will close. The winning projects will be paid the Capacity Clearing Price and will be treated as any other capacity resource for purposes of assessing any penalties.

B. A BRIEF RECAPITULATION

In our first White Paper, we described our proposal for extending the market allocation system that is the FCA, to include the allocation of scarce transmission connections. We began by first describing the simple case in which one plant wants one connection. Because only one plant seeks the connection, this is no different from the present queuing method. The ISO determines the feasibility of the desired connection location, and the plant estimates the total cost of the connection[1]. In the subsequent FCA, the plant's sponsor compares the descending price in the auction with its estimate of its plant's costs, including the connection costs, and weighs these against its estimate of the present value of all future net income sources. At some auction price, this potential plant will cease to look economically viable and will withdraw from the auction. If the auction ends without this plant having withdrawn, the plant gains its transmission connection, the auction market clearing price for its capacity for the commitment period, and the obligation to provide electricity during this commitment period.

We propose to use a sub-auction mechanism when two or more plants seek to locate at a specific location that cannot accommodate them all. In this contested connection case, the plants will enter the FCA having estimated their own plants' costs including the interconnection cost, which will be the same as it was in the first case when only one plant sought the connection. As in the first case, one or both of these plants will withdraw if the FCA price descends past the level at which the plants appear to be economically viable. If the auction ends and neither of the plants has dropped out, the ISO will continue with a sub-auction for the transmission connection. The starting price in the sub-auction will be the cost of the connection to the ISO. At this point, the ICR will have been exactly satisfied by including the megawatt capacity of the connection. The ensuing sub-auction serves the function of bidding up the cost of the connection until the less efficient of the two plants withdraws.

[1] We also propose that the ISO assist in the cost estimation process to the extent possible.

This sub-auction mechanism is potentially confusing because even though the price continues to decline, the descending clock auction has become an ascending clock auction with respect to the connection. Consider the following example: the FCA has ended with a market-clearing price that applies to all potential plants that have not withdrawn. The sub-auction starts at the FCA market-clearing price but now price declines represent additional connection costs. For the purposes of our example, assume that the auction clears at $7, and two plants want a specific 150 MW connection. The sub-auction will continue until one of the plants withdraws. If one of the plants withdraws at a price of $4.25, the winning plant will receive the $7 per kW-month FCA winning price as a capacity resource, but will have to pay $2.75 per kW month for the connection ($7 minus $4.25 = $2.75) in addition to the actual cost incurred to construct the connection. If the other plant had not withdrawn until the price was $1, the winning plant would have had to pay $6 ($7 minus $1) for its connection.

In this current proposal, we expand our original proposal to

1. better include plants that have longer construction periods,
2. include energy-only and export plants in a non-discriminatory fashion,
3. allow the bilateral trading of sites,
4. consider the treatment of existing queue holders,
5. deal with the situation where plants of different sizes seek the same connection, and
6. efficiently allocate the connections when a particular site can have multiple connections but each connection costs more than the previous connection.

III. Six Extensions to the Proposal

A. Encouraging the Long-Lead-Time Plant

Capital-intensive base-load and intermediate plants take longer to design and build than the three and a half years between the FCA and the Commitment Period. Thus, these projects

will need to have made significant capital commitments well before the FCA in order to begin operations by the start of the Commitment Period. Because these projects will expect to recover more of their fixed costs through infra-marginal rents, however, they will be less dependent on capacity payments than peakers, which will expect to recover a higher proportion of their fixed costs through capacity payments. Thus, longer lead time plants should be more willing to accept a lower initial capacity payment than peaking units and will likely win any sub-auction for interconnection positions.

Nevertheless, because peaking units have shorter lead times and may not have to make significant capital investments before the FCA, they could take the available interconnection positions before a base-load plant's construction progressed sufficiently for it to participate in the FCA. For example, a 900 MW clean coal plant may commence construction and anticipate completion six years later at a connection point that can support power plants totaling 900 MW. In the first and second FCAs after the clean coal plant began incurring substantial investments, other short-lead-time plants totaling 900 MW could win in the FCA and take the connections. When the clean coal plant is able to bid in the FCA, just over three years before it can operate, it might no longer have an available connection. Such a unit needs a mechanism that will permit it to "reserve" the interconnection if it can do so at a competitive price.

We recommend that once a long-lead-time project has met some specified construction milestone, ISO-NE should specify that the interconnection at that site must be allocated on an indivisible basis. For instance, if the long-lead-time project seeks to connect 1400 MW, ISO-NE would require any projects seeking to interconnect at that location to pay for the total 1400 MW of connection capability. The long-lead-time project would then participate in the next FCA only to the extent that was necessary to allocate interconnection rights. In other words, the long-lead-time project and any other qualified projects seeking a 1400 MW connection at that location – if any – would compete in a sub-auction. After the FCA clearing price is set, the remaining units would compete in the sub-auction for the sole purpose of determining the value of and rights to the interconnection. Competitors could include other long-lead-time projects that had also achieved the specified construction milestone or a group

of smaller, shorter-lead-time projects that could use and pay for the entire, indivisible 1400 MW connection. The project that remained in that sub-auction would be awarded the connection (which would be reserved for the project's expected completion date) and would pay the difference between the Capacity Clearing Price and the closing price in the sub-auction as a additional fee for the connection.

This procedure will require additional rules to assure that ISO-NE purchases only the amount of the ICR, not more or less. If the only competitors for the connection are all long-lead-time projects that will not be available for the relevant Commitment Period, there will be no problem, and their prospective capacity will be ignored for purposes of this auction. If some of the competing generators have qualified for the relevant Commitment Period, however, the FCA should pause when the amount of supply equals ICR assuming that the long-lead-time project will win the connection in the sub-auction. If the long-lead-time plant does not win the connection, however, there would be a surplus of capacity over ICR. In that case, the auctioneer would resume the auction and would continue until the surplus supply had been eliminated.

This approach would permit long-lead-time projects to lock in their interconnection before having made significant expenditures. Because they will generally be the most efficient potential generator, they will typically be willing to pay more and will usually win the sub-auction, thereby providing needed interconnection certainty for new base-load generation.

This method will not make meeting the ICR uncertain nor will it interfere with the smooth operation of the FCA. The sub-auction for the long-lead-time plant (as for the energy-only plant discussed below) will take place before the other sub-auctions. Even in the unlikely event that the long-lead-time plant does not win the connection, the FCA will be left with more than the desired amount of capacity and will therefore continue. This event will not be so much a matter of stopping and restarting the FCA as a brief pause. During this pause the long-lead-time plant and possibly competing plants will have their sub-auction. At the end of this presumably brief interlude, the auctioneer will know if the ICR has been

exactly met, as will usually be the case for the long-lead-time plant, or if the general auction needs to continue further in order to eliminate a surplus.

B. PROVISIONS FOR ENERGY-ONLY AND EXPORT PLANTS

An energy-only or an export plant with overlapping interconnection impacts should be allowed to enter the connections sub-auction stage of the FCA without having to participate in the FCA. An energy-only/export plant will be required to participate in the prequalification stage of the FCA, as if it were going to participate. For interconnection purposes, the energy-only/export plant would be treated like the plants that intended to participate in the FCA. If the qualification stage examination showed that the energy-only/export plant and an FCA-participating plant both sought to use the same or a limited connection, then if the participating plant was among the winning plants after the FCA cleared, the auction for the connections would proceed with the energy-only/export plant now included. If the energy-only/export plant won the sub-auction for the connection, it would acquire the connection, and the participating plant would not.

As with the long-lead-time plant described above, ISO-NE will need rules to ensure that it purchases only the supply necessary to meet ICR. Thus, the auction should stop when the amount of supply equals ICR assuming that all of the new energy-only/export plants will win their connections. If those plants all win their connections, the purchased supply will equal the ICR. To the extent that any energy-only/export plants do not win their connections, there would be a surplus of capacity over the ICR, and the auctioneer would restart the auction and continue until the surplus supply had been eliminated. Restarting and continuing the auction may cause one of the FCA-participating plants that won its connection to withdraw, however, and the previously losing energy-only/export plant may then want to reenter the auction. If this remote possibility is considered to be undesirable, the rules could forbid a plant that has withdrawn at one price to reenter at a lower price. Because the return of the energy-only/export plant will not affect meeting ICR, however, this possibility might be permitted.

C. Bilateral Agreements for Allocation of Interconnections

Bilateral agreements between parties with overlapping interconnection impacts would be permitted but would not be relied on as the allocation mechanism. The method for resolving connection conflicts should place all parties on an equal footing so that they can compete for a scarce resource on the basis of efficiency and costs. Our proposed mechanism gives no preference to any party merely because of its interconnection queue position. Thus, all parties should have relatively equal bargaining power if they wish to make a bilateral arrangement.

The allocation method cannot rely primarily on bilateral arrangements, however. There must always be a failsafe mechanism in the event that the parties do not agree. So long as that mechanism is fair and gives no party an advantage, the parties may be able to reach an equitable bargain on their own, but the rules need not encourage or facilitate such agreements.

D. Property Rights in Existing Queue Positions and the Disposition of Payments Determined in Sub-auctions for Interconnection Rights

It is not possible to predict the amount of the payments that may result from the sub-auctions for connection rights. We recommend that those payments be placed in a single fund that will be used solely to provide limited compensation to those projects with interconnection overlap impacts that

1. remained in the auction at the clearing price in the FCA,

2. did not win the connection in the sub-auction,

3. had acquired a queue position prior to the effective date of the new interconnection rules, and

4. had a superior queue position to the project that won the connection in the sub-auction. Only grandfathered projects with queue positions would be eligible for any compensation.

This provision is intended to protect any arguable reliance interest that some projects might have based on a queue position that predates changes to the interconnection rules. Any project that does not remain in the auction at the Capacity Clearing Price was not deemed competitive and should not be eligible for any compensation because it was not successful in the FCA and could not have used the connection. A project with an inferior queue position to the winning project also has no compensable claim. Finally, to the extent that the queue remains after modifications to the interconnection procedures, any later project has no reliance interest that needs to be compensated.

Compensation would cover only those reasonably incurred direct costs that were necessary to acquire or to maintain the project's queue position. The rules would specify as precisely as possible which categories of costs would be permissible. This compensation is not intended to reimburse the losing project for all of its costs related to the project but only for those costs that are directly related to its queue position and that were incurred in reliance on a previous interconnection procedure.

It is possible that the funds accumulated from payments determined in the connection sub-auctions would exceed any compensation to losing queue holders. At this time, we have no express recommendation for how any surplus funds should be allocated. We recommend instead that the rules provide for a disposition to be determined after some experience with the new rules, when we will be better able to assess the size of the fund. We do not seek to have these funds returned to load, but they should be used in a way that benefits the New England electrical system, including both load and supply.

E. PROVISIONS FOR DIFFERENT PLANT SIZES

The connection sub-auction must accommodate plants of varying sizes that may be competing for a single connection that cannot accept both. For instance, a 200 MW project and a 175 MW project may both seek to connect at a location that is limited to a maximum of 200 MW. The sub-auction must be structured so that both projects can be considered on a comparable basis.

To some extent, this issue arises in the FCA, where the auction price is in dollars per megawatt and plants of different size compete with each other on this basis. At the end of the auction, if plant indivisibility causes a surplus of supply over the ICR, the auction rules specify ways to consider the effect on total system costs and to carry forward any surplus to the next FCA as out-of-market resources.

The connection sub-auction differs from the FCA to the extent that specific connections are of specific sizes, and this size can impose a limit on the size of the generating plant that can use the connection. The auction for the connection could either be in terms of the price per MW, or it could be for the total cost of the 200 MW connection. Pricing the connection on a per MW basis will maximize the competition between the two plants, as it does in the FCA. This approach should include an evaluation of total system costs, as would be done in the FCA under analogous circumstances.

On the other hand, it would be possible to price the connection as a single unit – similar to our recommended approach for long-lead-time plants. Using the earlier example, the connection would be treated as a 200 MW unit. This approach would provide a competitive advantage to the 200 MW plant by making the connection less expensive on a per MW basis, *i.e.*, the total cost divided by 200 MWs is less than the total cost divided by 175 MWs. From the point of view of the entire system, this competitive advantage could be warranted because the 200 MW plant would provide a more efficient utilization of the scarce connection than would the 175 MW plant. It is possible, however, that this advantage could allow a less efficient 200 MW plant to win over a more efficient 175 MW plant. To take a further

example, if a 200 MW plant and three 50 MW plants are all contending for the same 200 MW connection, treating the connection as a single unit with a single unit price would seriously disadvantage the 50 MW plants unless they were able to form an alliance, which may be problematic.

We recommend that the connection sub-auction be priced on a per MW basis. This approach appears to permit greater competition and to entail fewer complications. With respect to meeting the ICR, if the 200 MW connection is contested by plants of different size, the size of the smaller plant should be used in the auction supply calculation rather than the size of the connection. Continuing the above example, the ISO would treat the connection as supplying 175 MW. If the 200 MW plant won the sub-auction, the FCA would continue until the excess was eliminated. Like the sub-auction for the long-lead-time plant and the energy-only/export plant, this sub-auction will be held before the general sub-auctions.

F. PROVISIONS FOR MULTIPLE CONNECTIONS AT THE SAME SITE

In developing and clarifying our proposal with regard to this issue, we now make a firm distinction between the situation where the number of plants seeking to connect is equal to or less than the number of available connections, and where the number of plants seeking to connect is more than the number of available connections. We call the first situation, "uncontested", and we call the other situation, "contested." The two situations are different in that only the situation where the connections are contested involves the connection sub-auction. We will start our discussion with the uncontested situation, as we did at the beginning of this white paper.

1. THE ALLOCATION OF SINGLE CONNECTIONS IS CONTESTED OR IS NOT CONTESTED

In our original explanation of the allocation of connections in a sub-auction, we started with the case in which there was one connection. There were two possibilities. One possibility was that only one plant wanted the connection. In this case, which plant gets the

connection was not contested so the plant that wanted the connection got the connection and paid the ISO connection costs. Our second case, and the one in which the sub-auction was used to allocate the contested connection to its highest use, was the case in which there was one connection and more than one plant wanted it. In this case, a sub-auction would follow the FCA. In the sub-auction, the price would continue to decline; however, now the decline was a subtraction from the net revenue the plant would have received and thus represented an increasing connection cost. In effect the descending-clock auction becomes an ascending-clock auction in which FCA winners bid for contested connections. As the connection cost increased, the contending plants would drop out of the auction and the next-to-last plant to drop out would set the price for the remaining plant. The remaining plant – *i.e.*, the presumptively most efficient plant that placed the highest value on the connection – would get the connection.

2. THE TREATMENT OF MULTIPLE CONNECTIONS IS SIMILAR

In describing the methods for handling multiple connections when each successive connection has increasing costs, we should make the same distinction between allocations that are contested and, therefore, are decided according to a competitive auction outcome, and allocations that are uncontested.

3. THE UNCONTESTED MULTIPLE CONNECTION

An uncontested situation for multiple connections occurs when the number of plants wanting a connection at a specific place equals or is less than the number of connections available at the specific place. The complicating factor arises in this case when the connections can be supplied by the ISO at a very steeply increasing cost for each additional connection. The goal here is not to exclude the least efficient plant (although this may happen) from the plants that are able to have one of a number of scarce connections, but rather to supply the connections to the plants that want them and that are willing to pay the average ISO's physical connection costs.

(1) Three Plants Want Three Connections

In this uncontested situation, the increasing cost of each connection raises the possibility that some plant will be excluded from this location because it cannot pay the cost. This is not necessarily a bad thing, and we will discuss it next. Using an example to illustrate the present case, assume that there are three plants that wish to connect at a certain location and that at this location the ISO can connect three plants at a steeply increasing cost per plant. At the time of qualification, the ISO qualifies exactly three plants that seek to connect at this location. This means that the connection process from here on will be uncontested. The ISO will announce that for the three plants, it will charge an average of the three connection costs to each of the three plants. This reimburses the ISO for its costs and does not leave any surplus. If the average cost of the connection is acceptable to each of the three plants, and if each of the three plants wins in the FCA, then each of the plants will be connected at this average connection cost. If only two of the plants win the FCA, the two plants will be connected at the lower average cost of the two connections. If at some time in the future another plant seeks to connect there, it will pay the more expensive incremental cost of adding another connection.

(2) Two Plants Want Two of the Three Possible Connections

If one of the three plants does not accept the average price and chooses to locate elsewhere, then the ISO will make two connections available and will charge the average price of making the two connections. **[We are still considering whether this rule lead two plants to buy out the third to significantly lower the average cost and whether the third plant seek that connection for the sole purpose of extracting a payment from the other two to induce it to drop out and lower the average cost for the remaining two.]**

4. THE CONTESTED MULTIPLE CONNECTION

In this section, we deal with the case in which there are more plants that desire to locate at a specific place than there are possible connections. We also assume that in this location there are a maximum of three connections which can be built at a steeply increasing cost per

connection. For the purpose of this discussion, we assume that the first connection costs $10,000; the second costs $50,000; and the third costs $100,000. There are two methods that can be used to allocate contested multiple connections. The first method is possible if the ISO can provide some guidance on the estimated costs of establishing the connections. If such cost guidance is forthcoming, this approach will allow plants more information about connection costs in different locations and will allow plants to choose different locations early on if they think the different costs warrant doing so. The second method applies if the ISO will not provide any cost guidance. We understand that plants are able to make their own estimates of connection costs even without guidance, so the loss of information may not be sufficient to lead to great inefficiency.[2]

a) METHOD 1: ISO PROVIDES COST GUIDANCE

If the ISO could provide non-binding cost estimates, the ISO could hold an informational ascending-clock auction for contested connections at the time of qualification or before. Importantly, this auction would establish

1. the number of increasing cost connections at individual points where these were expected to be contested,

2. the minimum ISO base-cost charges associated with connections at different sites and,

3. the maximum number of plants that would be in each sub-auction after the FCA if all the plants were winners in the FCA.

For example, if there was a location that could have a maximum of three connections at increasing cost, and if four or more plants expressed a desire to locate at that place, the ISO would hold an informational ascending-clock auction. Following our previous example, the first price in the auction would be $10,000 – the approximate cost of establishing only one connection. If only one plant was willing to pay $10,000, the connection would be

[2] The problem and the possible inefficiencies, caused by plants having to choose a location before knowing the connection costs, exist under the present queuing system. The problem is not new to our sub-auction proposal.

uncontested at $10,000 and the other three plants would seek other locations. If all four plants wanted to buy a connection at the low price, the ISO would then announce the second price of $30,000 (the average cost of the first two connections) and see how many plants wanted to purchase a connection at that price. If no plant wanted to pay $30,000, then there would be only one connection with a starting auction price of $10,000 in the sub-auction in which the four plants would participate if they were FCA winners.

If all four plants still wanted a connection at $30,000, the ISO auctioneer would raise the price to the average cost of the three connections or $53,000, and if all four plants accepted this, $53,000 would be the starting price in the contested auction.

If no plant wanted to pay as much as $53,000, there would only be two connections offered in the subsequent sub-auction and the sub-auction starting price would again be the average cost of the first two connections or $30,000. At this point in the qualification process, the plants would not have purchased anything but they could expect to pay at least the minimum auction starting price if they were among the winners of the FCA and then won the subsequent sub-auction, or to pay exactly the average cost if the connections were uncontested after the FCA.

b) METHOD 2: ISO DOES NOT PROVIDE ANY COST GUIDANCE

If the ISO does not provide any cost guidance, the approach will still basically be the same as the one we have just described but without the informational auction. In this case the plants will have to make their own estimates of the costs of connections at particular locations. The plants would know, from the ISO, how many other plants wanted to connect at a particular site, and the plants would know that the costs of a connection at that site would be steeply increasing with the number of connections. The plants would be told that if the connections were not contested, the cost of a connection would be the average cost of the connection at the site. If the connections were contested, the starting price of the sub-auction would be the average cost of the connections.

Method 2 could work almost as well as the informational auction approach, depending on how well the plants were able to estimate the costs of making the connection. To the extent the plants would not be able to have good information about the costs of the connections, they would be less able to pick the best locations or to know when to withdraw from the FCA. Not having accurate cost information in advance of the FCA presents the possible danger of a plant being surprised by the ISO cost of a connection after having won in the FCA, but this concern exists to a significant extent in the current system and can only be prevented by making the costs known before the FCA. Throughout this process, the ISO would have to let each plant know how many other plants wanted the same location because changes in the number of connections will cause major changes in the average cost of the connection.

Note that while the sub-auction price is unbounded, the uncontested price of a connection is the actual cost of the physical connection (or, in the case of multiple connections, the average cost). This distinction is important. In the contested case, the prices are decided on the basis of which plant places the highest value on a connection. In the uncontested case, the price is decided by the ISO's costs of making the connection. The actual clearing price in the sub-auction, of course, may be much more than the ISO's costs, depending on the desirability of the site. For example, assume that four plants compete in the sub-auction for three connections. Each plant has agreed to pay the base price of $53,000, so the sub-auction starts at this price. If one plant drops out at $160,000 the remaining three plants will each acquire a connection and will each pay the clearing price of $160,000.

5. SUMMARY OF MULTIPLE CONNECTION PROPOSAL

Our proposal regarding multiple connections does not require stopping and starting the auction. All plants should make a reasonable estimate of the cost of their connections prior to the FCA. The cost of the connection is part of the cost of the plant (that the participant must also estimate). In the FCA, as the price descends, the participant determines when to withdraw by comparing the auction price with the total cost of building the plant, including

the connection cost. The auctions will be neither efficient nor even successful if a participant can win in the FCA and only then discover that the connection costs make the plant uneconomic.

Even the single plant that will use an uncontested connection needs reasonable knowledge about interconnection costs, and ISO can assist to improve on the quality of those estimates. A plant cannot know when to stay in and when to drop out of the FCA unless it knows the approximate cost of its connection before the start of that FCA.

For contested connections, an estimate of the connection costs allows plants to know the physical ISO connection cost, which becomes the starting price in the sub-auction for a contested connection. Again, this allows the plants to decide when to drop out of the FCAs and when to stay in. There is no problem with meeting the ICR, because the ISO counts only the MWs that can be connected, which is not affected when contesting plants drop out in the sub-auction phase.