FCC Incentive Auction
Forward Auction
Clock Phase Bidding System

USER GUIDE

Last updated: July 13, 2016

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1. Introduction

This guide describes the features of the web-based FCC Auction System that will be used to bid in the clock phase of the forward auction.

During the forward auction clock phase, applicants that have been qualified by the FCC to participate may bid for generic blocks of paired spectrum.

1.1. Conventions

In this guide screen names are Capitalized. Internet addresses are highlighted in blue, links in the system are underlined, and the following text represents a Button.

Text boxes are used to indicate points where care is needed:

> ✍ *Care needed with this feature!*

Most of the examples are for "Big Wireless, Inc.," a bidder who is eligible to bid for all Partial Economic Areas ("PEAs"), does not have a bidding credit, and is eligible to bid for some reserved spectrum. Representative examples are also given for a bidder with a small business bidding credit and for a bidder with a rural service provider bidding credit.

In this guide, the term "bidder" refers to an applicant that has been identified by the FCC as qualified to bid in the forward auction based on review of its FCC Form 175 application and receipt of a timely and sufficient upfront payment. The terms "user," "you," and "authorized bidder" refer interchangeably to an individual authorized bidder identified on a qualified bidder's Form 175 as an individual authorized to access the Auction System and to submit bids on behalf of the qualified bidder.

1.2. Guide Structure

After this introduction, the guide is set out as follows:

- Section 2 provides an overview of the forward auction process
- Section 3 describes the system requirements for accessing the system and how to log in
- Section 4 explains how to navigate the system, provides a summary of the screens available to bidders
- Section 5 describes the product and impairment information
- Section 6 describes auction schedule and the communications between the bidder and the FCC
- Section 7 describes bidding in the clock phase of the forward auction
- Section 8 describes how to verify bids submitted in a round
- Section 9 describes how to access results of the forward auction

There are also six appendices:

- Appendix 1 provides troubleshooting tips for a number of different scenarios
- Appendix 2 provides additional information about RSA SecurID® tokens
- Appendix 3 contains a glossary of terms
- Appendix 4 provides examples of bid types
- Appendix 5 describes bid processing
- Appendix 6 provides a summary of bid types and bidding rounds

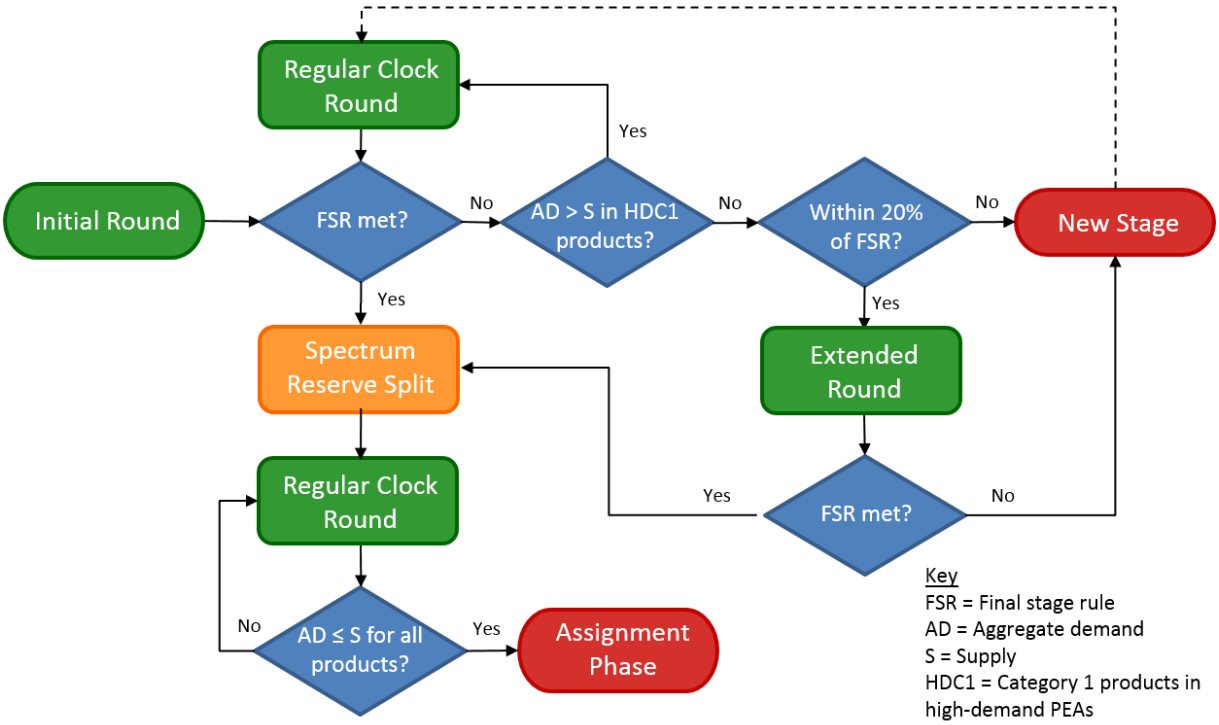
2. Introduction to the Auction System

The clock phase of the forward auction is conducted in a series of timed bidding rounds. During a bidding round, users are able to place bids for paired generic license blocks — "blocks" — of a "product"— a specific category of the blocks offered within a particular PEA. Each bid will specify a requested quantity of blocks of a product and a price. Bids can be submitted in one of two ways—via the bidding screen or via a bid upload file.

After a round closes, the Auction System processes the bids and posts the results. For each product, users can see their "processed demand"—the number of blocks the bidder holds after bid processing—and the prices associated with those demands. Users can see the aggregate demand for each product as well as the price at the end of the last completed round (the "posted price") and the price for the next round (the "clock price").

The schematic below (Figure 1) gives an overview of the flow of the forward auction during the clock phase. Bidding procedures differ slightly for different types of clock rounds, and this guide addresses basic bidding mechanics and the minor variations that occur in the first round of a stage, in the first round after the final stage rule (FSR) has been met, and in an extended round.

Figure 1: Flow of the clock phase of the forward auction



The auction starts with bidding in the first round of Stage 1, the initial round. Bidding proceeds with regular clock rounds[1] until the final stage rule is met or until there is no excess demand for any Category 1 (C1) blocks in any high-demand PEAs.[2] If the final stage rule is met, the spectrum reserve is implemented—C1 blocks are split into reserved and unreserved categories—and regular bidding rounds for C1 reserved (C1-R), C1 unreserved (C1-U), and Category 2 (C2) blocks continue until demand for each product is less than or equal to the supply of that product. At this point, the clock phase of the forward auction ends, to be followed by the assignment phase of the forward auction.

Alternatively, if there is no excess demand for any high-demand C1 product and the final stage rule has not been met but is within 20 percent of being met, an extended round is held.[3] If the final stage rule is met during the extended round, the spectrum reserve is implemented and the auction proceeds with regular rounds. However, if the final stage rule is not met, the stage will end and the incentive auction will proceed to a new stage at a lower clearing target. In a subsequent stage of the clock phase of the forward auction the new stage begins with a regular clock round with demands carried over from the previous stage.

[1] A "regular round" is a round of the clock phase of the forward auction that is not the first round of Stage 1 or an extended round.

[2] PEAs 1–40 are the "high-demand PEAs." "High-demand C1 products" are the products in PEAs 1–40 in license category C1.

[3] If there is no excess demand for any high-demand C1 product, the final stage rule has not been met, and the price increment needed to meet the final stage rule is not within 20 percent, the stage will end without an extended round and will proceed to a new stage at a lower clearing target.

3. System Requirements and Access

This section explains the system requirements for accessing the Auction System, how to log in, and other matters related to access.

3.1. Minimum System Requirements

At the minimum, the following is required to access the Auction System:

- Microsoft® Windows® 7 or Apple® Mac® OS X® 10.7
- Microsoft® Internet Explorer® 11 or a recent version of Google Chrome™ (the browser must be configured to accept cookies and JavaScript) with a minimum of TLS 1.1[4] security[5]
- Access to the Internet
- 1920 x 1280 screen resolution[6]

Smartphones and tablets are not supported. The Auction System may run on different computer configurations, including browsers not listed above. It is the responsibility of the user to test any alternative configurations with the Auction System in advance of the auction—for example during the mock auction—and to ensure that they have access to one of the supported browsers should they experience problems.

Users are discouraged from using web browsers containing third-party toolbars or other extensions. Third-party browser extensions potentially may cause problems for users of interactive websites, including the Auction System, and may make users' computers more vulnerable to hacker attacks. If in doubt, you should consult your internal information technology departments in order to disable third-party browser extensions or, if necessary, obtain a clean installation of a supported web browser.

To maximize protection against potential security vulnerabilities, users are advised to ensure the latest service pack (if applicable), security patches for their operating system (including Internet Explorer), and the most recent version of Google Chrome (where relevant), have been installed.

[4] These are the default settings for most modern browsers. Appendix 1 explains how to check the settings and/or reset them, in case this is necessary.

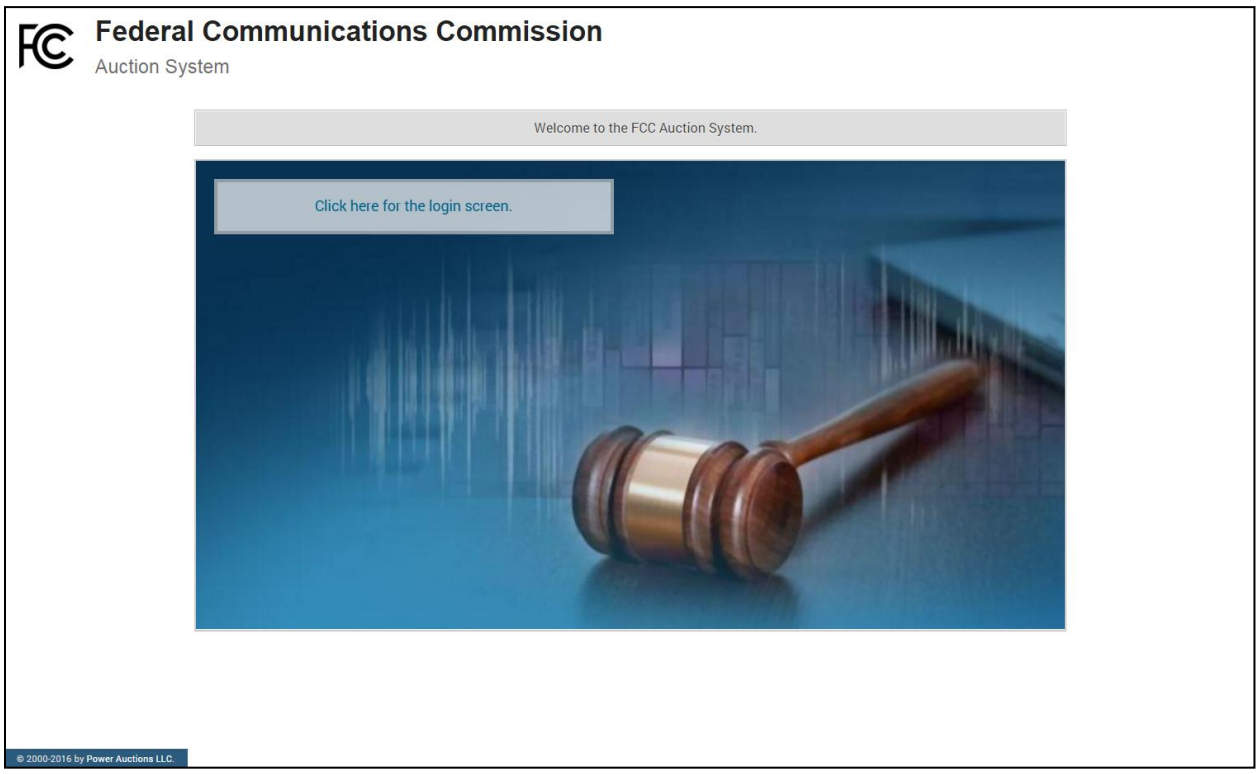
[5] Microsoft Internet Explorer 11 is referred to elsewhere in this document as "Internet Explorer." Google Chrome is referred to elsewhere in this document as "Chrome." Google and the Google logo are registered trademarks of Google Inc.

[6] Other screen sizes will work, but the system has been optimized for 1920 x 1280 screens in order to fit all of the information onto a single screen without horizontal scrolling. If all of the information from the Auction System cannot fit on your display, you can either zoom out using your Internet browser or scroll right and left using the scroll bars. To adjust the zoom, hold down the control ("ctrl") key and use the "+" and "-" keys to zoom in and out.

3.2. Logging In

Once the Auction System becomes available you can log in to it at a URL provided only to qualified bidders. When available, the link to the Login screen, as shown in Figure 2, will be visible. When the Login screen is not available, there will be a message on the screen and the link to access the Login screen will not be visible.

Figure 2: Auction System homepage



Click on the Click here for the login screen link in order to get to the Login screen shown in Figure 7 on page 10.

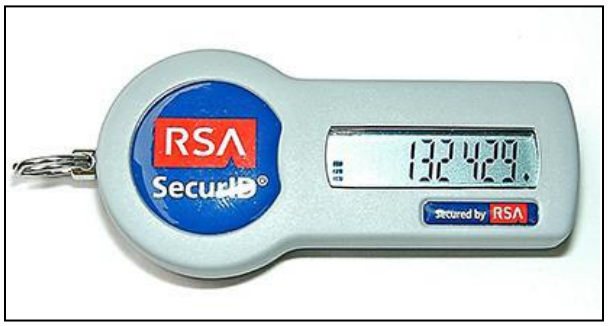
This guide provides two sets of login instructions: Section 3.2.1—initial login where an authorized bidder creates a personal identification number ("PIN") and logs in for the first time, and Section 3.2.2—the standard login used after the PIN is created.

Each authorized bidder listed on the bidder's Form 175 will have a unique username (user ID) provided by the Commission, which will be associated with a specific RSA SecurID® token ("RSA token") assigned to the authorized bidder for the auction. All authorized bidders for a qualified bidder will use the same password, which is the password associated with the FRN (FCC Registration Number) used on the bidder's Form 175. Thus, RSA tokens for Auction 1002 are specific to an authorized bidder, in contrast to procedures in prior FCC spectrum auctions. Each authorized bidder will need to set a private PIN for his or her token.

The RSA token generates a time-sensitive 6-digit tokencode that changes every 60 seconds. This tokencode is required as part of the login process along with the authorized bidder's user ID and password. RSA tokens will be sent by overnight delivery to the contact person identified in the FCC Form 175 for each qualified bidder listed on the Qualified Bidder PN, and must be distributed to each of the specified authorized bidders.

The username and the RSA token should be used only by the authorized bidder to which it was assigned. The Auction System logs all actions taken by a user based on the username entered when logging in.

Figure 3: An RSA SecurID® token



Please note that each RSA token is tailored to a specific auction. Therefore, RSA tokens issued for other auctions or obtained from a source other than the FCC will not work for this auction.

RSA tokens should be returned to the FCC when no longer needed.

3.2.1. First Time Login Procedures

The first time you log in to the system, you must create an RSA PIN. Each authorized bidder for a particular qualified bidder will create an RSA PIN once—unless the authorized bidder gets a replacement RSA token (e.g., because an RSA token has been lost or broken). After the RSA PIN has been created, you must follow the standard login procedures.

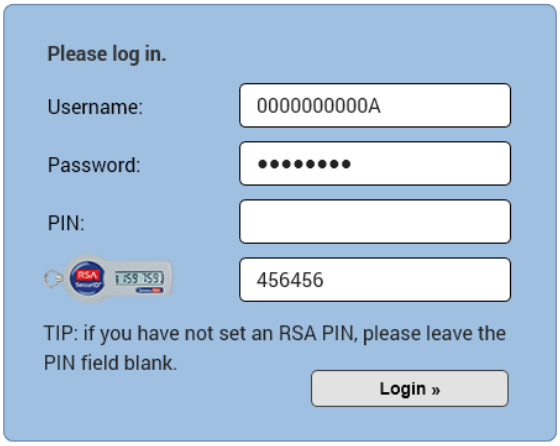
You will need the following login credentials to access the system for the first time:

- Username (user ID): FCC assigned
- Password: FRN password associated with the qualified bidder's FRN
- RSA tokencode: a six-digit code generated by the RSA SecurID® token

In the Auction System login area, type in the username, password and the current tokencode on the individually assigned RSA token as shown in Figure 4. Leave the PIN field blank and click Login » .

> ✍ *Tokencodes change every 60 seconds. Avoid using a code that is about to expire, as indicated on the token screen, by waiting for a new code to appear.*

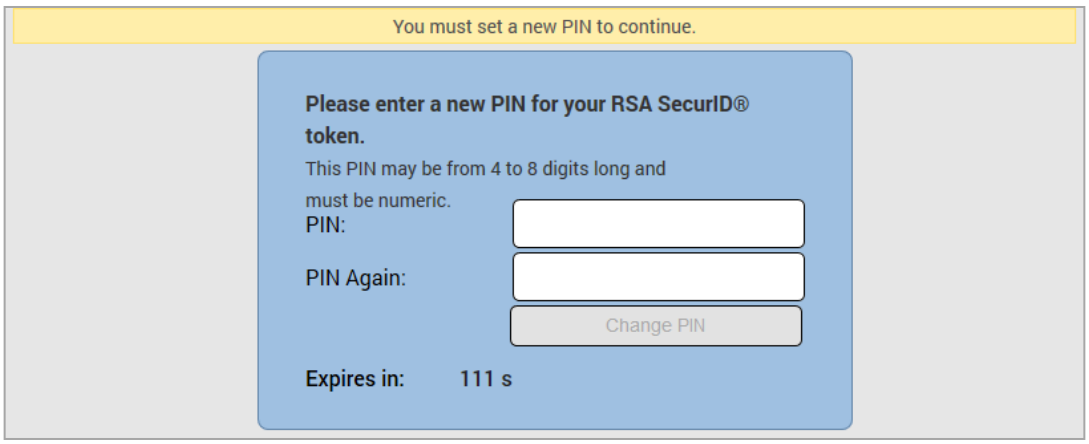
Figure 4: First time login procedure



RSA tokencode will be generated by your RSA SecurID® token and will not be the same as the code shown in Figure 4.

This opens a screen to create a private PIN as shown in Figure 5.

Figure 5: Set PIN screen

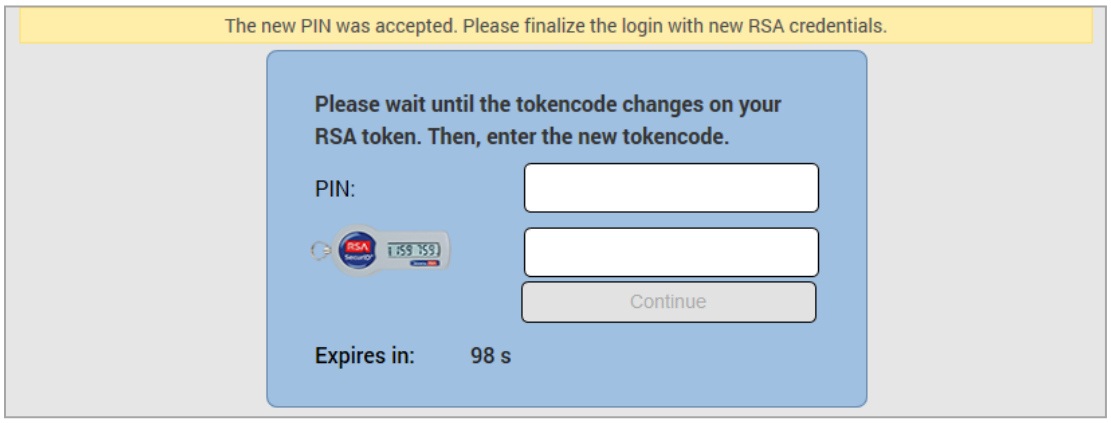


Type a 4-8 digit numeric PIN of your choice in the PIN field. Enter it twice as requested to ensure accuracy. Then click Change PIN. Memorize this PIN! Note that you have a limited amount of time to set a new PIN and confirm your credentials, as shown by the expiration time on the screen.

A message will display in a yellow box above the blue PIN and tokencode fields to indicate that the new PIN was accepted, as shown in Figure 6.

Type in the PIN you just created and a new tokencode. **Do not use the tokencode from the previous login page.** Make sure that the number on the RSA token's display has changed, type this new number into the tokencode field, then click Continue.

Figure 6: Confirm RSA credentials



After completing the set-up procedure, you will be able to access the Auction System and see the navigation bar on the left hand side. Thereafter, the standard log in procedure applies.

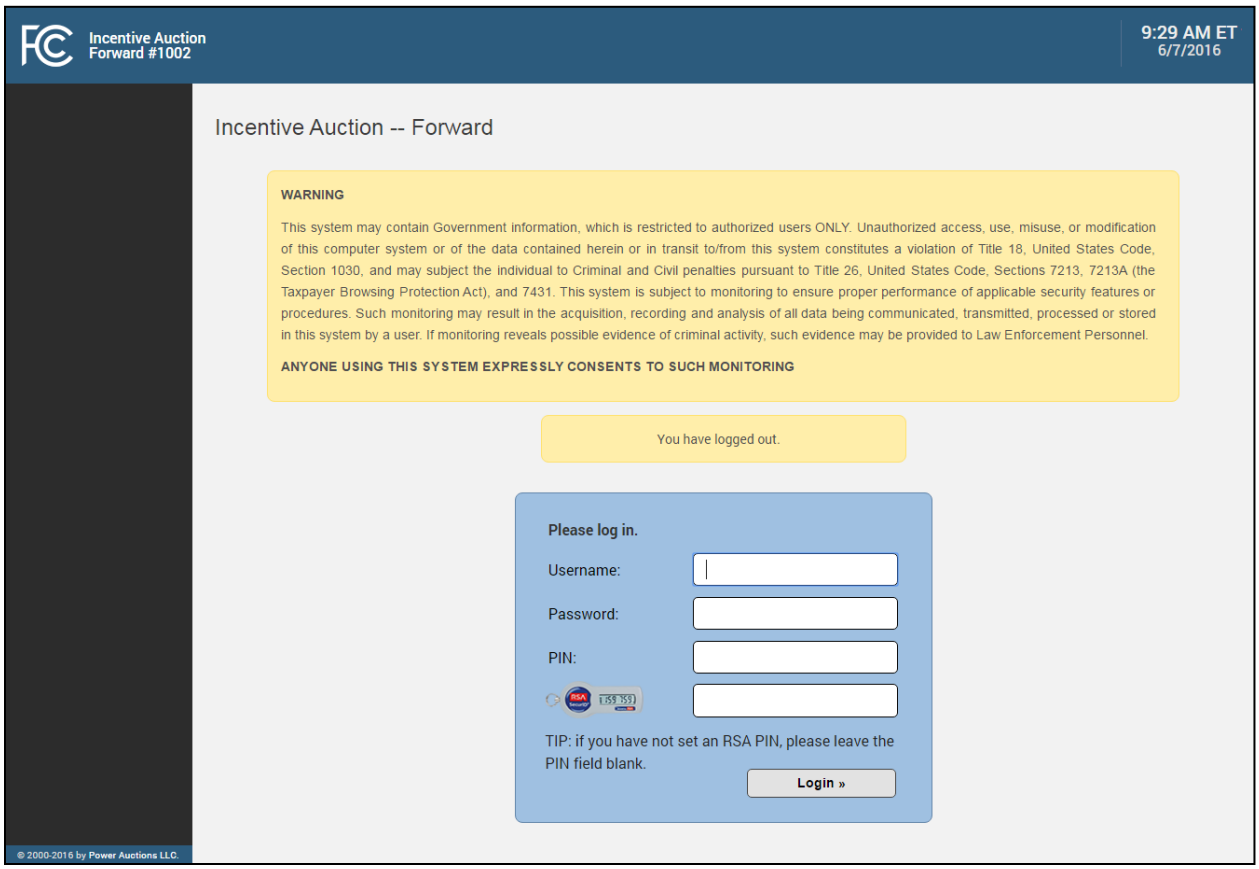
3.2.2. Standard Login Procedure

To log into the Auction System, you will need the following login credentials:

- Username (user ID): FCC assigned
- Password: FRN password associated with the qualified bidder's FRN
- PIN: numeric PIN created during the initial login
- RSA tokencode: a six-digit code generated by the RSA SecurID® token

Enter the information on the Login screen (see Figure 7) and click Login ».

Figure 7: Login screen



3.3. Multiple Users for the Same Bidder

It is possible for more than one authorized bidder for the same qualified bidder to log in and access the system at the same time, each using their assigned username and credentials. Any updates made by one such authorized bidder will be displayed on the screen of the other users for the same bidder after the screen is refreshed.

However, **only one such authorized bidder should bid at any given time** to avoid a potential conflict in data that may produce a bid, or set of bids, that was not intended.

> ✍ *To avoid a potential conflict in data that may produce a bid, or set of bids, only one authorized bidder should bid at any given time.*

3.4. Automatic Logout

A single user cannot be logged into the Auction System using two computers at the same time.

Trying to use the same username to access the Auction System from a second computer will automatically log the user out from the first computer and the first computer will display a log out notification. This is

a protective feature for users, because it allows a user to log in to the Auction System using a second computer if the first computer crashes before the user was able to log out of the system.

3.5. Lock Screen and Closing User Access

You may manually lock your screen by clicking on the Lock Screen button, located at the bottom of the navigation bar on every screen as shown in Figure 8 in the next section. Unlocking the screen again requires the password followed by clicking Unlock.

If you are inactive for more than 30 minutes, the Auction System will log you out completely. You will need to log in again to access the site. You may manually log out of the Auction System at any time using the Logout button, located at the bottom of the navigation bar on every screen, as shown in Figure 8. Logging out of the Auction System will not cause submitted bids to be lost.

3.6. Additional Information

Appendix 1: System Troubleshooting provides additional information about common errors that you may encounter accessing the system.

Appendix 2: RSA SecurID® Token Information provides additional information about RSA tokens. It explains what to do if a bidder wishes to change or replace an authorized bidder/user and what to do in the event of lost or damaged RSA tokens.

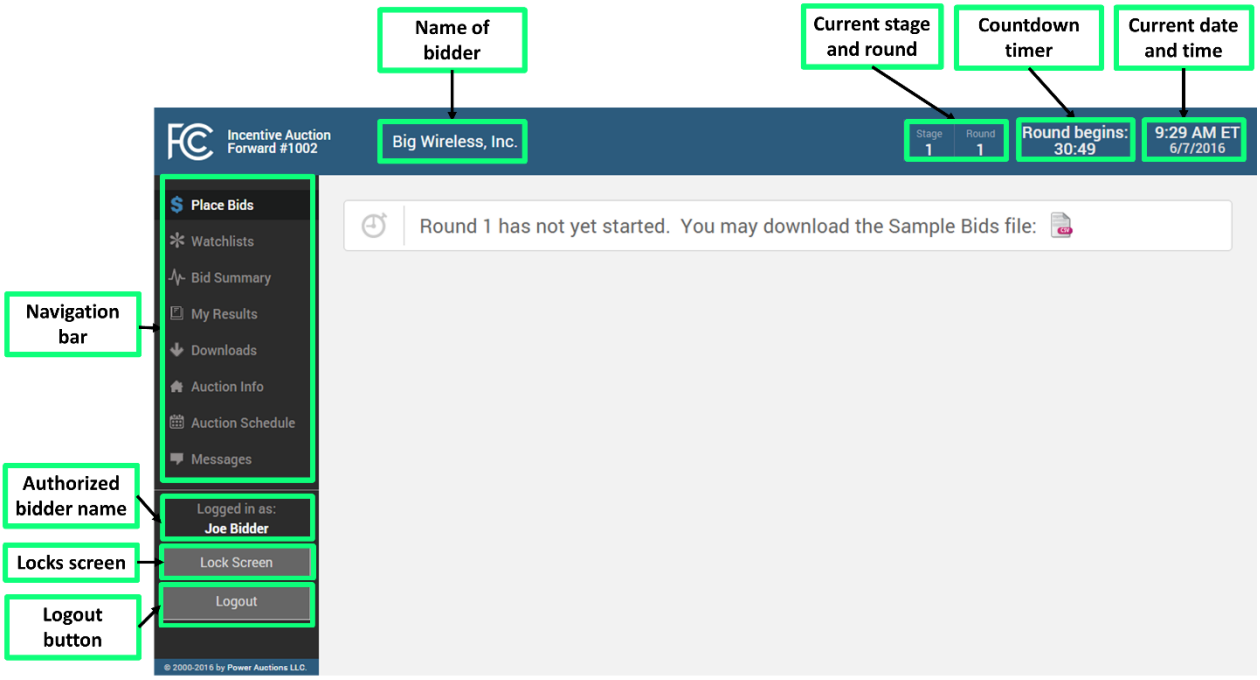
4. System Navigation and Overview

4.1. Navigation Bar and Features Common to All Screens

All screens have a navigation bar on the left, with links to the available screens. Beneath the navigation bar is your name (the name of the authorized bidder who has logged in), the Lock Screen button and the Logout button as described in Section 3.5.

The blue bar at the top of each screen displays status and timing information that is common to all screens. It shows the bidder name, the stage of the forward auction, the current round in the stage, a countdown timer showing the time to the beginning or the end of a round and the current date and time in Eastern Time (ET). When a stage has concluded the countdown timer is replaced with a message about the conclusion of the stage. An illustration of the navigation bar and common screen features is shown in Figure 8.

Figure 8: Navigation bar and features common to all screens



4.2. Summary of Auction System Screens

The navigation bar gives access to eight screens. Their functions are summarized in Table 1 below in the order in which they appear on the navigation bar.

Table 1: Summary of screens reached from the navigation bar

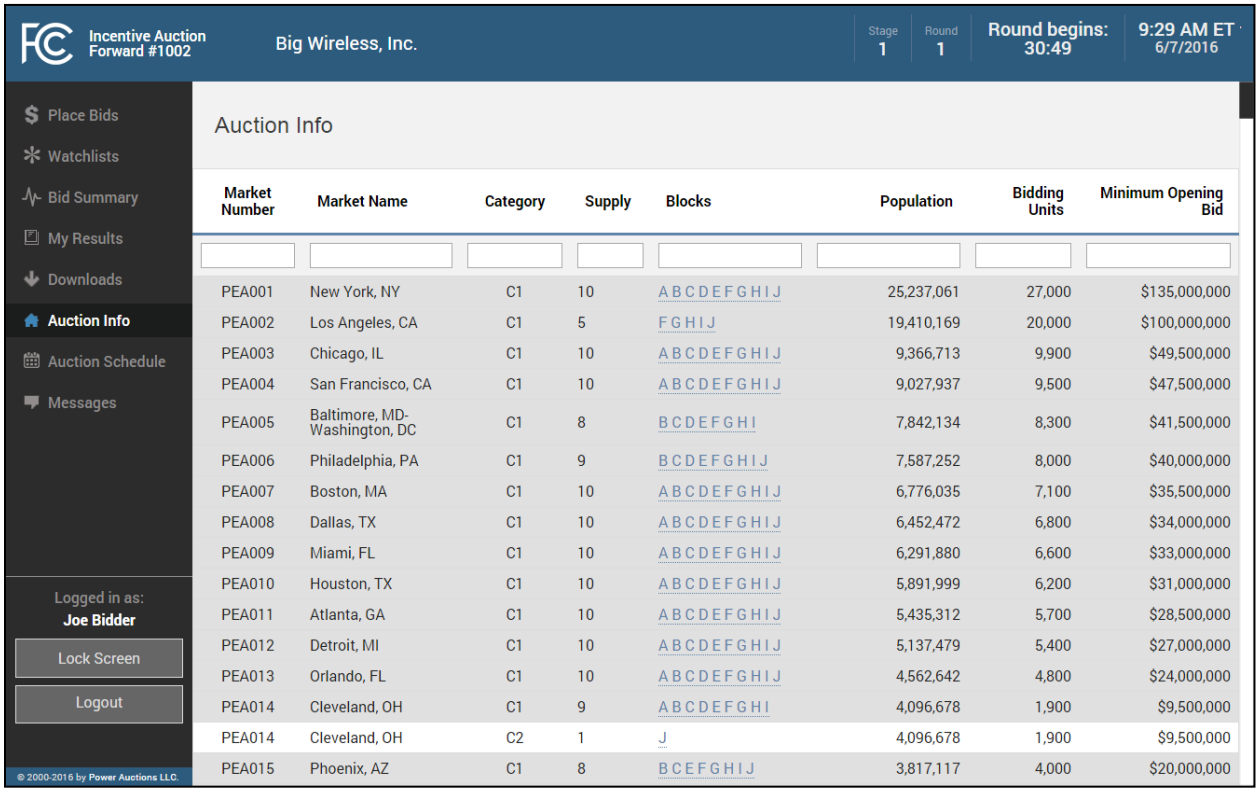
Place Bids	Allows you to place bids in a round either on the screen or by uploading a bid file

Watchlists	Allows you to create custom watchlists of products
Bid Summary	Allows you to view a summary of all bids submitted on behalf of the bidder during a particular round
My Results	Allows you to view the results of bid processing for the bidder in a given round for all products in which the bidder bid in the round or has processed demand for the previous round
Downloads	Allows you to download files about the bidder's bids and results and also the license impairment zip files
Auction Info	Allows you to view information about the available products in the current stage of the forward auction as well as information about the status of progress toward meeting the final stage rule
Auction Schedule	Allows you to view the schedule for upcoming bidding rounds
Messages	Allows you to view announcements and messages from the FCC—you may also use this screen to send messages to the FCC

5. Viewing Products and Impairment Information

The Auction Info screen provides basic information about all of the products available during the current stage of the forward auction (Figure 9).[7] You may access the Auction Info screen once the Auction System becomes available prior to the start of the clock phase of the forward auction and throughout the forward auction.

Figure 9: Auction Info screen



Market Number	Market Name	Category	Supply	Blocks	Population	Bidding Units	Minimum Opening Bid
PEA001	New York, NY	C1	10	A B C D E F G H I J	25,237,061	27,000	$135,000,000
PEA002	Los Angeles, CA	C1	5	F G H I J	19,410,169	20,000	$100,000,000
PEA003	Chicago, IL	C1	10	A B C D E F G H I J	9,366,713	9,900	$49,500,000
PEA004	San Francisco, CA	C1	10	A B C D E F G H I J	9,027,937	9,500	$47,500,000
PEA005	Baltimore, MD-Washington, DC	C1	8	B C D E F G H I	7,842,134	8,300	$41,500,000
PEA006	Philadelphia, PA	C1	9	B C D E F G H I J	7,587,252	8,000	$40,000,000
PEA007	Boston, MA	C1	10	A B C D E F G H I J	6,776,035	7,100	$35,500,000
PEA008	Dallas, TX	C1	10	A B C D E F G H I J	6,452,472	6,800	$34,000,000
PEA009	Miami, FL	C1	10	A B C D E F G H I J	6,291,880	6,600	$33,000,000
PEA010	Houston, TX	C1	10	A B C D E F G H I J	5,891,999	6,200	$31,000,000
PEA011	Atlanta, GA	C1	10	A B C D E F G H I J	5,435,312	5,700	$28,500,000
PEA012	Detroit, MI	C1	10	A B C D E F G H I J	5,137,479	5,400	$27,000,000
PEA013	Orlando, FL	C1	10	A B C D E F G H I J	4,562,642	4,800	$24,000,000
PEA014	Cleveland, OH	C1	9	A B C D E F G H I	4,096,678	1,900	$9,500,000
PEA014	Cleveland, OH	C2	1	J	4,096,678	1,900	$9,500,000
PEA015	Phoenix, AZ	C1	8	B C E F G H I J	3,817,117	4,000	$20,000,000

As shown in Figure 9, the Auction Info screen provides the market number, market name, license category, total supply, specific blocks, population, number of bidding units, and minimum opening bid prices for each product.[8]

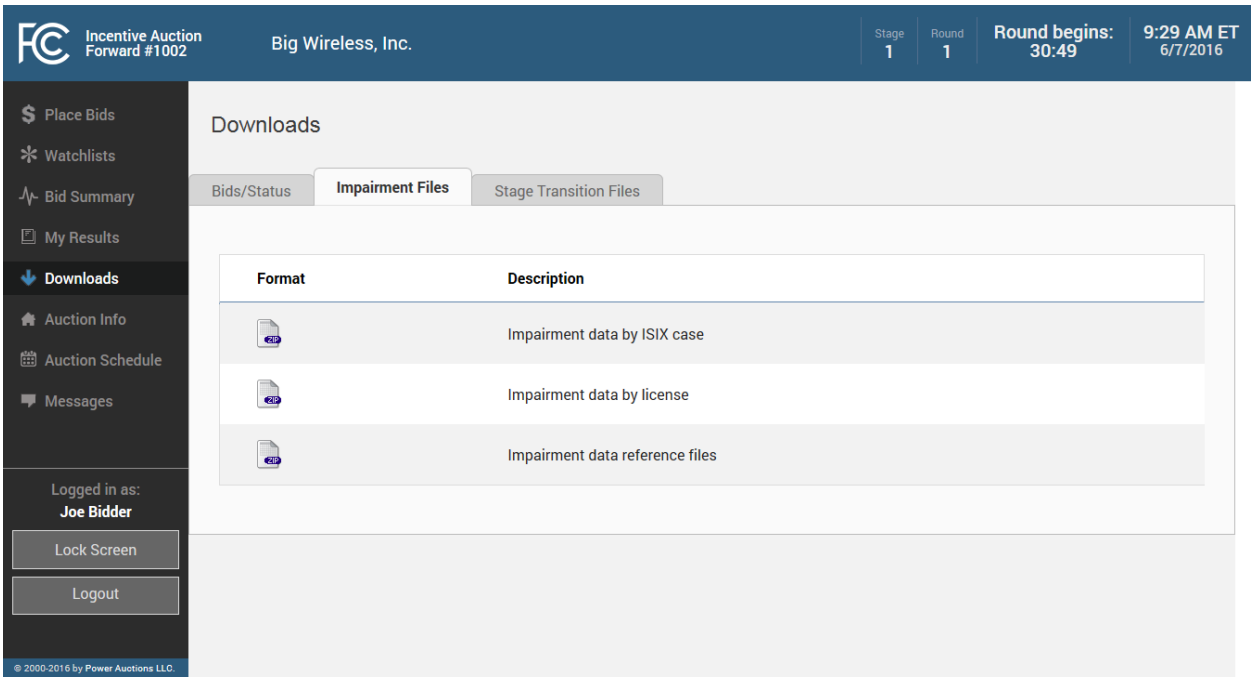
Additionally, for each product, you will be able to view the overall impairment percentage and frequencies for each of the specific blocks listed for a product by clicking on the link in the Blocks column.

[7] The products listed on the Auction Info screen are not limited to the PEAs that a bidder selected on its Form 175.

[8] You can also see product information on the public Incentive Auction Public Reporting System (PRS), which displays round-by-round information about the aggregate demand, current price, and next round price for each product. The PRS is available at auctiondata.fcc.gov.

More detailed information about the type and degree of impairment to specific blocks available in the current stage can be downloaded as zip files from the Auction System on the Downloads screen, shown below in Figure 10.

Figure 10: License Impairment Information



The impairment downloadable files are available before the start of the auction and between rounds of bidding during the auction. They are not available for download while a round is open. Three impairment data files are available: Impairment data by ISIX case, Impairment data by license, and Impairment data reference files.

Table 2 provides a summary of these files. Further details about the specifications for impairment files may be found in the Impairment File Formats document located on the Auction 1002 website under the Data tab (available at www.fcc.gov/auctions/1002).

Table 2: Impairment files

Download	Description
Impairment data by ISIX case	This zip file contains the detailed impairment information at a 2x2 km grid cell level for all four ISIX cases. In addition the zip file will contain a file that identifies all the eNB dummy points which are predicted to cause interference to at least one 2x2 km grid cell inside a facility's protected contour.
Impairment data by license	This zip file contains license-level impairment information and maps.
Impairment data **reference files**	This zip file contains reference files, which are the same for all clearing targets and are provided for every stage.

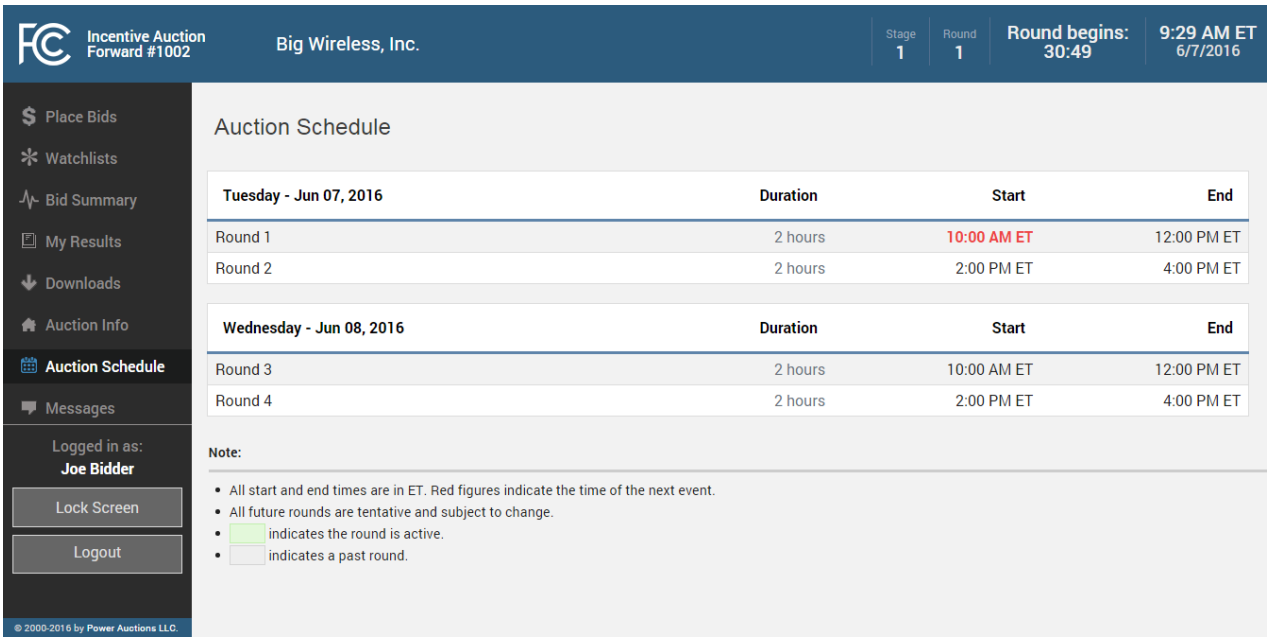
6. Auction Schedule and Messages

6.1. Auction Schedule

The Auction Schedule screen shows the current schedule for upcoming rounds in Eastern Time (ET), as illustrated in Figure 11. The FCC may adjust the number of rounds per day as necessary as the auction proceeds. The data and the number of rounds displayed in the example does not indicate the expected number of rounds in the auction; additional rounds will be displayed as the auction progresses. The screen displays the following information:

- The date, duration, start time and end time for all scheduled rounds;
- The countdown timer indicating the time until the round opens; and
- The time of the next event in red bold text—in this example, the start of Round 1;

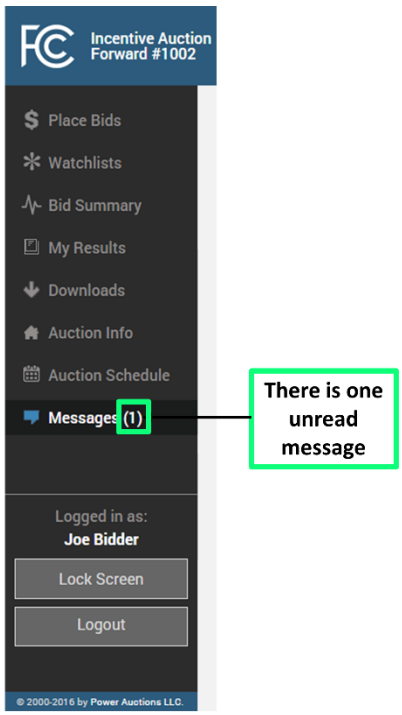
Figure 11: Auction Schedule screen



6.2. Messages: Announcements and Conversations

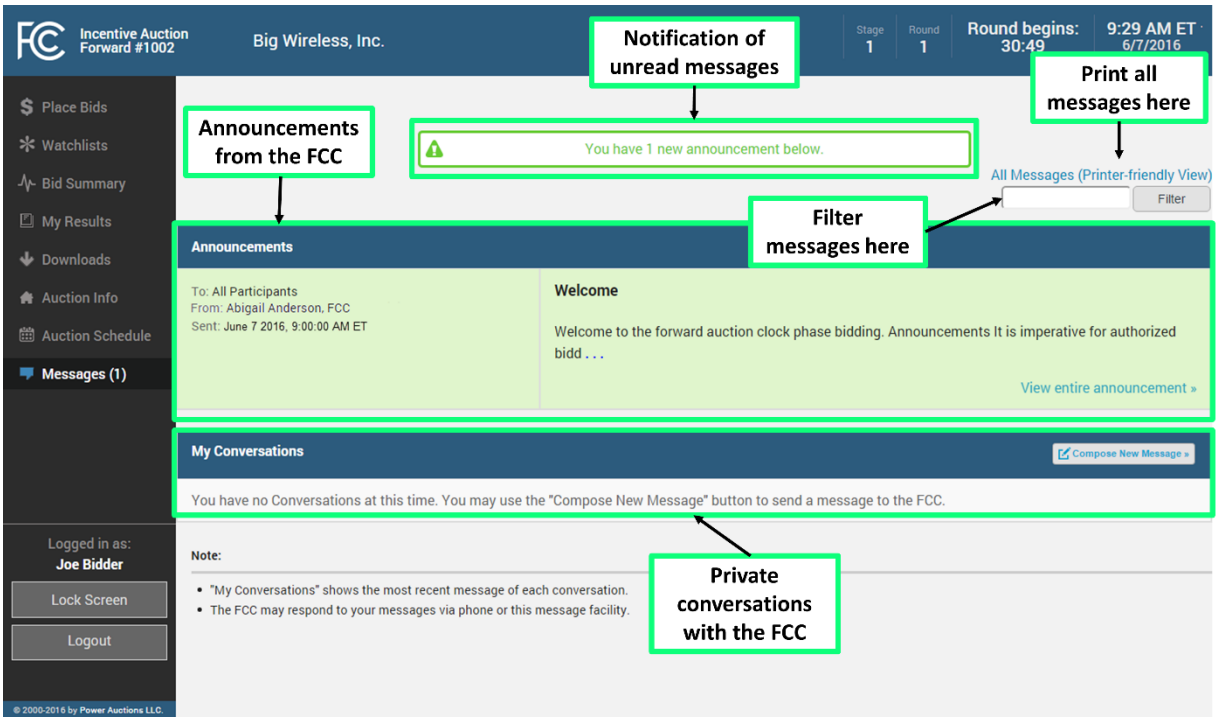
On the Messages screen you can see announcements made by the FCC and can communicate with the FCC by sending messages to and receiving responses from the FCC that are visible only to the bidder. If you have any unread announcements or conversations, the total number of unread messages is indicated in parentheses next to the Messages link in the navigation bar as shown in Figure 12.

Figure 12: New message indicator



To read an announcement, or to send a message to or read a response from the FCC, click on the Messages link in the navigation bar on the left side. The Messages screen will open, displaying all announcements and conversations, abbreviated where necessary, in reverse chronological order.

Figure 13: Messages screen



As shown in Figure 13 and Figure 17, if any message on the screen has not been read, a green notification box displayed at the top of the screen will indicate the number of unread announcements or conversations. Any unread message is highlighted in green. In order to read a message, you will need to click on the relevant View entire announcement » or View entire conversation / Respond » links.

After an unread announcement or conversation has been opened, the number in the parentheses by the Messages link on your screen will decrease accordingly. The number will not decrease until the View entire announcement » or View entire conversation / Respond » link has been clicked for the unread message.

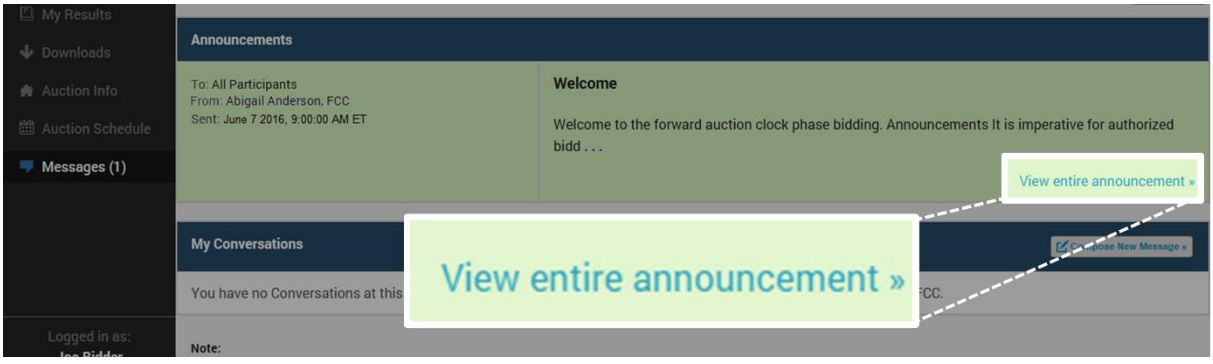
> ✍ *Whenever you see an indication that a message is unread, you should go to the Messages screen to open and read the message.*

At the top right hand side of the screen, a filter allows you to find messages containing particular words. You can view all of the bidder's messages by clicking on the All Messages link at the top right hand side of the screen, above the filter. This page can then be printed using the browser's print function.

6.2.1. Receiving and Reviewing Announcements

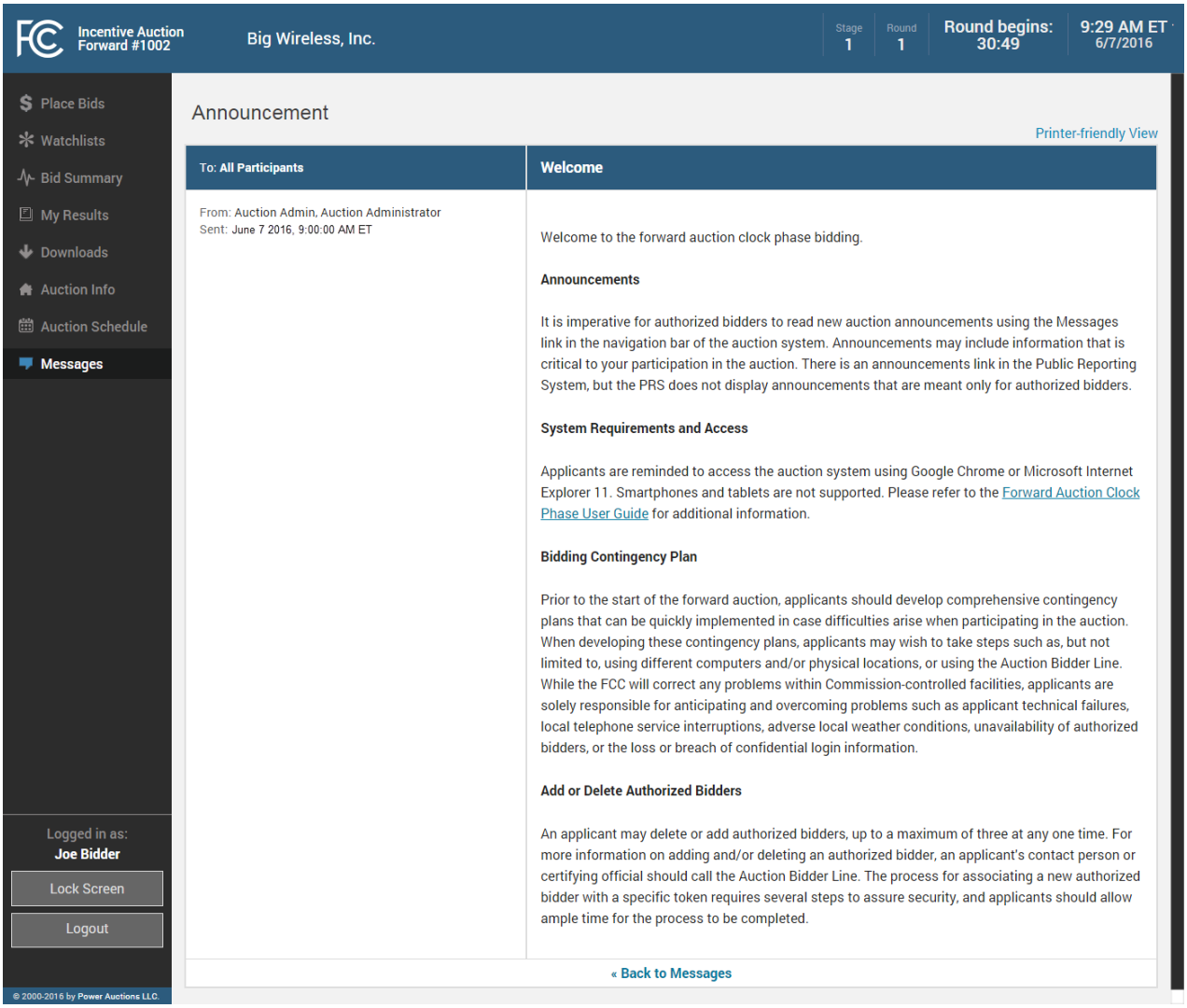
The FCC may send announcements to all bidders. Announcements contain important bidder information, such as changes in the number of rounds per day or the suspension of bidding due to unforeseen circumstances. The Message screen will only show the top portion of an announcement. As mentioned above, to view the entire text of an announcement you must open the announcement. To open an announcement, click on the Messages link on the navigation panel, then click on the View entire announcement » link for the announcement you wish to read, as shown in Figure 14.

Figure 14: View entire announcement link



Clicking on the View entire announcement » link loads an Announcement screen which displays the full text of the announcement as shown in Figure 15. To close the announcement and return to the Messages screen, click the « Back to Messages link.

Figure 15: An open announcement



6.2.2. Conversations with the FCC

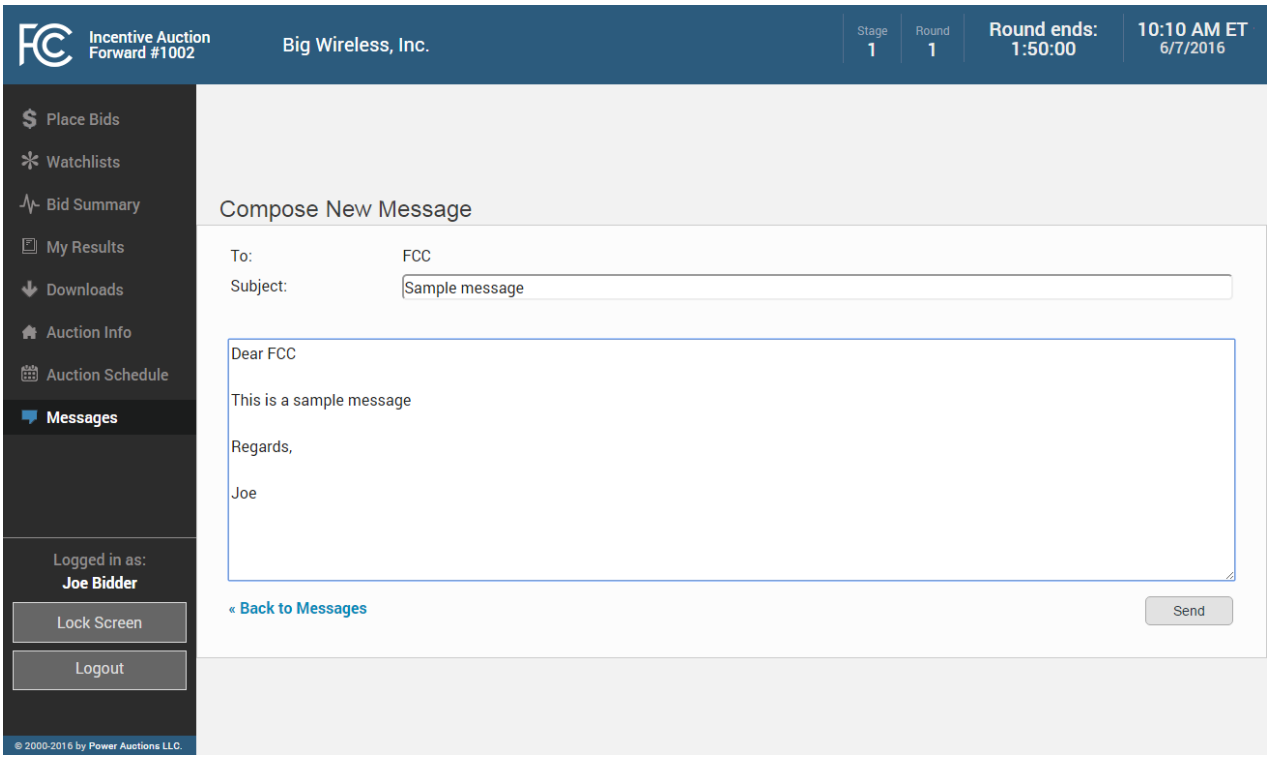
You can communicate with the FCC through the bidding system. A message from a user is associated with a bidder's FRN and the authorized bidder who sent the message. Only authorized bidders for a bidder can see such messages.

> *For time-sensitive issues, users should call the bidder line that is provided to qualified bidders.*

To compose a new message to the FCC, click on the Compose New Message button in the My Conversations section of the Messages screen, as shown in Figure 13 above.

To compose a message, enter the subject and content of the message in the relevant fields as shown in Figure 16 below. Click Send to send the message. To cancel an unsent message, click on the « Back to Messages link and return to the Messages screen.

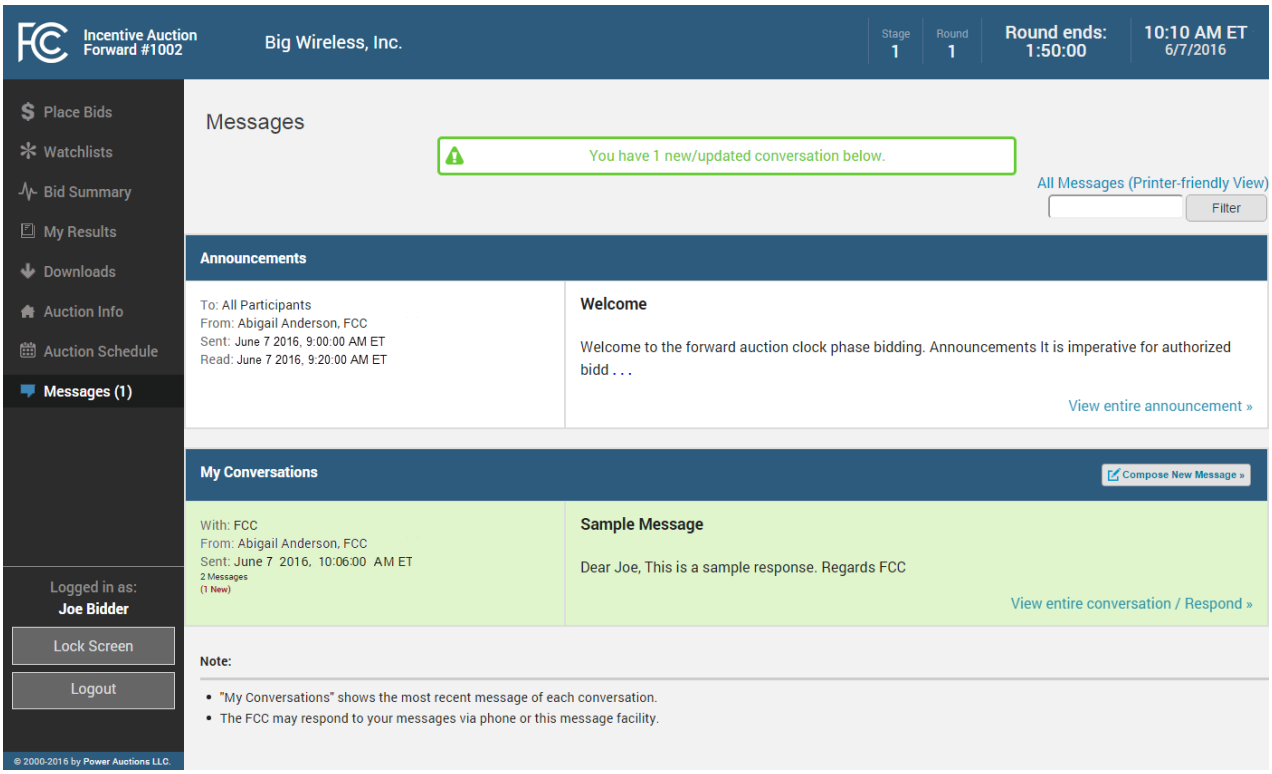
Figure 16: Compose a new message



A sent message will appear as a new conversation in the 'My Conversations' section of the Messages screen. The FCC may reply by sending an electronic message or by calling the contact person on the phone. If there is an electronic reply from the FCC, the reply will be added to that conversation.

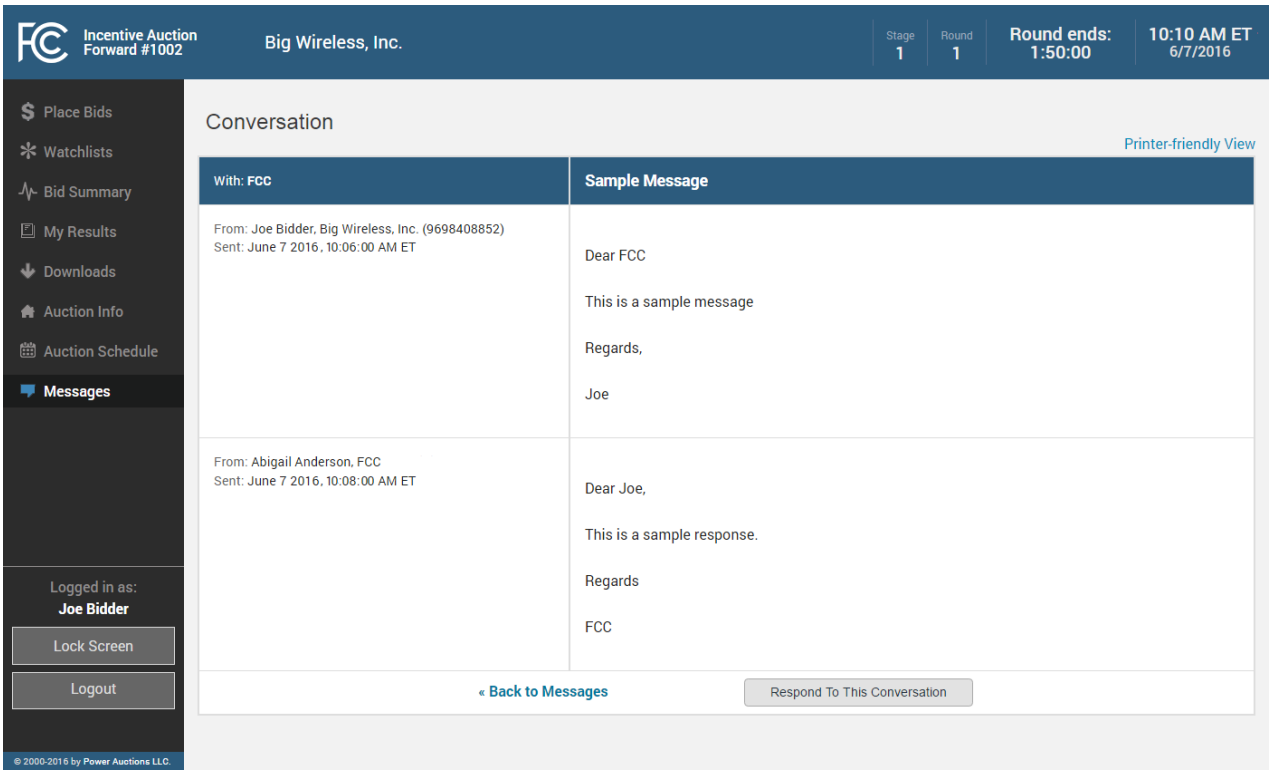
As with announcements, new messages are highlighted in green on the Messages screen until they are read. Only the most recent message of a conversation is shown on the Messages screen, as illustrated in Figure 17. To view the complete message and all messages in a conversation, click on the View entire conversation / Respond » link for that conversation.

Figure 17: A response to a conversation initiated by an authorized bidder



Clicking on the link to view an entire conversation opens the full conversation on the screen, as seen in Figure 18. Click on the « Back to Messages link to return to the messages, or click on the Respond to this Conversation button as shown in Figure 18 to add a further message to the same conversation. Type the message in the box that opens and click Send to send it to the FCC.

Figure 18: Viewing a conversation

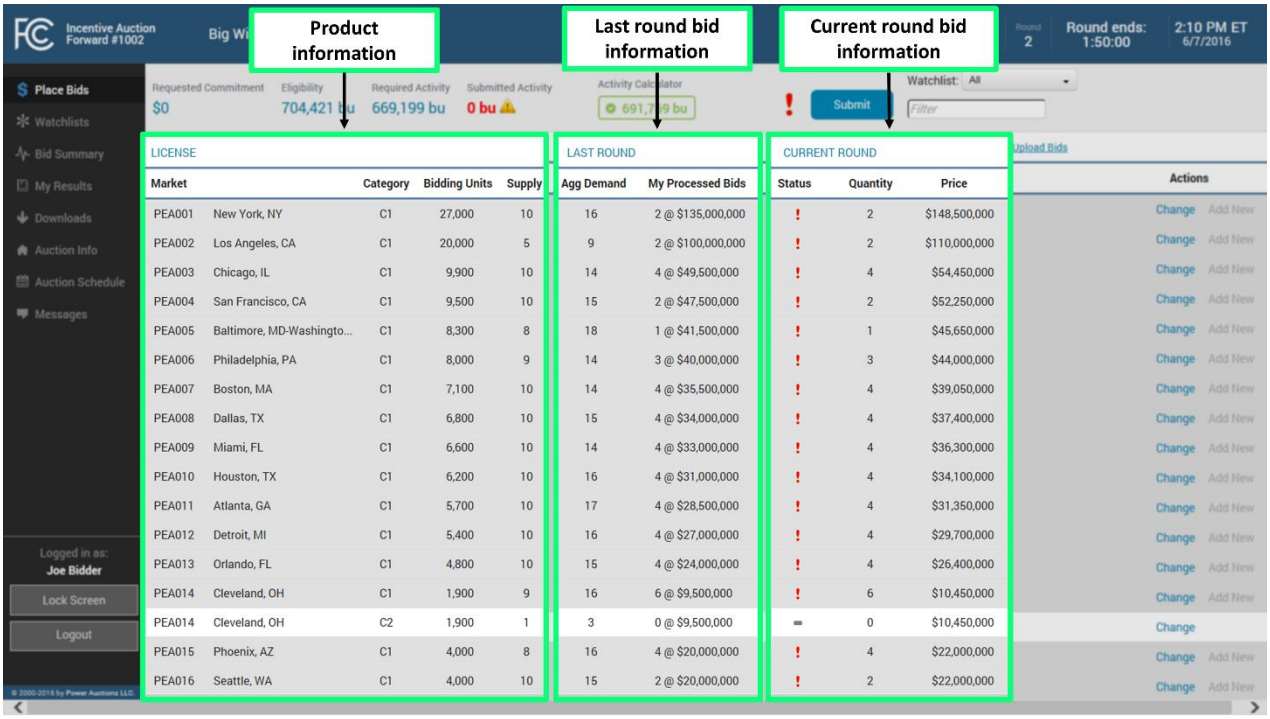


7. Bidding Functions

7.1. Basic Layout and Actions of the Place Bids Screen

Users conduct all bidding activities through the Place Bids screen, which is accessed through a link on the navigation bar on the left. Figure 19 illustrates the basic layout of the Place Bids screen.

Figure 19: Basic layout of the Place Bids screen

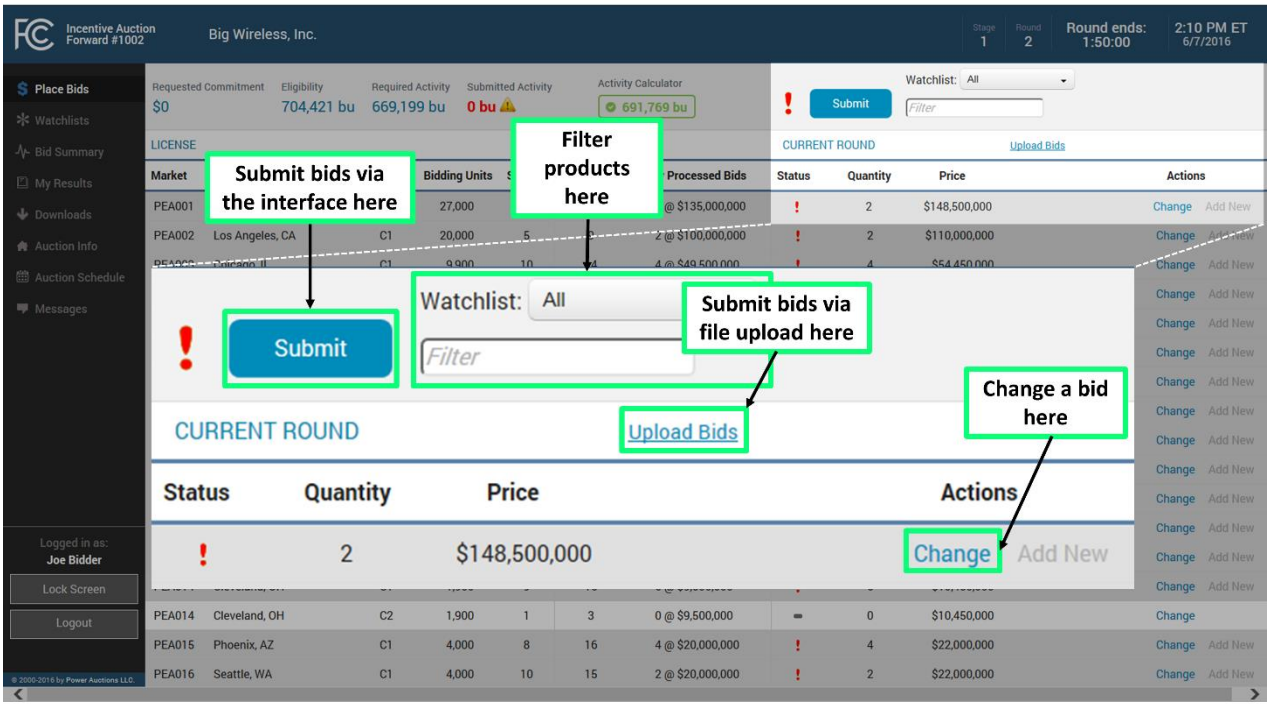


The main portion of the screen consists of a table that lists products. The Place Bids screen by default displays all the products on which you may bid based on the PEAs selected on the bidder's Form 175.

The first five columns provide information about each product, specifically, its market number and name, license category, bidding units, and supply. The next two columns provide bid information for each product from the last round, specifically, the product's aggregate demand, the bidder's processed demand for the product, and its posted price. The next three columns provide bid information for each product in the current round, specifically, the bidder's bidding status, the quantity of blocks the bidder is demanding, and the associated bid price. The bidding status indicator icons are discussed below. Also, in order to allow bidders to quickly differentiate between products in the same market, the background color of each row is color coded by product category.

The basic actions you can take on the Place Bids screen are highlighted in Figure 20 below.

Figure 20 : Actions on the Place Bids screen

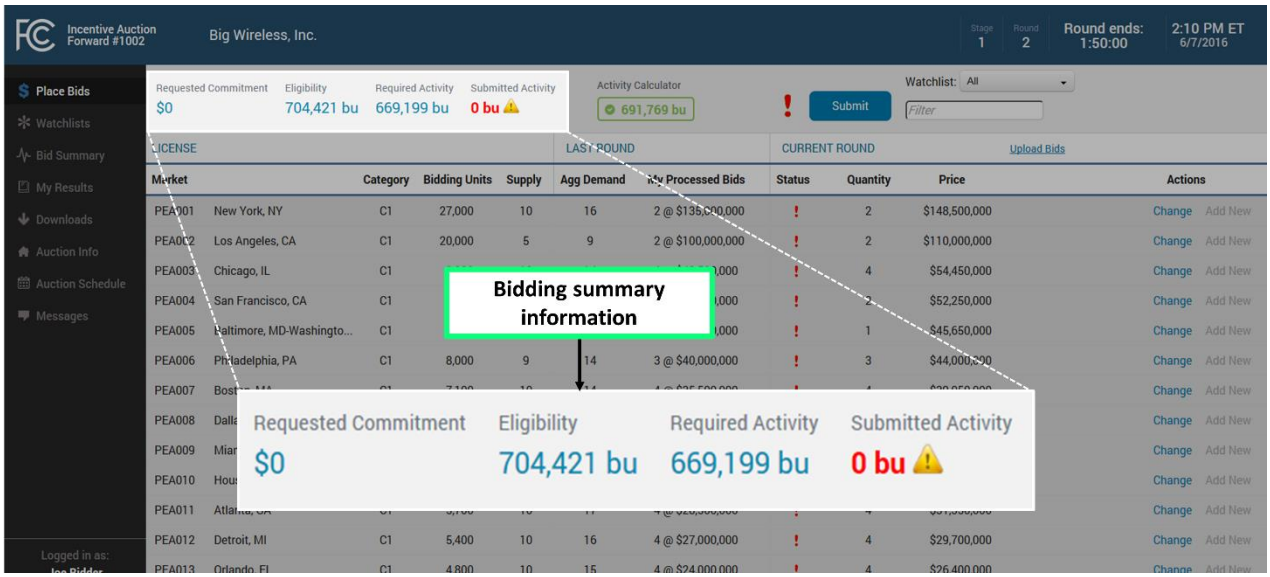


The Submit button allows you to submit the bids you entered through the user interface. You can filter products by selecting a watchlist from the Watchlists drop-down or by entering filter criteria in the filter box to filter on the displayed list of products. The Upload Bids link opens a dialogue box that allows you to upload a bid file rather than entering and submitting bids through the user interface (see Section 7.6). In the Actions column, you can click on the Change link to change a saved or submitted bid.

The top left portion of the Place Bids screen shows summary information about the bidder's submitted activity in the round, as well as its current eligibility and required activity (see Figure 21). Whenever you successfully submit bids in the system, the system updates the bidder's requested commitment and submitted activity numbers on the screen.

If a bidder has claimed a bidding credit, the requested commitment reflects the net requested commitment rather than the gross requested commitment, and additional information (including if the bidder's bidding credit discount has been capped) can be displayed by clicking on the magnifying glass icon (🔍) next to this number (for more information, see Section 7.4).

Figure 21. Bidding Summary Information



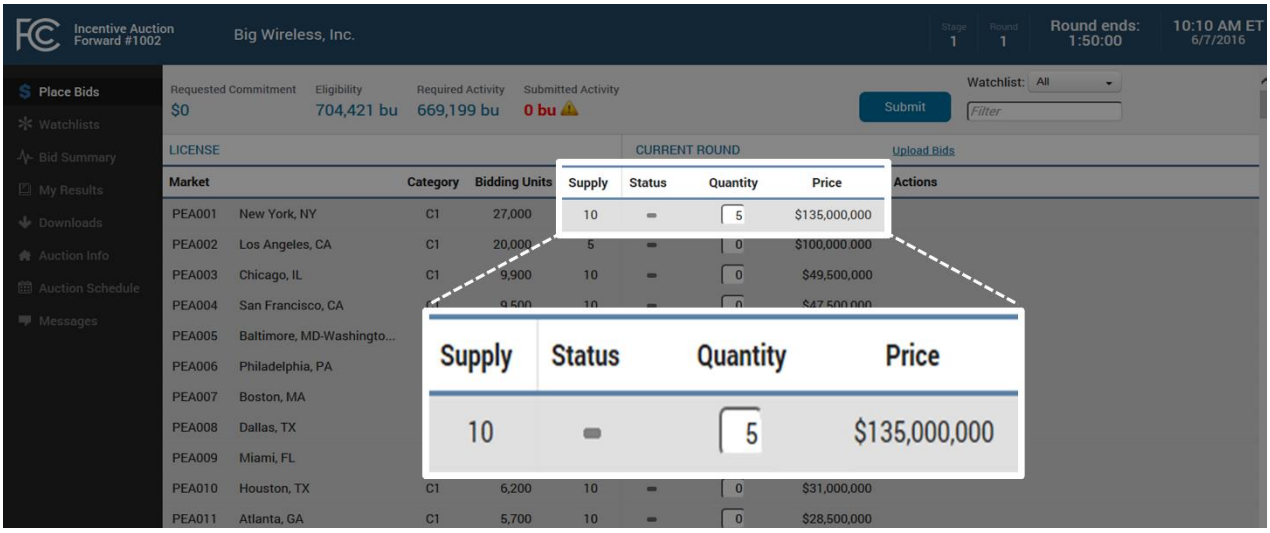
7.2. Placing Bids in the Initial Round via the User Interface

In the initial round of the forward auction, each bidder establishes its initial demand for products it wishes to bid on at opening prices by entering a quantity for those products. You will only be able to bid for products in PEAs the bidder selected on its Form 175.

7.2.1. Setting Demand

Before a bid has been submitted for a product in the initial round, the system allows you to set your initial demand by entering a numeric quantity up to the supply of the product in an input field (see Figure 22). This value indicates the number of blocks the bidder demands at the opening price.

Figure 22: Entering demand in the initial round of the auction

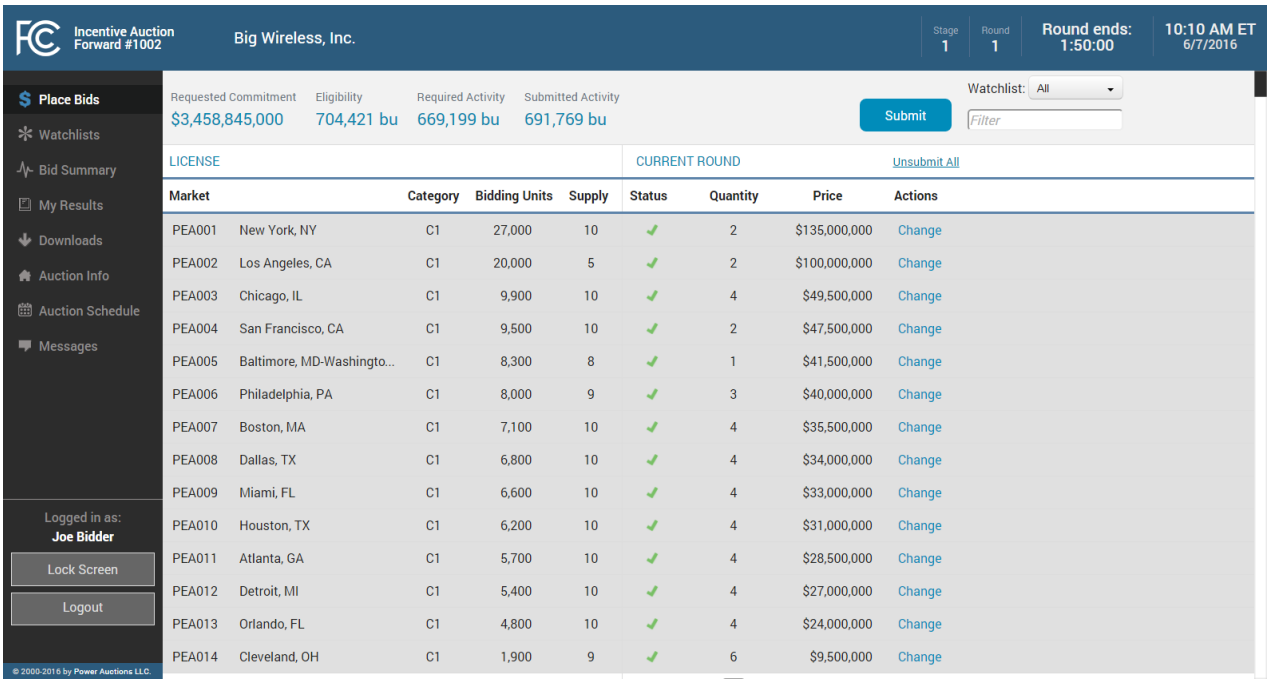


7.2.2. Submitting Initial Bids

Only bids that have been submitted will be processed by the system. Once you have entered quantities for all products on which you wish to bid, you must click Submit to submit all of the bids. The system will display a green checkmark (✓) in the status column to indicate that the bid has been successfully submitted to the system (see Figure 23). For each product for which a bid has not been submitted, the system displays a gray dash (-) in the status column.

After submitting your bids, the system also updates the requested commitment and submitted activity values displayed at the top of the screen to reflect the prices and bidding units associated with the bidder's total demand.

Figure 23. Summary of the submitted bids



The system requires bids to meet certain bidding restrictions during bid entry in order to be successfully submitted. For example, the system will display an error message if you attempt to enter bids that exceed the bidder's eligibility, or to enter a quantity that exceeds a product's supply.

Note: you may click Unsubmit All above the Actions column to quickly remove all submitted bids, returning the Place Bids screen to its state at the beginning of the round.

7.2.3. Changing Submitted Bids

As long as the initial round remains open, you may modify any submitted bids by clicking Change in the Actions column for a product. After you click Change, the quantity input field becomes editable, and the system will remove the green checkmark (✓) next to the bid to indicate that any modified quantity has

not yet been submitted. As with setting initial demand, you can then enter a new quantity for the product. If you would like to delete a bid, change the requested quantity to 0.

Once you have finished making changes, you must click Submit to submit all new bids, otherwise the previously submitted bids will remain in the system as submitted.

7.2.4. Unsubmitted Bids

During the initial round of the auction, the system will display a warning popup message if you try to navigate away from the Place Bids screen after entering quantities for a product without submitting the bid. If you then choose to leave the screen, any bids that you entered but did not submit will be lost.

7.3. Placing Bids after the Initial Round via the User Interface

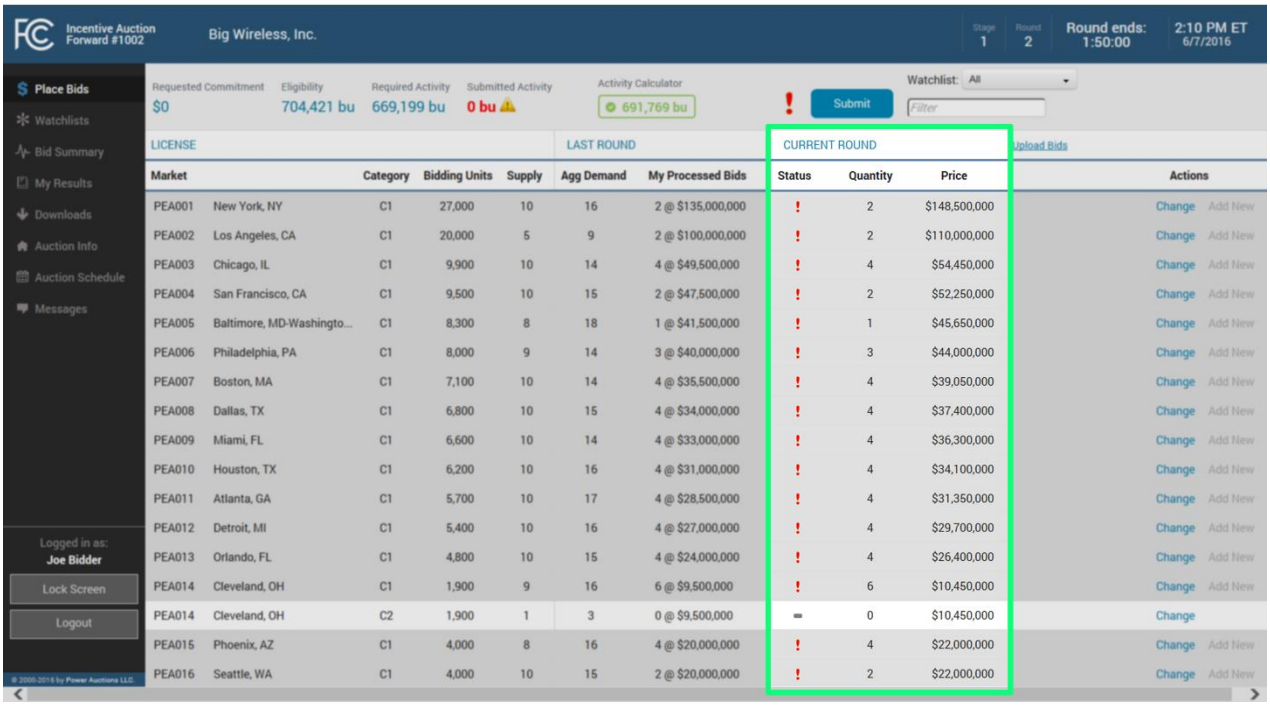
In each round after the initial round the auction system saves default bids to maintain a bidder's previous processed demand at the clock price for the round, which the bidder may modify and submit on the Place Bids screen. A bidder can quickly bid to maintain its demand by submitting its default bids. Alternatively, a bidder can change its bids to increase (in a regular clock round) or decrease demand for a product before submitting. In a regular clock round, a bidder may also enter one of several advanced bid options, as well enter multiple intra-round bids.

7.3.1. Default Bids

At the start of a round, the system saves a default simple bid for each product demanding the same quantity as the bidder's processed demand from the previous round at the new round's clock price (see Figure 24).[9] For each saved bid, the system displays a red exclamation mark (**!**) in the status column to indicate that a bid has been saved but not yet submitted. For each product for which no bid is submitted and the bidder does not have processed demand, the system displays a gray dash (-) in the status column.

[9] In the first round of a subsequent stage, the bidder's processed demand from the previous round is its processed demand at the end of the previous stage, subject to any caps due to a decrease in supply (see Section 7.3.7).

Figure 24: Place Bids screen with unsubmitted default bids



7.3.2. Submitting Saved Bids

If you find the default simple bids acceptable, you can click on the Submit button to submit all the bids and maintain the bidder's previous round's processed demand for each product at the new clock prices. Alternatively, you can change and save new bids (see Section7.3.3 below), and once finished, click on the Submit button to submit your saved bids to the system.

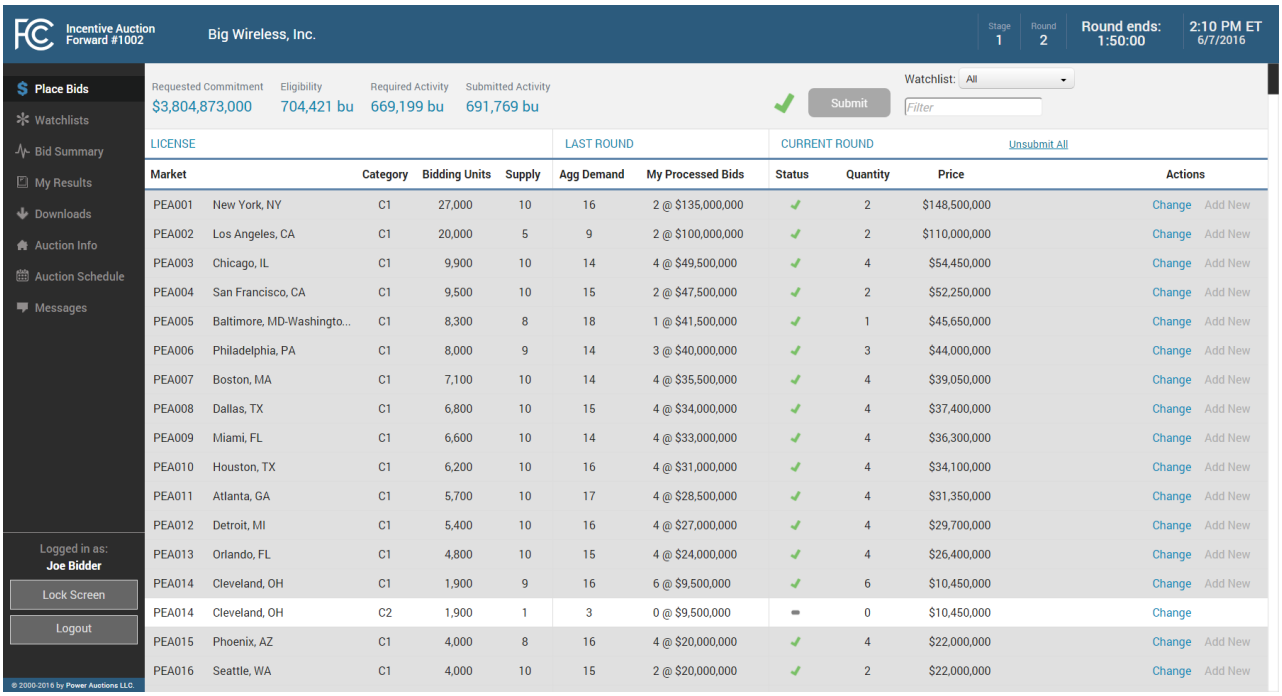
Note: if you have selected a watchlist other than the default All watchlist (see Section 7.5), clicking on the Submit button only submits saved bids that are part of that watchlist. If you have saved bids that are not part of that watchlist, those bids will remain unsubmitted.

> ✍ *Clicking on the Submit button submits all saved bids for the selected watchlist at once, and this behavior is unaffected by any filter criteria. Please make sure to review all of your saved bids before submitting.*

As in the initial round, once you have submitted a bid for a product, the system will display a green checkmark (✓) in the status column to indicate that you have successfully submitted the bid (see Figure 25). After submitting your bids, the system also updates the requested commitment and submitted activity values displayed at the top of the screen to reflect the prices and bidding units associated with the bidder's total demand.

Additionally, if you have submitted all of your saved bids, the system displays a large green checkmark (✓) next to the Submit button to indicate that all bids have been submitted.

Figure 25: Place Bids screen with submitted default bids



Please note: you may click Unsubmit All above the Actions column to quickly remove all submitted bids, returning the Place Bids screen to its state at the beginning of the round.

7.3.3. Changing Saved or Submitted Bids

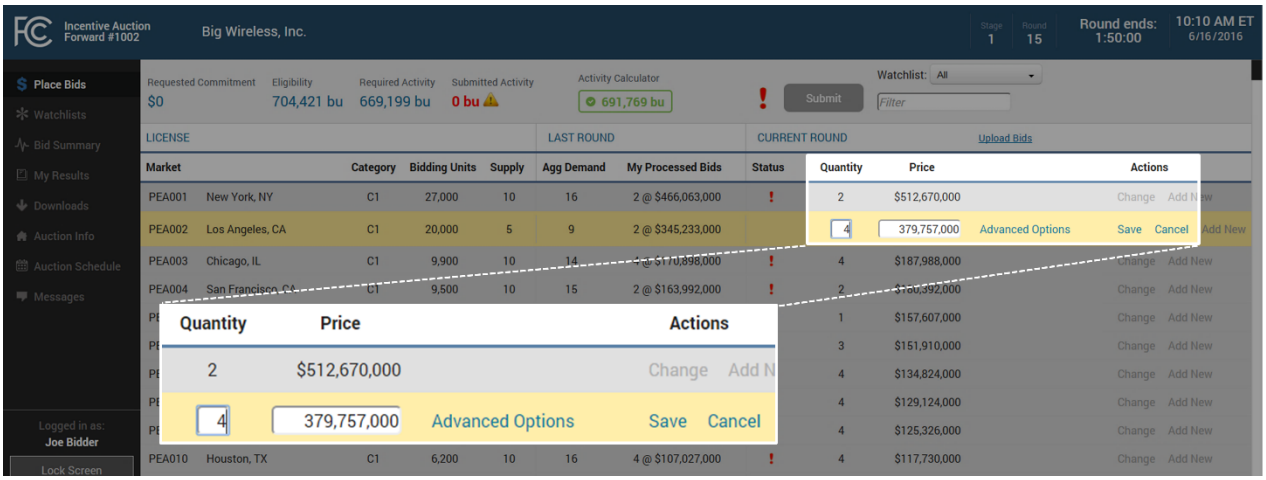
As long as the round remains open, you may modify any saved or submitted bids by clicking Change in the actions column for a product. While editing a bid, the Submit button is disabled until you either click Save to save the bid or Cancel to discard your changes.

7.3.3.1. Simple Bids

The quantity and price fields become editable after you click Change to edit a saved default bid or other simple bid. While editing the bid, you can specify a new quantity and, if desired, an intra-round price (see Figure 26), which may be any price that is greater than or equal to the posted price from the previous round and less than or equal to the clock price for the current round. The system will display the valid range of prices for a product when you hover the cursor over the price field.

Note: a bid at a lower price than the clock price must be for a different quantity than the bidder's processed demand for that product.

Figure 26: Changing a Simple Bid



If advanced bid options are available for the product, you may also change a simple bid to one of several advanced bid types by clicking on Advanced Options to access the advanced bid options drop-down menu (for details on entering these bids, see Section 7.3.3.2 below).

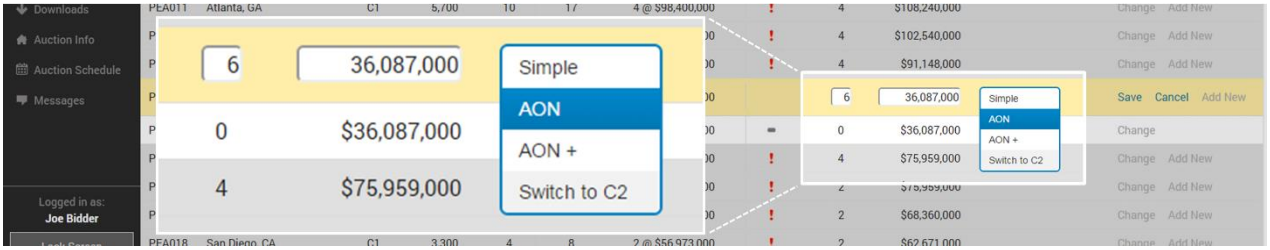
When you have finished, you must click Save to save the bid, or you may click Cancel to discard your changes. After you save the bid, the system will display a red exclamation mark (**!**) in the status column to indicate that a bid has been saved but not yet submitted.

> ✍ *Saving a bid does not submit the bid. You must click* Submit *to submit any saved bids.*

7.3.3.2. Advanced Bid Options

The advanced bid options drop-down menu is displayed when you click Advanced Options after you click Change to edit a saved or submitted simple or advanced bid. While editing the bid, you can select a bid type from the drop-down menu, including Simple, All-or-Nothing (AON), All-or-Nothing with Backstop (AON+), or Switch (see Figure 27). For examples of these bid types, see Appendix 4: Examples of Bid Types.

Figure 27: Selecting bid types from the advanced bid options menu



Note: Advanced bid options may not be available for a particular product depending on its supply, your demand, and whether or not another category of product exists in its PEA. Also, because you may not

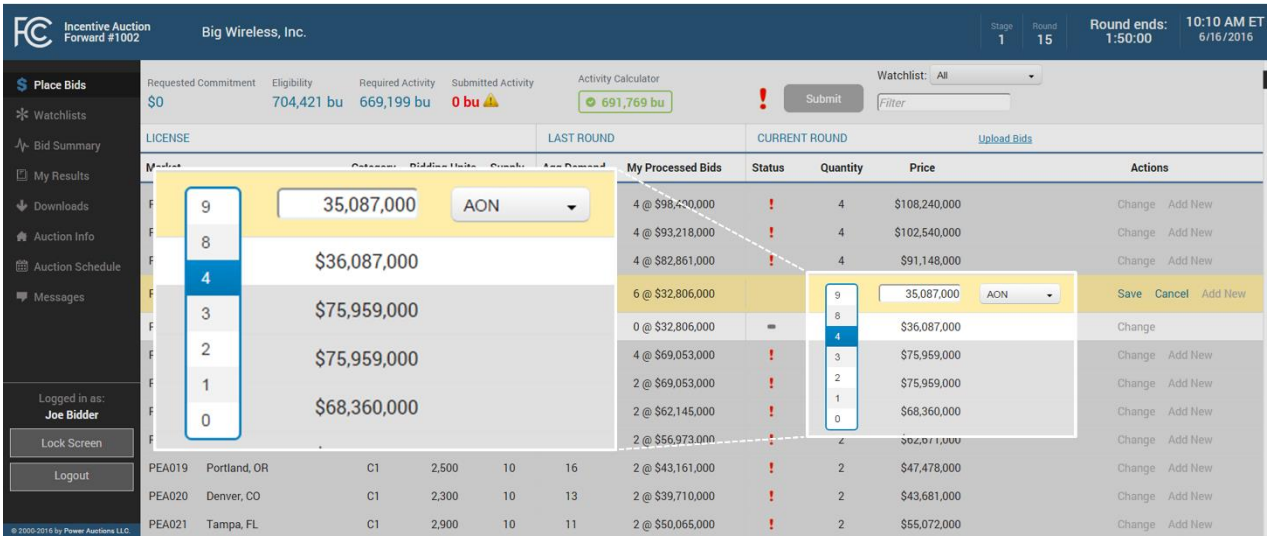
enter an advanced bid in an extended round for any product, the Advanced Options link will not be displayed in this round.

7.3.3.2.1. All-or-Nothing (AON) Bids

After selecting AON from the advanced bid options drop-down menu, the quantity input field becomes a quantity drop-down menu and includes only valid quantities for the bid (see Figure 28).[10] This bid option is unavailable if you cannot select a valid AON quantity (e.g., supply is 1 block).

To enter an AON bid, you must select a quantity and, if desired, specify an intra-round price for the bid.

Figure 28: Entering an All-or-Nothing Bid



When you have finished, you must click Save to save the bid, or you may click Cancel to discard your changes. After you save the bid, the system will display a red exclamation mark (**!**) in the status column to indicate that a bid has been saved but not yet submitted.

> ✍ *Saving a bid does not submit the bid. You must click* Submit *to submit any saved bids.*

7.3.3.2.2. All-or-Nothing with Backstop (AON+) Bids

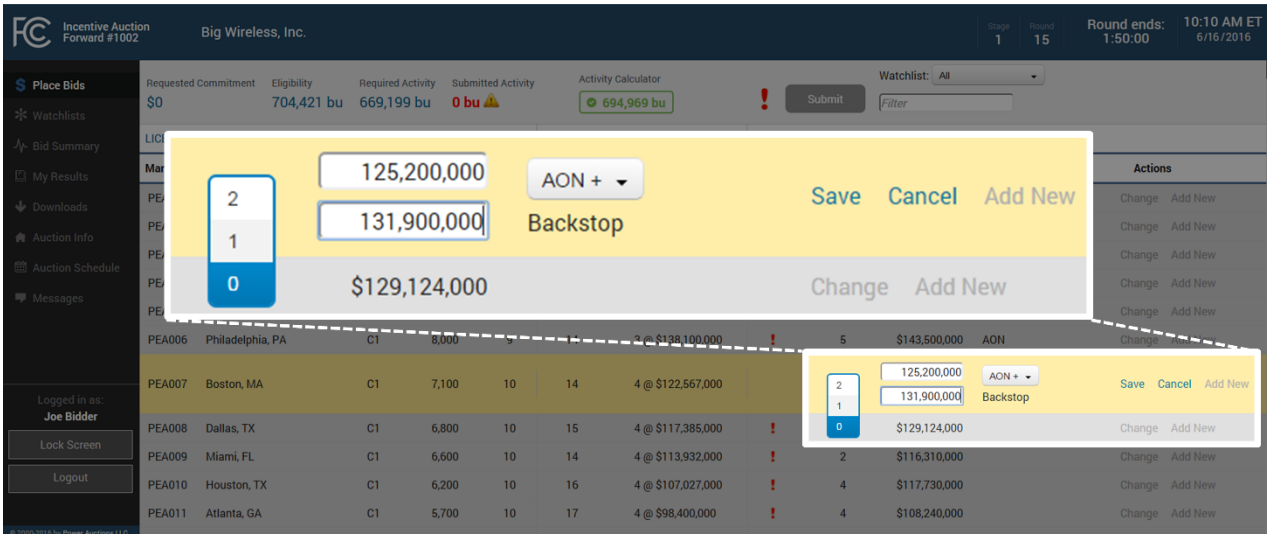
After selecting AON+ from the advanced bid options drop-down menu, the quantity input field becomes a quantity drop-down menu (including only valid quantities for the bid) and in addition, a backstop price input field is displayed (see Figure 29).[11] This bid option is unavailable if you cannot select a valid AON quantity (e.g., supply is 1 block).

[10] For an AON bid, all quantities must be less than or equal to the supply and at least two blocks more or less than your processed demand.

[11] For an AON+ bid, the quantity must be at least two blocks less than your processed demand.

To enter an AON+ bid, you must select a quantity, specify a price for the AON bid, and also specify a backstop price, which must be greater than the bid price.

Figure 29: Entering an All-or-Nothing with Backstop Bid



When you have finished, you must click Save to save the bid, or you may click Cancel to discard your changes. After you save the bid, the system will display a red exclamation mark (**!**) in the status column to indicate that a bid has been saved but not yet submitted.

> ✍ *Saving a bid does not submit the bid. You must click* Submit *to submit any saved bids.*

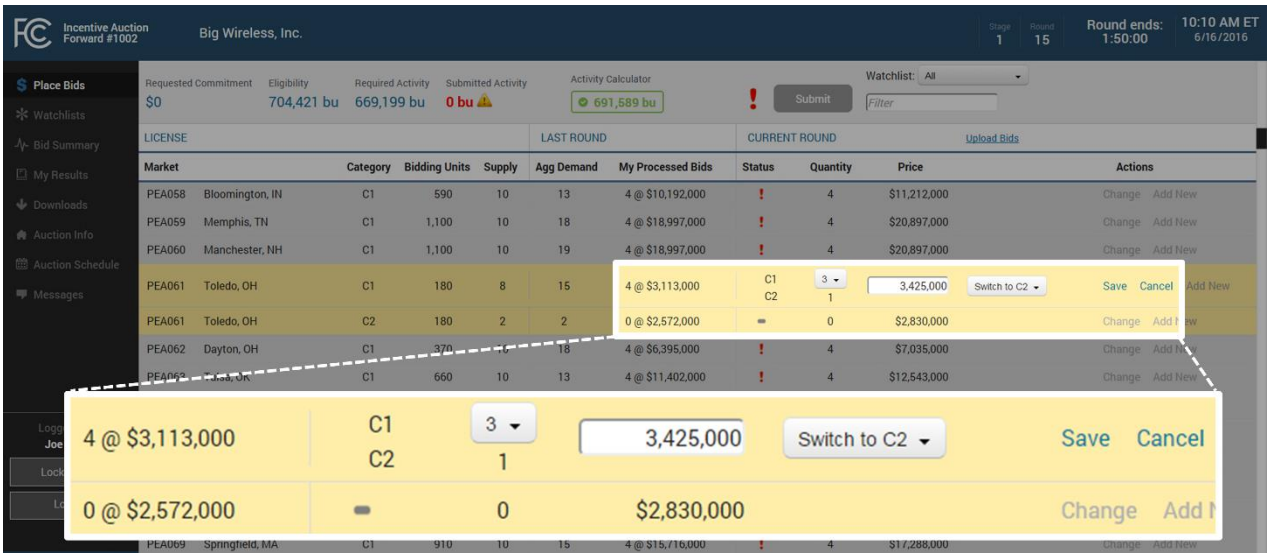
7.3.3.2.3. Switch Bids

After selecting Switch to <*Category Code*> from the advanced bid options drop-down menu,[12] the quantity input field becomes a quantity drop-down menu for the "switch from" category (including only valid quantities), and the "switch to" category is displayed with the resulting quantity (see Figure 30). This bid option is unavailable if there is only one category of product in the PEA on which you may bid.

To enter a Switch Bid, select a new quantity for the product you are switching from and, if desired, specify an intra-round price at which you would like the switch to occur. The quantity that you select for the "switch from" product indicates the quantity that you would like to have after bid processing for that product, not the number of blocks you wish to move to the "switch to" category. The quantity drop-down displays the valid quantities from which you can select. Once you have specified the bid, the screen shows the price (intra-round or clock) at which you would like the switch to occur for the "switch from" product and the clock price for the "switch to" product.

[12] Before the spectrum reserve split, at most one Switch Bid option may be available for a given product: Switch to C1 or Switch to C2. After the spectrum reserve split, a product may have at most two of three Switch Bid options available: Switch to C1-U, Switch to C1-R, or Switch to C2.

Figure 30: Entering a Switch Bid

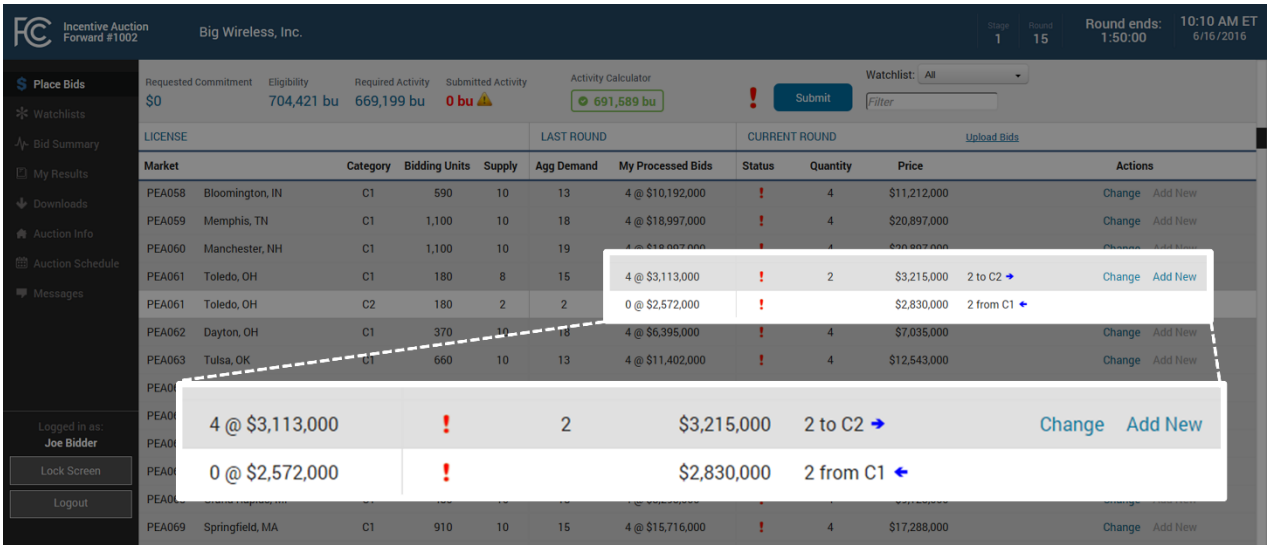


When you have finished, you must click Save to save the bid, or you may click Cancel to discard your changes. After you save the bid, the system will display a red exclamation mark (**!**) in the status column for both categories to indicate that the bid has been saved but not yet submitted.

> ✍ *Saving a bid does not submit the bid. You must click* Submit *to submit any saved bids.*

For the "switch from" product, the system displays the resulting quantity if the Switch Bid were to be fully applied. For the "switch to" product, the system displays a blank value for the quantity. Both products also show the details of the Switch Bid next to the Price column (see Figure 31).

Figure 31: Saved Switch Bids

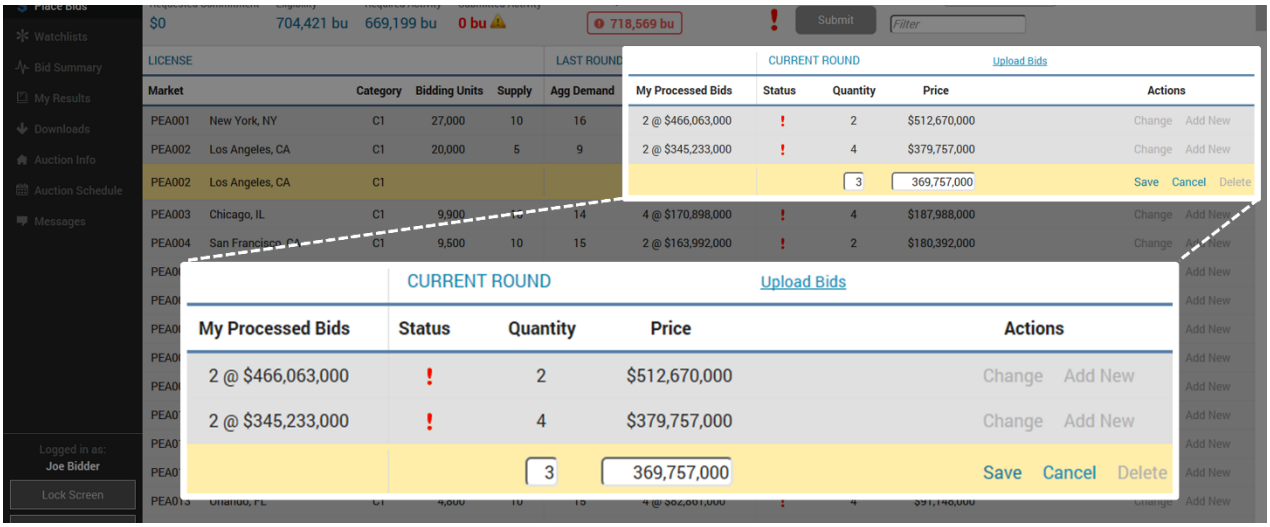


7.3.4. Entering Multiple Intra-round Bids

You may add multiple intra-round bids for the same product by clicking Add New in the Actions column for that product.[13] Multiple intra-round bids must either all decrease or all increase as the price increases, must be of the same bid type (i.e., Simple, All-or-Nothing, or Switch) and must be for different quantities.

For a simple bid, after you click Add New, you can specify a new quantity and intra-round price for the intra-round bid (see Figure 32).

Figure 32. Enter new bids as intra-round simple bids



For an advanced bid, after you click Add New, you may add a new intra-round advanced bid similar to how you enter an advanced bid of that type (see Section 7.3.3.2).

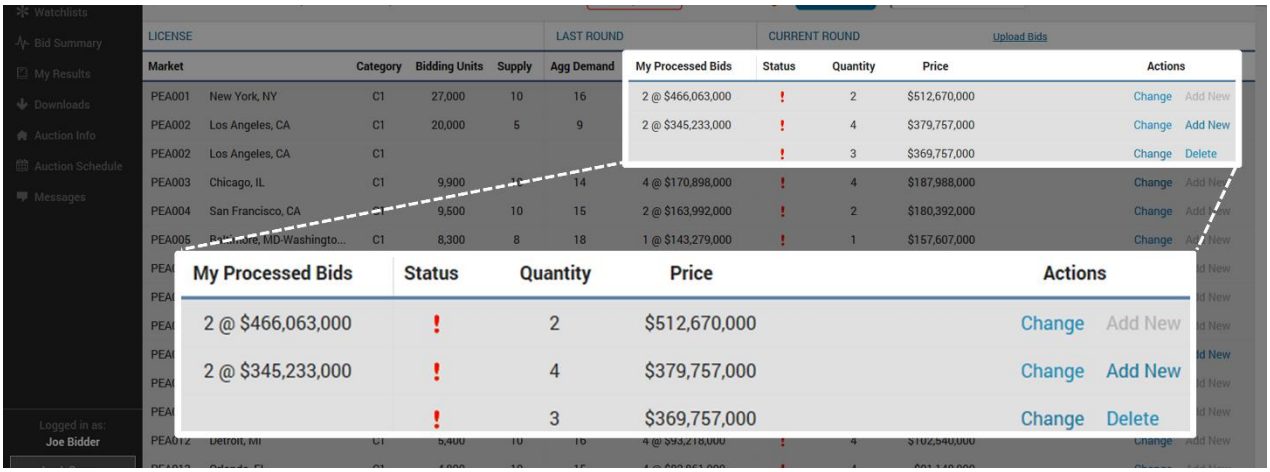
Note: the Add New link is disabled if an additional intra-round bid of that advanced bid type is not permitted.

Once you have finished entering the quantity and price for your intra-round bid, you must click Save in order to save the new bid, or you may alternatively click Cancel to remove the intra-round bid without saving.

You may repeat these steps to enter and save additional intra-round bids. When multiple intra-round bids exist for a product, you may delete an intra-round bid by clicking Delete in the Actions column (see Figure 33). After clicking Delete, you may then undelete that intra-round bid by clicking on Undelete in the Actions column.

[13] The Add New link is disabled if the user cannot submit multiple bids for that product given the supply, the processed demand, and the bids that have already been submitted, e.g., if the product's supply is 1 block, or if the quantity bid at the clock price is equal to or one less than the previous round's processed demand.

Figure 33. Delete additional intra-round bids



After you save a new intra-round bid, the system will display a red exclamation mark (**!**) in the status column to indicate that the bid has been saved but not yet submitted.

> ✍ *Saving a bid does not submit the bid. You must click* Submit *to submit any saved bids.*

7.3.5. Bidding in an Extended Round

Bidding during an extended round is similar to a regular clock round but with additional restrictions on bid types, quantities, and products.

In an extended round, you may only place bids for your high-demand C1 products where supply equals aggregate demand, and for which you had processed demand from the previous round. As a result, the system saves a default bid to maintain your processed demand at the clock price for these "extended round products" (see Section 7.3.1).

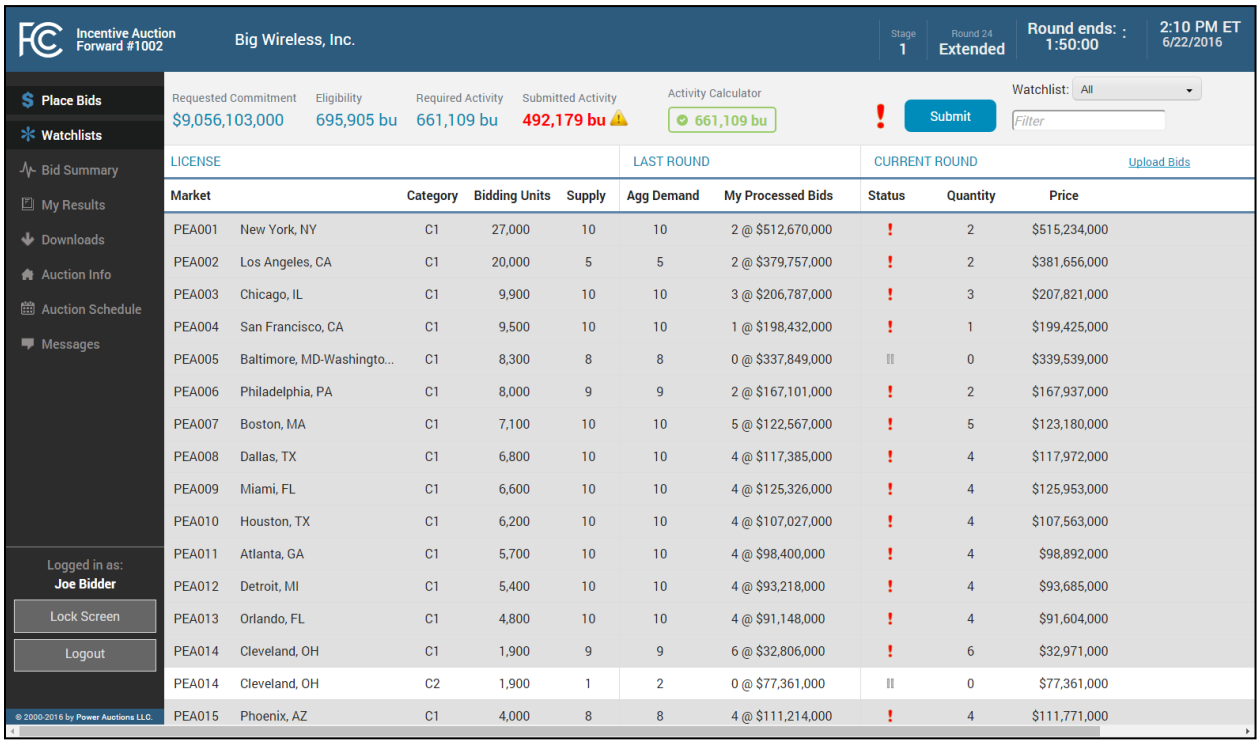
As with a regular clock round, for each saved bid, the system displays a red exclamation mark (**!**) in the status column to indicate that a bid has been saved but not yet submitted. For all other products, the system displays a gray double-bar icon (||) to indicate that you cannot bid for these products in the extended round (see Figure 34).

Note: non-extended round products in which the bidder has processed demand will still be displayed on the Place Bids screen and will count towards the bidder's requested commitment and submitted activity values. Moreover, the required activity displayed during an extended round does not take into account that the activity requirement will be 100% for extended round products when calculating eligibility after the extended round where the final stage rule is not met in the extended round.[14]

[14] For details on how eligibility is calculated after an extended round in which the final stage rule was not met see Appendix G to the *Applications Procedures PN*. *Application Procedures for Broadcast Incentive Auction Scheduled to begin on March 29, 2016; Technical Formulas for Competitive Bidding*, AU Docket No. 14-252, GN Docket No. 12-268, WT Docket No. 12-269, Public Notice, 30 FCC Rcd 11034, 11181 (WTB 2015) (*Application Procedures PN*).

> *The required activity displayed during an extended round does not take into account that the activity requirement will be 100% for extended round products when calculating eligibility after the extended round where the final stage rule is not met in the extended round.*

Figure 34: Place Bids screen in the extended round before submitting bids



If you are willing to maintain your demand at the clock price, you may click Submit to submit your default bids, as in a regular clock round (see Section 7.3.2).

Alternatively, if you are unwilling to maintain your demand for an extended round product at the clock price, you may modify any saved or submitted bid by clicking Change in the Actions column, as in a regular clock round (see Section 7.3.3).

Unlike in a regular clock round, when editing a bid during an extended round, you may only enter a single simple bid, and you may only change your quantity to reduce your demand by 1 block at a specific price. You may not enter multiple intra-round bids for a product, increase your demand by any number of blocks, or reduce your demand by more than 1 block in an extended round.

Note: if a bidder has eligibility greater than zero, but cannot bid in the extended round, it is still participating in the auction. The bidder will maintain its eligibility and you can once again bid in rounds after the extended round. If you cannot place bids in the extended round, the Place Bids screen will not

display the bidder's requested commitment for the round but will continue to display its products and processed demands.

> ✍ *If a bidder has eligibility greater than zero, but cannot bid in the extended round, it is still participating in the auction. The bidder will maintain its eligibility and you can once again bid in rounds after the extended round.*

7.3.6. Bidding after the Spectrum Reserve Split

The rounds after the spectrum reserve split are regular clock rounds, but there may be additional products, and the categories and supplies for products may be different than before the split.

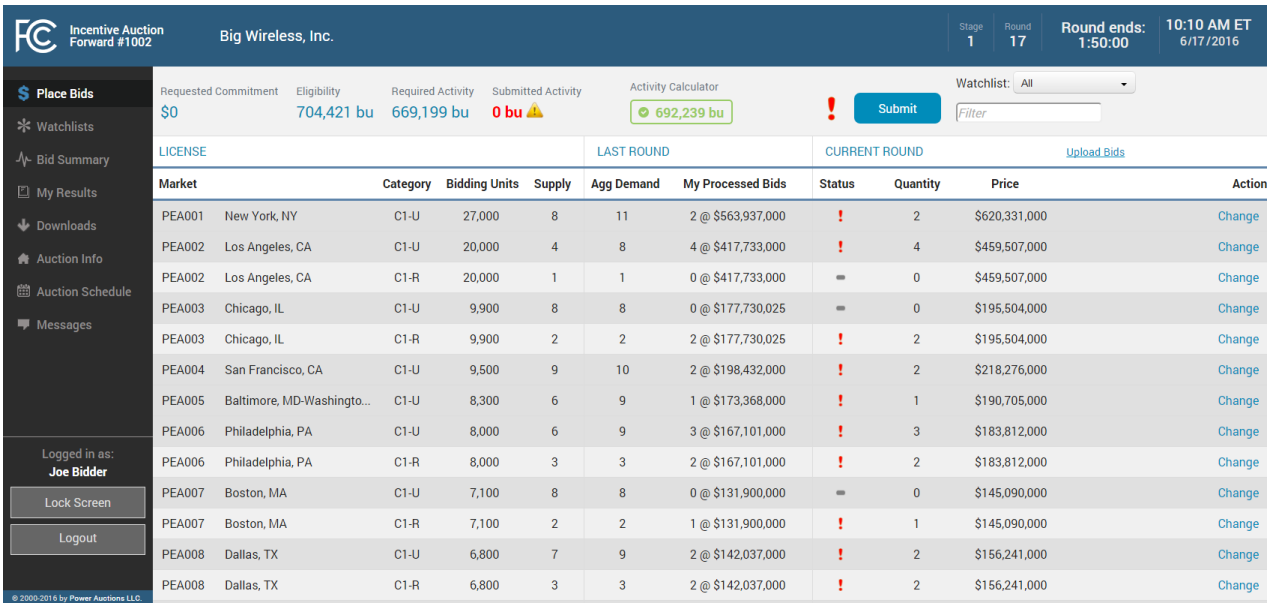
In the round after the spectrum reserve split, C1 products are split into C1-R and C1-U products. For a bidder that is eligible to bid on reserved blocks in a PEA, the system displays both C1-U and C1-R products, regardless of the bidder's processed demand for C1-R blocks in that PEA. For each product, the system displays the supply, clock price, and the bidder's processed demand allocated to each category (see Figure 35).

For a bidder that is not eligible to bid on reserved blocks in a PEA, the system displays the C1-U product for that PEA but does not display the C1-R product.

If a bidder's allocated demand for a C1-U product exceeds the C1-U supply for the product, the system caps the bidder's processed demand for the C1-U product at the C1-U supply.

Note: after the spectrum reserve split, you may view the My Split Transition download (see Section 9.2.2.2) and the My Results screen (see Section 9.2.1) to view information about the new product categories, the associated supplies, and the bidder's processed demand for each.

Figure 35: Place Bids screen after spectrum reserve split for a bidder that is reserve-eligible for some markets



7.3.7. Bidding in the First Round of a Subsequent Stage

Unlike the initial round of the auction, the first round of a subsequent stage is a regular clock round. During the first round of a subsequent stage, the system saves (but does not submit) default bids for all of a bidder's products for which it had processed demand at the end of the previous stage. Additionally, bidders can modify and submit bids, enter intra-round bids, and enter advanced bid options in the same manner as in any regular clock round.

In a new stage the supply for a product is generally reduced due to the lower clearing target.[15] If a bidder's demand at the end of the previous stage exceeds the new supply for a product, the system caps the bidder's demand in the new stage at the new supply. In addition, during the first round of a subsequent stage, bids to reduce demand that would result in aggregate demand being below supply for C2 products are applied in full even if that would cause aggregate demand to drop below supply. This way a bidder can reduce its demand for a C2 product in the case that the impairment percentages of the blocks of that product changed from one stage to the next.

Please note: at the start of a new stage, you may view the stage transition files on the Stage Transition File tab on the Downloads screen (see Section 9.2.2.2) to identify any products with quantities that have been capped coming into the new stage, as this is the only place where such information can be found.

[15] The clearing target includes C1, C2, and blocks that are not in the auction because they are too heavily impaired. If a PEA had a lot of heavily impaired blocks in the previous stage as compared to the current stage, the supply of C1 and C2 for this PEA in the current stage may be the same or even greater than what was in the auction in the previous stage.

7.3.8. Unsubmitted Bids

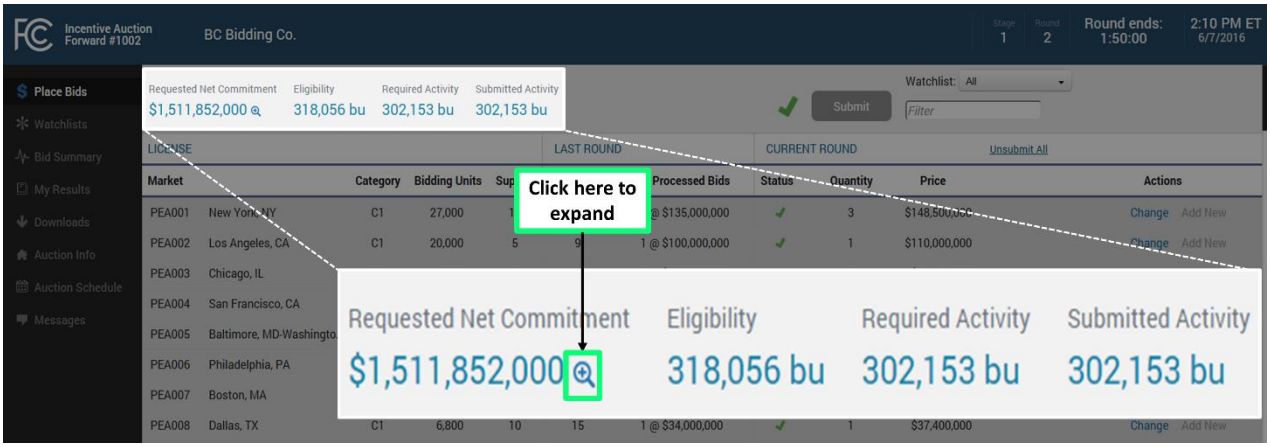
In rounds after the initial round, the system does not display a warning if you try to navigate away from the Place Bids screen with unsubmitted bids, because bids are saved at all points in a round, either automatically by the system (for default bids) or after a user has clicked Save to modify its bid. The system does, however, display a large red exclamation mark (!) next to the Submit button to indicate that at least one bid has been saved but not submitted.

If a bidder fails to submit a bid for a product for which it has processed demand, the Auction System will consider that to be a missing bid, which will be processed as a simple bid request for a quantity of zero at the previous round's posted price. A missing bid will not necessarily reduce the bidder's processed demand to zero after the round. The Auction System will apply as much of the missing bid request as it can, subject to the overall restriction that aggregate demand cannot fall below supply of a given product.

7.4. Monitoring Commitment and Activity

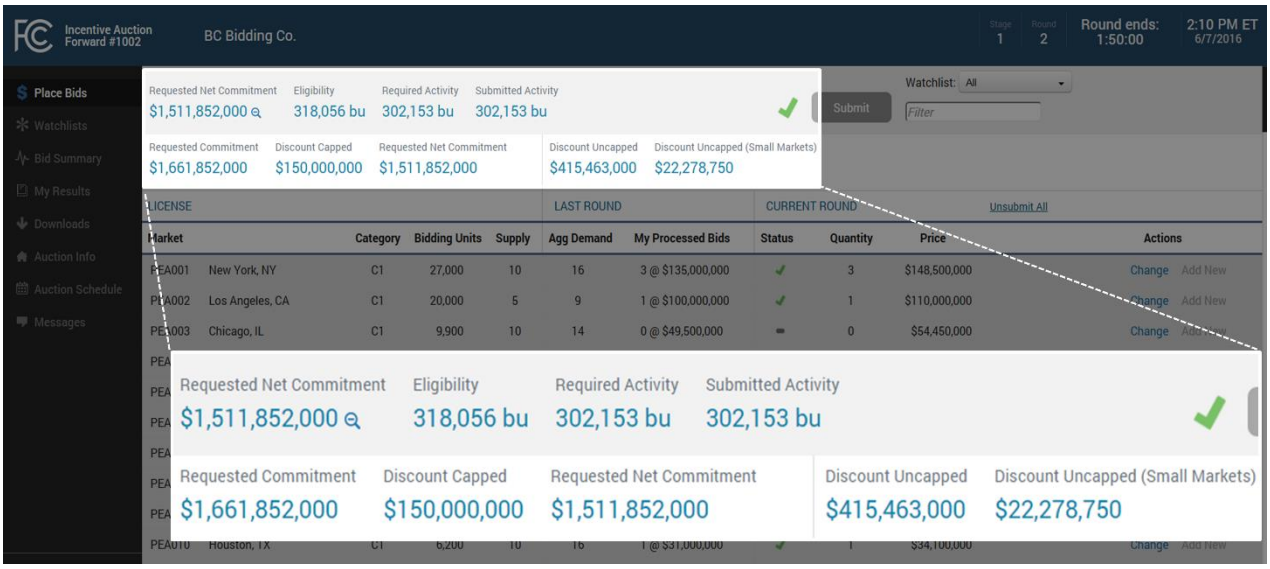
For each round, the system calculates a bidder's eligibility and required activity based upon its processed activity from the previous round (or, for the initial round, based upon its upfront payments), and its activity requirement for that round. The system displays these values in addition to the financial commitment and activity associated with your submitted bids, and every time you submit bids, the system updates your requested commitment and submitted activity (see Figure 36).

Figure 36: Summary bar for bidders



If the bidder is bidding with a bidding credit, the requested commitment reflects the net commitment, subject to any discounts and bidding credit discount caps. You may additionally view the gross requested commitment, the bidding credit discount (capped and uncapped), and if applicable, the uncapped discount for small markets by clicking on the magnifying glass icon (🔍) next to the requested net commitment (see Figure 37).

Figure 37: Expanded summary bar for bidder with small business credit



If the bidder's eligibility is reduced to zero after bid processing, you cannot place bids in subsequent rounds and the system will display a message indicating that while you may not bid again, you may continue to access the system for the remainder of the stage.

Note: if another stage is required, you will not be able to access the bidding system for subsequent stages if the bidder's eligibility is reduced to zero.

> ✍ *If a bidder's eligibility is reduced to zero in a stage, you will not be able to access the bidding system in subsequent stages.*

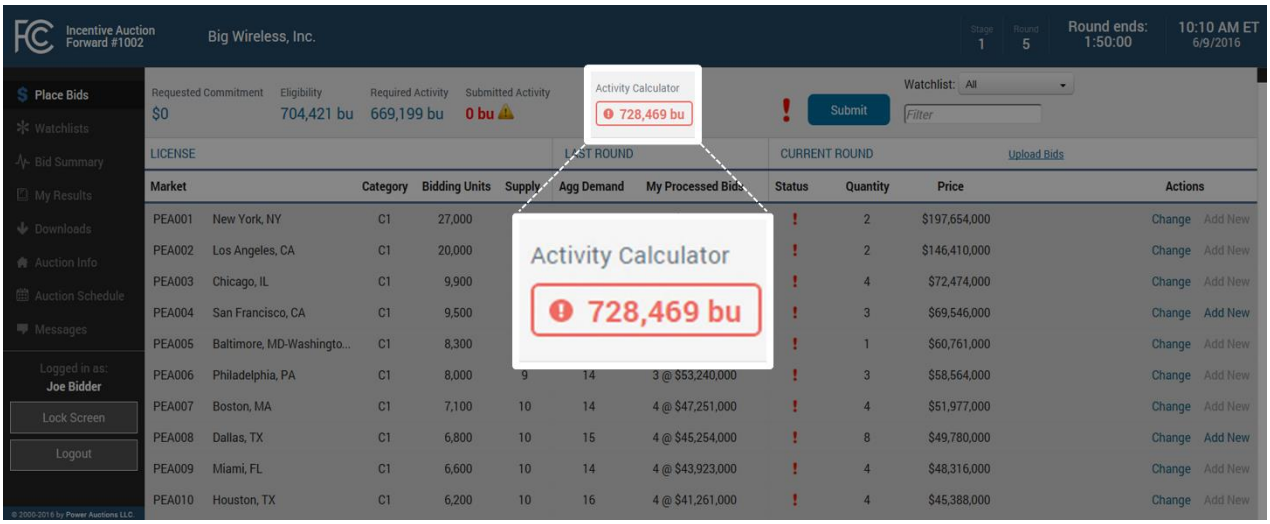
7.4.1. Activity Calculator

In all rounds after the initial round of the auction, when you have unsubmitted bids the system displays an activity calculator which reflects the activity of your saved bids, plus any submitted bids for which you have not saved any changes (see Figure 38). This calculator allows you to quickly determine whether your saved bids would satisfy the activity requirement or would exceed your eligibility before you submit your saved bids.

As you modify bids, the calculator updates to reflect your saved but not yet submitted bids, in contrast to your submitted activity value, which reflects bids actually submitted to the system. Once you submit your bids the activity calculator is no longer displayed, but it will once again appear if you change any submitted bids.

Note: as with submitted activity, the activity calculator value reflects your activity as if all saved and submitted bids were to be fully applied during bid processing.

Figure 38: Activity calculator



The activity calculator is red when your activity is less than the required activity or greater than your eligibility to alert you that you may need to adjust your bids, and turns green when your activity is between those values.

Note: the activity calculator reflects all submitted bids and any saved bids pertaining to the applied filters and watchlists (see Section 7.5).

7.5. Watchlists and Filtering

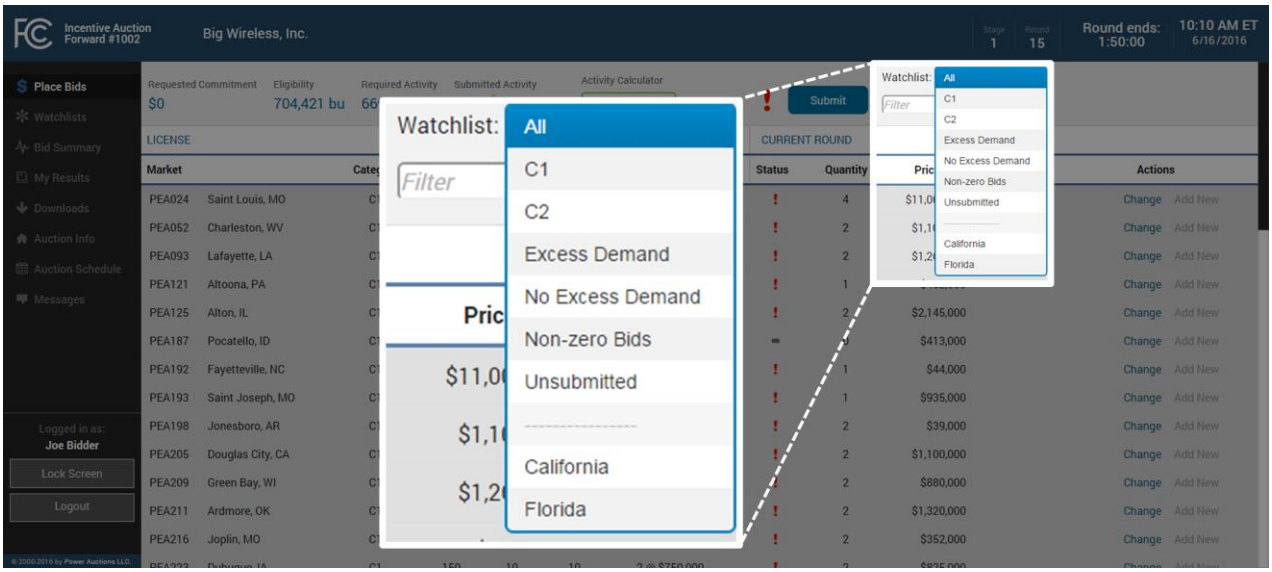
A watchlist groups a bidder's eligible products to make it easier to bid for a collection of products through the user interface: in addition to limiting what products are displayed on the Place Bids screen, submitting bids while a watchlist is selected only submits saved bids for products that are displayed in the watchlist. The system provides a number of system-created watchlists, and bidders may create up to ten additional custom watchlists, which the bidder can use on the Place Bids screen to restrict the submission of bids.

Additionally, you can quickly filter the products displayed on the Place Bids screen by entering a filter on the Place Bids screen. In contrast to watchlists however, filtering only limits which products are displayed and does not affect the submission of bids. Specifically, if a bidder has saved bids that are part of the selected watchlist, all of these bids are submitted irrespective of any filter that is applied when you submit bids.

7.5.1. Selecting and Submitting Bids using Watchlists

By default, the system displays the system-defined All watchlist on the Place Bids screen. If you want to select a different watchlist, you may select it from the Watchlist drop-down menu (see Figure 39).

Figure 39: Watchlist drop-down menu

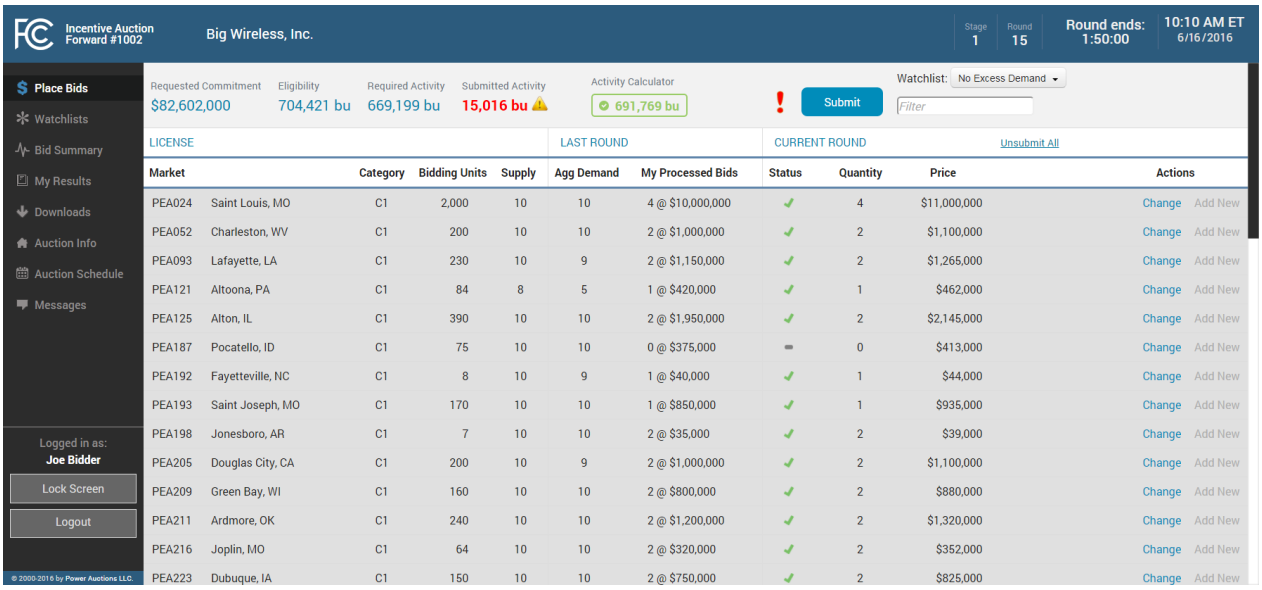


In the watchlist drop-down menu, the system displays all of your available watchlists during a round, with system-defined watchlists at the top, followed by custom watchlists below the dotted line. Note: system-defined watchlists vary according to the type of round of the auction.

To display only the products corresponding to a watchlist, select the watchlist name from the watchlist drop-down menu. When using a watchlist to bid, the Submit button only submits saved bids for your products displayed as part of that watchlist. If a bid had been previously saved but not submitted for a product that is not part of the selected watchlist, the saved bid will not be submitted.

Note: if you have an unsubmitted bid, the system will display a red exclamation mark (**!**) next to the Submit button to indicate that at least one bid has been saved but not submitted (see Figure 40).

Figure 40: Bid for watchlist products



In the example above, the bidder submitted bids for all products in the No Excess Demand watchlist. However, the bidder still has unsumbitted bids outside of this watchlist as indicated by the red exclamation mark (**!**) next to the Submit button.

> *If you have an unsubmitted bid, the system will display a red exclamation mark (**!**) next to the Submit button to indicate that at least one bid has been saved but not submitted*

7.5.2. System-Defined Watchlists

The system includes a number of pre-defined watchlists, the availability of which may vary depending on the type of round (see Table 3).

Table 3: System-defined Watchlists

Watchlists	Descriptions	Availability
All	All products the bidder is eligible to bid on based on the PEAs it selected on its Form 175	Always
C1	All of the bidder's C1 products across all its eligible PEAs	Before spectrum reserve split
C2	All of the bidder's C2 products across all its eligible PEAs	Always

C1-R	All of the bidder's C1-R products across all its eligible PEAs	After spectrum reserve split
C1-U	All of the bidder's C1-U products across all its eligible PEAs	After spectrum reserve split
Excess Demand	All of the bidder's products where aggregate demand for the product in the last round is greater than the supply of the product	After the initial round
No Excess Demand	All of the bidder's products where aggregate demand for the product in the last round is less or equal to the supply of the product	After the initial round
Unsubmitted	All of the bidder's products with saved bids that have not been submitted	Always
Non-zero bids	All of the bidder's products where the bidder's processed demand is greater than zero. It also includes products where the bidder has placed a bid for a quantity greater than zero in the current round	After the initial round
ER-only	All of the bidder's products that are biddable during the extended round	Extended round

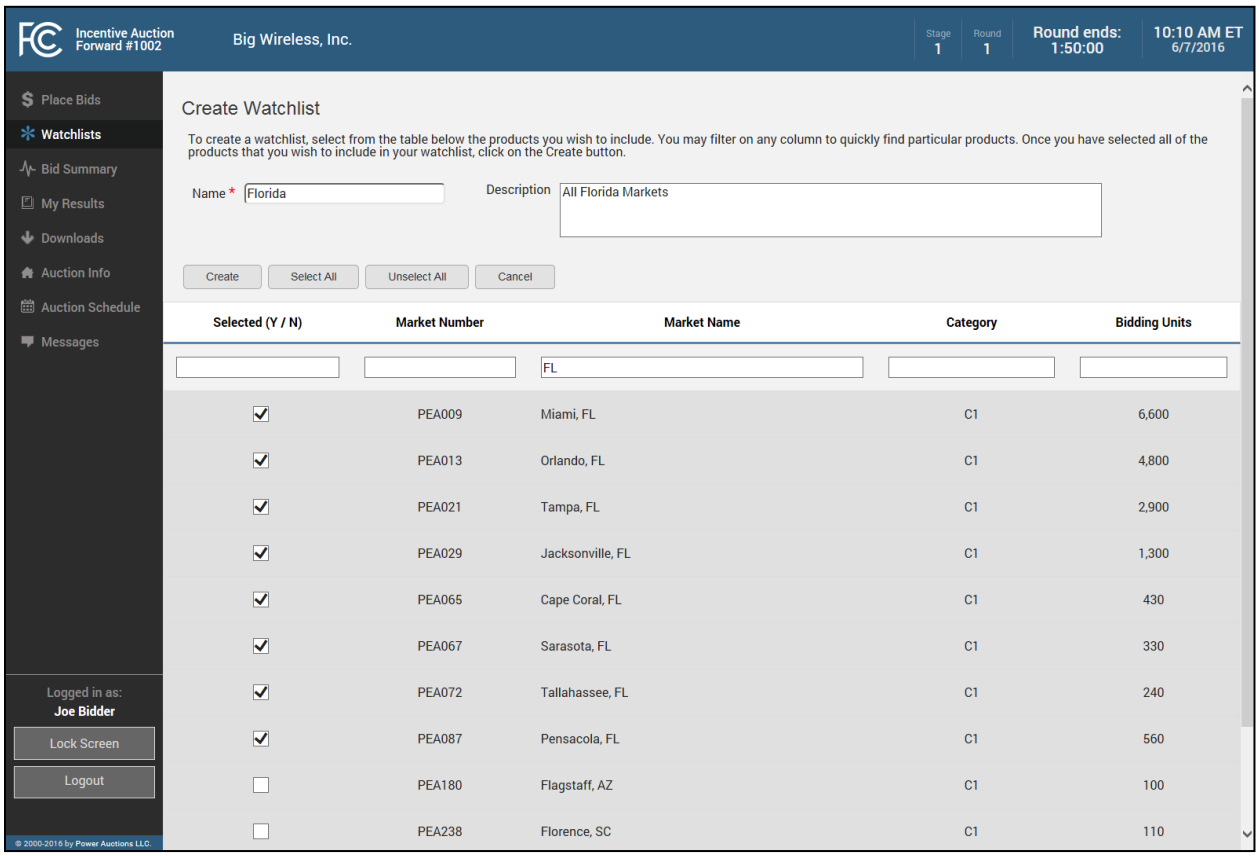
7.5.3. Creating Custom Watchlists

You may create and view custom watchlists via the Watchlists screen as soon as the auction system is available. Note: while each authorized bidder may create a watchlist, all watchlists are shared amongst the authorized bidders for a bidder. Additionally, there is a limit of ten custom watchlists that can exist at one time for a bidder.

From the Watchlists screen, you may create a new custom watchlist by clicking on the Create button to access the Create Watchlist screen (see Figure 41). On this screen, you can define a watchlist by entering a name and an optional description in the respective input fields, then selecting the checkbox next to the products that you would like to be part of the custom watchlist. Once you have finished selecting all products, you must click on the Create button to finish creating the custom watchlist. At any point, you may click on the Cancel button to return to the Watchlists screen without creating a new custom watchlist.

Note: each custom watchlist must have a unique name and at least one product selected.

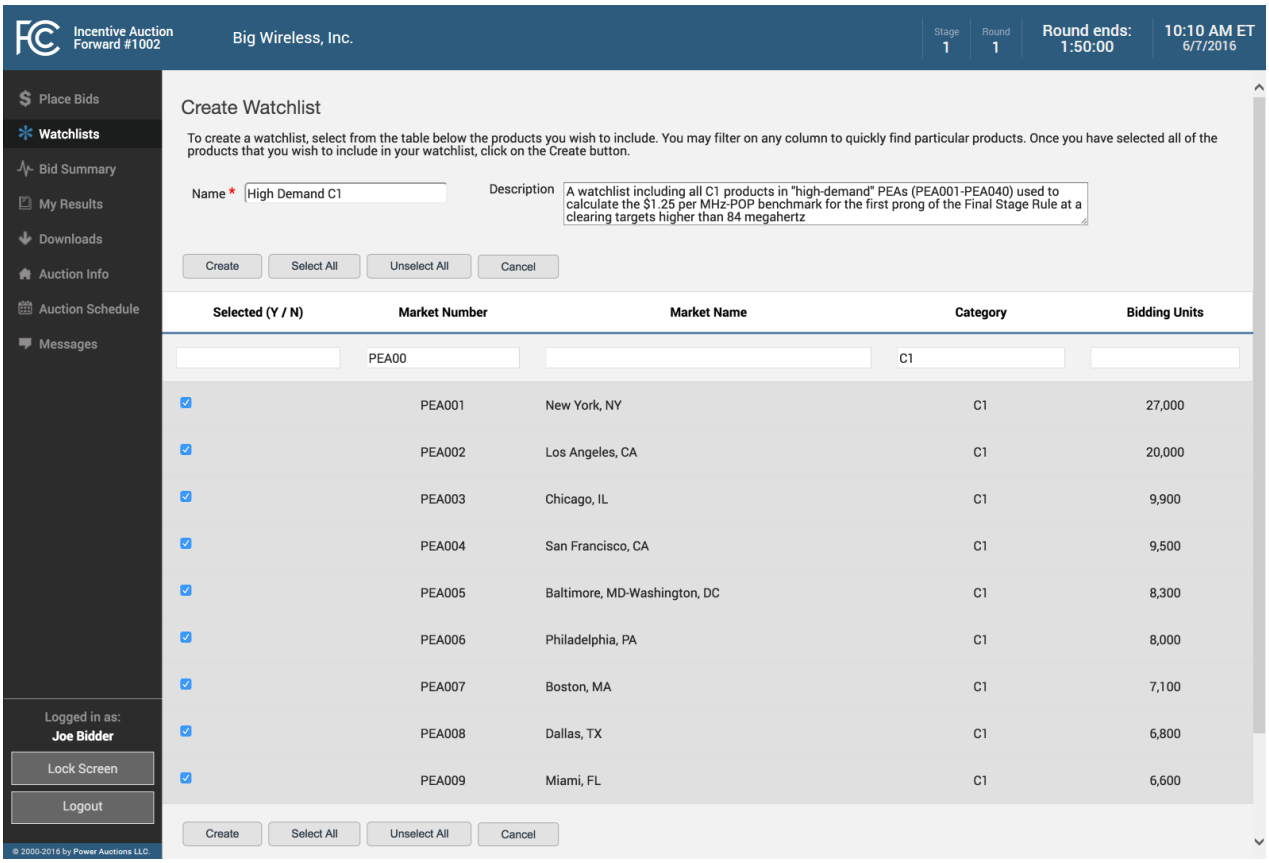
Figure 41: Create Watchlist screen



In order to more quickly select products, you may enter filter criteria in the input field at the top of each column to quickly filter your results. While filtered, you may click the Select All or the Unselect All buttons to select or unselect the checkbox for all products currently displayed on the screen. Note: clicking one of these buttons only selects or unselects the products that are displayed, and does not change whether any other products are selected or unselected.

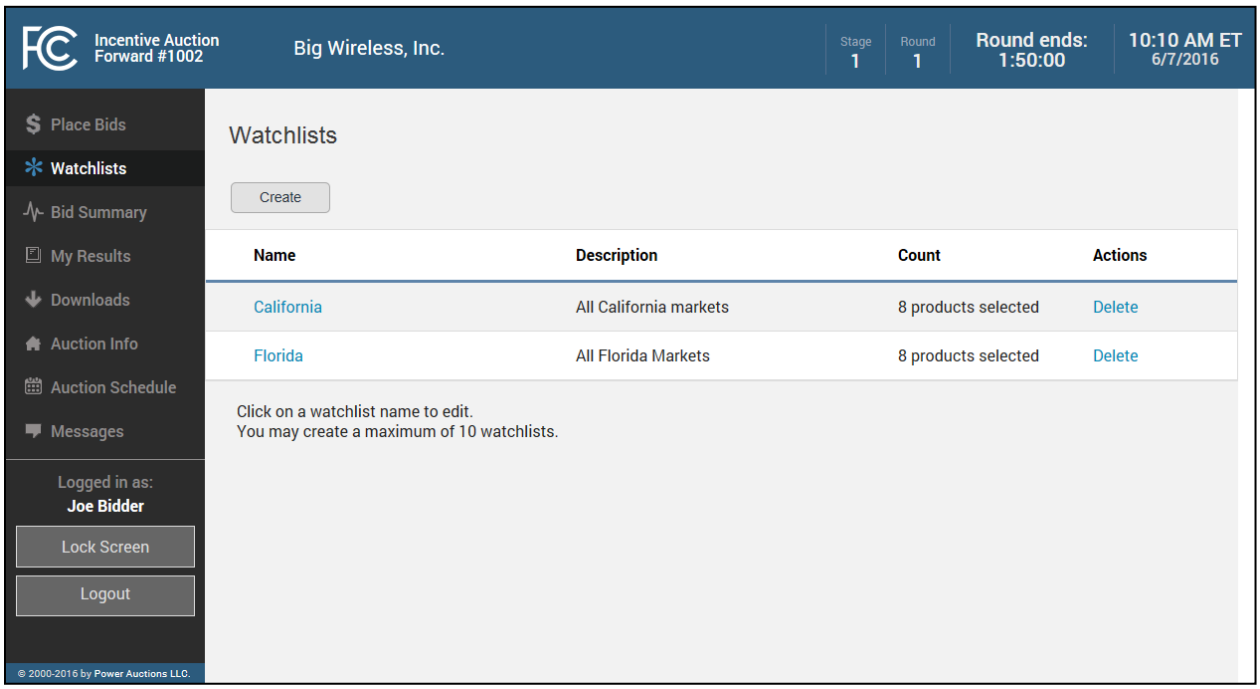
For example, to quickly create a custom watchlist of all C1 products in high-demand PEAs (PEA001 through PEA040), first enter "C1" in the Category filter input field to display only C1 products. Next, in the Market Number filter input field, enter "PEA00" to show only PEA001 through PEA009, then click on the Select All button to select these 9 products (see Figure 42). Next, change the Market Number filter to "PEA01" to show PEA010 through PEA019, then click on the Select All button. Repeat this process while filtering on "PEA02" and "PEA03" so that all C1 products in PEA001 through PEA039 are selected. Finally, change the Market Number filter to "PEA04" to show PEA040 through PEA049, but instead of selecting all products, select the checkbox next to PEA040, then click on the Create button to create the custom watchlist.

Figure 42: Using filters to create custom watchlist of High-demand C1 products



Clicking on the Create button will create a new custom watchlist that includes every product that you selected, irrespective of any filters that you currently have in place. After you have clicked to create the custom watchlist, the system navigates you back to the Watchlists screen, where you may view the list of custom watchlists (see Figure 43).

Figure 43: Watchlists screen



On the Watchlists screen, you may modify any custom watchlists by clicking on the watchlist name to access the Edit Watchlist screen. The process of modifying a custom watchlist is similar to creating a new custom watchlist: you may select or unselect the checkboxes next to products that you wish to add to or remove from the custom watchlist, change the name, and change the description. Once you are finished making modifications, click on the Update button to save your changes, or click on the Cancel button to return to the Watchlists screen without modifying your custom watchlist.

Finally, you may delete a custom watchlist by selecting Delete under the Actions column of the Watchlists screen. Note: there is no prompt to confirm deleting the watchlist, and this action permanently removes the custom watchlist. In addition, custom watchlists pertain to a specific stage of the auction and do not carry forward to the next stage.

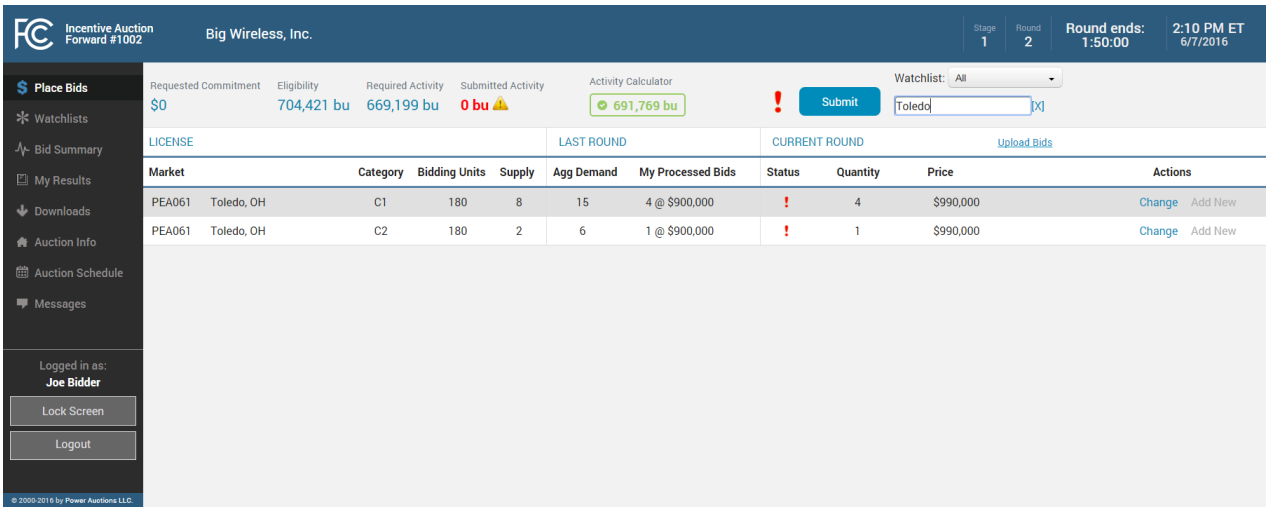
7.5.4. Selecting and Placing Bids using Filters

On the Place Bids screen, you may quickly filter the products displayed as part of the selected watchlist by entering filter criteria in the Filter input field to the right of the Submit button (see Figure 44). Filtering hides all products that are part of the selected watchlist and that do not match the filter criteria, which may be based upon any value in the Market, Category, Bidding Units, or Price columns. For example, if you have the default All watchlist selected and you enter “Toledo” in the Filter field, the system will hide all of your products that do not have that word as part of the Market.

Note: entering a filter simply hides products that do not match the filter criteria, but, unlike selecting a watchlist, filtering does not limit which saved bids are submitted when you click on the Submit button. If you click to submit while filtering on your products, all saved bids that are part of the selected

watchlist are submitted simultaneously, regardless of whether or not they match the filter criteria and are displayed on the Place Bids screen. For example in the filtered list below, clicking the Submit button would submit all saved bids in the All watchlist not just the bids related to the filter.

Figure 44: Filtering on the Place Bids screen



> *Entering a filter simply hides products that do not match the filter criteria, but, unlike selecting a watchlist, filtering does not limit which saved bids are submitted when you click on the Submit button.*

7.6. Placing Bids via File Upload

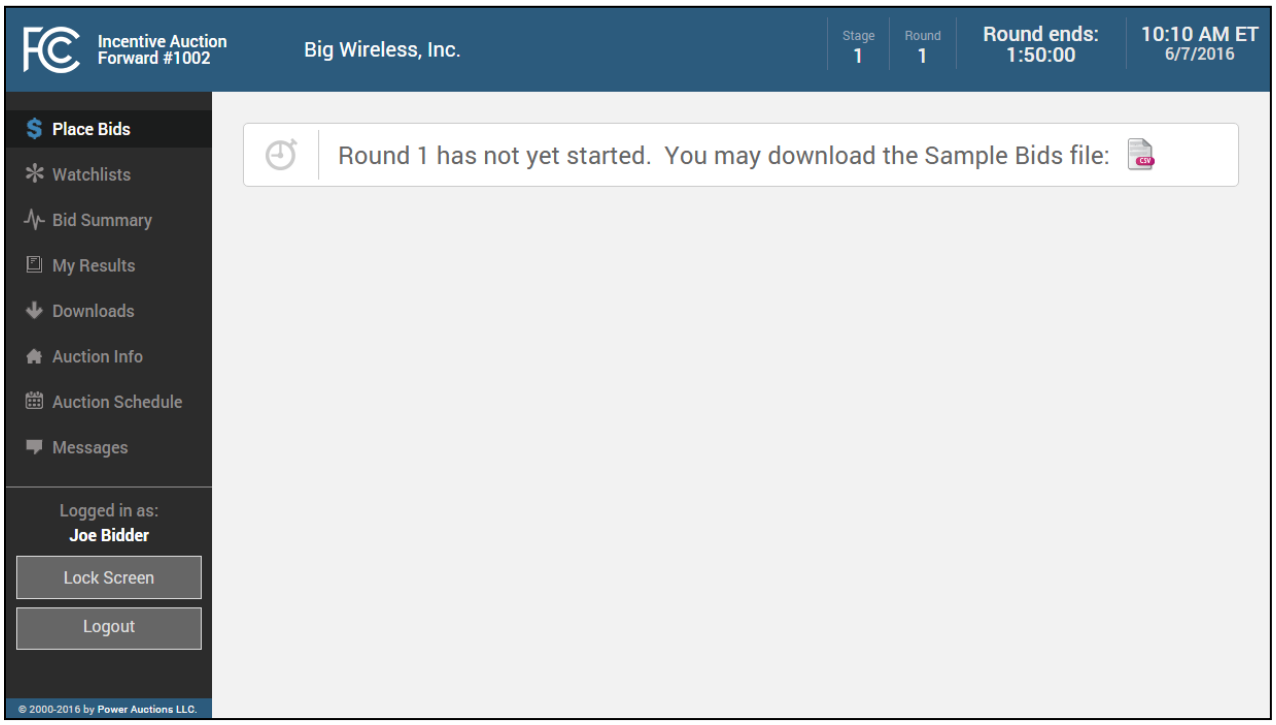
In each round, bidders may upload a defined bid file to place bids so long as no bids are currently submitted in the round. Full details about the specifications for bid upload files may be found in the Forward Auction Clock Phase File Formats document located on the Auction 1002 website under the Data tab (available at www.fcc.gov/auctions/1002).

7.6.1. Downloading Sample Bids

For each round, you may download a Sample Bids file matching the file specification for that round, which includes entries for all of the bidder's eligible products and, in rounds after the initial round, the default saved bid for each product.

Prior to the opening of the initial round, and prior to the opening of a subsequent round after prices have been announced for that round, you may download the Sample Bids file for that round on the Place Bids screen by clicking on the CSV file icon (see Figure 45).

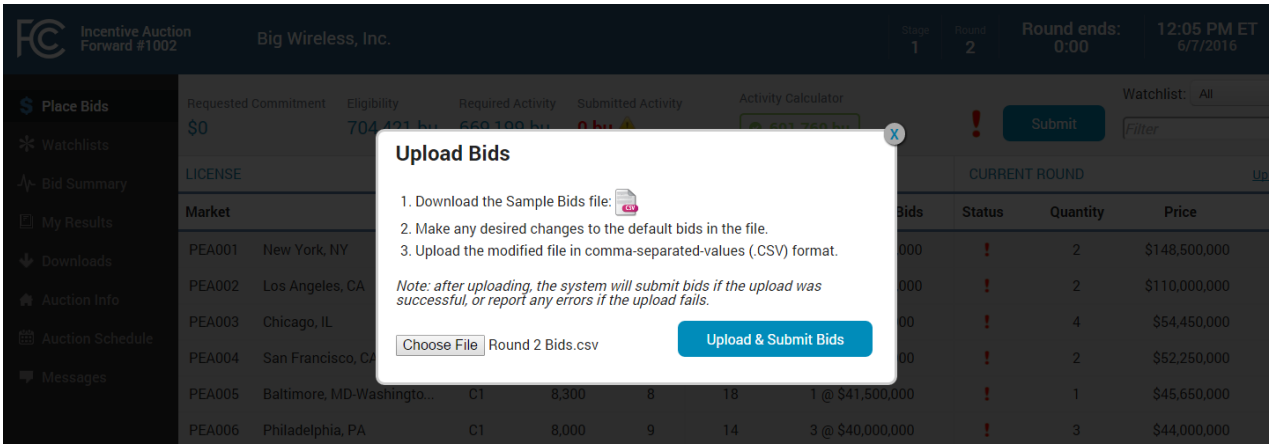
Figure 45: Download bid sample file before start of round



While a round is open, you may download the Sample Bids file for that round via the Upload Bids popup. You may access the Upload Bids popup by clicking Upload Bids beneath the Filter input field (see Section 7.1). If you have already submitted bids in the round, the Upload Bids link does not appear, and instead is replaced with the Unsubmit All link. In order to download your Sample Bids or upload a bid file, you must first click Unsubmit All to remove all submitted bids.

After you click Upload Bids, the system displays a popup window containing bid upload instructions as well as a link to the Sample Bid file (see Figure 46). To download your Sample Bid file, click on the CSV file icon.

Figure 46: Upload Bids popup with instructions



The specification for the Sample Bids file differs for the initial round and later rounds. Details about the specifications for sample files may be found in the Forward Auction Clock Phase File Formats document located on the Auction 1002 website under the Data tab (available at www.fcc.gov/auctions/1002).

7.6.2. Uploading a Bid File

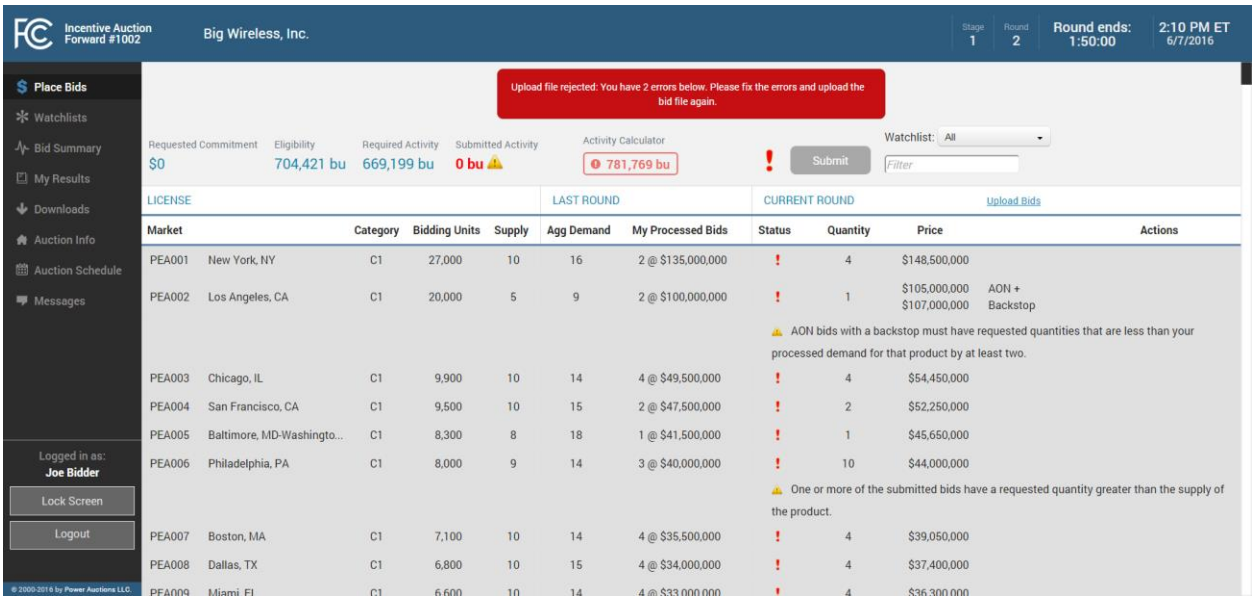
While a round is open, you may upload a bid file via the Upload Bids popup on the Place Bids screen. You may access the Upload Bids popup by clicking Upload Bids beneath the Filter input field (see Section 7.1). If you have already submitted bids, the Upload Bids link does not appear, and instead is replaced with the Unsubmit All link. In order to upload a bid file, you must first click Unsubmit All to remove all submitted bids.

From the Upload Bids popup, choose your bid file and click on the Upload & Submit Bids button (see Figure 46). If there are no errors, the bids defined in your bid file will be submitted and you will be redirected to the Place Bids screen, where your submitted bids will be displayed. The system will display a green checkmark (✓) in the status column to indicate that each bid has been successfully submitted to the system. Once you successfully submit bids via a bid upload, you may make changes to the bids via the user interface if you choose.

If there are one or more errors in the bid file, the system will reject the entire upload and display a message with an explanation of why the upload was unsuccessful on the Place Bids screen (see Figure 47).[16] After you fix the errors in your file, you may then upload your bid file again. A complete list of bid upload rejection criteria may be found in the Forward Auction Clock Phase File Formats document located on the Auction 1002 website under the Data tab (available at www.fcc.gov/auctions/1002).

[16] Only the first error condition found for the file or for each bid is shown. If the file cannot be parsed, the Place Bids screen will only display an error message over a blank page.

Figure 47: Place Bids screen with errors after bid upload rejected



8. Verifying Bids

Only submitted bids are processed by the auction system, and so the system provides a bidder with multiple options to verify that its bids were submitted properly.

8.1. Bid Summary

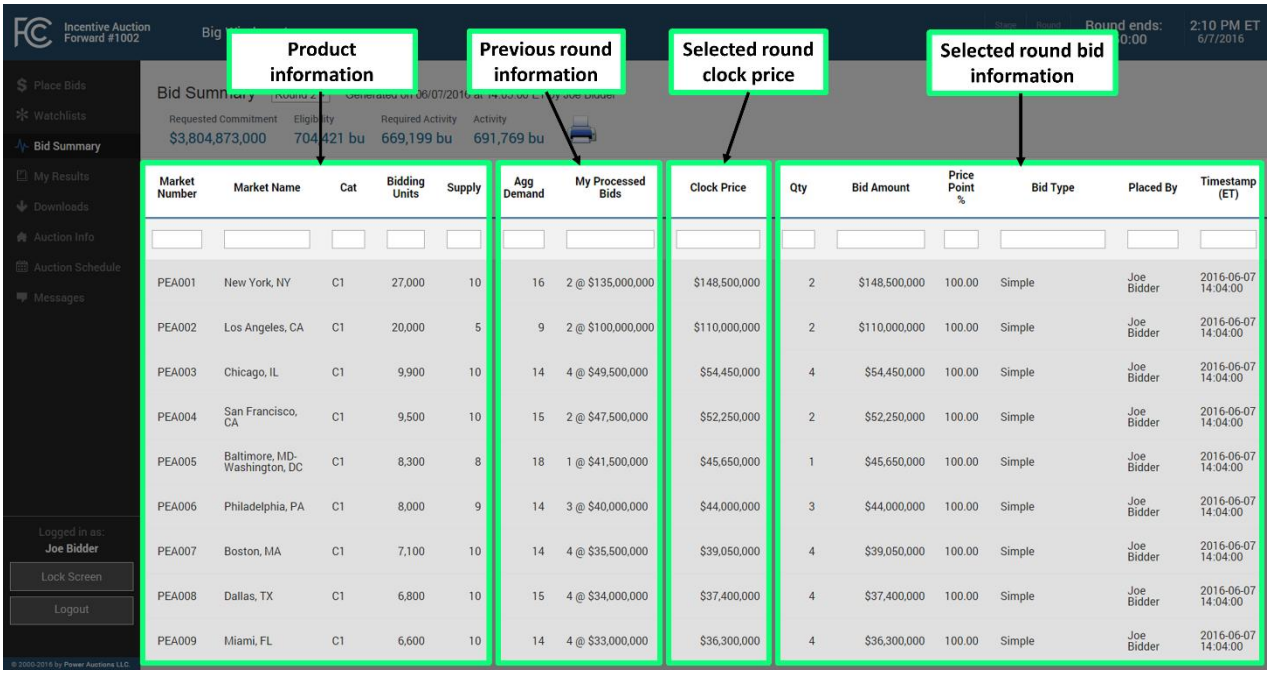
After the initial round opens and throughout the clock phase of a stage, you may verify the bids that have been submitted in a round on the Bid Summary screen, including the bids submitted in past rounds. This screen displays all bids submitted in a round with the associated submitted activity and requested commitment.[17]

The layout of the Bid Summary screen is shown in Figure 48 below, and displays information similar to that displayed on the Place Bids screen. The first five highlighted columns display product information. For rounds after the initial round of the auction, the next two columns show previous round bid information. The next column displays the clock price for the selected round, and the last six columns display information about the bid in the selected round, specifically, the price point, the name of the authorized bidder that submitted the bid, and the time of bid submission.

For each column, you may filter the table by entering a value in the input field at the top of the column. You may also re-sort the table by clicking on a column header to sort by the values in that column in ascending order. Clicking on the column header a second time re-sorts by the values in that column in descending order.

[17] A bid may have been submitted by you during the round, by another authorized bidder for the bidder, by a telephonic bid assistant entering bids on the bidder's behalf during the round, or by the system when the round closes if the bidder had missing bids.

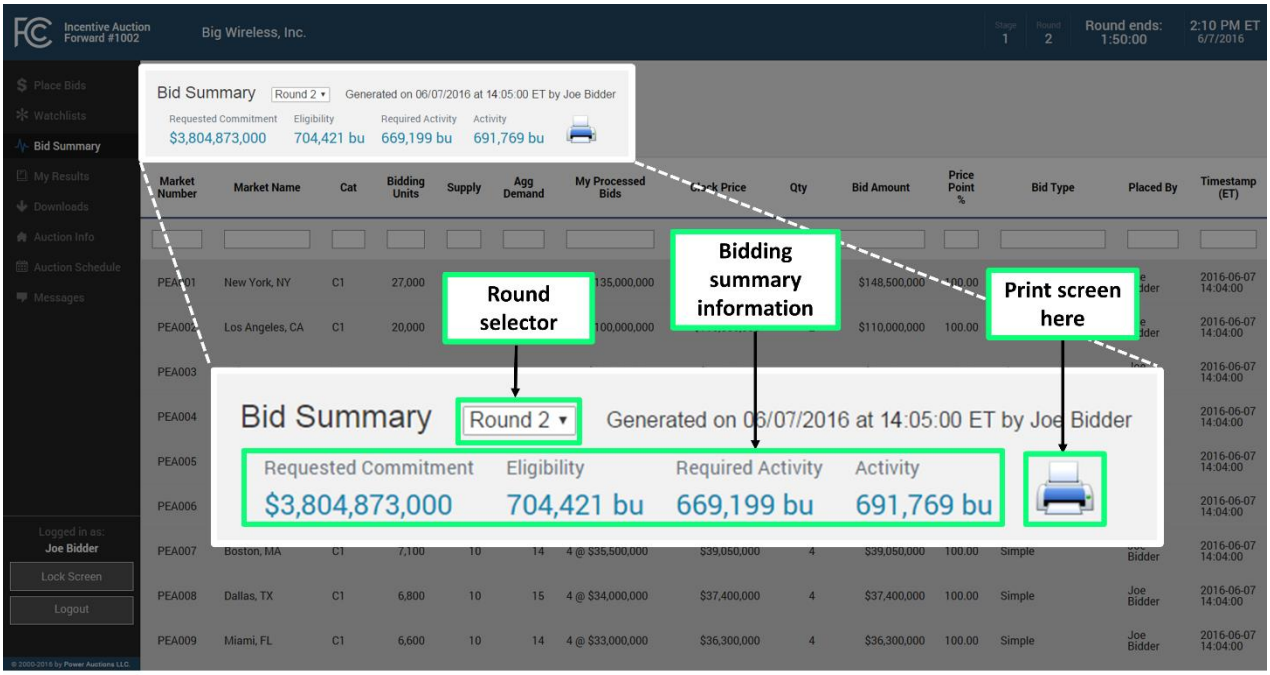
Figure 48: Basic layout of the Bid Summary screen



At the top of the Bid Summary screen is information regarding the requested commitment, eligibility, and submitted activity for the bidder in that round, again similar to the information on the Place Bids screen (see Figure 49). Unlike the information displayed on the Place Bids screen however, if you have selected a previous round on the Bid Summary screen, this information will display historical values relating to that round.

If the bidder is bidding with a bidding credit, the requested commitment reflects the net commitment, subject to any discounts and bidding credit discount caps. You may additionally view the gross requested commitment, the bidding credit discount (capped and uncapped), and if applicable, the uncapped discount for small markets by clicking on the magnifying glass icon (🔍) next to the requested net commitment.

Figure 49: Additional information and actions on Bid Summary screen



You may select previous rounds on the Bid Summary screen by selecting the round number from the round drop-down menu, located at the top of the screen.

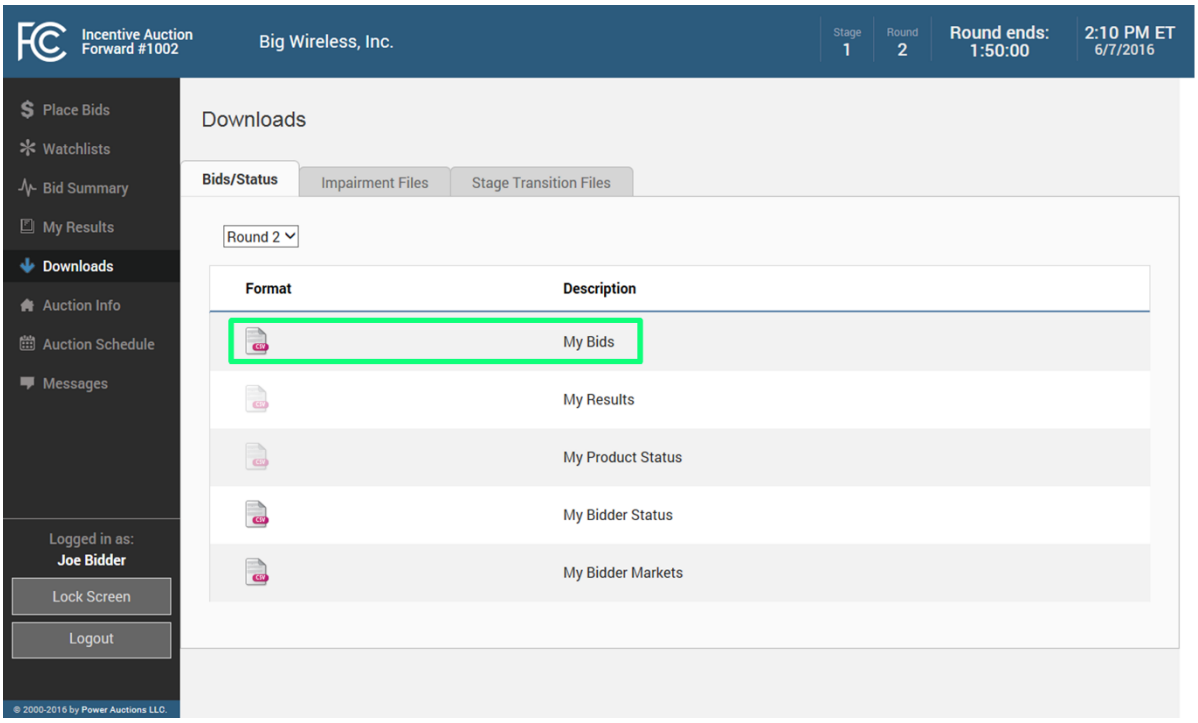
For the current round, if you have saved but not submitted bids the system displays a warning message about your missing bids at the top of the Bid Summary screen. Similarly, if you had saved bids that were not submitted in a previous round, the system displays only the summary of submitted bids in addition to a warning that there were bids that were not submitted.

At all times you may print a record of submitted bids in a round by clicking on the printer icon on the Bid Summary screen.

8.2. My Bids

You may also verify the bids that have been submitted via the My Bids download file, which can be downloaded from the Bids/Status tab on the Downloads screen. The My Bids download provides up-to-date information about bids submitted during the round and can be accessed at any time after the initial round opens (see Figure 50). Details about the specifications for downloadable files may be found in the Forward Auction Clock Phase File Formats document located on the Auction 1002 website under the Data tab (available at www.fcc.gov/auctions/1002).

Figure 50. My Bids download



The My Bids file provides a list of all the bids submitted to the Auction System for a bidder in a round, including any bids submitted in an open roundup to the point when the My Bids file is downloaded. The My Bids file contains identical information to the Bid Summary screen (see Section 8.1). Note: the My Bids file only contains the last submitted bid for each product, it does not contain earlier bids that were submitted in the same round for that product but subsequently changed.

9. Viewing Results

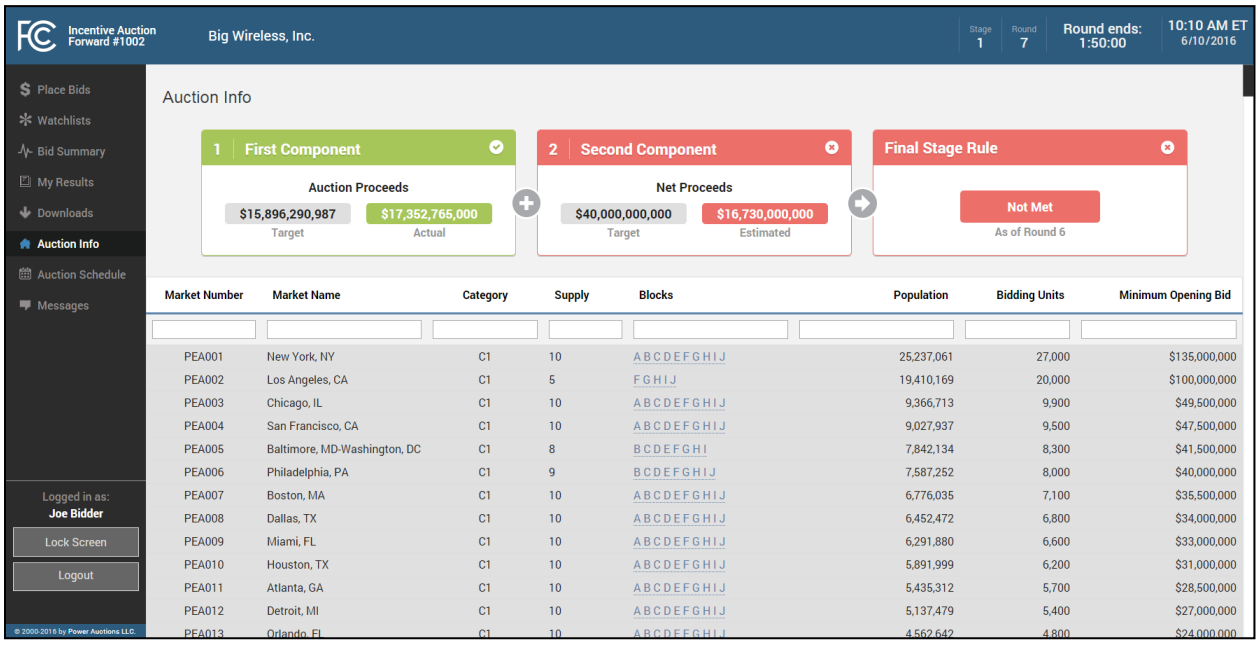
You can view information about results in several places: overall auction results are available on the Auction Info screen and separately in the Public Reporting System (PRS), whereas results specific to a bidder are available on the My Results screen and are downloadable on the Downloads screen.

9.1. Auction Results

Information about the overall results of the forward auction are available to bidders as well as the general public on the PRS. Details about the PRS are available in the Public Reporting System User Guide located on the Auction 1002 website (www.fcc.gov/auctions/1002) under the Education tab, and the PRS can be accessed by the public at https://auctiondata.fcc.gov/.

After the results from the initial round have been posted, the system provides information about how close the auction is to meeting the Final Stage Rule (FSR) via the FSR status indicator. The FSR status indicator is displayed on both the PRS Incentive Auction Dashboard screen as well as at the top of the Auction Info screen within the Auction System (see Figure 51). The numbers within the FSR status indicator are updated after results for each round are posted. For further details about the status indicator, please see Section 2.2 of the Public Reporting System User Guide.

Figure 51: Final stage rule when "Licensed Spectrum" target greater than 70 MHz



9.2. Bidder Results

You may view the results of bid processing for your bidder via the My Results screen. Only products for which a bid was submitted in the round and/or for which the bidder had processed demand in the

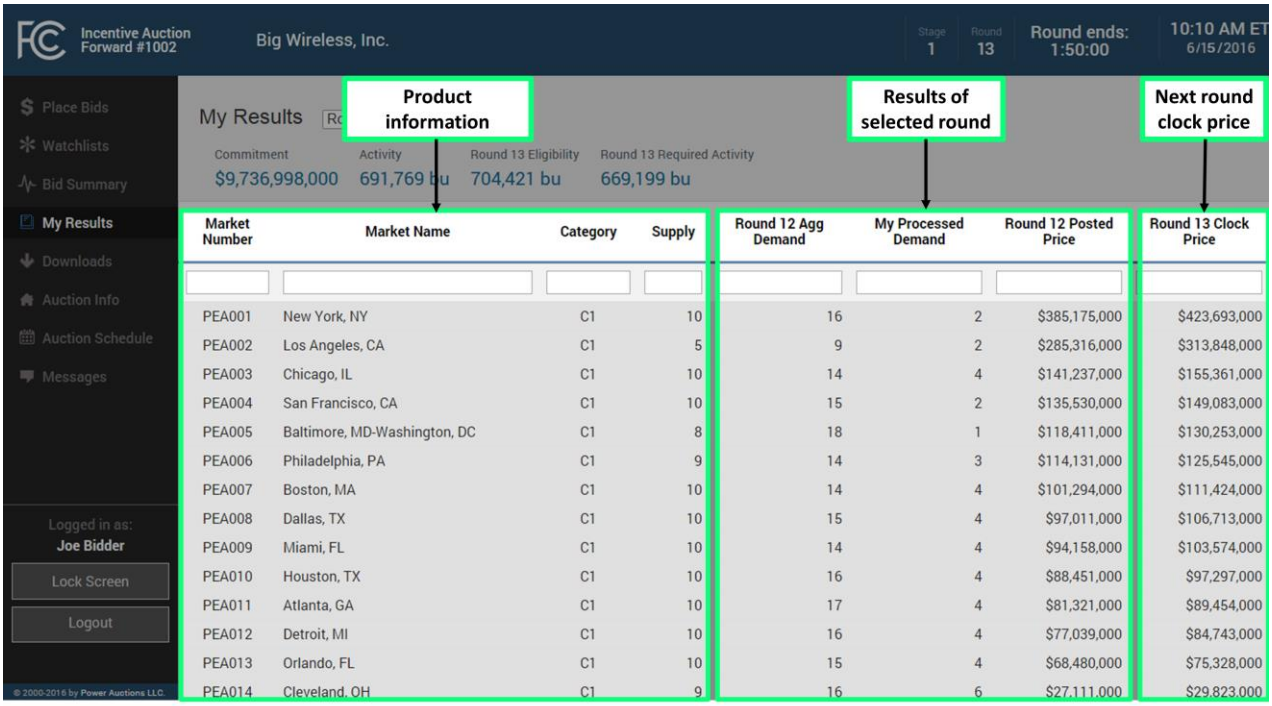
previous round are displayed on the My Results screen. You may also download information about these results on the Downloads screen. For details on bid processing, see Appendix 5: Bid Processing.

9.2.1. My Results screen

After results for a round have been posted, you may view the results of bids that were submitted in the round on the My Results screen, including results from past rounds. This screen displays information for all products for which the bidder had processed demand, as well as for which the bidder submitted bids in the previous round.

The basic layout of this screen is shown in Figure 52 below, and displays information similar to the Bid Summary screen. The first four columns provide information about each product, specifically, its market number and name, license category, and supply. The next three columns provide information about the product's aggregate demand, specifically, the bidder's processed demand, and the posted price of the product. Next round clock prices are displayed in the last column once the information for the next round has been updated in the system (usually at the same time or very soon after the results have been posted).

Figure 52: Basic layout of the My Results screen



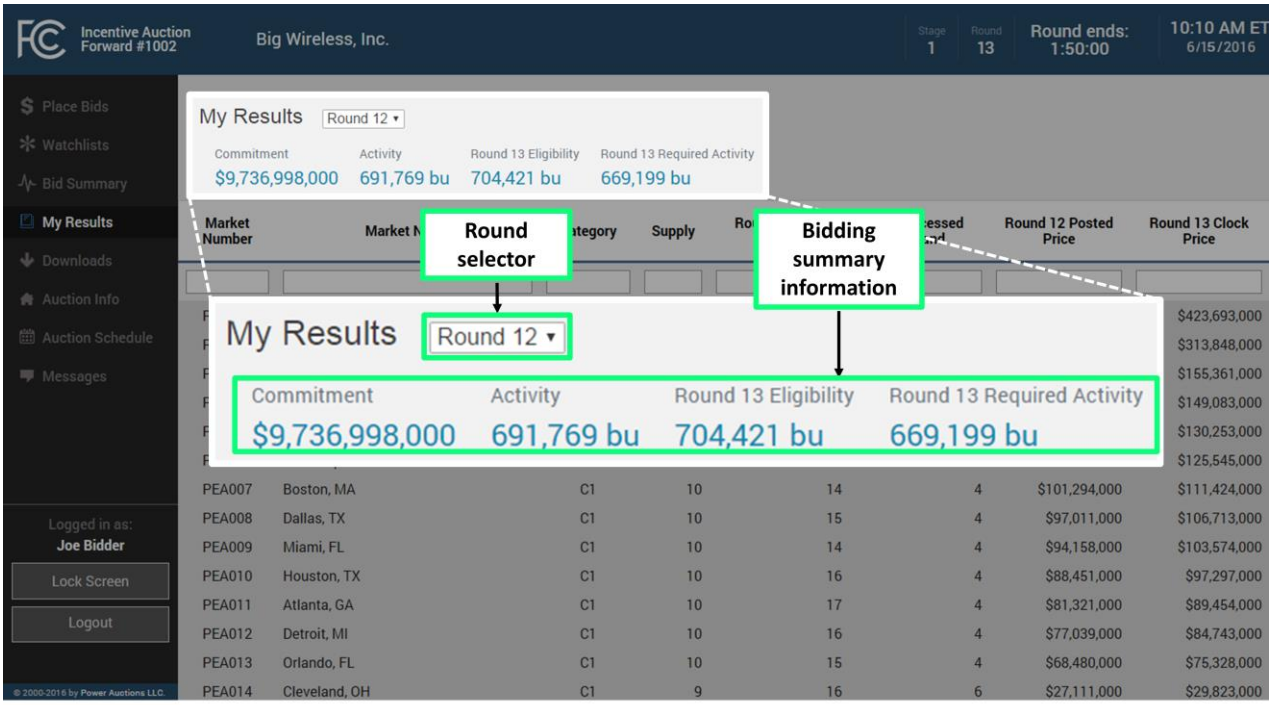
For each column, you may filter the table by entering a value in the input field at the top of the column. You may also re-sort the table by clicking on a column header to sort by the values in that column in ascending order. Clicking on the column header a second time re-sorts by the values in that column in descending order.

At the top of the My Results screen is information regarding the processed commitment and processed activity for that round, and the bidder's eligibility and activity requirement in the next round (see Figure 53). Like the Bid Summary screen, if you have selected a previous round on the My Results screen, this information will display historical values relating to that round.

If the bidder is bidding with a bidding credit, the requested commitment reflects the net commitment, subject to any discounts and bidding credit discount caps. You may additionally view the gross requested commitment, the bidding credit discount (capped and uncapped), and if applicable, the uncapped discount for small markets by clicking on the magnifying glass icon (🔍) next to the requested net commitment.[18]

You may also select previous rounds on the My Results screen by selecting the round number from the round drop-down menu, located at the top of the screen.

Figure 53: Summary bar for bidders



If the auction moves into a new stage, the My Results screen displays the bidder's eligibility for the next stage as well as the bidder's processed demand for each product at the end of the stage that just completed. These will generally be the bidder's processed demands at the beginning of the next stage,

[18] The My Results screen has a similar appearance to the Place Bids and Bid Summary screens; however, you should note that the numbers displayed on the summary bar on the My Results screen for a given round may be different from the numbers displayed on the Place Bids and Bid Summary screens for the same round. The My Results screen shows the results of processed demand rather than the requested demand.

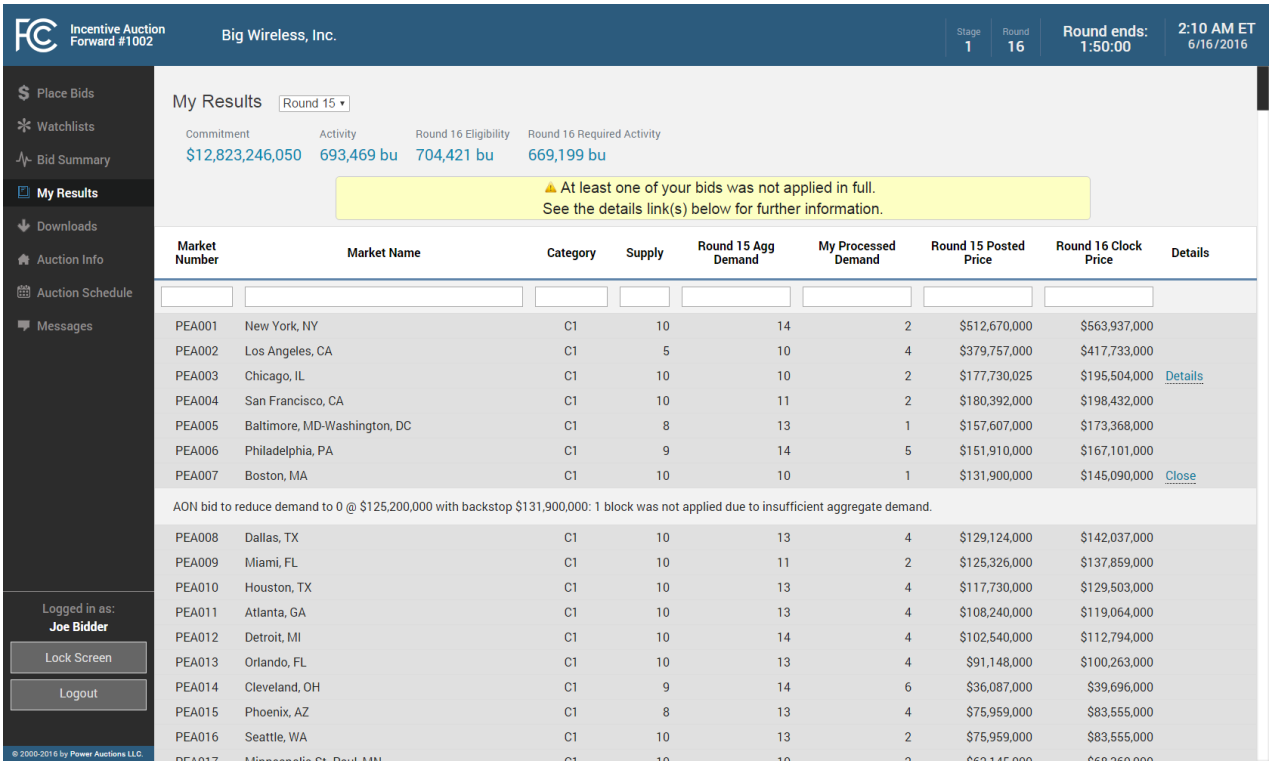
unless the bidder's demand for some products is capped due to the supply in the new stage.[19] The My Results screen displays the posted prices for the last round of this stage. These will be the opening round prices for the first round of the next stage.

9.2.1.1. Messages and Details

Bidders should note that if any of its bids were not fully applied, or, if for some products the posted prices of the previous round are lower than the previous round's clock prices, the commitment and activity displayed on the My Results screen may differ from the requested commitment and submitted activity displayed on the last round's Bid Summary screen.

If a bidder has one or more bids that were not fully applied, the My Results screen contains a message at the top of the page and a link appears in the Details column with more information about the bids for the product that was not applied in full (see Figure 54). The Details column only appears when there are details about the bid processing for one or more product.

Figure 54: Details message for partially applied bids on the My Results screen



Particular events (such as the spectrum reserve split, an extended round, or meeting the final stage rule) may create special detail messages. For example, the system provides detail messages on the My Results screen if a bidder's processed demand was capped because the supply for a product has

[19] To identify any products with quantities that have been capped, view the My Stage Transition Report (Section 9.2.2.2.) at the beginning of the next stage.

changed, as may occur in the first round after the spectrum reserve split (see Section 7.3.6) or in the first round of a subsequent stage (see Section 7.3.7). Similarly, the system provides details if a submitted bid was not applied, as may be the case for bids submitted during an extended round if the final stage rule was not met.

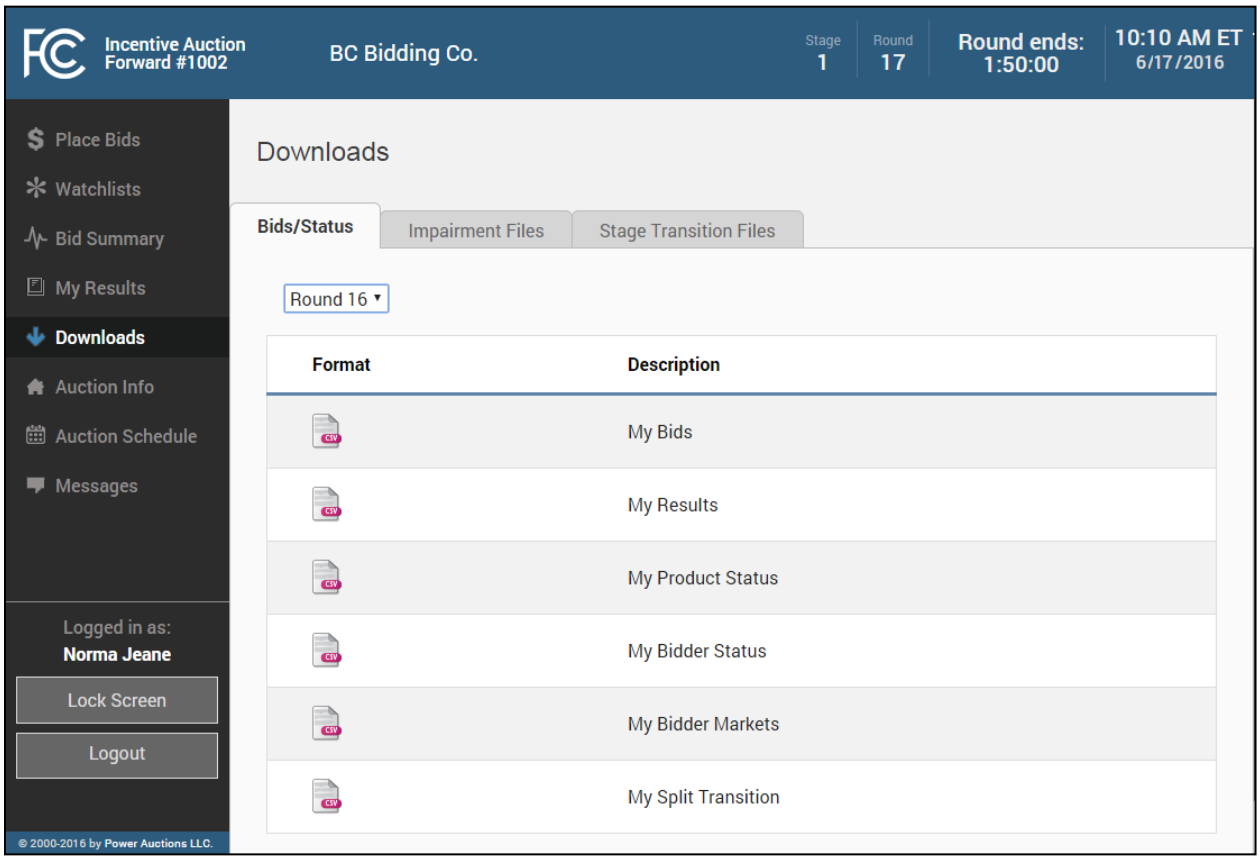
9.2.2. Downloadable Results

You can also download a number of different files containing results on the Downloads screen. Full details about the specifications for downloadable files may be found in the Forward Auction Clock Phase File Formats document located on the Auction 1002 website under the Data tab (available at www.fcc.gov/auctions/1002).

9.2.2.1. Bids/Status

You may view the results of a round via several files, which can be downloaded from the Bids/Status tab on the Downloads screen: My Results, My Products Status, and My Bidder Status (see Figure 55). For the round after the spectrum reserve split, you may additionally download the My Split Transition file from this screen. If a file is not yet available for the round, it will be grayed out and cannot be downloaded.

Figure 55: Downloads screen - Bids/Status



The My Results file provides a list of the results of bid processing for a bidder in a given round for all products for which the bidder had processed demand in the previous round and for all products on which a bid was submitted in the round. For each product, the file gives the processed demand, posted price and the aggregate demand. Additionally, if a bid was not fully applied, the file provides an indication of such and details about why one or more bids for the product were not applied. The information contained in the My Results file mirrors the information contained on the My Results screen (see Section 9.2.1 for details about the My Results screen).

The My Product Status file provides the status of each product after bid processing in a round. For each product the file gives the posted price, aggregate demand and the clock price in the next round. Additionally the file provides supporting information about each product in that round such as the round opening price and clock price, the supply, bidding units, and population.

The My Bidder Status file lists the bidder's eligibility, required activity and submitted activity in the round. The results of bid processing are also given for the round including the bidder's processed activity as well as the bidder's eligibility and required activity for the next round. Financial information for both a bidder's requested commitments and its processed commitments are also given.

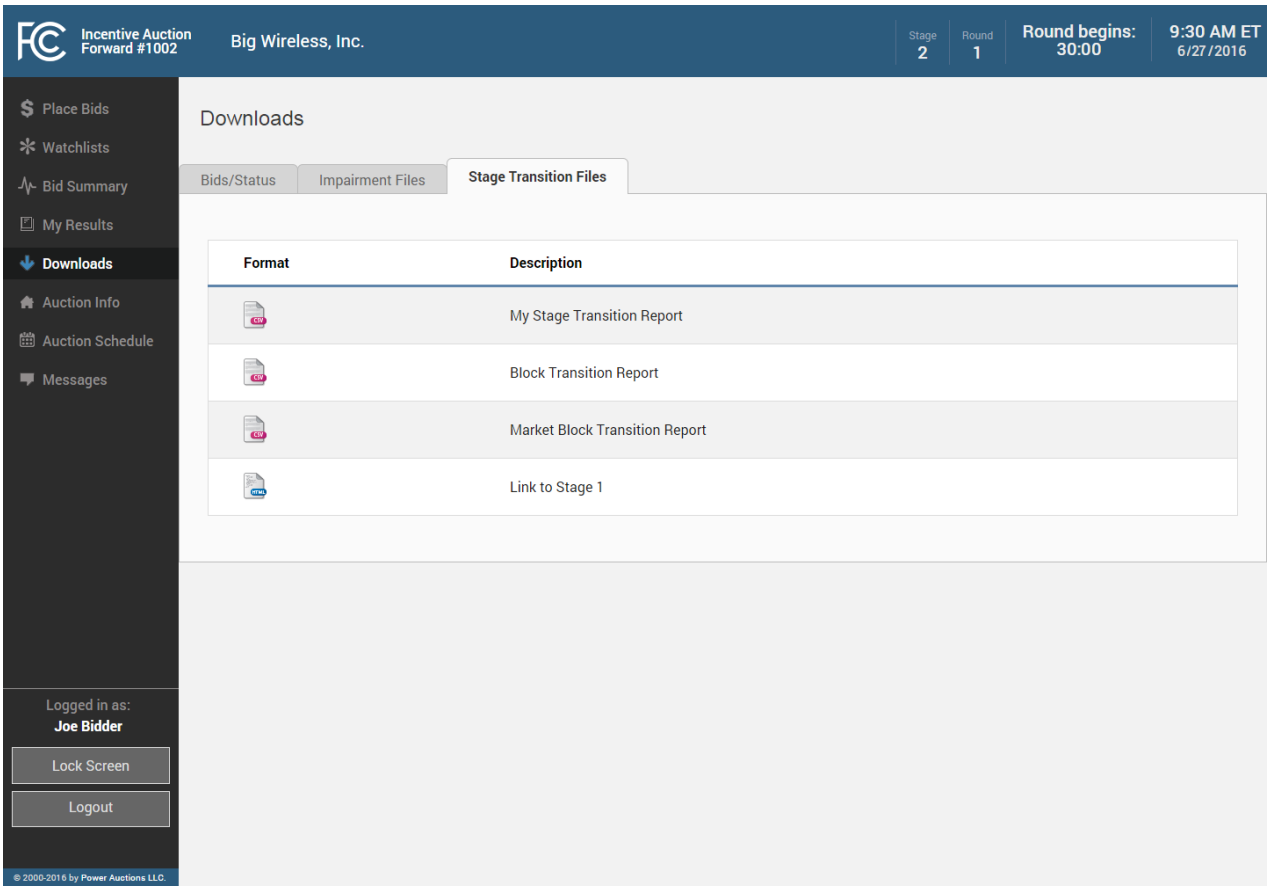
The My Split Transition file provides a bidder with information about the supply of products before and after implementation of the spectrum reserve—i.e., the split of Category 1 blocks into reserved and unreserved blocks by PEA—as well as information about how the bidder's demand for those products was allocated during the split. The Bids/Status tab also includes the My Bidder Market file which is a static file of the products that the bidder is authorized to bid on during the auction based on the PEAs selected on its Form 175 application. The file also indicates whether the bidder has certified it is eligible to bid on reserve spectrum in that PEA.

The My Bids file, also provided on this tab, is discussed earlier in Section 8.2.

9.2.2.2. Stage Transition Files

In a subsequent stage of the auction, you may view the results of a stage transition before the forward auction in the new stage begins via several files. These files can be downloaded from the Stage Transition Files tab on the Downloads screen and include: My Stage Transition, Block Transition, and Market Block Transition (see Figure 56). The Stage Transition Files tab also contains the URL for any previous stage, should you wish to view your bids and results for a previous stage.

Figure 56: Downloads screen— Stage Transition Files



The My Stage Transition file provides a bidder with information about the change in aggregate demand and supply of products from the previous stage after the auction transitions to a new stage. The file also provides a bidder with information about any change in its processed demand for those products.

The Block Transition file provides a bidder with information about the change in blocks from the previous stage after the auction transitions to a new stage. The block letter and associated frequencies for the band plan from the previous stage and the current stage are listed.

The Market-Block Transition file provides a bidder with information about the change in overall impairment levels from the previous stage in each block of each PEA after the auction transitions to a new stage. The percent of impairment for each PEA-block combination from the previous stage and the current stage are listed.

Appendix 1: System Troubleshooting

If you continue to experience problems after following the troubleshooting instructions, please call Technical Support at (877) 480-3201, option nine; (202) 414-1250; or (202) 414-1255 (TTY) (8:00 AM – 6:00 PM ET on business days).

Situation 1: Page cannot be displayed error message on first access

Figure 57: Internet Explorer connection error message

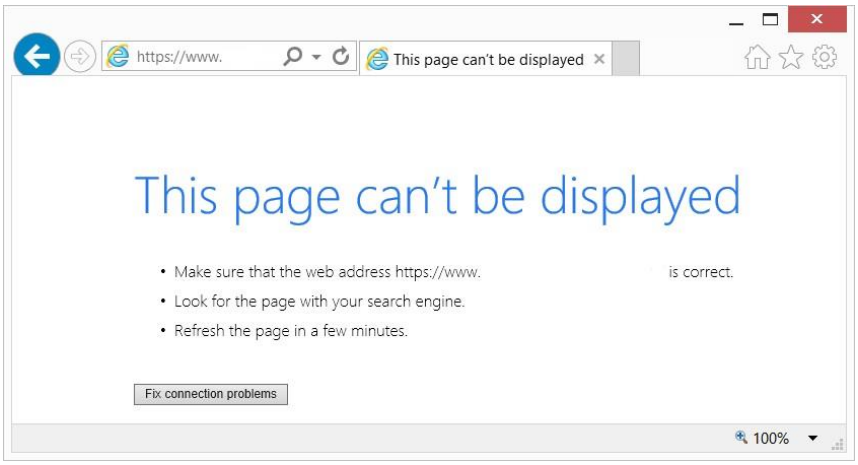


Figure 58: Internet Explorer error message when TLS 1.1 is disabled

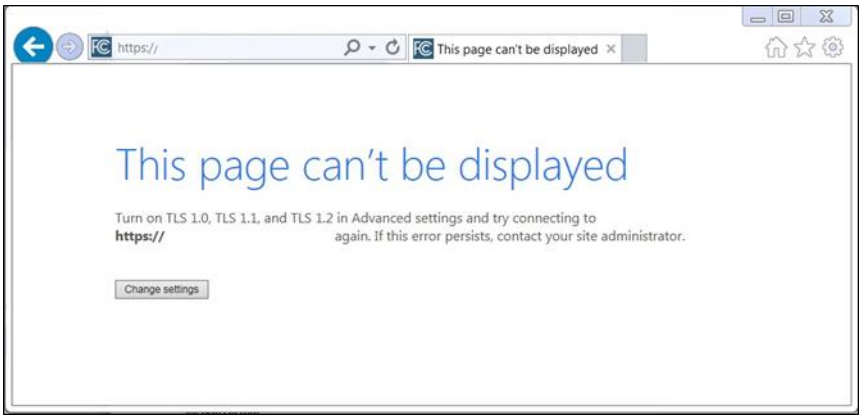
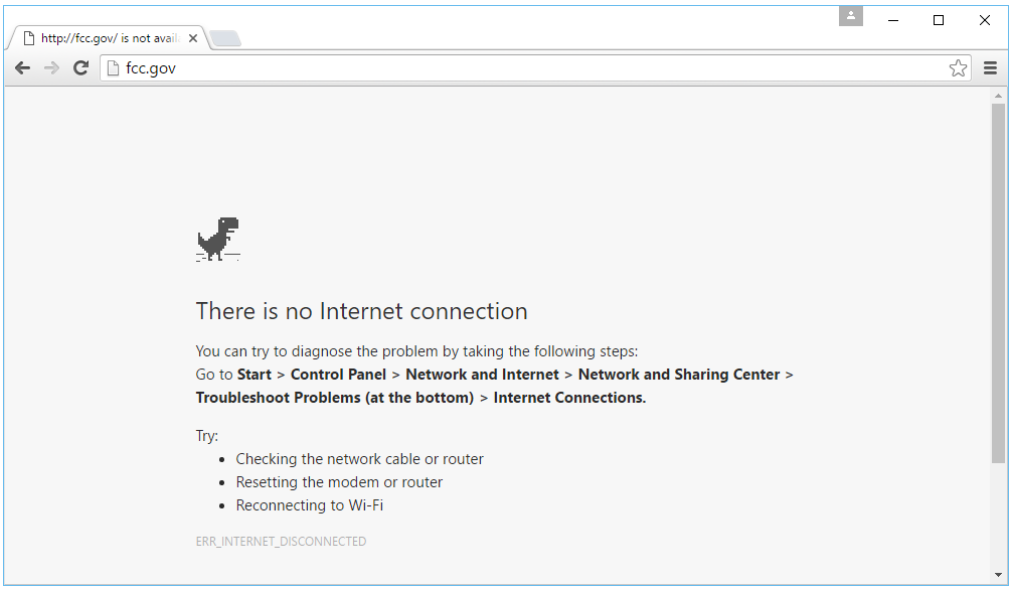


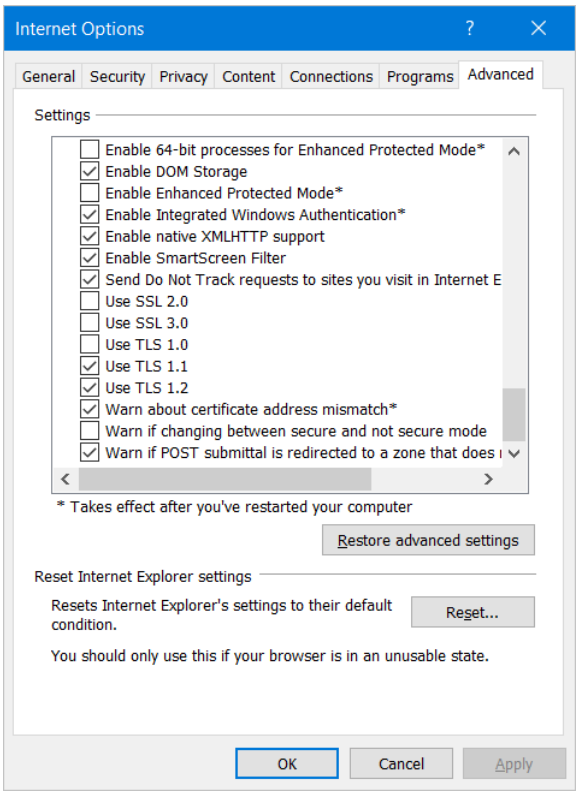
Figure 59: Google Chrome connection error message



If any of the screens shown above appear, complete the following steps:

- Confirm that the computer has external Internet access. Try to access a common site on the Internet such as www.google.com. If this is unsuccessful, the computer does not have external Internet access.
- Confirm that the URL for the Auction System is correct.
- Confirm that your organization has not blocked access to the site. Your organization may only allow you to access certain external web sites. Check with your IT department.
- You may not have selected the "OK" button when the message appeared stating that you are about to enter a secure site. Re-start the browser and try again ensuring you click on the "OK" button.
- Confirm that you are using the correct browser version (see system requirements in Section 3.1) by performing the following steps:
- Internet Explorer: First, click on the tools icon which can be found in the top right-hand corner of your browser). Then click "About Internet Explorer."
    - Chrome: First, click on the icon (which can be found in the top right-hand corner of your browser). Then click "Help" followed by "About Google Chrome."
- Confirm that TLS has been enabled on your browser.
    - Internet Explorer: this is done by clicking on the "Tools" menu and then "Internet Options" and then clicking on the "Advanced" tab. The following options must be ticked: "Use TLS 1.1" and "Use TLS 1.2." This is shown in Figure 60.
    - Chrome supports TLS 1.1 and TLS 1.2 by default. No changes are required.
- Confirm that your corporate firewall accepts TLS.

Figure 60: TLS settings for Internet Explorer



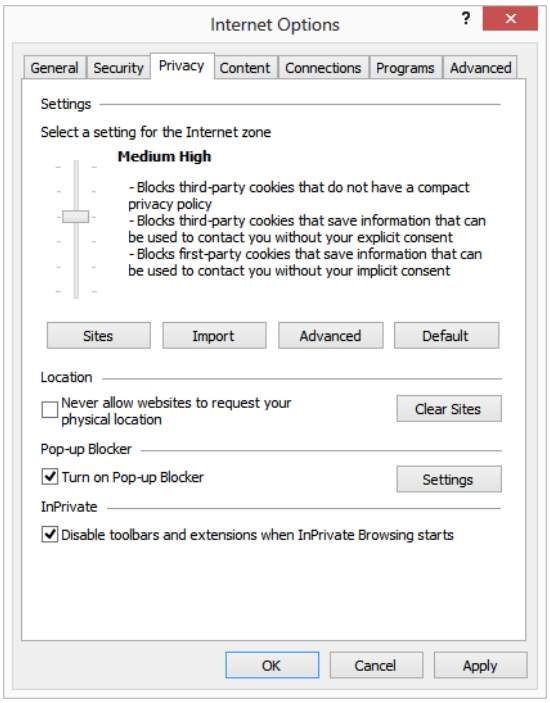
Situation 2: Cookies must be enabled error message

The Auction System requires that cookies are enabled on your browser. If cookies are disabled, you will see a message stating that cookies should be enabled.

To enable cookies in Internet Explorer, complete the following steps:

- Click on the tools icon in the top right-hand corner of your browser, "Internet Options."
  - Click on the "Privacy" tab of the "Internet Options" box that appears; and
  - Change privacy setting to "Medium High" or lower, as shown in Figure 61. Click on "OK."
  - Restart your browser.

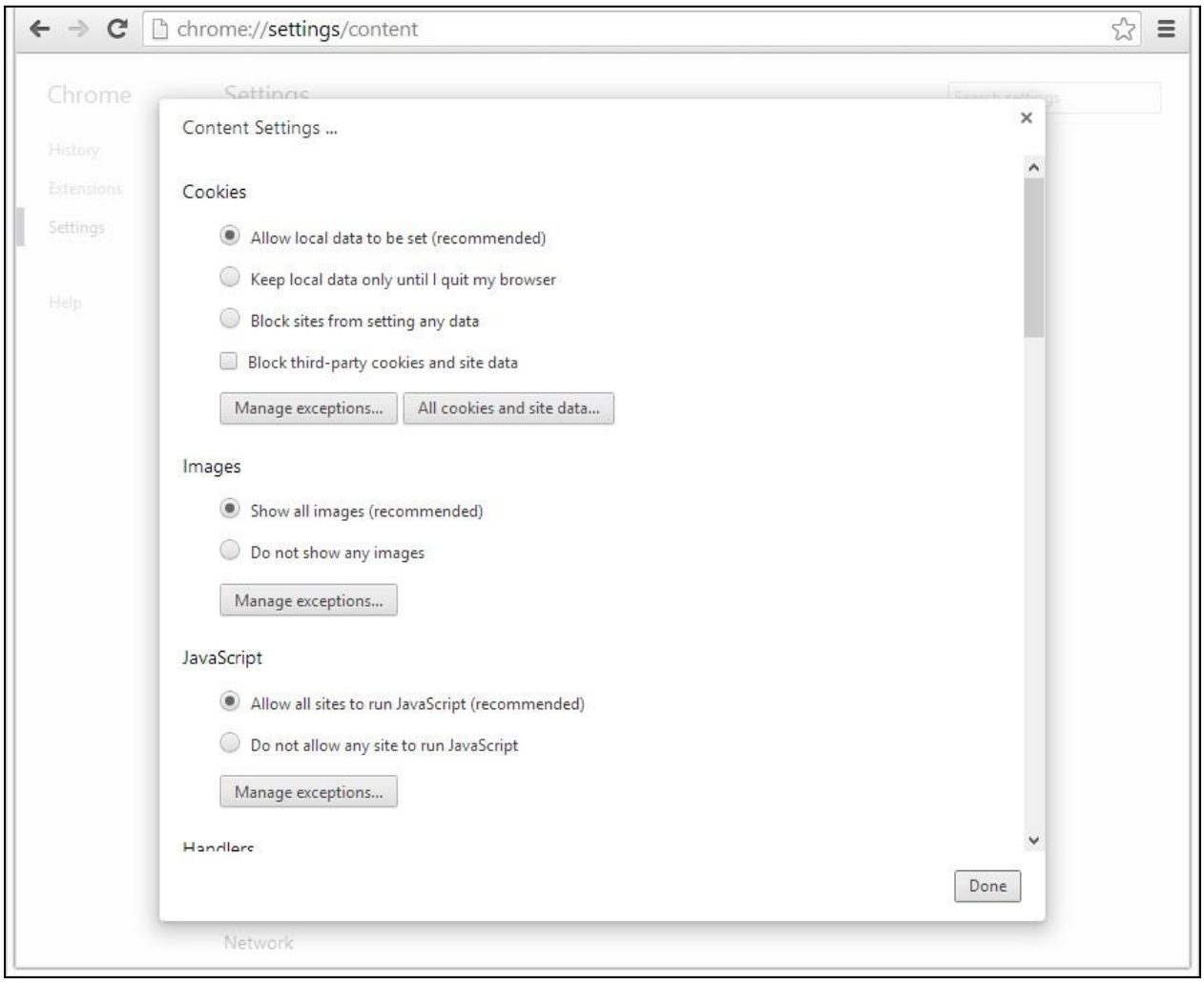
Figure 61: Enabling cookies in Internet Explorer



To enable cookies in Chrome, complete the following steps:

- Click on the tools icon in the top right-hand corner of your browser
  - Click on “Settings” followed by the “Show advanced settings” link at the bottom of the “Settings” tab that appears.
  - In the “”Privacy” section, click on the “Content Settings…” button to display a screen similar to that shown in Figure 62.
  - Select the radio box “Allow local data to be set (recommended)” as shown in Figure 62.
  - Click on “Done” to save the settings, and close the “Settings” tab.

Figure 62: Enabling cookies and JavaScript in Chrome



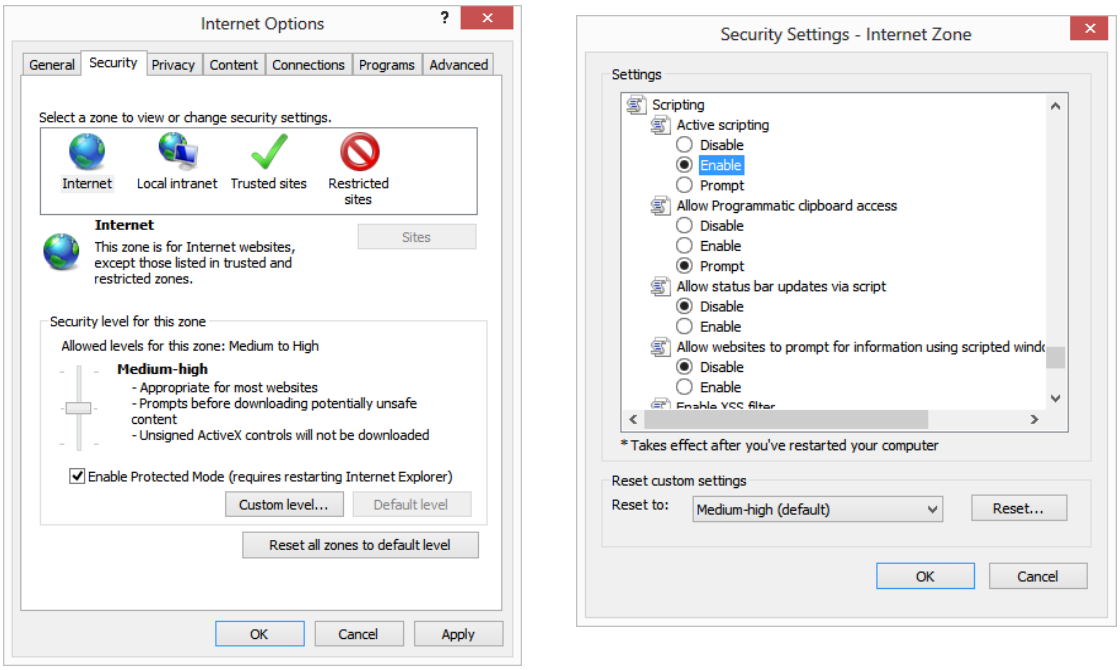
Situation 3: JavaScript must be enabled error message

The Auction System requires that JavaScript is enabled on the browser used. If JavaScript is disabled, there will be a message stating that "JavaScript in this browser is not enabled or is not working."

To enable JavaScript in Internet Explorer, either set the computer security level to its default or manually enable "Active Scripting" as described below.

- Click on the tools icon in the top right-hand corner of your browser. Click on the "Security" tab of the "Internet Options" box that appears.
- Either click on the "Default Level" button (which will return your security settings to "Medium-high" as shown in Figure 63) or click on the "Custom Level …" button and click on "Enable" for "Active Scripting' as shown in Figure 63.
- Click on "OK," and "OK" again if necessary.

Figure 63: Enabling JavaScript in Internet Explorer



To enable JavaScript in Chrome, carry out the following steps:

- Click on the tools icon in the top right-hand corner of your browser, then "Settings," then "Show advanced settings" which appears as a link at the bottom of the "Settings" tab.
- In the "Privacy" section, click on the "Content Settings…" button.
- Select the radio-box "Allow all sites to run JavaScript (recommended)" (see Figure 62). Click on "Done" to save the settings, and close the "Settings" tab. Click "OK."

Situation 4: Page cannot be displayed error message when navigating to new screen

If you have been using the Auction System successfully and "page cannot be displayed" appears when you click on a link or a button, then complete the following steps:

- Click on the Refresh/Reload button to reload the page.
    - If that is successful, please verify any actions that you were taking when the message was displayed. If you were in the middle of placing a bid, those changes will have been lost, and you will need to select and resubmit that bid. All submitted bids that had the green check mark will remain unaffected.
- Re-navigate to the Auction System URL and, if prompted, log in again.
- If that is successful, please verify any actions that you were taking, as discussed above.
- Your internet connection may have gone down. Confirm that your computer has external Internet access. Try to access a common site on the internet such as www.google.com. If this is unsuccessful, the computer does not have external internet access.

- The Auction System may be down. To confirm whether the Auction System is down, first confirm that you have internet access and then attempt to access the home page (see Section 3.2). If you are unable to view this page, or the page states that the Auction System is unavailable, then the Auction System may be down. Check to see whether you have received an email from the FCC indicating that the system is unavailable. The FCC will inform you when the Auction System is expected to be available again.

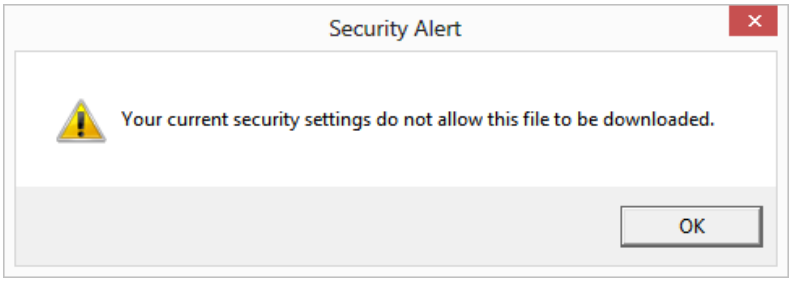
Situation 5: Page has expired error message when back button is clicked

Do not use the browser's back button to access a previous screen. To move between screens, use the links and buttons in the Auction System.

Situation 6: Security settings do not allow you to download error message

If Internet Explorer does not allow a file to be downloaded from the Auction System and displays the message shown in Figure 64, it is because downloads have been disabled in your browser.

Figure 64: Security message in Internet Explorer

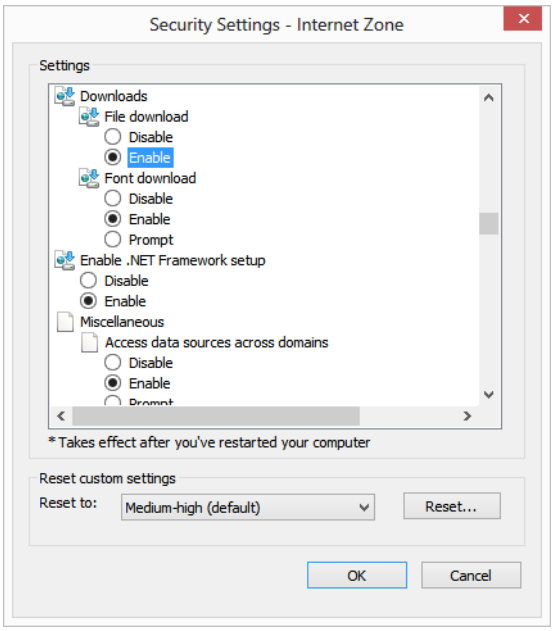


To re-enable downloads in Internet Explorer:

- Click on the tools icon in the top right-hand corner of your browser and click on the "Security" tab of the "Internet Options" box that appears.
- There are two ways to proceed:
  - Click on the "Default Level" button (which will return your security settings to "Medium-High" as shown in Figure 63 above, OR
  - Click on the "Custom Level…" button and click on "Enable" for "File Download" as shown in Figure 65.
- Click on "OK," and "OK" again if necessary.

If you cannot change these settings in your browser, please check with your IT department or systems administrator. User access to these settings may have been disabled for security purposes, in which case you will need to have these settings changed.

Figure 65: Enabling downloads in Internet Explorer



Situation 7: Computer or web browser crashes

If the browser crashes or the computer freezes, it is recommended that you reboot the machine (or use a different machine) to access the Auction System.

Please review any actions that you were taking when the computer crashed. If you were in the middle of submitting a bid, those changes will have been lost, and you will need to select and resubmit that bid. All submitted bids that had the green check mark will remain unaffected.

If the computer crashes while you are using the Auction System, you may access the Auction System using a different computer. When a user logs in to a second computer, whether the user has logged out of the first computer or not, the second login will automatically cause the user to be logged out of the first computer.

Situation 8: Certificate error message

If you access the Auction System and see a security message similar to that shown in Figure 66 (for Internet Explorer) or Figure 67 (for Google Chrome), you should not proceed. Please call Technical Support.

Figure 66: Certificate security error message in Internet Explorer

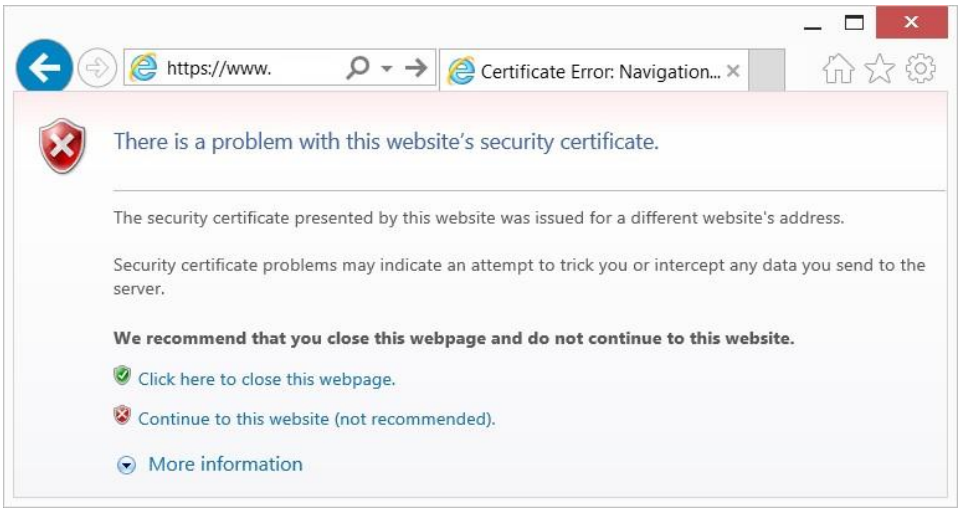
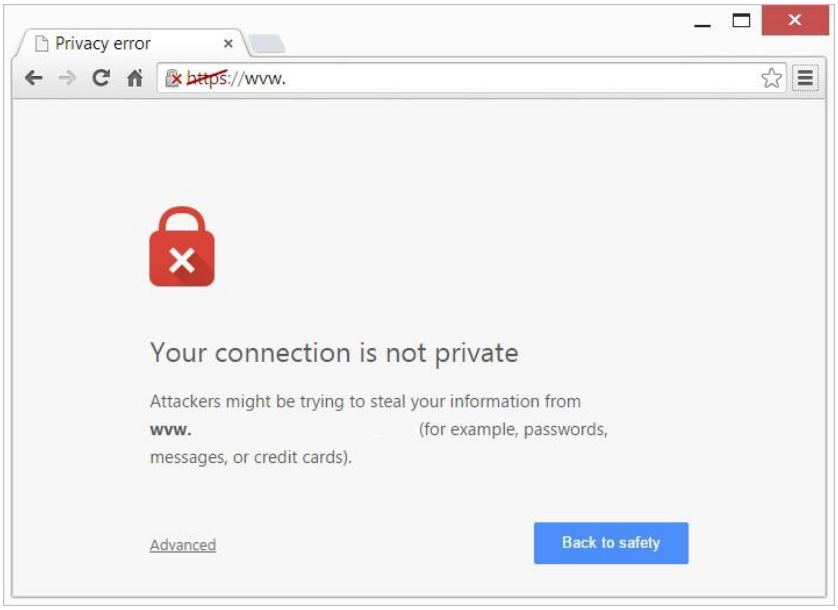


Figure 67: Certificate security error message in Google Chrome



Appendix 2: RSA SecurID® Token Information

For additional assistance with lost or damaged RSA tokens and for questions about changing a user (i.e. authorized bidder), the person who has been designated as the contact person, or the certifying official on the bidder's FCC Form 175 application (designated person), should call the Auction Bidder Line telephone number provided with your registration materials.

1. Number of RSA Tokens Issued and Extra RSA Tokens

Each qualified bidder is issued either two or three RSA tokens depending upon the number of authorized bidders it identified on its Form 175. A bidder with three authorized bidders is issued three RSA tokens. A bidder with two authorized bidders is issued two RSA tokens for its authorized bidders PLUS one extra RSA token. A bidder with one authorized bidder is issued one RSA token for its authorized bidder PLUS one extra RSA token. Each bidder is permitted to identify up to three authorized bidders on its Form 175.

> ✍ *Bidders cannot use the extra RSA token unless they contact the FCC to activate the extra RSA token for a specific user.*

Each RSA token is associated with a specific authorized bidder. RSA tokens are not interchangeable among authorized bidders. The FCC must reassign the token in the RSA server for the token to become functional.

2. Replacing Lost or Damaged RSA Tokens

In the event that an RSA token is lost or damaged, a bidder's designated person should call the Auction Bidder Line telephone number provided with the registration materials for assistance.

3. Change of User (Authorized Bidder)

A qualified bidder may change or replace its authorized bidders. For more information on changing the authorized bidder assigned to an RSA token, a qualified bidder's designated person should call the telephone number provided with the registration materials.

Appendix 3: Glossary of Terms

Term	Definition/Notes
Activity	Bidding activity is the total number of bidding units associated with a bidder's demands. During a bidding round, and before the bids from the round are processed, the submitted activity on the Place Bids screen and the activity on the Bid Summary screen show an estimate of activity that assumes all the bids submitted so far in the round are applied during bid processing. After the bids of a round have been processed, activity in My Results shows the total number of bidding units associated with the bidder's processed demands for the round ("processed activity").
Activity requirement	A requirement that the activity associated with a bidder's processed demand (in bidding units) be at least a certain percentage (e.g., 95%) of its bidding eligibility for the round.
Aggregate demand	The sum of processed demands by all bidders for a given product.
All-or-nothing bid (AON bid)	Indicates a desired quantity of blocks, a difference of two or more from the processed demand, at a specified price for which the bidder does not want a partial quantity if the system cannot fully apply the bid (in contrast, for example, to a simple bid.)
All-or-nothing bid with backstopping (AON+ bid)	An all-or-nothing bid coupled with a price, higher than the AON bid price, at which the bidder wants the quantity specified in the AON bid to be applied partially if possible.
Bidding credit	A bidding credit represents a discount on a winning bidder's bids. Bidders that qualify for a rural service provider bidding credit receive a 15% discount percentage. Bidders that qualify for a small business bidding credit receive either a 15% or 25% discount percentage. The total amounts of bidding credit discounts are capped. See bidding credit discount caps.
Bidding credit discount caps	The total amount of an eligible bidder's rural service provider bidding credit discount will be capped at $10 million. The total amount of an eligible bidder's small business bidding credit discount will be capped at $150 million. Of that, the small business bidding credit discount will be capped at $10 million for bids on blocks in small markets.

Term	Definition/Notes
Bidding unit	Unit used for calculating minimum opening bid prices and upfront payments, and for measuring activity and eligibility during the clock phase. All products in a PEA are assigned the same number of bidding units. This number does not change during the auction.
Category 1 (C1)	Licenses with impairment percentage less than or equal to 15%. When the spectrum reserve is implemented, Category 1 is split into two categories: reserved category 1 (C1-R) and unreserved category 1 (C1-U).
Category 2 (C2)	Licenses with impairment percentage greater than 15% and less than or equal to 50%.
Clearing target	Amount of spectrum in megahertz to be cleared in a stage.
Clock price	The maximum price at which a bidder can place a bid in the round.
Clock round	A time period during which bidders may submit bids for products in the clock phase of the auction.
Commitment	The sum of the bidder's processed demands for each product multiplied by the product's posted prices, for the round.
Eligibility	The maximum number of bidding units that a bidder may bid for in the round. For the first round of Stage 1, this depends on a bidder's upfront payment. For every other round, a bidder's eligibility depends on the activity associated with its processed demand after bid processing of the previous round and the activity requirement.
Extended round	A special round implemented if aggregate demand does not exceed supply for C1 products in the 40 high-demand PEAs when the final stage rule is within a 20% increment of being met but has not yet been met. During the extended round, bidders with processed demand for extended round products may bid to meet the final stage rule so as to avoid the need to move to another stage of the auction with fewer available spectrum blocks.

Term	Definition/Notes
Extended round products	C1 products in the 40 high-demand PEAs for which aggregate demand is equal to supply at the time that the extended round is triggered. If there are any C1 products in high-demand PEAs for which aggregate demand is strictly less than supply, those products will not be included for bidding in the extended round. An extended round is not triggered unless the aggregate demand is less than or equal to supply for every C1 product in a high-demand PEA.
Final stage rule	Reserve price conditions for the incentive auction which, when met, will determine that bidding in the incentive auction will end in the current stage, at the current clearing target.
Impairment percentage	The percentage of the population covered by a specific spectrum license (a particular block in a PEA) potentially subject to inter-service interference from television operations in the 600 MHz Band.
Initial round	Round 1 of Stage 1. The time period during which bidders may submit bids for products at the minimum opening bid prices.
Intra-round bid	A bid that indicates a change in demand from the bidder's processed demand at a price greater than or equal to the last round's posted price and less than the current round's clock price. Intra-round bids are processed in ascending order of price points, but are entered and displayed in dollars.
Licensed spectrum	The amount of spectrum in most PEAs that is offered for bidding in the forward auction of a stage. For example, a clearing target of 126 MHz corresponds to licensed spectrum of 100 MHz, or 10 paired blocks.
Minimum opening bids	The opening prices for products in the forward auction. In the initial round, a bidder bids for a quantity of blocks at these prices.
Missing bid	If a bidder fails to submit a bid for a product for which it has processed demand, the Auction System will consider that to be a missing bid, which will be processed as a simple bid request for a quantity of zero at the previous round's posted price. A missing bid will not necessarily reduce the bidder's processed demand to zero after the round. The Auction System will apply as much of the missing bid request as it can, subject to the overall restriction that aggregate demand cannot fall below supply of a given product.

Term	Definition/Notes
Phase	There are two phases in the forward auction: the clock phase and the assignment phase. The clock phase will be followed by the assignment phase in the final stage of the auction.
Posted price	The price for a product after the bids for a round are processed. The posted price for a round becomes the lowest price that can be bid in the next round.
Price point	The price point indicates the percentage of the distance of the bid price between the posted price of the previous round and the clock price of the current round. For example, the 0 percent price point refers to the last round's posted price, the 100 percent price point refers to the clock price, and the 50 percent price point refers to the average of the last round posted price and the clock price of this round. For bid processing, the system converts prices into price points in order to determine the order of processing across all products.
Processed activity	The total number of bidding units associated with the bidder's processed demand after the bid processing of the round.
Processed demand	The bidder's demand for the product after the bid processing of the round.
Product	The pairing of a PEA and a license category. For example, "PEA001-C1" or "PEA001-C1-U".
Regular clock round	A time period during which bidders may submit bids for products, not the initial round (Round 1 of Stage 1) or an extended round.
Requested commitment	The total gross bid amount calculated at the clock price given all bids that the bidder has submitted so far in the round, assuming that all bids are applied during bid processing. During the round, bids for the round have not yet been processed, so the requested commitment is an estimate of a bidder's commitment, which is updated as bids are submitted. This number is calculated and shown to the bidder while the round is open on the Place Bids and Bid Summary screens. After the round closes, the bidder's requested commitment based on all the bids that the bidder submitted during the round continues to be available on the Bid Summary screen.

Term	Definition/Notes
Required activity	The minimum total number of bidding units associated with the bidder's processed demand required to maintain the same bidding eligibility for the next round. This number is calculated before the round starts based on bid processing from the previous round and is shown to the bidder on the My Results screen (before the round starts) and on the Place Bids screen (while the round is open for bidding). The required activity displayed during an extended round does not take into account that the activity requirement will be 100% for extended round products if the final stage rule is not met in the extended round. As a result, it is possible for a bidder's eligibility to be reduced after the extended round even though the bidder's processed activity exceeds the number that was displayed as required activity during the extended round.
Round opening price	This is the minimum price at which a bidder can place a bid in the round. For any round after the initial round, the minimum price is the posted price of the previous round.
Simple bid	The basic bid type used in the forward auction, which specifies a quantity of blocks demanded and a price (by default the clock price). A simple bid to change demand is treated as a request, and if it is not possible to apply the simple bid in its entirety, it may be applied partially. However, with a simple bid to reduce demand, the bidder will never pay more than its specified price for an unreduced quantity.
Small markets	All PEAs with a population of 500,000 or less (PEAs 118-416, excluding PEA 412). Winning bids in these markets are subject to the small market bidding credit discount cap.
Spectrum reserve split	The division of Category 1 products into reserved and unreserved categories (C1-R and C1-U), which occurs when the final stage rule is met.
Stage	A reverse auction and a forward auction conducted for a given clearing target. Stage 1 has the largest clearing target; any subsequent stages are conducted for smaller clearing targets. If the final stage rule is met in the forward auction of a given stage, then that stage is the final stage. The assignment phase follows the clock phase of the forward auction in the final stage.

Term	Definition/Notes
Submitted activity	The total number of bidding units associated with all bids submitted up to that point in the round, assuming that all are applied during bid processing.
Supply	The number of blocks of a product available during a particular stage in the forward auction. The supply of a product varies by stage.
Switch bid	A request to switch demand for a specified number of blocks from one product (the “from” product) to another (the “to” product) within the same PEA. Switch bids may be applied partially, but the increase in demand in the “to” product will always match in quantity the reduction in the “from” product.

Appendix 4: Examples of Bid Types

This appendix provides a high-level explanation of the different bid types. Further details are available in Section 6 of Appendix G to the *Application Procedures PN*.

In the initial round, bidders indicate their initial demands for products at the minimum opening bid price for each product. In subsequent rounds, there is a range of prices for each product for the round.[20] The lowest price in the range, the round opening price, is the posted price from the previous round. The highest price is the clock price.

During the rounds that follow the initial round, the bidder will either maintain its demand for a given product or request to change its demand. The bidder will be able to use one of several bid types to indicate its demands. If the bidder wishes to:

1. Maintain the same demand as the processed demand—for all prices in the round—it will use a Simple bid at the clock price;
2. Specify a different demand *starting at a price* in that product's price range for the round, it may use a Simple bid, an All-or-Nothing (AON) bid, or an All-or-Nothing bid with backstopping (AON+); or
3. Switch blocks from one category of the PEA to a different category of the PEA *starting at a price* in the "from" product's price range, it may use a Switch bid.

The following examples focus on product PEA003-C1, which has a supply of 8 blocks, a processed demand of 4 blocks, and a price range for the current round of $5,000 - $6,000. The second product in the table, PEA003-C2, will only be used for the Switch Bid example.

Product	Supply	Bidder's Processed Demand	Posted Price of previous round	Clock Price of this round
PEA003-C1	8	**4**	$5,000	$6,000
PEA003-C2	2	0	$4,000	$4,800

1. Maintain the same demand as the processed demand—for all prices in the round

If the bidder wants to maintain the same quantity as its processed demand at any price in the current round, then the user must submit a *Simple bid for that quantity at the current round's clock price*. In the scenario above, if the bidder wants to maintain its demand of 4 blocks for PEA003-C1 for all prices between $5,000 and $6,000, then the user should submit a *Simple Bid* for 4 blocks at $6,000. This indicates that that the bidder is willing to accept 4 blocks at any price for the round up to and including the clock price of $6,000.

[20] The one exception is a product that is not biddable in the extended round (i.e., not an extended round product). A product that is not biddable in the extended round does not have a range of prices in that round.

2. Specify a different demand starting at a price in that product's price range for the round

If the bidder wants a different demand for PEA003-C1 *starting at a price* in that product's price range for the round, the user may choose to:

- Enter a *Simple Bid* for the desired quantity at that price. The desired quantity can be either larger or smaller than the processed demand.
- Enter an *All-or-nothing (AON) Bid* for the desired quantity at that price if the difference between the processed demand and the desired quantity is at least 2 blocks.
- If the difference between the processed demand and the desired quantity is a decrease of at least 2 blocks, enter an *All-or-nothing with backstop (AON+) Bid* for the desired quantity at that price, with a backstop at a higher price.
- Enter a *Switch Bid* to move demand from one category of a PEA to another category of the same PEA.

Bid processing will treat the three types of bids differently in determining processed demand and the posted price for PEA003-C1.

Example 1: Simple Bid to reduce demand for PEA003-C1 from 4 blocks to 2 blocks at $5,500

Suppose that after the bids of the previous round are processed, the bidder's processed demand for PEA003-C1 is 4 blocks and the posted price is $5,000. In the current round, the clock price is $6,000, and the bidder places a single simple bid requesting to reduce its demand to 2 blocks at price $5,500.

To the auction system, this bid means the following:

- At a price below $5,500, the bidder is willing to purchase 4 blocks.
- At a price of exactly $5,500, the bidder is willing to purchase 2, 3, or 4 blocks.
- At a price above $5,500, the bidder is willing to purchase only 2 blocks.

When the Auction System processes the bids at price $5,500, the simple bid will be applied fully, partially, or not at all depending on the level of excess demand for PEA003-C1 at that point in the bid processing.

(a) If aggregate demand exceeds supply by more than 2 blocks, the bid is fully applied. The bidder will hold 2 blocks.
(b) If aggregate demand exceeds supply by exactly 2 blocks, the bid is also fully applied. The bidder will hold 2 blocks.
(c) If aggregate demand exceeds supply by only 1 block, the bid is partially applied. The bidder will hold 3 blocks.
(d) If aggregate demand does not exceed supply, the bid is not applied. The bidder will continue to hold 4 blocks.

Using the same bid, if no other bidder has submitted a bid requesting to change its demand for PEA003-C1, then:

- In case (a), the posted price will be equal to $6,000.
- In cases (b) and (c), the posted price will be equal to $5,500.
- In case (d), the posted price will be equal to $5,000.

Example 2: Simple Bid to increase demand for PEA003-C1 from 4 blocks to 6 blocks at $5,500

Suppose again that after the bids of the previous round are processed, the bidder's processed demand for PEA003-C1 is 4 blocks and the posted price is $5,000. In the current round, the clock price is $6,000. By placing a single simple bid for 6 blocks for the product at price $5,500, the bidder is indicating that it is willing to buy a quantity between 4 and 6 blocks at any price associated with this round.[21] Increases in demand are always applied, provided that would not result in processed activity that exceeds the bidder's eligibility.

To the Auction System, this bid means the following:

- The bid (for the purpose of processing order) is processed when the price is $5,500.
- The bidder is willing to purchase 4, 5, or 6 blocks at any price between $5,000 and $6,000.

When the Auction System processes the bid at price $5,500, the simple bid will be applied fully, partially, or not at all depending on whether that would cause the bidder's processed activity to exceed its eligibility at that point in the bid processing.

(a) If the bidder has sufficient eligibility to add 2 blocks, the bid is fully applied. The bidder will hold 6 blocks.
(b) If the bidder has sufficient eligibility to add only 1 block, the bid is partially applied. The bidder will hold 5 blocks.
(c) If the bidder does not have sufficient eligibility to add any blocks, the bid is not applied. The bidder will continue to hold 4 blocks.

Using the same bid, if no other bidder has submitted a bid requesting to change its demand for PEA003-C1, then:

- If the aggregate demand exceeds supply, the posted price will be equal to $6,000.
- If the aggregate demand equals supply, the posted price will be equal to $5,000.

[21] Bids are processed in order of price point and whenever a bid is applied, the queue of unapplied bids is revisited in order of priority. In this case, if there is a bid by another bidder to reduce demand in the queue at $5,200, for example, applying the increase at $5,500 may make it possible for the requested reduction by the other bidder to be applied. If aggregate demand becomes equal to supply at the lower price point, the posted price may be $5,200. For further details, see Appendix 5: Bid Processing.

- If the aggregate demand is less than supply, the posted price will be equal to $5,000.

If at least one (additional) bid was applied that reduced demand for PEA003-C1, then:

- If the aggregate demand exceeds supply after processing all bids, the posted price will be equal to $6,000.
- If the aggregate demand equals supply after processing all bids, the posted price will be equal to the highest priced bid that was applied in full or partially that had a reduction in demand.
- Note that it is not possible for the aggregate demand to be less than supply in this scenario, as the reduction would not have been applied.

Example 3: AON Bid to reduce demand for PEA003-C1 from 4 blocks to 2 blocks at $5,500

Suppose again that after the bids of the previous round are processed, the bidder's processed demand for PEA003-C1 is 4 blocks and the posted price is $5,000. In the current round, the clock price is $6,000, and the bidder places a single all-or-nothing bid requesting to reduce its demand to 2 blocks at price $5,500.

To the Auction System, this bid means the following:

- If the price is below $5,500, the bidder is willing to purchase 4 blocks.
- If the price is $5,500 or higher, the bidder is willing to purchase either 2 or 4 blocks (depending on whether the all-or-nothing bid can be applied in full), but not 3 blocks.

An all-or-nothing bid is either applied in full or is not applied at all; it is never applied partially. However, unlike a simple bid requesting a reduction, an all-or-nothing bid requesting a reduction will not stop the

price if it cannot be applied. This leaves the possibility that the bidder may continue to hold its processed demand from the previous round as the price rises all the way to the current clock price.

When the Auction System processes the bids for PEA003-C1 at price $5,500, the all-or-nothing bid will either be applied fully or not at all depending on the level of excess demand for the product at that point in the bid processing.

(a) If aggregate demand exceeds supply by more than 2 blocks, the bid is fully applied. The bidder will hold 2 blocks.
(b) If aggregate demand exceeds supply by exactly 2 blocks, the bid is also fully applied. The bidder will hold 2 blocks.
(c) If aggregate demand exceeds supply by 1 block, the bid is not applied at all. The bidder will hold 4 blocks.
(d) If aggregate demand does not exceed supply, the bid is not applied at all. The bidder will hold 4 blocks.

Continuing the same example, if no other bidder has submitted a bid requesting to change its demand for PEA003-C1, then:

- In cases (a) and (c), the posted price will be equal to $6,000.
- In case (b), the posted price will be equal to $5,500.
- In case (d), the posted price will be equal to $5,000.

CAUTION: If an All-or-Nothing Bid cannot be applied in full, then the bidder maintains its processed demand from the last bid that was processed (either in the last round or this round). Note that the posted price could be equal to this round's clock price.

Example 4: AON Bid to increase demand for PEA003-C1 from 4 blocks to 6 blocks at $5,500

Suppose that after the bids of the previous round are processed, the bidder's processed demand for PEA003-C1 is 4 blocks and the posted price is $5,000. In the current round, the clock price is $6,000. By placing a single all-or-nothing bid for 6 blocks for the product at price $5,500, the bidder is indicating that it is willing to buy either 4 or 6 blocks at any price associated with this round.

When the Auction System processes the bid at price $5,500, the AON bid will be applied fully or not at all depending on whether that would cause the bidder's processed activity to its exceed its eligibility at that point in the bid processing.

(a) If the bidder has sufficient eligibility to add 2 blocks, the bid is fully applied. The bidder will hold 6 blocks.
(b) If the bidder has sufficient eligibility to add only 1 block, the bid is not applied. The bidder will continue to hold 4 blocks.

(c) If the bidder does not have sufficient eligibility to add any blocks, the bid is not applied. The bidder will continue to hold 4 blocks.

Using the same bid, if no other bidder has submitted a bid requesting to change its demand for PEA-C1, then:

- If the aggregate demand exceeds supply, the posted price will be equal to $6,000.
- If the aggregate demand equals supply, the posted price will be equal to $5,000.
- If the aggregate demand is less than supply, the posted price will be equal to $5,000.

If at least one (additional) bid was applied that reduced demand for PEA003-C1, then:

- If the aggregate demand exceeds supply after processing all bids, the posted price will be equal to $6,000.
- If the aggregate demand equals supply after processing all bids, the posted price will be equal to the highest priced bid that was applied in full or partially that had a reduction in demand.
- Note that it is not possible for the aggregate demand to be less than supply in this scenario, as the reduction would not have been applied.

Example 5: AON+ Bid to reduce demand for PEA003-C1 from 4 blocks to 2 blocks at $5,500 with a Backstop of $5,700

An AON+ Bid is a combination of an AON Bid at a lower price and a request to treat this as a Simple Bid at a higher price (the backstop price) in the case that the AON bid cannot be applied in full. Only one AON+ Bid can be specified for a product in a given round and it must be for a reduction in the bidder's demand. If the AON portion of the AON+ Bid is applied in full, then the backstop portion of the AON+ Bid is ignored. If the AON portion is not applied, then the backstop portion may be applied partially, stopping the price short of the clock price for the bidder's remaining units.

Suppose that after the bids of the previous round are processed, the bidder's processed demand for PEA003-C1 is 4 blocks and the posted price is $5,000. In the current round, the clock price is $6,000, and the bidder places an AON+ Bid requesting to reduce its demand to 2 blocks at price $5,500 with a backstop at $5,700.

To the Auction System, this bid means the following:

- If the price is below $5,500, the bidder is willing to purchase 4 blocks.
- If the price is between $5,500 and $5,700, the bidder is willing to hold either 2 or 4 blocks, but not 3 blocks.
- If the price is exactly $5,700, the bidder is willing to hold either 2, 3, or 4 blocks.
- If the price is above $5,700, the bidder is willing to hold only 2 blocks.

This AON+ Bid is applied as described above, depending on the level of excess demand for PEA003-C1 at $5,500. However, if the All-or-Nothing bid was not applied at $5,500 and the bidder continues to hold 4

blocks, the backstop indicates that at a price of $5,700, the bidder would accept a partial reduction in demand if the full bid cannot be applied. Therefore, in the example without the backstop bid, depending on the amount of excess demand, the bidder could have ended the round with processed demand of 4 blocks at the clock price of $6,000, but with the backstop bid, if the price rose to $5,700, the bid could have been partially applied at $5,700 and the clock price would stop at $5,700.

If no other bidder has submitted a bid requesting to change its demand for PEA003-C1, then:

(a) If aggregate demand exceeds supply by more than 2 blocks, the bid is fully applied. The bidder will hold 2 blocks and the posted price will be equal to $6,000.

(b) If aggregate demand exceeds supply by exactly 2 blocks, the bid is fully applied. The bidder will hold 2 and the posted price will be equal to $5,500.

(c) If aggregate demand exceeds supply by exactly 1 block, the bid is partially applied at the backstop price. The bidder will hold 3 blocks and the posted price will be equal to $5,700.

(d) If demand does not exceed supply, the bid is not applied at all. The bidder will hold 4 blocks and the posted price will be equal to $5,000.

3. Switch blocks from one category of the PEA to a different category of the PEA starting at a price in that product's price range for the "from" product

A bidder has the option of switching demand from one category of a PEA to another category of the same PEA using a *Switch Bid*. The Switch Bid is applied if there is excess demand for the "from" product to allow the bid to be applied in full or in part.

Suppose that after the bids of the previous round are processed, the bidder's processed demand is 4 blocks for PEA003-C1 and 0 blocks for PEA003-C2 and the posted price of PEA003-C1 is $5,000. In the current round, the clock price for PEA003-C1 is $6,000, and the bidder places a single switch bid to switch its demand by 2 blocks from Category 1 (C1) to Category 2 (C2) at price $5,500.

To the auction system, this bid means the following:

- If the price of PEA003-C1 is below $5,500, the bidder is willing to purchase 4 C1 blocks and zero C2 blocks.
- If the price of PEA003-C1 is equal to $5,500, the bidder wishes to switch demand from C1 to C2 by up to 2 blocks.
- If the price of PEA003-C1 is above $5,500, the bidder is willing to purchase 2 C1 blocks and 2 C2 blocks.

Note that the bidder does not specify a quantity or a price for C2 blocks in its bid. By placing the bid, the bidder indicates a willingness to increase its demand for C2 by up to 2 blocks at all prices up to the current clock price for C2. The processing order for the switch bid is based on the price of the C1 product.

When the Auction System processes the bid at price $5,500, this switch bid will be applied fully, partially, or not at all depending on the level of excess demand for C1:

(a) If aggregate demand exceeds supply by more than 2 blocks in C1, the bid is fully applied. The bidder will then hold 2 blocks of PEA003-C1 and 2 blocks of PEA003-C2.[22]
(b) If aggregate demand exceeds supply by 2 blocks in C1, the bid is fully applied. The bidder will then hold 2 blocks of PEA003-C1 and 2 blocks of PEA003-C2.
(c) If aggregate demand exceeds supply by only 1 block in C1, the bid is partially applied. The bidder then will hold 3 blocks of PEA003-C1 and 1 block of PEA003-C2.
(d) If aggregate demand does not exceed supply, the bid is not applied at all. The bidder will continue to hold 4 blocks of PEA003-C1 and 0 blocks of PEA003-C2.

Continuing the same example, if no other bidder has submitted a bid requesting to change its demand for PEA003-C1, then:

- In case (a), the posted price for PEA003-C1 will be $6,000.
- In cases (b) and (c), the posted price for PEA003-C1 will be $5,500.
- In case (d), the posted price for PEA003-C1 will be $5,000.

The posted price for PEA003-C2 depends on whether aggregate demand is greater than equal to or less than supply and on whether any bids to reduce demand for that product were applied during bid processing.

In all cases, the bidder's total processed demand across the categories is still 4 blocks. However, a switch bid may be applied partially in the sense that the number of blocks that are switched from one category to the other category may be smaller than the maximum number of blocks that the bidder was willing to switch, depending on whether it is possible to reduce the bidder's demand for the "from" category.

[22] In this example, the bidder started the round with 0 blocks of processed demand for C2. If, for example, it had started with positive processed demand for C2 of, say, 1 block, then the system will increase its demand for C2 by the amount that is switched. For example, if 2 blocks were switched from C1 to C2, the bidder would have processed demand for 3 blocks of C2 after the switch bid is applied.

Appendix 5: Bid Processing

Bid processing determines at the conclusion of a round of bidding, the processed demands for all bidders and the posted prices for all the products. Bids are processed differently in the initial round, regular clock rounds, and the extended round. This appendix provides an overview of bid processing in all types of rounds and gives a detailed example of bid processing in a regular clock round. For more details on how bids are processed, see Appendix G to the *Application Procedures PN*.

1. Initial Round

In the initial round, each bidder specifies the quantities it wants of each product at the minimum opening bid prices. All initial round bids are applied during bid processing, so a bidder's processed demand for a product is equal to the quantity specified in its bid. The posted prices for the initial round are the minimum opening bid prices of the forward auction.

2. Regular Clock Round

For regular clock rounds, bids to maintain processed demands at the clock price will always be applied. Bids to change demands are treated as requests and are applied to the extent possible.

To determine *processed demands*, bids are ordered by price point (from lowest to highest) across all bids (all products in all PEAs), and then by a bid-specific pseudorandom number (from lowest to highest).[23]

Reductions in demand will only be applied during bid processing if there is excess demand for the product. An increase in demand will only be applied during bid processing if the resulting processed activity would not exceed the bidder's eligibility for the round.

If a bid cannot be applied at the price point at which it is considered, it is placed in a queue where it maintains its bid processing order. Every time a bid is applied, the auction system reconsiders the bids in the queue in order, applying any that can then be applied.

After the processed demands have been determined, the *posted price* of a product for the round is set as follows:

- If aggregate demand (evaluated using the processed demands) exceeds supply, the posted price will be set equal to the clock price for the round.
- If aggregate demand (evaluated using the processed demands) is equal to supply and at least one bid to reduce demand for that product was applied (either entirely or partially), the posted

[23] The price for the "from" product in a switch bid determines when the switch bid is considered during bid processing. Thus, if the switch bid is applied at the 50.00% price point for the "from" product, both sides of the switch bid are considered at that time.

price will be the highest price at which a reduction for the product was applied. That is, the posted price will be the price at which a reduction caused aggregate demand to equal supply.

- Otherwise, the posted price will be the same as in the previous round.

The *final stage rule* is checked after bid processing. If the final stage rule is met and there is excess demand for at least one product, the spectrum reserve split occurs and the results for that round will contain the spectrum reserve products (see Section 7.3.6).

To implement the split, a reserve-eligible bidder that has processed demand for a C1 product will have its processed demand distributed between the C1-R and C1-U (reserved and unreserved respectively) products. The system first determines how many blocks of C1-R the bidder will have. The remaining blocks are allocated to C1-U. The processed demands of non-reserve eligible bidders for C1 will become demands for C1-U. If a non-reserve eligible bidder's previous demand for C1 exceeds the supply of C1-U or if a reserve-eligible bidder's allocation of C1-U exceeds the supply of C1-U, the bidder's processed demand for C1-U will be reduced to equal the supply of C1-U. The bidder will not lose the eligibility associated with the reduced demand in that round. The posted price determined for C1 will serve as the lower bound of the price range for bidding for both C1-R and C1-U in the next round.

3. Extended Round

In an extended round, bidders with processed demand for C1 products in high-demand markets where aggregate demand equals supply are given the opportunity to place additional bids for those products in order to meet the final stage rule. An extended round bidder can either accept the clock price for a product or place a simple bid indicating a price at which it wishes to reduce its demand by one block.

Bid processing for the extended round will consider bids in order of price point, as in regular clock rounds, but will check the final stage rule during processing rather than after processing is complete. If the final stage rule is met, processing will stop at the price point at which it is met. The posted price for each extended round product will be the price corresponding to the price point at which the final stage rule is met, unless a reduction was requested at a lower price point.[24] In PEAs where a reduction was requested, the posted price will be the lowest price at which a reduction was requested. If the final stage rule is not met, the posted price will be the clock price in PEAs where all bidders accepted the clock price, and the lowest price at which a reduction was requested in PEAs where at least one bidder requested a reduction in demand.

Bid processing will consider at most one reduction for each extended round product. If the final stage rule is met, no reductions will actually be applied. Bidders will maintain their processed demands from the previous round, but as noted, the posted price for the round will be the lowest price at which a reduction was requested or the price at which the final stage rule is met, whichever is lower. If the final stage rule is not met, a reduction of at most one block will be applied for each extended round product. The bidder requesting a reduction at the lowest price point in the extended round price interval will

[24] A reduction could be the result of a missing bid.

have its processed demand reduced by one block going into the next stage (when, in general, supply will be reduced by one block) and, as a result, its eligibility will generally be reduced.

If the final stage rule is met during the extended round, the round opening price for bidding in the next round (a regular clock round) will be the posted price for the extended round products and, for all other products, the posted price from the last regular round. Processed demands for all bidders for all products will be the same as in the last regular round.

4. Example of Bid Processing for a Regular Clock Round

Consider a product, PEA166-C1, with a supply of 10 blocks. The Round 3 opening price for PEA166-C1 is $100,000 and the clock price is $110,000. The second column of the following table shows the bidders' Round 3 processed demands:

Bidder	Round 3	Round 4		
	Processed Demand	Bid: quantity @ price (all simple bids)	Price Point	Order for Processing
Bidder 1	1 block	0 @ $111,000	0.0909090909	1
Bidder 2	4 blocks	0 @ $115,500	0.5000000000	3
Bidder 3	1 block	0 @ $119,000	0.8181818182	5
Bidder 4	4 blocks	2 @ $115,000	0.4545454545	2
Bidder 5	0 blocks	2 @ $118,000	0.7272727273	4
Bidder 6	2 blocks	2 @ $121,000	1.0000000000	6
Total	12			

The aggregate demand for Round 3 is 12 blocks. Since aggregate demand exceeds supply, the posted price of Round 3 is set to be equal to the clock price of Round 3, that is, $110,000. Suppose that the clock price of Round 4 is $121,000. Round 4 bids must be between $110,000 and $121,000.

The third column of the table shows the bids in Round 4. Five of the six bidders submitted simple bids for quantities that are different than their Round 3 processed demands. Bidder 6 submitted a simple bid to maintain its Round 3 processed demand at the Round 4 clock price.

The fourth column shows the price points associated with the bids. The price points are used to determine the order in which bids are considered during processing (shown in the last column). Bids at lower prices are processed first. The bid processing proceeds as follows:

- The bid of Bidder 1 is considered first. This bid is a request to reduce demand from 1 block to 0 blocks starting at $111,000. Since there is sufficient excess demand at $111,000, it is applied, bringing aggregate demand for PEA166-C1 down to 11.

Bidder	Round 3	Round 4			
	Processed Demand	Bid: quantity @ price (all simple)	Applied?	Processed Demand	Aggregate Demand
Bidder 1	1 block	0 @ $111,000	Yes	0	11

- The bid of Bidder 4 is considered next. The bid is a request to reduce demand from 4 blocks to 2 blocks starting at $115,000. The bid cannot be applied in full at this time because there is only excess demand of 1 block. It is applied partially, bringing the demand of Bidder 4 down to 3 blocks and aggregate demand down to 10. Now aggregate demand is equal to supply and Bidder 4's bid is placed in a queue.

Bidder	Round 3	Round 4			
	Processed Demand	Bid: quantity @ price (all simple)	Applied?	Processed Demand	Aggregate Demand
Bidder 1	1 block	0 @ $111,000	Yes	0	11
Bidder 4	4 blocks	2 @ $115,000	Partially	3 blocks	10

Queue			
Bidder	Processed Demand	Bid: quantity @ price (all simple)	Order for Processing
Bidder 4	3 blocks	2 @ $115,000	2

- The bid of Bidder 2 is considered next. This is a request to reduce its demand from 4 blocks to zero. It is not applied at this time because there is no excess demand so the bid is added to the queue.

Bidder	Round 3	Round 4			
	Processed Demand	Bid: quantity @ price (all simple)	Applied?	Processed Demand	Aggregate Demand
Bidder 1	1 block	0 @ $111,000	Yes	0	11
Bidder 4	4 blocks	2 @ $115,000	Partially	3 blocks	10
Bidder 2	4 blocks	0 @ $115,500	No	4 blocks	10

Queue			
Bidder	Processed Demand	Bid: quantity @ price (all simple)	Order for Processing
Bidder 4	3 blocks	2 @ $115,000	2
Bidder 2	4 blocks	0 @ $115,500	3

- The bid of Bidder 5 is considered next. This is a request to increase demand from zero blocks to 2 blocks. Assuming that Bidder 5 has sufficient eligibility, its bid is applied. As a result, aggregate demand for the product increases to 12.

Bidder	Round 3	Round 4			
	Processed Demand	Bid: quantity @ price (all simple)	Applied?	Processed Demand	Aggregate Demand
Bidder 1	1 block	0 @ $111,000	Yes	0	11
Bidder 4	4 blocks	2 @ $115,000	Partially	3 blocks	10
Bidder 2	4 blocks	0 @ $115,500	No	4 blocks	10
Bidder 5	0 blocks	2 @ $118,000	Yes	2 blocks	12

Queue			
Bidder	Processed Demand	Bid: quantity @ price (all simple)	Order for Processing
Bidder 4	3 blocks	2 @ $115,000	2
Bidder 2	4 blocks	0 @ $115,500	3

- Since the bid request of Bidder 5 was applied, the bid requests in the queue are now reconsidered. Bidder 4's remaining request to reduce from 3 blocks to 2 blocks is considered first since it is the bid with the lowest price point in the queue. This bid was applied partially before and now it can be applied in full and removed from the queue. The demand of Bidder 4 is changed from 3 blocks to 2 blocks, bringing aggregate demand down to 11.

Bidder	Round 3	Round 4			
	Processed Demand	Bid: quantity @ price (all simple)	Applied?	Processed Demand	Aggregate Demand
Bidder 1	1 block	0 @ $111,000	Yes	0	11
Bidder 4	4 blocks	2 @ $115,000	Partially	3 blocks	10
Bidder 2	4 blocks	0 @ $115,500	No	4 blocks	10
Bidder 5	0 blocks	2 @ $118,000	Yes	2 blocks	12
Bidder 4	4 blocks	2 @ $115,000	Yes	2 blocks	11

Queue			
Bidder	Processed Demand	Bid: quantity @ price (all simple)	Order for Processing
Bidder 2	4 blocks	0 @ $115,500	3

- The bid of Bidder 2 to reduce demand from 4 blocks to zero remains in the queue and is considered next. It is partially applied, bringing the demand of Bidder 2 from 4 blocks to 3 blocks and aggregate demand down to 10. Bidder 2's bid remains in the queue, because it has not been fully applied.

Bidder	Round 3	Round 4			
	Processed Demand	Bid: quantity @ price (all simple)	Applied?	Processed Demand	Aggregate Demand
Bidder 1	1 block	0 @ $111,000	Yes	0	11
Bidder 4	4 blocks	2 @ $115,000	Partially	3 blocks	10
Bidder 2	4 blocks	0 @ $115,500	No	4 blocks	10
Bidder 5	0 blocks	2 @ $118,000	Yes	2 blocks	12
Bidder 4	4 blocks	2 @ $115,000	Yes	2 blocks	11
Bidder 2	4 blocks	0 @ $115,500	Partially	3 blocks	10

Queue			
Bidder	Processed Demand	Bid: quantity @ price (all simple)	Order for Processing
Bidder 2	3 blocks	0 @ $115,500	3

- The bid of Bidder 3 is considered next. It is not applied due to insufficient aggregate demand and it is placed in the queue.
- The bid of Bidder 6 is trivially applied, because the bidder did not request to change its quantity.

Bidder	Round 3	Round 4			
	Processed Demand	Bid: quantity @ price (all simple)	Applied?	Processed Demand	Aggregate Demand
Bidder 1	1 block	0 @ $111,000	Yes	0	11
Bidder 4	4 blocks	2 @ $115,000	Partially	3 blocks	10
Bidder 2	4 blocks	0 @ $115,500	No	4 blocks	10
Bidder 5	0 blocks	2 @ $118,000	Yes	2 blocks	12
Bidder 4	4 blocks	2 @ $115,000	Yes	2 blocks	11
Bidder 2	4 blocks	0 @ $115,500	Partially	3 blocks	10
Bidder 3	1 block	0 @ $119,000	No	1 block	10
Bidder 6	2 blocks	2 @ $121,000	Yes	2 blocks	10

Queue			
Bidder	Processed Demand	Bid: quantity @ price (all simple)	Order for Processing
Bidder 2	3 blocks	0 @ $115,500	3
Bidder 3	1 block	0@$119,000	5

The processed demands of the round have now been determined. In this example, aggregate demand is now equal to supply. The posted price of the product for Round 3 is set to $115,500, the maximum price associated with a reduction bid that was applied in the round (in this case, the bid was applied partially).

The bid increment percentage will be added to the posted price from Round 4 to determine the clock price for Round 5. The Round 4 bids that were not applied during bid processing do not carry over to Round 5.

Appendix 6: Summary of Bid types and Bidding Rounds

	Type of Round	Types of Bids	Spectrum Category
1	Initial Round (Stage 1, Round 1)	▪ Simple Bid (at opening price)	C1, C2
2	Regular Clock Rounds before spectrum reserve split (including first round of a subsequent stage)	▪ Simple Bid ▪ All-or-Nothing (AON) Bid ▪ All-or-Nothing with Backstop (AON+) Bid ▪ Switch Bid	C1, C2
3	Regular Clock Rounds after spectrum reserve split	▪ Simple Bid ▪ All-or-Nothing (AON) Bid ▪ All-or-Nothing with Backstop (AON+) Bid ▪ Switch Bid	C1-R, C1-U, C2
4	Extended Round	▪ Simple Bid (to either maintain demand or reduce demand by 1 block)	Extended round products for which the bidder has positive processed demand