



**6712-01**

**FEDERAL COMMUNICATIONS COMMISSION**

**47 CFR Parts 1, 27 and 73**

**[AU Docket No. 14-252; GN Docket No. 12-268; FCC 14-191; DA 15-24; DA 15-60]**

**Comment Sought on Competitive Bidding Procedures for Broadcast Incentive Auction 1000, Including 1001 and 1002**

**AGENCY:** Federal Communications Commission.

**ACTION:** Proposed rule; proposed auction procedures.

**SUMMARY:** The Auction 1000 Request for Comment initiates the pre-auction process by which the Federal Communications Commission will develop detailed procedures for the broadcast television spectrum incentive auction, taking into account public comment received in response to its proposals. The Auction 1000 Request for Comment includes specific proposals, including on determination of the initial broadcast television spectrum clearing target, opening bid prices, benchmarks for the final stage rule, and the final television channel assignment process, and seeks comment on those proposed procedures.

**DATES:** Comments are due on or before February 13, 2015, and reply comments are due on or before March 13, 2015. Written comments on the Paperwork Reduction Act proposed information collection requirements must be submitted by the public, Office of Management and Budget (OMB), and other interested parties on or before *[INSERT DATE 60 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]*.

**ADDRESSES:** All filings in response to this notice must refer to AU Docket No. 14-252 and GN Docket No. 12-268. The Federal Communications Commission strongly encourages interested parties to file comments electronically, and requests that an additional copy of all comments and reply comments be submitted electronically to the following address: [auction1000@fcc.gov](mailto:auction1000@fcc.gov). Comments may be submitted by any of the following methods:

- Federal eRulemaking Portal: <http://www.regulations.gov>. Follow the instructions for submitting comments.
- Federal Communications Commission's Web Site: <http://fjallfoss.fcc.gov/ecfs2/>. Follow the instructions for submitting comments.
- Paper Filers: Parties who choose to file by paper must file an original and one copy of each filing. Filings can be sent by hand or messenger delivery, by commercial overnight courier, or by first-class or overnight U.S. Postal Service mail. All filings must be addressed to the Commission's Secretary, Attn: WTB/ASAD, Office of the Secretary, Federal Communications Commission. All hand-delivered or messenger-delivered paper filings for the Commission's Secretary must be delivered to FCC Headquarters at 445 12th Street, S.W., Room TW-A325, Washington, DC 20554. All hand deliveries must be held together with rubber bands or fasteners. Any envelopes must be disposed of before entering the building. Commercial overnight mail (other than U.S. Postal Service Express Mail and Priority Mail) must be sent to 9300 East Hampton Drive, Capitol Heights, MD 20743. U.S. Postal Service first-class, Express, and Priority mail must be addressed to 445 12th Street, S.W., Washington, DC 20554.

People with Disabilities: Contact the FCC to request reasonable accommodations (accessible format documents, sign language interpreters, CART, etc.) by e-mail: [FCC504@fcc.gov](mailto:FCC504@fcc.gov) or phone: 202-418-0530 or TTY: 202-418-0432.

PRA Comments: In addition to filing comments with the Secretary, a copy of any comments on the Paperwork Reduction Act information collection requirements contained herein should be submitted to the Federal Communications Commission via email to [PRA@fcc.gov](mailto:PRA@fcc.gov) and to Nicholas A. Fraser, Office of Management and Budget, via email to [Nicholas\\_A.\\_Fraser@omb.eop.gov](mailto:Nicholas_A._Fraser@omb.eop.gov) or via fax at 202-395-5167.

**FOR FURTHER INFORMATION CONTACT:** Wireless Telecommunications Bureau, Auctions and Spectrum Access Division: For auction legal questions: Erin Griffith at (202) 418-0660 and for general auction questions: Linda Sanderson at (717) 338-2868; Spectrum and Competition Policy Division: For mobile spectrum holding questions: Amy Brett at (202) 418-1310; and Broadband Division: For 600

MHz Band service rule questions: Madelaine Maior at (202) 418-1466. Media Bureau, Video Division: For broadcast questions: Dorann Bunkin at (202) 418-1636. Office of Engineering and Technology: For repacking and inter-service interference questions: Aspasia Paroutsas (legal) at (202) 418-7285 or Martin Doczkat (technical) (202) 418-2435. For additional information concerning the Paperwork Reduction Act information collection requirements contained in this document, send an email to [PRA@fcc.gov](mailto:PRA@fcc.gov) or contact Cathy Williams on (202) 418-2918.

**SUPPLEMENTARY INFORMATION:** This is a summary of the Auction 1000 Request for Comment adopted on December 11, 2014 and released on December 17, 2014, as well as the Order adopted and released on January 7, 2015, extending the dates for responding to the Auction 1000 Request for Comment and the Supplemental Auction 1000 Request for Comment adopted and released on January 15, 2015. The Auction 1000 Request for Comment includes as attachments the following appendices: Appendix A, Incentive Auction General Flow; Appendix B, ISIX Constraints; Appendix C, Clearing Target Optimization; Appendix D, Reverse Auction Pricing and Bid Processing Algorithm; Appendix E, Final Channel Assignment Optimization; Appendix F, Bidding Units, Upfront Payments, and Minimum Opening Bids; Appendix G, Forward Auction Clock Phase; and Appendix H, Forward Auction Assignment Phase. The complete text of the Auction 1000 Request for Comment, including all attachments and related Commission documents, is available for public inspection and copying from 8:00 a.m. to 4:30 p.m. Eastern Time (ET) Monday through Thursday or from 8:00 a.m. to 11:30 a.m. ET on Fridays in the FCC Reference Information Center, 445 12<sup>th</sup> Street S.W., Room CY-A257, Washington, DC 20554. The Auction 1000 Request for Comment and its attachments, as well as related Commission documents, also may be purchased from the Commission's duplicating contractor, Best Copy and Printing, Inc. (BCPI), 445 12<sup>th</sup> Street S.W., Room CY-B402, Washington, DC 20554, telephone 202-488-5300, fax 202-488-5563, or you may contact BCPI at its website: <http://www.BCPIWEB.com>. When ordering documents from BCPI, please provide the appropriate FCC document number, for example, FCC 14-191. The Auction 1000 Request for Comment and its attachments, as well as related documents, also are available on the Internet at the Commission's website: <http://wireless.fcc.gov/auctions/1000/>, or

by using the search function for AU Docket No. 14-252, GN Docket 12-268 on the Commission's Electronic Comment Filing System (ECFS) web page at <http://www.fcc.gov/cgb/ecfs/>.

This document contains proposed information collection requirements. The Commission, as part of its continuing effort to reduce paperwork burdens, invites the general public and the Office of Management and Budget (OMB) to comment on the information collection requirements contained in this document, as required by the Paperwork Reduction Act of 1995, Public Law 104-13.

Comments should address: (a) whether the proposed collection of information is necessary for the proper performance of the functions of the Commission, including whether the information shall have practical utility; (b) the accuracy of the Commission's burden estimates; (c) ways to enhance the quality, utility, and clarity of the information collected; (d) ways to minimize the burden of the collection of information on the respondents, including the use of automated collection techniques or other forms of information technology; and (e) way to further reduce the information collection burden on small business concerns with fewer than 25 employees. In addition, pursuant to the Small Business Paperwork Relief Act of 2002, Public Law 107-198, see 44 U.S.C. 3506(c)(4), we seek specific comment on how we might further reduce the information collection burden for small business concerns with fewer than 25 employees.

OMB Control Number: None

Title: Application by a Broadcast Licensee to Participate in a Broadcast Spectrum Incentive Auction (BSIA), FCC Form 177; and 47 CFR 1.22002.

Form No.: FCC Form 177

Type of Review: New collection.

Respondents: Business or other for profit entities; Not-for-profit institutions; State, local or Tribal government.

Number of Respondents and Responses: 2,254 respondents; 2,254 responses.

Estimated Time Per Response: 3 hours.

Frequency of Response: One time reporting requirement.

Obligation to Respond: Required to obtain benefits. The statutory authority for this information collection is contained in sections 154(i) and 309 of the Communications Act of 1934, as amended.

Total Annual Burden: 6,762 hours.

Total Annual Costs: N/A.

Privacy Act Impact Assessment: N/A.

Nature and Extent of Confidentiality: Pursuant to statute, pending the effective date of related license reassignments and spectrum reallocations, the Commission will take all reasonable steps necessary to protect the confidentiality of Commission-held data of a broadcast licensee participating in the broadcast spectrum incentive auction, pursuant to 47 CFR 1.22006.

Needs and Uses: Any broadcast licensee choosing to participate in the broadcast spectrum incentive auction must provide information to demonstrate that it is legally, technically, and financially qualified to participate, pursuant to 47 CFR 1.22000 and 1.22004. Information collection on the form will include information regarding the relevant broadcast license, information regarding parties with an ownership interest in the license, and if applicable, information regarding any agreement that the applicant may have to share a broadcast channel in the event that it relinquishes some of its spectrum usage rights through the auction.

Statutory Authority: The statutory authority for this information collection is contained in sections 154(i) and 309 of the Communications Act of 1934, as amended.

OMB Control Number: 3060-0600

Title: Application to Participate in a FCC Auction; FCC Form 175; 47 CFR 1.2105, 1.2110 and 1.2112.

Form No.: FCC Form 175

Type of Review: Revision of currently approved collection.

Respondents: Business or other for-profit; Not-for-profit institutions; State, local or Tribal governments.

Number of Respondents and Responses: 500 respondents; 500 responses.

Estimated Time Per Response: 90 minutes.

Frequency of Response: On occasion reporting requirement.

Obligation to Respond: Required to obtain or retain benefits.

Total Annual Burden: 750 hours.

Total Annual Costs: N/A.

Privacy Act Impact Assessment: N/A.

Nature and Extent of Confidentiality: There is no need for confidentiality with this collection of information. Applicants may request confidential treatment of information collected in FCC Form 175 pursuant to 47 CFR 0.459.

Needs and Uses: The Commission will revise the FCC Form 175 to require a party to certify compliance with requirements applicable to the incentive auction prior to submitting the Form.

Statutory Authority: The statutory authority for this information collection is contained in sections 154(i) and 309 of the Communications Act of 1934, as amended.

## **I. INTRODUCTION**

1. With the Auction 1000 Request for Comment, the Commission takes another important step toward conducting the broadcast television spectrum incentive auction, a new tool to help meet the Nation's accelerating spectrum needs. The Commission established the rules and policies for the incentive auction in the Report and Order, "Expanding the Economic and Innovation Opportunities of Spectrum Through Incentive Auction," 79 FR 48441, August 15, 2014 (Incentive Auction R&O). The Auction 1000 Request for Comment initiates the pre-auction process by which the Commission will develop, based on additional public input, the detailed procedures necessary to carry out the auction. It includes specific proposals on crucial auction design issues such as determination of the initial broadcast television spectrum clearing target, opening bid prices, benchmarks for the final stage rule, and the final television channel assignment process. The legal authority for the Commission's proposals is set forth in the rules the Commission adopted in the Incentive Auction R&O.

2. The incentive auction will include a “reverse auction” in which broadcasters will offer to voluntarily relinquish some or all of their spectrum usage rights, and a “forward auction” of new, flexible-use licenses suitable for providing mobile broadband services. Forward auction proceeds will be used to pay broadcasters that relinquish rights in the reverse auction. As part of the reverse auction, the Commission will reorganize or “repack” the broadcast TV spectrum so that the television stations that remain on the air after the incentive auction occupy a smaller portion of the UHF band. For the incentive auction to succeed, the reverse and forward auctions and the repacking process must work seamlessly.

3. To encourage voluntary broadcaster participation, the Commission is striving to make the reverse auction design simple and transparent from the perspective of the broadcaster bidder. Broadcasters will be able to participate online through an easy-to-use computer interface and will be able to react to prices provided by the auction system rather than having to formulate their own bids. They will have multiple options to relinquish their spectrum usage rights in exchange for a share of auction proceeds—including to cease broadcasting, to continue broadcasting in a different band, or to share a channel with another station. Broadcasters can decide whether to participate after opening prices are announced, and may drop out of the bidding in any subsequent round if they decide the prices are too low. Stations will be treated the same in the repacking process whether or not they participate in the reverse auction. Except for broadcasters that receive auction proceeds in exchange for relinquishing spectrum usage rights, the identities of broadcasters that participate in the auction will remain confidential for a period of two years after the incentive auction.

4. Because the reverse auction and the repacking process are interdependent, the Auction 1000 Request for Comment includes proposals that may affect broadcasters that do not choose to participate in the reverse auction, such as objectives for optimizing final channel assignments in the remaining television bands. In making such proposals, the Commission is mindful of Congress’s directive to make all reasonable efforts to preserve the coverage area and population served of eligible

broadcasters that remain on the air following the auction, and the Commission seeks to avoid unnecessary disruption to free, over-the-air television service.

5. The proposals in the Auction 1000 Request for Comment are organized into three major sections. First, the integration section addresses how the reverse and forward auctions will be integrated. Among other things, the integration section addresses the determination of an initial spectrum clearing target, how much market variation to accommodate, and the process of moving to subsequent stages of the auction if necessary. The issues and proposals discussed in the integration section may be of interest to potential participants in both the reverse and the forward auctions, as well as to broadcasters that do not choose to participate in the reverse auction. The second and third sections of the Auction 1000 Request for Comment focus on the reverse and forward auctions, respectively. They address opening prices, details of the application process, and bidding procedures for each auction, as well as issues unique to each auction, such as how the repacking process will work in the context of the reverse auction and the final frequency assignment process for licenses won in the forward auction.

6. The Auction 1000 Request for Comment also includes a number of technical appendices, which detail the mechanics of the proposed auction design, such as use of data from the inter-service interference (ISIX) methodology in order to identify potential “impairments” to 600 MHz Band spectrum blocks, optimization procedures for determining the spectrum clearing target and final TV channel assignments, and algorithms for the reverse and forward auctions. The information in the appendices supplements the description of these elements in the Auction 1000 Request for Comment, but the Auction 1000 Request for Comment contains the information necessary for an interested party to evaluate participation in the reverse or forward auction.

7. The major steps of the incentive auction process, based on the proposals in the Auction 1000 Request for Comment, together with the decisions in the Incentive Auction R&O, are illustrated in Appendix A of the Auction 1000 Request for Comment. From the perspective of potential bidders, the major steps will be as follows. (1) Procedures PN: After considering the record produced in response to

the Auction 1000 Request for Comment, the Commission will adopt final auction procedures and provide detailed explanations and instructions for potential auction participants in a future public notice (Procedures PN). (2) Auction application: Any party wishing to participate in the bidding in either the reverse auction or the forward auction must submit an auction application by a date to be specified in the Procedures PN. Opening prices in the auction will be made available at least 60 days in advance of the deadline for applications to participate in either the reverse or the forward auction. An auction applicant must disclose to the Commission on the application, among other things, specified information about the applicant's identity, certifications, and, for reverse and forward auction applications, respectively, selections regarding bid options or licenses it may wish to bid on. Each applicant will be informed whether its application is complete or deficient in particular respects after Commission staff reviews it for completeness and consistency with the relevant auction rules. Any applicant whose application is incomplete will have a specified period of time within which to resubmit its application to correct deficiencies. (3) Reverse auction initial bid commitment: In order to qualify to bid in the reverse auction, each reverse auction applicant that successfully completes an application must identify one of the bid options it selected on its application as its preferred option, thereby indicating its commitment to relinquish the spectrum usage rights associated with that option at the opening price for that option. (4) Clearing target determination: Based on the commitments of broadcasters in response to the opening prices, the auction system will determine the broadcast TV spectrum clearing target for the initial stage of the auction, which will have an associated 600 MHz Band plan. (5) Forward auction upfront payment: After the clearing target along with the associated band plan is determined, forward auction bidders must submit upfront payments to qualify to bid. Each applicant's upfront payment will establish its bidding eligibility in terms of bidding units. (6) Reverse auction bidding clock phase: Reverse auction bidding will begin. Each qualified bidder will have an opportunity to bid by responding in successive clock bidding rounds to price offers, which may be reduced as bidding progresses. If at any time the price offered is lower than a bidder wants to accept, the bidder can drop out of the bidding. (7) Forward auction bidding clock phase: Forward auction bidding will begin on two different categories of

licenses. The license categories will reflect the extent of potential impairments from television stations to a given license. Each qualified bidder will have an opportunity to bid by indicating in successive clock bidding rounds its demands for categories of generic license blocks in specific geographic areas. The auction system will check after each round of clock bidding to determine whether the final stage rule has been satisfied. If bidding stops in “high-demand” markets before the final stage rule is satisfied, the auction system will initiate an extended round of bidding for licenses in those markets aimed at satisfying the final stage rule. If the final stage rule is met after any forward auction round (clock or extended), the auction system will implement the market-based spectrum reserve. Bidding rounds will continue in all markets after the final stage rule is met, ending when demand does not exceed supply. (8) Subsequent auction stage if necessary: If the final stage rule is not satisfied in the forward auction portion of the initial stage, the auction system will move to the next stage of the auction. (9) Final TV channel assignment optimization: After the final stage rule is satisfied, the auction system will determine final television channel assignments for all television stations that will remain on the air following the incentive auction. (10) Forward auction assignment phase: After bidding stops in the clock phase of the forward auction, the forward auction assignment rounds will be conducted to assign frequency-specific 600 MHz Band licenses consistent with the demands of specific bidders in specific geographic areas.

8. The Commission intends to begin accepting applications to participate in the broadcast television spectrum incentive auction in the fall of 2015, and to start the bidding process in early 2016. The Commission will finalize specific deadlines in the Procedures PN, but recognizes the need to give parties adequate notice prior to the application filing date. The Commission will endeavor to give several months’ notice prior to the application filing deadline. Parties who may be interested in participating in the reverse or forward auction should regularly monitor the LEARN website. The broadcast spectrum incentive auction, which is designated as Auction 1000, will begin with bidding in the reverse auction, designated as Auction 1001, followed by bidding in the forward auction, designated

as Auction 1002. Since adopting the Incentive Auction R&O in May, the Commission has made progress on a number of auction-related issues, including how to predict potential inter-service interference in certain areas and the auction’s potential impact on low-power television stations, wireless microphones, and unlicensed white space devices. The staff also has released additional information regarding the reverse auction and the repacking process. Well in advance of the auction, the Procedures PN will establish final auction procedures and provide detailed explanations and instructions for potential auction participants. The Commission will resolve outstanding issues outside the scope of the pre-auction process in advance of the Procedures PN.

## **II. BACKGROUND**

### **A. Incentive Auction Order**

#### **i. 600 MHz Band Plan**

9. Pursuant to the Incentive Auction R&O, in the forward auction the Commission will offer licenses for the UHF band spectrum that is repurposed through the incentive auction on a geographic area basis. The service areas for these licenses will be Partial Economic Areas (PEAs). The 600 MHz Band will be licensed in 5+5 megahertz paired uplink and downlink blocks, which will be authorized for fixed and mobile Frequency Division Duplex (FDD) operations.

10. The 600 MHz Band Plan the Commission adopted in the Incentive Auction R&O consists of an uplink band that will begin at channel 51 (698 MHz), followed by a duplex gap, and then a downlink band. Because the incentive auction may be conducted in several stages, each for a different “spectrum clearing target,” the Commission adopted a set of band plan scenarios based on the number of television channels cleared.

11. The first stage of the forward auction will offer licenses corresponding to one of these band plan scenarios, and subsequent stages, if necessary, will offer licenses for scenarios corresponding to lower clearing targets. The 600 MHz Band Plan can accommodate variation in the amount of

spectrum recovered in different geographic areas in order to prevent the most restricted market from limiting the quantity of spectrum the Commission can offer generally across the nation. If not all PEAs can be cleared, the 600 MHz Band Plan will accommodate market variation either by including some spectrum blocks subject to inter-service interference, or alternatively, fewer spectrum blocks than in most PEAs across the country.

## **ii. Repacking Process**

12. Repacking involves reorganizing television stations in the broadcast television bands so that the stations that remain on the air after the incentive auction will occupy a smaller portion of the UHF band, thereby freeing up a portion of that band for new wireless uses. Prior to the commencement of the reverse auction, the staff will determine the coverage area and population served of every television station whose coverage area and population served the Commission will make “all reasonable efforts” to preserve in the repacking process, using the methodology described in the Office of Engineering and Technology Bulletin No. 69. Based on this data, the staff will develop “constraint files” for each station that will be used to check the feasibility of assigning permissible channels to stations that will remain on the air.

13. Before bidding in the reverse auction begins, the initial “clearing target” for how much broadcast TV spectrum will be repurposed through the reverse auction and the repacking process will be determined based on broadcasters’ collective willingness to relinquish spectrum usage rights at the opening prices announced by the Commission. The clearing target will dictate the total number of remaining television channels available for the repacking process.

14. At the start of the reverse auction bidding process, television stations will fall into two general categories: non-participating stations that will remain on the air after the incentive auction, and participating stations that may or may not remain on the air, depending on the reverse auction outcome. The auction system will use a “repacking feasibility checker” to ensure that every non-participating station is assigned a television channel in its pre-auction band consistent with the Commission’s

statutory obligation to make reasonable efforts to preserve its population and coverage area. Each time a participating station drops out of the auction, it will be assigned a channel in its pre-auction band consistent with this obligation, and the repacking feasibility checker will determine whether a channel that meets these requirements is available for each individual station that continues to participate in the bidding.

15. Television station channel assignments in the remaining television bands will be provisional throughout the bidding stages of the auction. Final channel assignments will be made after the final stage rule is satisfied and bidding ends in the reverse and forward auctions. At that point, the assignments for each television station that will be assigned a channel in the remaining TV bands will be optimized to ensure efficient final channel assignments that preserve the coverage area and population served of each station and account for the additional goals that the Commission has adopted or will adopt in this pre-auction process.

### **iii. Auction Process**

16. The incentive auction will consist of reverse and forward auctions. The reverse auction will collect information about the prices at which broadcast television licensees would be willing to voluntarily relinquish some or all of their spectrum usage rights. The forward auction will consist of a clock phase and an assignment phase. The clock phase will identify the prices that potential users of repurposed broadcast television spectrum will pay for generic spectrum blocks. In the assignment phase, winners of blocks in the clock phase will bid for specific licenses to use the spectrum. The results of both auctions will be used to determine whether the overall reserve price, or final stage rule, has been satisfied. Once the reserve price requirements of the final stage rule are met and bidding meets the conditions of a stopping rule, the overall results of the bidding in both auctions will determine those broadcasters selected to relinquish spectrum usage rights and the amounts of their incentive payments from the reverse auction, as well as the winning bidders for flexible-use 600 MHz Band licenses and the prices they will pay for those licenses from the forward auction. After the final stage rule is satisfied and

there is no excess demand for licenses, broadcasters that will remain on the air will receive final channel assignments and winners of generic licenses will have the opportunity to bid for specific frequencies. Then the incentive auction will close.

17. The reverse and forward auctions will be integrated in one or more stages. Each stage will consist of a reverse auction and a forward auction bidding process; multiple stages will be run only if necessary. The forward auction bidding process will follow the reverse auction bidding process. If bidding in the forward auction does not satisfy the final stage rule, additional stages will be run with progressively lower spectrum clearing targets in the reverse auction and fewer licenses available in the forward auction, until the final stage rule is satisfied.

18. In the Incentive Auction R&O, the Commission adopted a descending clock format for the reverse auction in which, in each bidding round, stations will be offered prices for one or more bid options and indicate their choices at those prices. The prices offered to each station for options will be adjusted downward as the rounds progress in a way that accounts for the availability of television channels in different bands in the repacking process. A station will continue to be offered prices for bid options until its voluntary relinquishment of rights becomes needed to meet the current spectrum clearing target. When all remaining bidders' relinquishments are needed in this way, the reverse auction for the stage will end. If the final stage rule is satisfied in that stage, then those bidders will be winning bidders, and the price paid to each will be at least as high as the last price it agreed to accept.

19. For the clock phase of the forward auction, the Commission adopted an ascending clock auction format in which bidders will be able to bid for generic spectrum blocks in one or more license categories, to be followed by an assignment mechanism for frequency-specific licenses. Consistent with the Mobile Spectrum Holdings R&O, 79 FR 39977, July 11, 2014, the forward auction will incorporate a market-based spectrum reserve of blocks for certain eligible bidders. There will be a separate clock price for each license category in each PEA, and bidders will indicate the number of blocks that they demand at the current prices. The prices generally will rise from round to round, as long as the demand

for blocks exceeds availability. Bidders still demanding blocks when the clock prices stop rising in every license category in every PEA will become winners provided the final stage rule is satisfied. If the rule is not satisfied, bidders will have an opportunity to make additional bids to meet the rule in an extended bidding round. Once the final stage rule is satisfied, winners may indicate their preferences for frequency-specific licenses in the assignment phase of the forward auction. Final license prices will reflect the winning bid amounts from the clock bidding rounds as well as any adjustments from the extended bidding and assignment rounds.

#### **B. Inter-Service Interference (ISIX) Order and Further Notice**

20. The Commission recently issued an order establishing a methodology for use during the incentive auction to predict inter-service interference in areas where broadcast and wireless services operate on the same or adjacent channels as a result of market variation. In such areas, television channels may not be available in the remaining television bands for all of the stations that will remain on the air, and one or more stations may have to be assigned channels in the 600 MHz Band, that is, in the portion of the UHF spectrum that generally will be repurposed. Assigning channels to television stations in the 600 MHz Band creates a potential for harmful interference to both broadcast and wireless operations. In addition, some areas may be subject to inter-service interference resulting from existing television stations along the borders in Canada and Mexico. The ISIX Order established a methodology (the ISIX methodology) for predicting such interference.

21. The ISIX methodology varies depending on the applicable interference scenario or case. Cases 1 and 2 relate to interference from television to wireless operations (base stations and user equipment, respectively). Cases 3 and 4 relate to interference from wireless operations (base stations and user equipment, respectively) to digital TV receivers. The applicable interference case depends on where television stations are placed in the 600 MHz Band.

22. In the Incentive Auction R&O, the Commission defined an “impaired” PEA as one in which a 600 MHz Band licensee is restricted to some extent from operating within the geographic

boundary of the PEA in order prevent harmful interference to television operations in the 600 MHz Band; and conversely, one in which a 600 MHz Band licensee may receive harmful interference from television operations in the 600 MHz Band. In the ISIX Order, the Commission further clarified that impairments may result in “restricted” and “infringed” areas within a 600 MHz Band service area. A “restricted” area is one in which the wireless operator could cause harmful interference to a television station. An “infringed” area is one in which the wireless operator may receive harmful interference from a television station. The Commission proposed in the ISIX Further Notice, 79 FR 76282, December 22, 2014, to allow wireless carriers to operate in areas where they may receive interference from TV stations, but not in areas where they may cause any harmful interference to television operations in the 600 MHz Band. The Commission further proposed that a 600 MHz Band licensee with an “impaired” license would hold the license for the entire PEA but would be limited to operations within the boundaries permitted under the inter-service interference rules. The ISIX Further Notice also proposed a methodology for use after the auction to prevent inter-service interference based on actual deployment of wireless networks, including a zero-percent threshold for interference to TV stations from wireless services.

### **C. Mobile Spectrum Holdings Order**

23. The Commission established the maximum amount of licensed spectrum that will be reserved in each PEA for eligible entities (reserve-eligible entities) in the forward auction for different initial stage spectrum clearing targets. A spectrum clearing target will include licensed spectrum and guard bands; however only licensed spectrum is relevant to determination of the reserve. If the auction does not close in the initial stage, the maximum amount of reserved licensed spectrum in each PEA in subsequent stages will be the smaller of (1) the maximum amount in the previous stage, or (2) the amount that the reserve-eligible bidders demanded at the end of the previous stage. The maximum amount of reserved spectrum is 30 megahertz for initial clearing targets with more than 100 megahertz of licensed spectrum. The Mobile Spectrum Holdings R&O inadvertently omitted the 80 megahertz

clearing scenario established by the Commission (as set forth in the technical appendix to the Incentive Auction R&O) from an accompanying chart. Consistent with the Commission’s finding that a maximum spectrum reserve of 30 megahertz is appropriate for most levels of total available spectrum licenses except for levels less than 70 megahertz, the maximum amount of reserved spectrum for an 80 megahertz clearing scenario is 30 megahertz. The actual amount of reserved spectrum will depend on the demand by reserve-eligible bidders when the auction reaches a “spectrum reserve trigger.” The auction system will set the spectrum reserve trigger at the point when the final stage rule is satisfied.

### **III. PROPOSED PROCEDURES FOR OVERALL INCENTIVE AUCTION STRUCTURE, INCLUDING INTEGRATION OF REVERSE AND FORWARD AUCTIONS**

24. The Commission seeks comment on integrating the reverse and forward auction bidding processes consistent with the staged structure it established in the Incentive Auction R&O. In particular, the Commission seeks comment on procedures for setting the broadcast television spectrum clearing target and for determining whether the final stage rule is satisfied, as well as on the steps triggered by the determination that the final stage rule is satisfied.

#### **A. Setting an Initial Spectrum Clearing Target and Determining Impairments**

25. The Commission proposes procedures for setting the initial clearing target for the auction. The approach the Commission proposes will establish the highest clearing target possible from among the available options given broadcaster participation in the reverse auction. Alternatively, the Commission seeks comment on whether it should omit any initial clearing targets, such as the 108 MHz clearing target. The auction system will use mathematical optimization techniques to identify provisional TV channel assignments that protect the coverage area and population served of non-participating television stations as required by the Spectrum Act. Where necessary, non-participating stations will be assigned to channels in the 600 MHz Band. Any stations assigned to channels in the 600 MHz Band will be entitled to the same protection in the repacking process as other TV stations, and will be protected from inter-service interference under the standards the Commission adopted in the ISIX

proceeding, in which it has proposed strict standards to protect TV stations from such interference. In making such assignments, the Commission proposes that the auction system will minimize potential inter-service interference to 600 MHz Band licenses. To limit the extent of market variation in the provisional TV channel assignment plan, the Commission proposes to limit impairments on a nationwide aggregated basis to less than 20 percent of the total U.S. population (measured on a weighted basis). If a provisional channel plan does not exceed this limit, the auction system may apply any secondary objectives for TV channel assignments that the Commission establishes. If a provisional channel plan exceeds the less than 20 percent limit, however, the process will start again with the next lower clearing target.

26. The Commission first addresses its proposed approach to measuring the extent of potential inter-service interference to 600 MHz Band PEAs in order to set the clearing target. Second, the Commission addresses objectives for determining the location of any TV stations that must be assigned to the 600 MHz Band to accommodate market variation. Third, the Commission explains its proposal to use “weighted-pops” to calculate the market variation associated with a clearing target and propose a standard for limiting market variation. Fourth, the Commission addresses the use of optimization techniques under its proposed approach to setting a clearing target.

**i. Measuring the Extent of Potential Impairments**

27. In order to determine a clearing target, the auction system must be able to evaluate the extent of any potential impairments to licenses in the 600 MHz Band as a result of market variation. In the ISIX R&O, the Commission adopted the ISIX methodology to predict potential inter-service interference between TV and wireless services. Appendix B of the Auction 1000 Request for Comment details how the Commission proposes to use the data produced using this methodology to generate mathematical constraints that enable the auction system to measure the extent of potential impairments to 600 MHz Band licenses in order to set a clearing target. Under the proposed procedure, the raw data the ISIX methodology produced at the two-by-two kilometer cell level would be aggregated into uplink

and downlink, county-level data sets (a table cross-referencing counties to PEAs is available on the Commission's website at <http://transition.fcc.gov/oet/info/maps/areas/>) and mapped to specific 600 MHz Band licenses in advance of the incentive auction. The percentage of the population of each county subject to inter-service interference then would be calculated for every TV station eligible for protection in the repacking process on every possible channel in the 600 MHz Band. Consistent with the ISIX methodology, which defines each cell as "impaired" or "unimpaired" depending on whether it is subject to any inter-service interference, the procedure would apply a threshold to determine whether a county is "impaired" for each possible TV station and channel combination.

28. The Commission invites comment on a threshold for determining whether a county is "impaired" for purposes of determining impairments for a given clearing target. In particular, the Commission invites comment on setting a threshold within the range of 10-to-20 percent. Under the Commission's proposed methodology, a county with predicted impairment above the threshold for a specific station-channel assignment would be considered wholly impaired, i.e., 100 percent of the county population, for purposes of measuring the extent of impairment in the PEA when setting the clearing target. In considering the impaired population to which the Commission will apply the threshold, it also proposes to distinguish between uplink and downlink impairments. In this regard, a TV station in the uplink portion of the 600 MHz Band might allow unimpaired use of the downlink portion of a paired 5+5 megahertz license. Accordingly, the Commission proposes that rather than consider uplink impairments above the threshold to be wholly impaired as it does with downlink impairments, it consider a county with uplink impairments above the threshold to be 50 percent impaired. Commenters that advocate a different threshold or approach should explain why they believe their approach would better inform the setting of a clearing target.

29. The Commission proposes to aggregate the data in order to reduce the volume of data inputs to a quantity that reasonably can be utilized in setting a clearing target. The data would be aggregated to this level only for use in the optimization procedure to set a clearing target; the

Commission proposes that the auction system would provide more detailed data on the location and extent of impairment to 600 MHz Band licenses during the forward auction. .

30. Under the Commission’s proposed procedure for setting an initial clearing target, the mathematical constraints for measuring impairments that are the inputs to the optimization procedure would be generated before the auction, so that during the auction the optimization can dynamically calculate the percentage of impaired population within each license for any possible combination of TV stations and channel assignments in the 600 MHz Band by adding the total population of the “impaired” counties within the PEA and dividing that sum by the total population of all of the counties within the PEA. The Commission proposes that if a 600 MHz Band license is more than 50 percent impaired by the assignment, the optimization procedure will consider all of the associated weighted-pops to be impaired, consistent with its proposal not to offer such licenses in the forward auction.

**ii. Assigning TV Stations to the 600 MHz Band as Necessary to Accommodate Market Variation**

31. The Commission seeks comment on certain details for assigning television stations to the 600 MHz Band as necessary to accommodate market variation. Under the Commission’s proposed approach, the auction system will use mathematical optimization techniques to identify a provisional TV channel assignment plan for stations that elect not to participate in the auction that best meets certain primary objectives. While these techniques will identify channels in the remaining TV bands for as many of these stations as possible, the auction system may not be able to assign channels in the remaining bands to all of the stations that must be assigned channels in areas that are constrained due to factors such as lack of broadcaster participation in the reverse auction or international border-related issues. Under such circumstances, the auction system will assign television stations to channels in the 600 MHz Band. Any television stations assigned to channels in the 600 MHz Band will be entitled to the same protection in the repacking process as other TV stations, and will be protected from inter-

service interference under the standards the Commission adopts in the ISIX proceeding, in which it has proposed not to allow any harmful interference to TV stations from wireless services.

32. Importantly, although TV channel assignments in the broadcasting portion of the band will be provisional until the final channel assignment process, which occurs after bidding ends in the final stage of the auction, under the Commission's proposed approach any assignments of television stations to channels in the 600 MHz Band will be fixed prior to the start of the forward auction for that stage, and those assignments will be final if no subsequent stages of the auction are necessary. Thus, a television station's assignment to a channel in the 600 MHz Band for purposes of setting a clearing target may determine both its post-auction channel assignment and the specific impairments to 600 MHz Band blocks that will be offered in the forward auction, depending on whether the final stage rule is satisfied in that stage. If subsequent stages are necessary, the auction system will generate a new band plan that may involve different provisional TV station and channel assignments in the 600 MHz Band. In contrast to any TV channel assignments in the 600 MHz Band, the vast majority of assignments to channels in the remaining television bands will change constantly during the repacking process.

33. Because of differences in wireless uplink and downlink transmission technologies, location of a television station in the downlink or uplink portion of the 600 MHz Band is likely to affect the extent of impairments to affected PEAs and, therefore, 600 MHz Band license prices. In particular, uplink impairments are likely to affect larger geographic areas than downlink impairments, although whether that interference to a larger area translates into a significantly larger impact on value to the forward auction licenses depends on the population density within a PEA. Uplink impairments also may affect fewer spectrum blocks than downlink impairments, however, because they would allow for unimpaired use of the downlink portion of a 600 MHz Band license by carriers with below-1 GHz uplink spectrum. On the other hand, assigning stations to the downlink band would limit the geographic reach of impairments and promote greater contiguity with television stations in the remaining TV bands. Assigning stations to the downlink band, and/or only to the licensed portion of the uplink band, would

also result in more consistently usable nationwide spectrum for wireless microphones and unlicensed devices that will operate in the duplex gap, i.e., the guard band between 600 MHz Band uplink and downlink services. In cases where a television station must be assigned to a channel in the 600 MHz Band in order to meet a given clearing target, the Commission proposes to assign these stations based on its goal of minimizing the loss of value due to impairments, i.e., minimizing the total impaired weighted-pops nationwide. Under this proposal, the optimization procedure could assign TV stations to any frequency in the 600 MHz Band. This could lead to assignments in the uplink portion of the 600 MHz Band in some markets, and in the downlink portion in others. The Commission proposes to include this objective in the optimization procedure consistent with its goals of limiting the potential for inter-service interference and maintaining a generally consistent band plan. In addition, the proposed objective will increase the likelihood of meeting the incentive auction reserve price conditions at the initial clearing target. On the other hand, the Commission recognizes that this approach may result in assigning television stations to the duplex gap or other guard bands in some markets, and limit the contiguity of TV stations if they are not assigned to the downlink portion of the 600 MHz Band.

34. Alternatively, the Commission seeks comment on whether it should assign stations to the downlink portion of the 600 MHz Band whenever feasible to do so, in the interest of greater contiguity and ensuring more consistently usable nationwide unlicensed spectrum. The Commission notes that by limiting the choice of assignments, a downlink-only approach may make it more difficult to identify an assignment of TV stations that meets the less than 20 percent standard than would its more flexible proposed approach and, therefore, could result in setting a lower clearing target. The Commission invites commenters to address the costs and benefits of its proposal and the alternative, including the potential impact on broadcast and wireless licensees, as well as on wireless microphones and unlicensed devices, and to discuss how the Commission should prioritize objectives where multiple outcomes are possible. In the Part 15 NPRM, 79 FR 69709, November 21, 2014, the Commission proposed technical

criteria for wireless microphones and unlicensed devices for each possible guard band size (7, 9, or 11 megahertz).

**iii. Standard for Limiting Market Variation**

35. In the Incentive Auction R&O, the Commission established that the 600 MHz Band Plan will allow for market variation, while recognizing that it is important to limit the potential for inter-service interference and maintain a generally consistent band plan nationwide by applying a “near-nationwide” standard. The Commission therefore proposes to limit the amount of market variation associated with the initial spectrum clearing target by limiting impairments on a nationwide aggregated basis to less than 20 percent of “weighted-pops.” The Commission believes that its proposed approach will promote the central goal of a successful auction that allows market forces to determine the highest and best use of spectrum. By accommodating market variation, it will ensure that broadcasters have the opportunity to participate in the reverse auction in markets where interest is high, and avoid the need to restrict the licenses offered in the forward auction to the number available in the most constrained market. At the same time, by strictly limiting the total amount of market variation associated with a clearing target, it will limit the potential for inter-service interference and help 600 MHz Band licensees achieve economies of scale when deploying their new networks. The Commission’s proposed approach also takes into account the relative costs and benefits of impairing licenses in different PEAs.

36. For purposes of applying the near-nationwide standard, the Commission proposes to measure the impact of potential impairments in terms of “weighted-pops,” weighting the affected population in a license area by an index of area-specific prices from prior auctions. The same weighted-pops amount will be applied for each spectrum block in a PEA. This index is the same index used for calculating bidding units before applying the proposed decile approach. Both indices are provided in Appendix F of the Auction 1000 Request for Comment. The Commission proposes to incorporate the final results of the auction of AWS-3 licenses (Auction 97) when calculating the indices. The Commission seeks comment on whether it should group the index by deciles for purposes of applying

the near-nationwide standard as it proposes for calculating bidding units. Under this approach, for a given clearing target and assignment of TV stations to channels, the Commission calculates the percentage of the population impaired in every PEA for each license using the county level data generated using the measurement approach. The Commission multiplies that percentage by the weighted-pops associated with the PEA to determine the “impaired weighted-pops” for the license. To calculate a nationwide total of impaired weighted-pops, the impaired weighted-pops for all licenses associated with a clearing target will be added together. This total will then be divided by the nationwide total number of weighted-pops for all licenses associated with that clearing target to determine whether the maximum aggregate nationwide impairment standard or threshold is satisfied. The Commission believes that its proposed approach to applying a threshold provides for flexibility in balancing the population that will be affected by potential inter-service interference with the number of markets that will be affected, and accounts for the relative value of the market to wireless providers based on past auction prices. Alternatively, the Commission seeks comment on whether it should use a metric that does not weight population by the amount of bandwidth and/or by a price index. For example, an alternative metric could require that 80 percent of the U.S. population (or price-weighted population) must be in areas not considered impaired, regardless of the quantity of impaired spectrum in any one area.

37. The Commission proposes to set the near-nationwide standard at less than 20 percent. Under this standard, a clearing target could be chosen only if 80 percent or more of the weighted-pops in the targeted amount of spectrum nationwide is considered unimpaired according to its methodology. If the provisional TV channel assignment plan associated with a clearing target results in potential impairments to 20 percent or more of the total number of weighted-pops nationwide, the auction system would consider a lower clearing target. The Commission believes that a less than 20 percent limit is appropriate to avoid reducing the amount of spectrum that will be available in most areas nationwide while ensuring that, for any given clearing target, 600 MHz Band Plan licenses generally will not be

affected by inter-service interference. The Commission's proposal to use weighted-pops also will help to ensure that most of the spectrum in the most heavily-weighted PEAs remains unimpaired.

38. The Commission seeks comment on these proposals. The Commission also invites comment on alternatives to its proposed near-nationwide standard. For example, should the Commission set a lower standard? Should the Commission require that certain PEAs, or a specific number of PEAs (e.g., 40 of the top 50 PEAs as measured by total population), not have any Category 2 licenses in order to choose a clearing target? The Commission encourages commenters to address the trade-offs involved in any alternative approach that they advocate.

#### **iv. Clearing Target Optimization Procedure**

39. Consistent with the Incentive Auction R&O, the process the Commission will use to set the initial clearing target will incorporate mathematical optimization techniques. The proposed optimization procedure is set forth in detail in Appendix C of the Auction 1000 Request for Comment. This process will also provisionally assign television stations to channels under an assignment plan that best meets the rules and objectives the Commission proposes. Once a clearing target is set, the resulting provisional assignment plan of television stations to channels in the television bands will be used by the reverse auction system as the initial tentative assignment, and information about license impairments due to stations assigned in the 600 MHz Band will be used in the forward auction portion of the stage.

40. The proposed procedure will apply a number of rules or constraints that any provisional assignment plan must satisfy. It will ensure that any assignment plan includes a permissible channel in its pre-auction band for every television station that is not participating in the reverse auction. The procedure will apply the technical repacking constraints established in the Incentive Auction R&O, taking into account any fixed constraints specific to an area or a channel that would prevent an assignment of a station to a channel, as well as all other stations that cannot be located on a co- or adjacent channel. The procedure also will determine an initial assignment of participating stations to

relinquishment options consistent with the station's initial commitments made during the application process and will attempt to assign as many stations as possible to their preferred option.

41. The Commission proposes that the primary objective of the proposed clearing target optimization procedure will be to minimize the total impaired weighted-pops nationwide. The optimization procedure will measure the percentage of population impaired in a PEA for a given television station and channel assignment using the measurement approach and described in more detail in Appendix C of the Auction 1000 Request for Comment. Thus, the optimization procedure will determine a feasible assignment of television stations to channels in the remaining TV bands where possible and, as necessary, assign stations to channels in the 600 MHz Band so as to minimize potential impairments to 600 MHz Band licenses.

42. In addition to these primary rules and objectives, the procedure could consider additional criteria in setting a clearing target. For example, should the procedure apply criteria to account for operation of the proposed dynamic reserve price process? Should it apply criteria to increase the likelihood of satisfying the final stage rule? The Commission seeks comment on whether to apply additional criteria in setting a clearing target. The Commission asks commenters to keep in mind that the tradeoff from stricter requirements may be to move to a lower clearing target, where fewer licenses will be available and fewer stations will be needed to relinquish spectrum usage rights.

43. Any channel assignment plan that satisfies the primary rules and objectives also may be modified for secondary objectives, provided that it does not violate the Commission's less than 20 percent standard for impairments. Should the Commission incorporate a secondary objective that would favor an initial channel assignment with at least a minimum level of vacancy in the broadcasting portion of the band, so as to give the auction system more flexibility to find feasible assignments during the bidding rounds, potentially avoiding the need to move to a lower clearing target because it failed to meet the final stage rule? In this context, should the Commission consider requiring that the 20 percent nationwide standard include sufficient vacancy to accommodate additional impairments created during

any reverse auction dynamic reserve pricing procedures? The Commission seeks comment on possible secondary objectives to be applied in the optimization procedure. Because the optimization procedure may identify more than one possible assignment plan that satisfies the primary rules and objectives, the Commission particularly seeks comment on how the procedure should choose between plans to best meet the goals of the incentive auction. For example, the Commission asks commenters to consider whether the procedure should favor an assignment in which the number of 600 MHz Band blocks, or the number of Category 1 blocks (a Category 1 license is any license with potential impairments that do not exceed 15 percent of the population) is most nearly the same in the largest number of PEAs, in order to promote the geographic contiguity of the band plan. Alternatively, the Commission invites comment on whether the optimization procedure should try to minimize the number of PEAs—or the number of particular PEAs—in which Category 2 blocks outnumber Category 1 blocks, to avoid having PEAs with significantly fewer Category 1 blocks than are available in most areas nationwide.

## **B. Final Stage Rule**

44. The final stage rule the Commission adopted in the Incentive Auction R&O incorporates an aggregate reserve price based on the bids in the forward auction. Satisfaction of the rule conditions will cause the current stage to become the final stage for the auction's clock bidding rounds. The rule has two components, both of which must be satisfied. The first and second components are complementary and not cumulative. The auction must satisfy both components, but it need not raise sufficient proceeds to satisfy the first in addition to the second. Rather, the same bids and proceeds can be considered when satisfying each component. The Commission seeks comment on determining the price and spectrum clearing benchmarks for the first component of the rule, as well as on other rule implementation issues.

### **i. First Component: Average / Aggregate Prices in Forward Auction**

45. The Commission proposes an average price per MHz-pop (the term MHz-pop is defined as the product derived from multiplying the number of megahertz associated with a license by the

population of the license's service area, i.e., PEA, for the 600 MHz band, specifically) benchmark of \$1.25 for spectrum offered in the largest 40 PEAs by population in the forward auction and a forward auction spectrum benchmark of 70 megahertz, corresponding to a broadcast spectrum clearing target of 84 megahertz. The Commission also seeks comment on its proposal to consider a subset of those licenses in applying the first component of the final stage rule.

46. The first component ensures that winning bids for the licenses in the forward auction reflect competitive prices. The Commission explained in the Incentive Auction R&O that the first component of the reserve price will be satisfied if, for a given stage of the auction: (1) the average price per MHz-pop for licenses in the forward auction meets a price benchmark that will be set by the Commission in the pre-auction process; or (2) the total proceeds associated with licenses in the forward auction exceed the product of the price benchmark, the forward auction spectrum benchmark, and the total number of pops for those licenses. The determination of the average price and spectrum clearing benchmarks is therefore essential to the implementation of the first component of the final stage rule.

47. Setting an average unit price benchmark of \$1.25 per MHz-pop in the largest 40 PEAs by population will accomplish the Commission's goal of "assuring that prices for licenses in the forward auction reflect competitive values without reducing the amount of spectrum repurposed for new, flexible-use licenses." The closest comparable spectrum auction—Auction 73—generated an auction-wide average price per MHz-pop of \$1.28 and an average price among paired spectrum blocks of \$1.36. Since that auction closed in early 2008, spectrum prices generally appear to have increased, although the growth rate cannot be validated based on comparable data due to the absence of final results for a large-scale auction in that period. Moreover, because the prices of 600 MHz Band licenses will be determined by the forward auction bidding, the Commission believes that any aggregate reserve price it sets should reflect a "floor" and not a "ceiling" of the "competitive values" of these licenses, in order to provide sufficient margin to account for the inherent price uncertainty present in any auction.

48. The Commission proposes to set the forward auction spectrum benchmark to correspond with the spectrum recovery scenario in which the Commission clears 84 megahertz of broadcast TV spectrum and offer licenses for 70 megahertz of spectrum in the forward auction. The spectrum benchmark will be used as part of the alternative formulation of the final stage rule's first component, which "recognizes that if the incentive auction repurposes a relatively large amount of spectrum for flexible uses, per-unit market prices may be expected to decline consistent with the increase in available supply." An 84 megahertz broadcast TV spectrum clearing target, which would repurpose all of the spectrum between TV channel 37 and the 700 MHz Band and provide 70 megahertz of spectrum in the forward auction, would promote the Commission's competitive goals by enabling multiple bidders to obtain low-band spectrum. Therefore, the Commission believes that this threshold is appropriate for the forward auction spectrum benchmark.

49. The Commission proposes to determine whether the first component of the final stage rule is satisfied based on the average prices for a subset of PEAs likely to be subject to the greatest level of demand. The Commission proposes to include in the subset the 40 largest PEAs by population because they cover geographic areas that have usually generated the highest average prices per MHz-pop in prior spectrum license auctions. In previous auctions, prices for licenses in these "high-demand" areas have accounted for a substantial fraction of total auction revenues, and further, licenses in "high-demand" areas tend to reach their final prices well before bidding stops on all licenses, making these markets a good leading indicator of final auction revenues. Further, using this subset of PEAs will promote a speedy auction by enabling the auction system to determine quickly when the final stage rule will not be met necessitating a new stage with a lower clearing target. The Commission seeks comment on this use of "high-demand" PEAs and the proposed definition of this "high-demand" subset.

50. The Commission further proposes, in considering whether average prices meet the benchmark, to consider only bids for spectrum blocks in Category 1. The Commission proposes to offer spectrum blocks in two categories of generic licenses for bidding in the forward auction. Specifically,

the Commission defines a Category 1 license as any license with potential impairments that affect zero to 15 percent of the population of a specific PEA, and as Category 2, any license with potential impairments that affect greater than 15 percent but less than or equal to 50 percent of the population. Limiting the Commission's consideration of blocks in this manner is consistent with its proposed use of data from other auctions in determining the relevant average price, as the licenses in those prior auctions were not impaired in a manner comparable to the proposed licenses in Category 2.

51. Applying the Commission's proposals to the first component of the final stage rule, as explained in more detail in Appendix G of the Auction 1000 Request for Comment, the first component will be satisfied if the average price per MHz-pop for Category 1 licenses in "high-demand" PEAs in the forward auction equals or exceeds \$1.25 per MHz-pop at clearing targets at or below the benchmark clearing target. For clearing targets above the benchmark clearing target, the Commission proposes to consider current auction proceeds for all licenses when comparing to the proceeds that would be generated by the benchmark price for "high demand" PEAs and the benchmark clearing target. This simplifies the evaluation of the formulation since the Commission will compare a number publicly announced at the end of every round (the total forward auction proceeds) to a fixed number known in advance (the product of the price and spectrum benchmarks that it adopts, and the total number of pops covered by licenses in "high-demand" PEAs). Under this formula, the first component of the final stage rule may be satisfied even if the overall average price per MHz-pop in the "high-demand" PEAs fails to meet the proposed \$1.25 price benchmark.

52. In evaluating whether the first component of the final stage rule is satisfied, the Commission also proposes not to take into account any adjustments to final clock prices. Thus, the Commission proposes to rely on gross bids, rather than bids net of individual bidders' bidding credits or any adjustments for impairments. The first component is intended to assess whether the bids reflect competitive prices for the licenses. The Commission tentatively concludes that the clock prices will adequately measure competitive prices for the licenses in the proposed Category 1, even though the full

amount of the clock price may not be collected from every winning bidder. Moreover, since winning bidders will not yet be determined at the time the final stage rule is met, it will not be clear which licenses will be subject to bidding credits. The clock price reflects a common metric for pricing the licenses and is appropriate to use in assessing whether the first component of the final stage rule has been satisfied.

**ii. Second Component: Covering Costs**

53. The second component of the final stage rule requires that the proceeds of the forward auction be sufficient to meet mandatory costs and expenses set forth in the Spectrum Act and any Public Safety Trust Fund amounts needed in connection with FirstNet. Given the purpose of assuring sufficient proceeds for specified purposes, the Commission proposes a conservative approach to estimating the proceeds resulting from forward auction bids for evaluating whether the second component is met.

54. The Spectrum Act requires that the forward auction generate proceeds sufficient to pay three types of expenses: payments to winning bidders in the reverse auction; the Commission's relevant administrative costs of the auction; and an estimate of broadcaster relocation costs eligible for reimbursement. In addition, the Commission concluded that the forward auction proceeds also must cover a fourth expense: any Public Safety Trust Fund amounts still needed to provide funding for FirstNet as contemplated in the Spectrum Act.

55. The reverse auction itself will determine the amount of the first expense. With regard to the second expense, the Commission cannot yet provide a reliable estimate of the amount of its expenses in conducting the incentive auction because there is still much work to do before it can conduct the auction. The Commission therefore proposes here to provide an estimate in the Procedures PN and a maximum percentage by which the final amount might vary from that estimate. The final amount for purposes of the final stage rule would be provided no later than the commencement of bidding. The flexibility in this approach will enable the Commission to discharge its statutory obligation to recover the

relevant expenses from auction proceeds while providing adequate information to potential and actual auction participants to make informed decisions about participating and bidding.

56. With regard to the third expense that must be covered, the actual amount that will be needed to reimburse broadcasters from the TV Broadcaster Relocation Fund (Reimbursement Fund) will not be known until sometime after the auction. In any event, the Spectrum Act provides that the forward auction must generate proceeds sufficient to meet the Commission's estimate of the total expenses, as opposed to the actual amount. The Commission proposes to estimate this amount at \$1.75 billion, the maximum amount that the Spectrum Act permits it to deposit in the Reimbursement Fund. The Commission considers setting this expense at the maximum amount to be prudent in light of the difficulty of estimating the amount in advance and the substantially conflicting range of estimates suggested in the record to date.

57. With regard to the fourth expense, the Commission proposes to announce in the Procedures PN any amount needed in the Public Safety Trust Fund to provide funding for FirstNet. The maximum amount of the Public Safety Trust Fund deposits to be made available to FirstNet for build out under the Spectrum Act is \$7 billion. The amount that the incentive auction must provide will depend on the proceeds generated for FirstNet by the auction of AWS-3 licenses (Auction 97) and whether, once Auction 97 has been concluded, there are any Public Safety Trust Fund amounts still needed to provide funding for FirstNet as contemplated in the Spectrum Act. The Commission is optimistic that upon the conclusion of Auction 97, it will be clear that deposits to the Public Safety Trust Fund will be sufficient to fully fund requisite amounts for FirstNet.

58. The Commission proposes to take into account discounts that may affect actual amounts paid by winning bidders when evaluating whether the second component of the final stage rule is satisfied. Given the second component's purpose of assuring sufficient proceeds for specified purposes, the Commission believes a more conservative approach to estimating the ultimate proceeds resulting from forward auction bids is appropriate than for the first component of the final stage rule.

Accordingly, in determining whether the second component has been satisfied, the Commission proposes to take into account any discounts based on impairments, as well as discounts based on small business bidding credits applicable to particular bidders.

59. A final license price may be adjusted to take into account the extent of any impairments that exist in the license. Accordingly, the Commission proposes here that it use the available information regarding the extent of the impairments when evaluating the final stage rule to discount the current clock price by the impairments. Doing so effectively will apply the same percentage discount that will be applied to the final price for the license, presuming the final stage rule is satisfied. The estimate used will be the lowest amount possible for the final price, which ultimately may be larger based on bidding in clock rounds and any additional bidding on the license in the assignment phase.

60. It is more difficult to estimate the final effect of small business bidding credits on auction proceeds prior to the conclusion of the auction. In order to do so, the Commission proposes that the auction system will presume that the bidder with the largest bidding credit will win the blocks it is bidding on and then proceed to the bidder with the next largest bidding credit and so on, until there are no more blocks left. Moreover, the Commission proposes to presume that the bidders with the largest bidding credits will win the blocks that are least impaired and thus, subject to the least adjustment based on the extent of impairment. The Commission believes that this approach is appropriate in light of the purpose of the second component. The Commission notes that a more conservative approach would be to discount all bids by the largest bidding credit claimed by any bidder in the auction, thereby assuring that the final winning bids could not be any lower than the estimate. However, the Commission does not propose to take this more conservative approach because it likely would overestimate substantially the discounts on final winning bids.

61. Unlike other bidding credits, winning bidders initially apply for Tribal lands bidding credits after the close of bidding, and so the amount of any Tribal lands bidding credits will not be known until after the auction, making it very difficult to assess their effect on auction proceeds. In past

auctions, the Commission addressed this difficulty with a rule (47 CFR 1.2110(f)(3)(v)) that limits any amounts disbursed as Tribal lands bidding credits based on the available funds that exceed the relevant reserve price. The rule thus allows the award of Tribal lands bidding credits so long as the awards do not reduce the amount of funds otherwise required by a reserve price. The second component of the final stage rule specifically functions to assure that auction proceeds will equal or exceed the total of the four expenses that the second component reflects. Accordingly, the Commission proposes to apply 47 CFR 1.2110(f)(3)(v) with respect to the amount of the second component to preclude the possibility that the post-auction award of Tribal lands bidding credits could reduce auction proceeds below the total of the four expenses. Under this proposal, so long as there are sufficient proceeds to fund both the four expenses and any Tribal lands bidding credits, the credits will be awarded in full. If the proceeds are not sufficient to cover both the four expenses and any such Tribal lands bidding credits, the credits will be reduced proportionally as provided in 47 CFR 1.2110(f)(3)(v) so that the four expenses will be covered in full and any credits awarded will use only proceeds in excess of the total of the four expenses. Commenters objecting to this proposal should specify an alternative approach to prevent total auction proceeds from falling below the amount of the final stage rule's second component.

### **C. Stage Structure**

62. In the Incentive Auction R&O, the Commission decided that the incentive auction will begin with reverse auction bidding followed by forward auction bidding in the initial stage and that, if necessary, bidding will continue over multiple stages, each including reverse and forward auctions, for successively lower clearing targets, until the final stage rule is met. Here the Commission seeks comment on remaining issues related to the stage structure. In particular, the Commission proposes procedures to determine whether the auction is in its final stage. The Commission also proposes procedures for moving to an extended round if certain conditions are met, as well as steps for transitioning to a new stage if necessary.

**i. Sequence of Reverse and Forward Auctions**

63. Consistent with the Commission’s decision in the Incentive Auction R&O regarding the first stage, the Commission intends that in any stage, the reverse auction will occur first, to be followed by the forward auction. Under this proposal, the reverse auction will run until the reverse auction stopping rules are met. The forward auction will commence once the reverse auction has stopped.

64. The Commission seeks to provide the minimum necessary time between the reverse and forward auctions in any stage. The Commission therefore proposes to start forward auction bidding in the initial stage on the second business day after the close of bidding in the stage’s reverse auction. With respect to any subsequent stages, the Commission proposes to start forward auction bidding on the next business day after the close of reverse auction bidding. Before forward auction bidding commences in any stage of the auction, forward auction bidders will be informed of the number of blocks to be offered in each PEA and the degree to which any of those blocks are impaired. The Commission seeks comment on this proposal. If commenters suggest a longer interval, the Commission asks that they provide details on why a longer period is desirable.

**ii. Final Stage Determination and Implementation of Extended Round**

65. The Commission proposes to evaluate whether the final stage rule is met throughout forward auction bidding in order to determine as quickly as possible whether the auction is in its final stage. This approach will allow the auction system to implement procedures triggered by satisfaction of the rule as early as possible and promote the speedy conclusion of the overall auction process. Specifically, the auction system will evaluate whether forward auction proceeds are sufficient to satisfy the final stage rule as part of the bid processing that occurs after each round of forward auction bidding. As prices and associated auction proceeds increase during the forward auction, the auction system will have the needed information to evaluate whether all required conditions of the final stage rule have been met.

66. The Commission also proposes to implement an “extended round” in which bidders will have the opportunity to increase their bids to make up any shortfall in the final stage rule under specified circumstances. The purpose of an extended round is to attempt to satisfy the final stage rule without moving to a new stage and lower clearing target. In the absence of an extended round, the current stage of the auction would be deemed to have failed and the auction would move to a new stage with a reduced clearing target.

**iii. Transition to Any Subsequent Stages**

67. After the conclusion of a stage that has ended without satisfying the final stage rule, and prior to beginning of any subsequent stage, the Commission proposes that the auction system will announce the new bidding schedule, including the date and time that bidding will start in the reverse auction portion of the next stage. If the auction must move to a new stage, the Commission proposes to set the clearing target for the next stage as the next lowest clearing target. Alternatively, the Commission seeks comment on whether the benefits outweigh the costs of skipping some clearing targets. For example, should the Commission skip the 108 MHz clearing target when moving to a lower clearing target because under that scenario two downlink blocks are separated from the remaining downlink blocks by channel 37?

**D. After the Final Stage Rule Is Satisfied**

68. When forward auction bidding satisfies the final stage rule, that stage of the auction will be the final stage. Meeting the final stage rule will not “close” the forward auction, however, as long as demand exceeds supply in any PEA. Rather, bidding will continue until demand does not exceed supply for all blocks in all PEAs. When this clock phase of the auction ends, the next step in the forward auction will be the assignment phase in which successful forward auction bidders will bid for frequency-specific licenses equal to the number of blocks they won in the clock phase. The Commission proposes that bidding in the assignment phase of the forward auction will start five business days after the auction system provides more detailed information about the assignment phase. The Commission recognizes

that forward auction bidders will need a period of time to develop bidding strategies for the assignment phase, particularly since this is the first time it has conducted a frequency assignment phase. However, the Commission's goal is to conclude the incentive auction as efficiently as possible. Thus, the Commission believes the interval it proposes before beginning the assignment phase should be adequate.

#### **IV. PROPOSED REVERSE AUCTION PROCEDURES**

##### **A. Relinquishment Options and Information Available**

69. The Commission explained in the Incentive Auction R&O that the purpose of the reverse auction is to identify broadcasters willing to relinquish some or all of their spectrum usage rights, and the corresponding incentive payments those broadcasters will require, in order to clear a stage-specific spectrum clearing target. To this end, the Commission adopted a descending clock auction format, relinquishment options, and a repacking methodology that will be incorporated into the reverse auction system. Bidding will take place in a series of rounds in which a bidder will be presented with price offers for each of its valid options for relinquishing spectrum usage rights. The Commission seeks comment on procedures to implement the various relinquishment options it established. The Commission also addresses the information that will be made available to bidders and to the public during the reverse auction bidding process.

##### **i. Options for Relinquishing Spectrum Usage Rights**

70. The Commission proposes to implement the relinquishment options established in the Incentive Auction R&O by giving each bidder the opportunity to bid for the various options that are open to it given the station's pre-auction band location (UHF, High-VHF, or Low-VHF). Specifically, a licensee with a UHF station can bid to relinquish all spectrum usage rights and go off-air, or to move to a High-VHF channel or a Low-VHF channel. A licensee with a High-VHF station can bid to go off-air or to move to a Low-VHF channel. A licensee with a Low-VHF station can bid only to go off-air. To incorporate the channel sharing option into the bidding process, the Commission proposes that a participant that wishes to relinquish rights in order to share another licensee's channel will bid to go off-

air, following the same bidding procedures as bidders that wish to go off-air without retaining a license. Throughout the auction, all bidders will maintain the option of declining to accept a price offer for an option, indicating that at this price or lower, they choose to drop out of the bidding.

71. The Commission proposes to treat the various options available to broadcasters, from license relinquishment to remaining on the air in their pre-auction bands, as a hierarchy in order of relinquishment and value to the auction. With regard to a UHF station, bidding to go off-air would be at the top, or first, in the hierarchy, followed by a move to Low-VHF, then to High-VHF, and finally, remaining on the air in its pre-auction band. Bidding to go off-air would be first in the hierarchy for High-VHF and Low-VHF stations as well, followed by a move to Low-VHF (for High-VHF stations only), and then remaining on the air in their respective pre-auction bands. The Commission will later refer to this ordering in addressing several of its proposed reverse auction implementation procedures.

72. The Commission proposes that a bidder will not be permitted to bid for options that would involve greater relinquishments than the most recent option selected. Under the Commission's proposal, the auction system will permit a bidder to move up (from greater relinquishment to less), but not down. For example, assuming a bidder with a UHF station selects all three relinquishment options in its application and then indicates its preferred option is to go off-air, the auction system will allow the bidder to choose the option of moving to a Low-VHF channel (if there is a vacancy in the Low-VHF band) later in the bidding, but not vice versa. If and when the auction system accepts that change in the bidder's preferred option, the bidder will not be allowed to request to go off-air later because that would represent a move down in the hierarchy of options. Likewise, selecting the option of moving to a High-VHF bid would preclude later bidding to go off-air. The Commission proposes this approach so that the auction system can calculate price offers based on consistent indications of bidder preferences, which will simplify bidding choices and lead to a speedier reverse auction.

73. The Commission proposes to treat a channel-sharing bid as the Commission does a bid to go off-air because, from the perspective of the auction system, a channel sharing bid is identical to a

license relinquishment bid. Under this proposal, a bidder that seeks to relinquish its rights and share a channel with another broadcaster will be required to enter into a channel sharing agreement before the bidding, and will continue to hold a broadcasting license following the auction, but will not be subject to different bidding procedures during the auction than other participants that are going off the air. A broadcaster that relinquishes spectrum usage rights in order to share a channel will have its post-auction channel determined according to its contract with its channel sharer—that is, another broadcaster that remains on-air. The Commission notes that parties to a channel sharing agreement bear the consequences of any defects in the agreement or the failure of either party to perform pursuant to its terms. The Commission is not a guarantor or an enforcer of channel sharing agreements.

**ii. Reverse Auction Information Available During the Auction**

74. The Commission proposes to limit the disclosure of information regarding bidding during the auction. This proposal is separate and apart from the Commission’s statutory obligation to maintain the confidentiality of information regarding the identity of participating broadcasters.

75. Specifically, the Commission proposes that the auction system will offer each reverse auction bidder only the prices for options specific to its station(s). Under the Commission’s proposed approach bidders will not know the prices being offered to other bidders.

76. The Commission proposes that while the incentive auction is open, it will disclose to the public the current stage status, specifically the stage number and whether or not bidding is still open in the reverse auction for that stage. When bidding in the reverse auction for a stage is closed, the Commission also will disclose to the public the total of reverse auction bids that the forward auction proceeds must satisfy as part of the second component of the final stage rule.

**B. Application to Participate and Commitment to Initial Relinquishment Option**

77. The Commission seeks comment on particular aspects of the reverse auction application process. Specifically, the Commission seeks comment on information to be provided from potential

channel sharers, i.e., stations that may or may not participate directly in the auction and that have agreed to share a channel with an auction participant that relinquishes its spectrum usage rights in the auction. The Commission also seeks comment on information to be required from certain participants whose eligibility is uncertain, and from all participants with respect to their exercise of due diligence prior to participating. In addition, the Commission describes how each applicant will identify—and commit to—its initial preferred option among the available options for relinquishing spectrum usage rights.

**i. Information from Channel Sharing Participants**

78. The Commission proposes that any auction applicant submitting a channel sharing agreement with its application also be required to submit a separate certification by the channel sharer that the channel sharing agreement submitted is a true, correct, and complete copy of the channel sharing agreement between the parties. This certification must be executed by a party with authority to make such representations on behalf of the channel sharer. The Commission adopted rules in the Incentive Auction R&O outlining the information required of an applicant seeking to participate in the auction in order to share a channel after the auction. Under these rules, channel sharers—stations that agree to share their channels after the auction with stations that relinquish rights in the auction in order to channel share—need not apply to participate in the auction. However, they must provide any “necessary” certifications. The Commission believes that the proposed certification is necessary in order to smooth the post-auction transition by helping to assure the accuracy of the channel sharing agreement submitted with the application.

**ii. Agreement to Escrow, if Necessary for Participation**

79. The Incentive Auction R&O considered the circumstances of broadcasters that have licenses that have expired or are subject to a revocation order (collectively a “license validity proceeding”), or that have Class A stations subject to a downgrade order, when the license validity proceeding or Class A downgrade order has not become final and non-reviewable by a date prior to commencement of the auction that will be specified in the Procedures PN. If the license invalidity

determination becomes final between the time a broadcaster is found to be qualified to participate in the reverse auction and commencement of reverse auction bidding, the broadcaster will be excluded from participating in the reverse auction. In those circumstances, the Commission established that the broadcaster is allowed to participate provided that its reverse auction proceeds would be placed in escrow pending the final outcome of the license validity proceeding or order. The Commission similarly established that a broadcaster with a pending enforcement matter or a pending license renewal application that raises an enforcement issue is allowed to participate in the reverse auction, on condition that such a broadcaster that no longer would hold any broadcast licenses upon acceptance of a license relinquishment bid agrees that a share of its reverse auction proceeds be placed by the Commission in escrow to cover potential forfeiture costs. The Commission now proposes the mechanism for implementing this arrangement in those circumstances where it is appropriate. Specifically, the Commission proposes that broadcasters with pending enforcement, license renewal, or other potential eligibility impediments must agree, as part of their application to participate in the auction, that auction proceeds which they otherwise could receive for relinquishing spectrum usage rights will be held by the U.S. Treasury. The U.S. Treasury would maintain the funds that are held back in a manner that accounts for each broadcaster's potential share pending the final resolution of specified issues, or for two years, as described in the Incentive Auction R&O. In addition, all such broadcasters that would not control any other television stations if its bid or bids were accepted must agree to remain subject to the Commission's jurisdiction and authority to impose enforcement or other FCC liability post-auction. The Commission seeks comment on this proposal.

80. This proposal implements the Commission's determination that such broadcasters may be qualified to participate even though they (a) have uncertain eligibility to participate due to particular circumstances or (b) have certain outstanding potential liabilities to the Commission. More specifically, the Commission provided that a broadcaster that has a license that is subject to pending proceedings that, if resolved against the broadcaster, would make the broadcaster ineligible to participate, might become

qualified to bid if the broadcaster agrees to have the full amount of any incentive auction proceeds it might win held by the U.S. Treasury, pending resolution of the outstanding proceedings.

81. The Commission also concluded that a broadcaster might participate in the reverse auction even though the relinquishment of its broadcast spectrum usage rights might otherwise limit the Commission's ability to recover potential liabilities to it, provided that the broadcaster agrees that some of any incentive payment would be held by the U.S. Treasury to cover potential forfeiture amounts. In the second case, when such a broadcaster is notified of its eligibility to participate in the reverse auction after filing an application, the Wireless Telecommunications, Media, and Enforcement Bureaus will provide that broadcaster with information about any pending enforcement matter that cannot be resolved before the reverse auction. In addition, the Bureaus will indicate the amount of reverse auction proceeds that will be held should the broadcaster relinquish its license(s) as a result of the auction and therefore otherwise no longer be subject to the Commission's jurisdiction.

82. As to the amount to be held with respect to a particular broadcaster, all of the relevant auction proceeds would be held pending the final resolution of the status of the license in the case of a broadcaster with a license that may be determined post-auction not to have been eligible for relinquishment at the time of the auction. In the case of a broadcaster that has outstanding potential liabilities and might cease to be subject to Commission jurisdiction after relinquishing all of its broadcast spectrum usage rights, the amount determined prior to the auction by the Bureaus would be held. As described in the Incentive Auction R&O, amounts held will be released to the broadcaster or the Commission, as appropriate in light of the final resolution of the relevant specified issues.

83. The Commission also invites comment on an alternative proposal, under which, instead of holding the funds in the U.S. Treasury, it would deposit the relevant amounts in a third party financial institution to serve as a private escrow agent. Under this alternative, prior to the auction, the Commission would designate a private escrow agent for each broadcaster agreeing to the escrow in its application. The Commission will require that any escrow agent maintain the confidentiality of

Commission-held data of broadcasters participating in the reverse auction. The Commission seeks comment on this alternative, including the terms of any escrow agreement with a third-party agent.

**iii. Certification Regarding Due Diligence**

84. The Commission proposes that all applicants will be required to certify the truth of the following statement as a part of their application to participate in the reverse auction: “The applicant acknowledges and agrees that any information provided by the Commission’s outside contractors who are advising and assisting it with education and outreach in connection with the reverse auction is for informational purposes only and that neither the Commission nor any of its outside contractors makes any representations or warranties with respect to any such information and shall have no liability to the applicant in connection therewith.” The Commission’s rules already provide that an applicant to participate in the reverse auction must certify that it has sole responsibility for investigating and evaluating all technical and marketplace factors that may have a bearing on the bids it submits in the reverse auction. The Commission’s proposed additional certification will likewise help assure that each applicant accepts responsibility for its bids and will not attempt to place responsibility for its bids on either the Commission or the information provided by third parties as part of the Commission’s outreach. Requiring this proposed certification is also consistent with the Commission’s rule providing that an application will contain “such additional information as may be required,” 47 CFR 1.2204(c)(11).

**iv. Committing to an Initial Relinquishment Option**

85. The specific opening prices for each bidding option available to each station eligible to participate in the reverse auction will be provided at least 60 days in advance of the deadline to apply to participate in the reverse auction. The Commission proposes that each applicant to participate in the reverse auction will indicate for each of its stations listed in its application all of the spectrum relinquishment options available to it that it may be willing to consider. After Commission staff reviews a submitted application and the applicant has resolved any issues regarding the information provided, the applicant will be required to indicate a single preferred relinquishment option for each of its stations

from among those that it previously indicated it would be willing to consider. An applicant must indicate a preferred relinquishment option and in certain cases may also specify alternative(s) for that preferred option. An applicant must specify a preferred option (and any alternative(s), if it so chooses) for each station listed in its application in order to qualify as a bidder with respect to those stations in the reverse auction. This step will constitute a commitment by the applicant to fulfilling the terms of its preferred option (or alternative(s)) for a particular station, i.e., relinquishing the relevant spectrum usage rights in exchange for the opening price in the event the auction system can accommodate the preference (or an alternative). This first commitment will establish the starting point for bidding in the clock rounds.

86. In order for an applicant's commitment for a station to be a valid starting point for bidding, it must be feasible for the auction system to accommodate an option for that station. The auction system can always accommodate going off-air as a preferred option because going off-air does not require finding a feasible channel assignment. However, the auction system may not be able to accommodate moving to either the Low-VHF or High-VHF band as a preferred option if there are not enough channels available in that band (vacancy) at the start of the auction to accommodate all stations with such a preference. Accordingly, the Commission proposes that an applicant that selects moving to either Low-VHF or High-VHF as its preferred option for a station may indicate alternative options for that station, which would be used in the event that the preferred option cannot be accommodated. Under the Commission's proposal, the auction system will attempt to accommodate the preferred option. If it cannot and the applicant indicated one or more alternative options for the station, the system will attempt to accommodate one of the alternative options when determining an initial assignment of stations to relinquishment options. If the system assigns the station to one of its alternative options, that option will constitute the applicant's commitment and become that station's assigned option at the start of bidding. If the auction system cannot accommodate an applicant's preferred option or any of its alternative options for a station, that station will be assigned a channel in its pre-auction band. Thus, an applicant

that wants to guarantee a station's participation in the bidding should indicate going off-air as either its preferred option or as an alternative option, as a vacancy for every station to move to Low-VHF or High-VHF cannot be guaranteed.

87. The Commission proposes that once bidding begins in the clock rounds a bidder will not be permitted to bid for options that would involve greater relinquishments than the previous option selected. Thus, under the Commission's proposal, an applicant considering multiple relinquishment options for a station will need to consider the restriction on moving one way up the hierarchy of options in deciding which option to commit to at the commitment stage of the application process, since its choice may preclude later being able to bid for other options below it. For example, initially committing to moving to Low-VHF would preclude later switching options to going off-air; initially committing to moving to High-VHF would preclude later switching options to going off-air or moving to Low-VHF; and initially committing only to moving to either Low-VHF or High-VHF, without committing as an alternative to going off-air, could result in non-participation if there is no vacancy in either of these bands at the start of the auction.

88. Initial Assignment. Once each station has made an initial commitment(s), the auction system will determine an initial assignment of stations to relinquishment options using optimization techniques. This initial assignment will determine the relinquishment option for which a station will be offered prices at the beginning of the reverse auction. Due to the limited availability of VHF channels, the Commission proposes to prioritize rules that will be used to determine, in the event that all participating stations cannot be assigned to their preferred options, how to choose an alternative option for some stations. If a station cannot be assigned to its preferred option or an alternative option, it will not participate in the reverse auction bidding and will be assigned to a channel in its pre-auction band. As set forth in detail in Appendix C of the Auction 1000 Request for Comment, the Commission proposes the following rules in order of priority: (1) minimize the number of UHF participating stations that must be assigned to their pre-auction band; (2) minimize the number of VHF participating stations

that must be assigned to their pre-auction band; (3) maximize the number of participating stations that can be assigned to their preferred relinquishment option; (4) maximize the number of participating stations that can be assigned to go off the air as an alternative option; and (5) minimize the sum of impaired weighted-pops across all licenses (i.e. solve for the primary objective of the clearing target optimization). The Commission proposes to give rules (1) and (2) the highest priority to minimize the number of stations that are assigned to their pre-auction band and, therefore, cannot participate in the reverse auction. Rule (1) precedes all others to minimize the likelihood of creating additional impairing stations in the 600 MHz Band. If not all stations can simultaneously be assigned to their preferred option pursuant to rule (3), rule (4) would ensure that the maximum number of stations that must be assigned an alternative option are assigned the option to go off the air, in order to provide the most opportunities for bidding in the reverse auction. Finally, rule (5) would require the optimization to choose among the remaining options based on the primary objective of minimizing the sum of impaired weighted-pops across all licenses in the 600 MHz Band.

### **C. Descending Clock Bidding Procedures**

89. In adopting a descending clock format for the reverse auction, the Incentive Auction R&O explained that “bidders will be faced with relatively simple choices of determining whether or not they are still willing to accept the current prices for bid options.” It determined that price offers for bid options generally will start high and descend between rounds for each participating station, and indicated that price offers for each station may be adjusted based upon factors reflecting that particular station’s impact on the repacking process. In the Incentive Auction R&O, the Commission adopted rules allowing for the use of reserve pricing in the reverse auction, and noted that it may adopt procedures to implement a form of dynamic reserve pricing (DRP). The Commission also explained in general terms the descending clock auction procedures for selecting winning bids and determining prices to be paid to winning bidders.

90. The Commission proposes procedures for determining the prices reverse auction bidders will be offered during the bidding rounds. The Commission then address the bidding process in detail, proposing procedures for the types of acceptable bidder responses to price offers in a round, including procedures for bidding for multiple relinquishment options. The Commission also addresses how the auction system will process bidder responses to determine which stations will have their bids accepted. Finally, the Commission proposes procedures to implement bidding activity and stopping rules.

**i. Determining Price Offers**

91. The Commission clarifies that a “bid” in this descending clock auction means a response to a price that is offered to the bidder. This is consistent with the fundamental premise of a clock auction, where bidders do not initiate bids but rather indicate over a series of rounds whether they are willing to accept offered prices that increase or decrease, depending upon whether it is an auction to sell or buy. The clock prices stop increasing or decreasing when there is no longer competition among the bidders to buy or sell an item. For example, in a simple procurement auction to buy one item, the auction stops when only one bidder is left that is willing to supply the item at the current price offer. In the reverse auction, the Commission will aim to “procure” a targeted amount of cleared television spectrum and bidders will compete to relinquish spectrum usage rights to enable that clearing. Through their bids in each round, bidders will indicate their continued willingness to accept a given offer price for a relinquishment option, which will constitute a commitment to relinquish their spectrum usage rights at that price, or they will reject the offer, possibly indicating a lowest price they are willing to accept.

**a. Opening Price Methodology**

92. Opening prices must be high enough to encourage robust participation in the reverse auction, but not so high that the reverse auction requires many hundreds of rounds to reach final clearing prices. In designing a system of competitive bidding, which includes setting opening prices, the Commission promotes several statutory goals, including “recovery for the public of a portion of the value of the public spectrum resource made available for commercial use and avoidance of unjust

enrichment through the methods employed to award uses of that resource,” 47 USC 309(j)(3)(C). To balance these objectives, the Commission proposes to calculate an opening bid price for each station, using a station-specific “volume” factor and an underlying base clock price for a UHF station going off air. The opening bid for the UHF off-air and channel sharing options will be the same, as both would result in the return of a full six megahertz of UHF spectrum for reallocation to flexible-use licenses. Because the Commission will not know the initial clearing target prior to accepting bidder applications, and therefore will not exclude any stations or markets from the auction in advance, the Commission intends to provide opening prices to every eligible broadcaster. If, upon establishing the initial clearing target, the auction system identifies markets where broadcaster participation is not needed, it will so inform broadcasters in any such market and provisionally assign each of them channels in their pre-auction bands. The opening prices may be zero for stations that the auction system determines do not constrain the Commission from reorganizing the UHF band. The opening off-air bid for UHF stations would be the product of each station’s volume factor and the base clock price. Opening bid prices for a move from the UHF band to the Low-VHF or High-VHF band would be calculated by applying a specific discount to the off-air bid amount for each of these options.

93. The Commission proposes to calculate a station’s volume using this formula:  $\text{Station Volume} = (\text{Interference})^{0.5} * (\text{Population})^{0.5}$ . The Commission proposes to set interference equal to the number of co- and adjacent channel constraints a station would impose on repacking on a pairwise basis. The interference component measures a station’s potential impact on repacking. More specifically, for each station pairing, the Commission first determines the maximum number of constraints that can exist between the two stations on any channel in bands into which both stations can be repacked. Thus, between two UHF stations, the Commission would consider all channels in the UHF, High-VHF or Low-VHF bands (channels 2-51) to determine the maximum number of constraints that exist between the two stations consistent with the hierarchy of relinquishment options. Between a UHF station and a High-VHF station, the Commission would consider only channels in the High-VHF band

(channels 7-13) and Low-VHF band (channels 2-6) to determine the maximum number of constraints that exist between the two stations. Between a UHF station and a Low-VHF station, the Commission would consider only channels in the Low-VHF band (channels 2-6) to determine the maximum number of constraints that exist between the two stations. The Commission then sums up these maximums for each station to set its interference metric. The Commission proposes to measure population as the number of people residing within the station's interference-free service area. A fuller description of this calculation is set out in Appendix D of the Auction 1000 Request for Comment.

94. To calculate a station's opening bid price, the Commission will multiply its volume times a base clock price. The base clock price is a constant amount per unit of volume. Based on the Commission's work to date on the design of the incentive auction, it expects that a base predicated on an opening bid price of \$900 million for the station with the highest volume will achieve robust participation by stations across multiple markets. The Commission therefore proposes to set the base clock price so as to yield an opening bid of \$900 million for this station. It should be noted that if this highest volume station is not in UHF, its base clock price would be decreased by the discount applied to its pre-auction band. This discount is detailed in Appendix D to the Auction 1000 Request for Comment. The Commission will calculate volume for all stations and then rescale so that the maximum station volume is one million. Dividing the \$900 million opening bid price for the highest volume station by one million results in a base clock price of 900. The base clock price will drop in each round of the reverse auction, while a station's volume will remain constant. The price offered to a bidder to go off air in a given round will be the product of the base clock price in that round and the station's volume. The markets and stations needed in the reverse auction will depend on which stations choose to participate, and actual compensation to stations will be determined by the auction.

95. The Commission tentatively concludes that this formula appropriately balances the manifold goals that Congress has charged it with in connection with the incentive auction. First, a combined interference-population volume establishes opening bid prices that should provide the

necessary incentive for broadcaster participation. Consistent with the Commission's determination in the Incentive Auction R&O, its proposed approach will yield opening bid prices that reasonably approximate underlying relative differences in value of stations to the auction. The Commission's proposed formula is not based on a station's market or enterprise value. If a station has many constraints and blocks many other stations from being repacked, then under the Commission's proposal, its opening price will reflect that contribution to the auction's ability to clear spectrum. The population component complements the interference metric by enabling the Commission to clear more spectrum in markets where the forward auction value of relinquished spectrum usage rights is apt to be higher. Second, the opening bid price set using the proposed methodology will enable the Commission to close the auction in a reasonable number of rounds, providing ease of participation for broadcasters and enhancing the prospects for a successful auction. Third, the balanced approach the Commission proposes will meet its statutory obligation to promote the interests of taxpayers in getting a portion of the value of the spectrum sold at the forward auction. Finally, use of a population factor is consistent with the fact that the spectrum recovered from broadcasters will enable flexible use licenses to be offered in the forward auction subject to procedures that are based, among other things, on the population covered by each PEA.

96. Under the Commission's proposed approach, opening bid prices for moving from the UHF band to the Low-VHF or to the High-VHF band (the VHF options) will be set at a value relative to the opening price for going off-air. For moving from UHF or High-VHF to Low-VHF, the Commission tentatively concludes that a station's opening price should be between 67 and 80 percent of the station's price to go off-air. For moving from UHF to High-VHF, the Commission tentatively concludes that a station's opening bid price should be between 33 and 50 percent of the station's off-air price. The Commission seeks comment on where in these ranges it should set the discounts or whether some other discount is appropriate for these bid options. The Commission emphasizes that these would only be

opening discounts. Final discounts for the VHF options will be determined by the demand by bidders for VHF channels and the availability of those channels.

97. The Commission proposes to calculate the opening prices for the VHF options as a discount off the off-air opening price because a winning bidder electing one of the VHF options will retain a full six megahertz channel, and thus should not receive the same compensation as bidder that relinquishes its rights to a six megahertz channel. The proposed level of the discounts reflects a comparison of the technical characteristics of UHF and VHF channels and of the characteristics of Low-VHF and High-VHF channels. In particular, VHF frequencies are more susceptible to interference than UHF frequencies. Specifically, noise from nearby electrical devices can disrupt reception on these lower frequencies, especially indoor reception. While present across the VHF bands, this issue is more pronounced on low-VHF channels than on High-VHF channels. Thus, while the opening price for a VHF option should not be the same as for the off-air relinquishment option, it should be high enough to offset the potential loss in value associated with this increased interference potential.

98. The smaller discount for the Low-VHF option as compared to High-VHF reflects that television receivers are subject to greater interference in the Low-VHF band. The proposed respective discounts for the Low-VHF and High-VHF options also reflect the relative number of unoccupied channels in each band. There are substantially more unoccupied Low-VHF channels than High-VHF channels. As a result, in nearly all markets, a station could move to a Low-VHF channel without the need to reassign any channels in that band. Conversely, there are relatively few markets where a station could move to High-VHF channels unless other stations vacate that band or are repacked within the band. In at least some scenarios, therefore, the Commission may need to pay two stations in connection with a UHF-to-High-VHF move: a High-VHF station to vacate its channel, and UHF licensee to move to High-VHF. A smaller discount, i.e., a higher opening price, for the Low-VHF option would signal the greater value of this option to the auction. The Commission seeks comment on its proposed approach to

setting opening prices for the VHF options, the appropriate discount levels, or whether there are additional factors or approaches that the Commission should consider.

**b. Price Offers in Initial and Subsequent Rounds**

99. The Commission proposes that, in the first clock round of the reverse auction, a bidder whose commitment to a preferred or assigned alternative option at the opening price is not provisionally accepted by the auction system will be offered a lower price for the assigned option. As long as the bidder indicates it is willing to accept the offered prices, and if a feasible channel assignment exists for the station in its pre-auction band, the auction system will progressively offer lower prices for that option. When the Commission refers to checking a feasible channel assignment in a station's pre-auction band when determining price offers, for stations with a pre-auction band of UHF, the Commission is referring to the remaining television portion of the UHF band. A bidder that indicates it will consider multiple bidding options will be informed of current prices for those options and will have the opportunity to request to switch to bidding for another option. A bidder that switches bidding options will then be offered progressively lower prices for that option, but only so long as a feasible channel assignment exists for the station in its pre-auction band.

100. The Commission proposes to offer a bidder lower prices for relinquishment options as long as the bidder is still competing with other stations to relinquish rights, consistent with the basic clock auction's competitive framework. When a station's relinquishment becomes essential to meeting the clearing target (because there is no longer room for it in its pre-auction band), the auction system will stop offering lower prices to that station, and will provisionally accept the station's offer to relinquish its usage rights.

101. More specifically, whenever a station is provisionally assigned to a band, either because it dropped out of bidding or because its bid to switch to a different relinquishment option was applied, the repacking feasibility checker will consider for each station that remains active whether a channel can still be found in its pre-auction band, given all other stations that need to be assigned channels in that

band (i.e., non-participants and other stations that have previously dropped out of the bidding and are assigned to that band). When the feasibility checker cannot find a way to repack a station into its pre-auction band because of the other stations that must be accommodated, the auction system will not reduce the station's price in that auction round. If the feasibility checker determines that the station cannot be repacked in its pre-auction band for the remainder of the stage, then the auction system will notify the bidder that the station's prices and relinquishment offer are "frozen" for the remainder of the stage. An exception to the general case may occur for VHF stations. For a VHF station, the amount of vacancy in its pre-auction band may increase as bidding rounds progress, so a station that had a relinquishment bid frozen because it was infeasible to accommodate in its pre-auction band can later become feasible. For instance, if a UHF station is currently assigned to move to upper-VHF but subsequently drops out of the bidding to remain in UHF, that move may create a vacancy in upper-VHF. Because of this, unlike UHF stations, stations with pre-auction channels in the VHF band may unfreeze in later rounds of the same stage if it becomes possible to accommodate the station in its pre-auction VHF band. If the system determines that the station can feasibly be assigned a channel, the station will be offered a lower price in the next bidding round.

102. Price reductions in each round, explained in detail in Appendix D of the Auction 1000 Request for Comment, will be based on the base clock price. The base clock price is calculated for the case of a station whose pre-auction band is UHF that is still feasible to repack in the UHF band and still bidding to go off-air. The Commission proposes to reduce this base clock price by between three percent and 10 percent per round. The Commission also proposes that the amount may be changed at any point during the reverse auction based on bidding activity during the auction. Using smaller decrements is likely to increase the number of rounds necessary to reach final auction prices. The Commission seeks comment on the possibility of using proxy bidding, which could reduce the bidders' need to closely monitor numerous, frequent bidding rounds. With proxy bidding, a bidder could ask the system to continue to bid for its current relinquishment option in every round until either its price falls

below a bidder-specified threshold or the bidder intervenes to change its bid, whichever happens first. In each round, the bidder would be informed of the first round in which the price of its option could possibly fall below its specified threshold. This notice would allow the bidder to anticipate the timing of when it may need to change its bid or update its proxy bid. The range of potential reductions will enable the auction to move at an appropriate pace while also providing the flexibility to offer bidders appropriate price choices as the auction progresses. For instance, if the decrement in a round is four percent, this means that the price offered per volume in this round to a UHF station for going off-air is four percent lower than what the base clock price was after the bid processing of the previous round. Appendix D of the [Auction 1000 Request for Comment](#) describes how the Commission proposes to compute the prices that are offered to VHF stations for going off-air and/or for relinquishment options that are different from going off-air. Appendix D alternatively considers adjusting the decrement of each station as a function of its vacancy in the various bands. The Commission seeks comment on this alternative proposal.

**c. Dynamic Reserve Prices in Early Rounds of the First Stage**

103. The Commission proposes to implement dynamic reserve price (DRP) procedures in the early rounds of the reverse auction in the first stage. The DRP procedures the Commission proposes implement a limited exception to the proposal regarding price reductions and enable the auction system to reduce the price offered a station below the opening or previous round's price even when the station cannot feasibly be assigned a channel in its pre-auction band, so long as assigning the station a channel in the 600 MHz Band will not result in inter-service interference that exceeds the nationwide standard for market variation. Accordingly, while DRP procedures are in effect, a UHF station may be offered a lower price for an option even if it cannot feasibly be assigned a channel in the remaining TV portions of the UHF band; if it refuses the offer, it may be assigned to a channel in the 600 MHz Band. By mitigating the risk that a station may be awarded its opening price merely because there is no channel to offer in its pre-auction band—a result that would have little or nothing to do with what the station would

be willing to accept in exchange for relinquishing its spectrum usage rights—these procedures will increase the likelihood of a successful auction. This is because DRP procedures make it possible to offer higher opening prices, thereby attracting greater broadcaster participation, than would otherwise be the case. Absent DRP, lower opening prices would be necessary. Because the procedures the Commission proposes for discontinuing DRP will limit the extent to which opening prices can fall, even as reduced by DRP, the higher opening prices may ultimately provide higher incentive payments to broadcasters. In addition, by enabling the reduction in broadcaster payments where such payments are acceptable to broadcasters, the proposed DRP procedures will make it easier to satisfy the second component of the final stage rule.

104. Under the Commission’s proposed approach, the reverse auction will begin in the first stage with DRP procedures in effect. While DRP procedures are in effect, participating UHF stations that cannot feasibly be assigned a channel in the remaining TV portion of the UHF band will be treated differently than when DRP procedures are not in effect: the prices offered to such stations will be reduced. In contrast, the prices of such stations will not be reduced when DRP procedures are not in effect. Regardless of whether dynamic reserve pricing procedures are in effect, the prices of a participating VHF station will not be reduced during bid processing if that station cannot be feasibly assigned a channel in its pre-auction band. Should a UHF station decline to accept a price offer when DRP procedures are in effect, the station may provisionally be assigned a channel in the 600 MHz Band, creating potential impairments to one or more 600 MHz Band blocks.

105. The Commission proposes to discontinue DRP procedures when their application risks exceeding the less than 20 percent nationwide standard for limiting market variation proposed. More specifically, the Commission proposes that DRP procedures be discontinued when, if the Commission were to assign all of the participating UHF stations for which the auction system cannot find a feasible channel in the remaining TV portion of the UHF band, the predicted aggregate level of impairments to licenses in the 600 MHz Band would exceed this standard.

106. The Commission seeks comment on this proposal and on how to determine whether the standard would be exceeded, as a full channel assignment optimization would be too time consuming to run during the reverse auction clock rounds. One approach would be for the auction system to use a limited version of the channel assignment optimization procedures proposed for setting a clearing target to determine when the aggregate level of potential impairments from participating stations dropping out of the auction could exceed the proposed national standard. Once DRP procedures are discontinued, however, the Commission proposes that the system fully optimize the provisional channel assignments to minimize the impact of any impairments created during DRP.

107. The Commission also seeks comment on alternative approaches for determining when DRP would be discontinued in order to avoid these risks. For instance, DRP procedures could be discontinued when there is the potential that the next participating station for which the auction system cannot find a feasible channel in the remaining TV portion of its pre-auction band, if it chose to drop out of the auction, would cause the predicted aggregate level of impairments to licenses in the 600 MHz Band to exceed this threshold. This alternative approach would always result in aggregate impairment that is just one station short of the threshold, while the proposed approach could result in a lower level of impairment, and possibly even no additional impairment, due to DRP. The Commission also seeks comment on whether, instead of determining when to discontinue DRP using predicted aggregate impairments, the Commission should use the population served by UHF stations that cannot be feasibly assigned a channel in the TV portion of UHF as a proxy for predicted aggregate impairments.

## **ii. Bidding and Bid Processing**

108. Some bidders in the reverse auction will be interested in only a single relinquishment option (single-option bidder). Other bidders may wish to consider price offers for multiple relinquishment options (multiple-option bidder). The Commission proposes detailed procedures for bidder responses and bid processing for bidders in both categories.

**a. Bidding for a Single Relinquishment Option**

109. At the start of the clock rounds, the Commission proposes that a single-option bidder whose commitment to a bid option at the opening price is not provisionally accepted will be presented with a price offer lower than the opening price it committed to accept and asked if it is willing to accept the lower price. The Commission proposes that the bidder will have three choices: it may accept the offered price (i.e., submit a bid at the clock price), submit an intra-round bid, or not respond. If the bidder accepts the offered price, it will be finished bidding for that round and can await the results of the round.

110. If the bidder does not place a bid, the auction system will treat the bidder as unwilling to relinquish its rights for less than it previously accepted. If the bidder places an intra-round bid, the bidder's intra-round bid will indicate to the auction system that, at prices at least as high as the intra-round bid (including the opening price), the bidder is willing to relinquish its spectrum usage rights, but at lower prices the bidder's station must be provisionally assigned a channel in its pre-auction band.

111. During each subsequent bidding round, a bidder that continues to participate in the bidding—that is, a bidder that accepted the clock price offered during the previous round—will be presented with a new, lower price offer, and will have the same response choices as during the first round.

112. Under the Commission's proposed procedures, which are described in detail in Appendix D of the [Auction 1000 Request for Comment](#), the auction system will process the bids submitted during a bidding round at the close of the round based on bid prices. If prices in the round drop below the level of an intra-round bid, the single option bidder will drop out of further bidding in the auction. The auction system will then evaluate the feasibility of repacking (that is, assigning permissible channels to) all other stations that continue to participate in the bidding in their pre-auction bands. If the system determines that a participating station cannot feasibly be accommodated in its pre-auction band, the system will stop reducing the station's price at the point at which the station is infeasible to repack.

Acceptance of a bid will be provisional until the final stage rule is satisfied, at which point provisionally-accepted bids will become winning bids. Appendix D describes in detail the process by which the Commission proposes to integrate the repacking feasibility checking methodology into the reverse auction process.

113. As the auction system iteratively considers bids and potential channel assignments, it may determine that it will accept a relinquishment offer at a price higher than the lowest price the bidder indicated it would accept. Hence, a bidder that makes an intra-round bid during a round may have its bid accepted at a price higher than the intra-round bid.

114. Once the auction system has processed all of the bids submitted in a round and the results of the round have been determined, the auction system will indicate to each bidder its status—that is, whether its relinquishment bid has been provisionally accepted, whether it is still bidding for the option, or whether it is designated to be assigned a channel in its pre-auction band because it dropped out of the bidding. A bidder that accepted the clock price offered during the round whose station feasibly can be repacked in its pre-auction band will be offered a lower price for the next round.

115. The Commission invites comment on whether it should simplify the reverse auction bidding process by not providing the option to place an intra-round bid, and instead simply ask each bidder if it is willing to accept the new lower price for its relinquishment option. If the bidder is unwilling to accept the lower offered price, the auction system would not ask for an intra-round bid. This approach could simplify both bidding and bid processing, as all bids would be processed at the clock prices. This would eliminate uncertainty about the price a bidder may receive at the start of the next round for the different relinquishment options. Implementing this alternative would require that the Commission use generally smaller increments for price reductions, and could reduce to some degree the flexibility afforded to bidders to choose specific price points within a round.

## **b. Multiple Option Bidding**

116. The Commission has proposed that with respect to a particular station a bidder's initial commitment will determine which option the bidder will be bidding for initially and explained that the station's bid option selections on the pre-auction application will determine which options it may later consider, consistent with the proposed hierarchy of options. Accordingly, at the start of the first clock round, as for a single-option bidder, a multiple-option bidder in an area where there are more stations willing to accept relinquishment options than needed to meet the clearing target will be presented with a price offer for its option that is lower than the opening price it committed to accept. The multiple-option bidder will also be able to see current prices for each of its other bid options.

117. In addition to being able to accept the lower price for its preferred option or place an intra-round bid, a multiple-option bidder will have the option, at current prices, to request to switch to any other of its eligible relinquishment options, consistent with the option hierarchy. The auction system will implement the switch if the feasibility checker determines that it is feasible to assign the station to a channel in the band associated with the new option. The bidder will then be offered a lower price for the new relinquishment option in the next round unless the bidder becomes frozen. However, if the system is unable to assign the bidder a channel in its newly preferred option, the system will still consider the bidder to be bidding for its previous option at the last price it agreed to accept.

118. In the event that multiple bidders request to switch to bid on moving to the same band in the same round, the auction system may not be able to accommodate each request. As a result, the Commission proposes that a multiple-option bidder requesting to switch options must also indicate whether it is willing to accept the lower clock price for its currently assigned option, in case the system cannot accommodate its request to switch. A bidder unwilling to accept the lower price offer for its current option may place an intra-round bid to indicate a specific price at which it wishes to drop out of bidding for its current option. If there is not a channel available in the option to which a multiple-option bidder requests to switch, and the price for its assigned option drops below the intra-round bid amount

during bid processing for the round, the bidder will drop out of the bidding and be designated to be assigned a channel in its pre-auction band.

119. At the close of the bidding round the auction system will process the bids submitted during the round as in the single option bidder scenario, by considering the bids in decreasing order of bid price, consistent with the descending clock format. Once the auction system has processed all of the bids submitted in a round, the auction system will indicate to each bidder whether its request to switch bidding options was accepted, as well as whether it had a bid provisionally accepted or whether it dropped out of the bidding during the round.

120. Under the alternative “no intra-round bidding,” multi-option bidders would simply respond to single price offers without the opportunity to place intra-round bids. Submitted bids would be processed by attempting to accommodate a station’s requests to switch options (if any) and processing the station’s election to drop out of the bidding (if any). If as a result of another station’s bid, a bidder cannot be feasibly assigned a channel in its pre-auction band, the system would not lower the bidder’s prices.

### **iii. Stopping Rule**

121. The Commission proposes a stopping rule for the reverse auction whereby bidding rounds will continue until no stations are still bidding—that is, each participating station either has had a bid to relinquish rights accepted or has been assigned to a channel in its pre-auction band. Both acceptance of a bid and assignment to a channel will be provisional until the final stage of the auction.

### **D. New Stage Procedures**

122. If a stage of the auction fails to satisfy the final stage rule, the Commission will run a new stage of the auction at the next lower clearing target as identified in the Technical Appendix of the Incentive Auction R&O. The Commission proposes that at the start of any subsequent stages of the incentive auction, the auction system will conduct another clearing target optimization that will take into

account the additional channel that will be available for broadcasting in the UHF band as a result of the reduction in the amount of UHF spectrum reallocated for flexible-use licenses under the next lower clearing target. The optimization procedure will “re-shuffle” the assignment of stations in the UHF band (both the television portion and the 600 MHz Band) using the ISIX constraints and based upon the new clearing target with the objective of minimizing the number of impaired “weighted-pops.”

123. With a reduced clearing target, the auction system may be able to find a feasible channel assignment for some bidders that had been provisional winners in the prior stage, that is, bidders that were frozen in a relinquishment option when the auction system determined that they could no longer be assigned a channel in their pre-auction bands. These bidders will resume bidding. Stations that dropped out of the bidding in a prior stage to be assigned a channel in their pre-auction band will retain that status and will not resume bidding. The Commission proposes to reset the base clock price to the highest point at which any newly-feasible bidder was frozen in a prior stage. Then, in each round, as the clock price descends to reach the point at which a newly-feasible bidder was frozen in the previous stage, the bidder will again see lower price offers and will resume active bidding. Consequently, in a new stage, such bidders may not see their prices decrease for many rounds as the clock catches up to the point where each station had been previously frozen.

124. The auction system will calculate price offers for bidders that can now be assigned a channel in their pre-auction bands using the descending clock pricing procedures, provided that the clock price is at or below the level at which these bidders had their relinquishment offers provisionally accepted in the prior stage. Bidders will respond to these prices, and reverse auction bidding rounds in the new stage will continue, according to the bidding procedures.

125. The Commission seeks comment generally on these proposed procedures for initiating bidding in a new stage of the reverse auction. The Commission also seeks comment more specifically on whether, in order to reduce the number of rounds, especially where some bidders may have had their

offers accepted in significantly earlier rounds of the prior stage, the Commission should increase the rate at which price offers descend for all newly-feasible bidders that are again actively bidding.

**E. Determining a Final Television Channel Assignment Plan**

126. The Commission invites comment on appropriate objectives in optimizing the final television channel assignment plan and on how to prioritize those objectives. Further detail on this process can be found in Appendix E of the Auction 1000 Request for Comment. At the end of each reverse auction stage, all channel assignments in the remaining television bands will be provisional. After the final stage rule is satisfied, the Commission will determine final television channel assignments. The reassigned broadcasters will have the opportunity, after the release of the final channel assignment plan, to seek an alternative channel. Like the provisional assignments made during the clearing target optimization and repacking processes, final TV channel assignments will be subject to the constraints adopted in the Incentive Auction R&O in order to preserve each eligible station's coverage area and population served. Unlike the provisional assignments made during the reverse auction clock rounds, which will be based solely on such constraints, final channel assignments will be made applying optimization techniques that take into account additional objectives. The Commission stated in the Incentive Auction R&O that it would seek comment on the details of the final channel assignment optimization in the Auction 1000 Request for Comment, and expressed its intention to optimize the final channel assignment plan to minimize relocation costs. In the recent ISIX R&O and Further Notice, the Commission adopted two additional objectives for the final optimization: avoiding channel assignments that would result in aggregate new interference to any individual station over one percent and avoiding significant viewer losses due to terrain losses. The Commission deferred a decision as to how to optimize for the latter objective, recognizing that it could be accomplished in different ways.

127. Consistent with the Commission's prior determinations, it now proposes to determine the final TV channel assignment plan based on the following objectives, listed in order of priority: (1) maximizing the number of stations assigned to their pre-auction channel; (2) minimizing the number of

stations predicted to receive aggregate (that is, from multiple stations) new interference above one percent; and (3) avoiding reassignments of stations with high anticipated relocation costs in order to minimize total relocation costs. The Commission discusses these objectives and how they might work together and seeks comment on any other possible final TV channel assignment plan objectives.

128. Maximizing Channel “Stays.” In order to repurpose a contiguous portion of the current UHF television band for new, flexible uses, some television stations currently operating on higher UHF channels will need to be reassigned lower channels in the UHF band. While some channel reassignments are inevitable in order to clear any spectrum, the Commission seeks to minimize the disruption that channel reassignments will have on both broadcasters and their viewers, as well as to reduce the overall cost of the repacking process. In addition, avoiding new channel assignments where possible will help to avoid viewer losses due to terrain losses that can result when a station is reassigned to a different channel. The Commission therefore proposes to maximize the number of stations that stay on their pre-auction channel as its first objective in the final channel assignment optimization. By maximizing the number of stations that stay on their pre-auction channels, the Commission can reduce repacking costs, avoid disruption to broadcasters and their viewers and avoid losses in viewers and coverage area due to terrain that may result from channel reassignments.

129. Minimizing Aggregate New Interference Over One Percent. As the Commission previously determined, it will optimize the final channel assignment plan to avoid channel assignments that would result in aggregate new interference of more than one percent to any individual station. The Commission invites comment on two possible approaches to implementing this objective using optimization techniques. The first approach is to minimize the maximum amount of aggregate new interference that any one station could receive. The second approach is to minimize the number of stations predicted to receive aggregate new interference above one percent. The former approach will ensure that the amount of aggregate new interference that any one station receives is as small as possible but could have the drawback of creating more stations with aggregate new interference above one

percent. The latter approach ensures that the number of stations with aggregate new interference above one percent is minimal but could have the drawback of not explicitly restricting the amount of aggregate new interference for any one station. As the Commission discussed recently in the ISIX Order, however, it anticipates that the worst cases will be limited in number and will not exceed two percent, and stations may remedy any such situations by seeking alternative channel assignments in the post-auction transition process. The Commission also invites comment on combining the two approaches. The Commission seeks comment on these and other possible approaches to optimizing to reduce aggregate new interference.

130. Minimizing Relocation Expenses. The costs associated with reassigning a station to a new channel in the repacking process vary from station to station. For example, some stations broadcast from antenna structures that may be particularly difficult to modify due to height, geography, or weather conditions; other stations may need to acquire significant new equipment in order to broadcast from their reassigned channels. In the Incentive Auction R&O, the Commission stated its intention to disburse funds from the \$1.75 billion TV Broadcaster Relocation Fund as fairly and efficiently as possible. In order to carry out this intention, the Commission proposes to minimize the total relocation costs using the most accurate publicly available data to measure such costs. Recognizing that the Commission may not have perfectly accurate data on equipment, facilities, and other factors relevant to determining anticipated relocation costs, the Commission seeks comment on this proposal and specifically on how to determine these expenses.

131. Prioritizing Multiple Objectives. The Commission further seeks comment on prioritizing objectives in the final TV channel assignment plan objectives. In order to combine the objectives into a single process, the Commission proposes that the final TV channel assignment procedure first solve or optimize for a primary objective and use that outcome as a constraint on solving the secondary objective, which would then constrain solving the tertiary objective. Given that minimizing channel moves will promote multiple objectives, the Commission proposes to make it the primary objective. Under the

Commission's proposed approach, the final channel optimization procedure first would determine an assignment of stations that maximizes the number of stations assigned to their pre-auction channel. The procedure then would apply the Commission's proposed secondary objective by determining another assignment that minimizes the total number of stations predicted to receive new aggregate interference over one percent, but would restrict that assignment such that the number of stations assigned to their pre-auction channel is within 95 percent of the maximum number in the first step. The Commission proposes to set the percentage to 95 percent to allow some flexibility in the second assignment while mostly restricting the assignment to maintain the maximum number in the first assignment. Finally, the procedure would apply these two restrictions to the determination of a third assignment of stations that minimizes anticipated relocation expenses. The Commission seeks comment on these priorities given that the objective with highest priority necessarily restricts the objective with next priority and so on.

#### **F. Incentive Payments**

132. As noted in the Incentive Auction R&O, the process by which auction proceeds will become available to pay reverse auction participants their shares precludes a specific deadline for sharing proceeds. The Commission will share auction proceeds with broadcasters relinquishing spectrum usage rights as soon as practicable following the conclusion of the incentive auction. The Commission notes that circumstances regarding the post-auction clearing and relocation of broadcasters may make it in the public interest to prioritize payments to some broadcasters over others in order to expedite the entire post-auction transition process. For example, the Commission determined in the Incentive Auction R&O that winning bidders in the reverse auction would be required to vacate their pre-auction channels within three months of receiving payment of their share of auction proceeds. As the Commission explained in the Incentive Auction R&O, the ability of stations that are assigned to new channels in the repacking process may be dependent on other stations' moves. Hence, there may be situations in which prioritizing payment to a particular winning bidder may expedite the transition

process for other broadcasters. The Commission retains discretion to take factors that facilitate the transition process into account when determining the sequence of payments sharing auction proceeds.

## **V. PROPOSED FORWARD AUCTION PROCEDURES**

### **A. Information Available During the Auction, Inventory, and Implementation of the Spectrum Reserve**

133. This section addresses proposals regarding the information that will be available to forward auction bidders at various times during the auction, the categories of generic licenses that will be available for forward auction bidding, and creation of separate categories of “reserved” and “unreserved” spectrum blocks at the time the final stage rule is met pursuant to the Mobile Spectrum Holdings R&O, 79 FR 39977, July 11, 2014.

#### **i. Forward Auction Information Available During the Auction**

134. As with most recent spectrum license auctions, the Commission proposes to limit information available in the forward auction in order to prevent the identification of bidders placing particular bids until after the auction is over. More specifically, the Commission proposes to not make public the PEAs that an applicant selects for bidding in its application, the amount of any upfront payment made by or on behalf of the applicant, or any other bidding-related information that might reveal the identity of the bidder placing the bid. Concerns about anti-competitive bidding and other factors that the Commission has relied on to prevent identification of particular bidders during auctions also apply to the forward auction portion of the incentive auction. The Commission invites commenters that disagree with its proposal to address why they support a different approach.

135. Notwithstanding the foregoing, in order to facilitate compliance with 47 CFR 1.2105(c) which prohibits parties seeking licenses in the same geographic area from communicating with one another regarding certain bidding-related information, the Commission proposes to notify each forward auction applicant of the identities of other forward auction applicants that have selected geographic areas

that overlap with the applicant's own selection and, therefore, fall within the scope of the rule. As the information the Commission will provide relates to the bids and bidding strategies of the other participants, applicants are prohibited from communicating the information that they receive to other auction participants unless doing so comes within one of the exceptions provided in the rule.

136. The Commission also proposes that the auction system will provide forward auction bidders with the following information, at the times indicated: (1) prior to bidding in the clock phase of each stage, the clearing target for that stage; (2) after the reverse auction portion of any stage ends, the number of spectrum blocks in each license category in each PEA and the percentage impairment of each block and the location of those impairments, as well as the ISIX data for such impairments; and (3) after the reverse auction portion of each stage ends, the total dollar amount of forward auction proceeds needed to satisfy the second component of the final stage rule.

137. In connection with the reverse auction, the Commission proposes to make public the total of reverse auction bids when bidding in the reverse auction for a stage is closed, as that is part of the second component of the final stage rule. Similarly, the Commission will make public the forward auction bid amounts at the end of each round, as those are the amounts that will be used to determine whether the first component of the final stage rule has been satisfied.

**ii. Forward Auction Inventory: Determining Categories of Generic Licenses**

138. In the Incentive Auction R&O, the Commission decided it would conduct bidding for categories of generic licenses in the clock phase of the forward auction, recognizing that the Commission would need to consider "a number of factors, such as proximity to television stations or guard bands" when determining how to group license blocks into categories for bidding. Here the Commission seeks comment on a proposal to offer two categories of licenses in the clock phase of the forward auction based on relative levels of impairment caused by proximity to television stations in the 600 MHz Band.

139. The Commission proposes to offer spectrum blocks in two different categories of generic

licenses for bidding in the forward auction (“Category 1” and “Category 2”), based on the extent of potential impairments in those specific PEA license areas. The Commission also proposes thresholds for distinguishing between the two categories, as well as for determining when a license is sufficiently impaired that it will not be offered for sale in the clock phase of the forward auction. In addition, the Commission proposes a price adjustment procedure to account for varying degrees of impairment in the licenses offered. The Commission emphasizes that, consistent with its determination in the Incentive Auction R&O to accommodate market variation to a limited extent only, and with its proposal to strictly limit the amount of market variation in determining an initial clearing target, the Commission anticipates that most licenses offered in the forward auction will fall into Category 1, therefore, will have potential impairments affecting 15 percent or less of the population in the license area. Nevertheless, the Commission must be able to distinguish between Category 1 and Category 2 licenses in order to achieve its auction goals. The Incentive Auction R&O adopted a strong interoperability rule that requires that any user equipment certified to operate in any portion of the 600 MHz Band must be capable of operating, using the same technology that the licensee has elected to use, throughout the entire 600 MHz Band. The Commission emphasizes that offering multiple categories of licenses during the auction will have no effect on interoperability because the same rules apply to all 600 MHz Band licenses regardless of whether the license is offered in Category 1 or Category 2.

140. Minimizing the number of separate bidding categories to the extent possible serves the Commission’s goal of speeding up the forward auction bidding process. In light of this goal, and because the Commission created the 600 MHz Band guard bands in the Incentive Auction R&O to provide sufficient protection from harmful interference to make 600 MHz Band licenses fungible in areas not affected by market variation, the Commission does not propose to establish separate categories of generic licenses based on proximity to television stations or guard bands in areas that are not affected by market variation.

141. The Commission proposes to categorize as Category 1 any license with potential impairments that affect zero to 15 percent of the population of the PEA and as Category 2 any license with potential impairments that affect greater than 15 percent but less than or equal to 50 percent of the population. Under this proposal, a license with potential impairments that affect more than 50 percent of the population will not be offered in the forward auction. The Commission proposes to calculate the extent of impairment on a granular basis, using cell-level data. Specifically, the Commission proposes to calculate the percentage of population impaired in each block at a two-by-two kilometer cell level by applying the ISIX methodology to the assignment plan determined by the clearing target optimization procedure. With regard to the proposed 15 percent threshold for Category 1 licenses, wireless operators normally can expect some degree of interference to service in their license areas due to terrain and other factors. A 15 percent threshold would provide flexibility for the auction system to assign licenses to Category 1 even if they are subject to a limited degree of inter-service interference, and winners of generic licenses will have the opportunity to bid for frequency-specific licenses within each category during the assignment phase of the forward auction. Moreover, the Commission proposes to apply discounts at the end of the assignment phase to reflect the extent to which a generic license is subject to impairment, i.e., the Commission would discount Category 1 licenses based on their specific degree of predicted impairment. Accordingly, the Commission believes that licenses with potential impairments that affect between zero and 15 percent of the population reasonably may be considered fungible. The Commission invites comment on this proposal. As an alternative, the Commission seeks comment on whether to limit the proposed Category 1 to licenses that are not predicted to be subject to any inter-service interference, that is, with potential impairments that affect zero percent of the PEA population. This would enhance fungibility but reduce the number of licenses available in Category 1.

142. The Commission proposes a 50 percent threshold for determining whether an impaired license will be offered in the clock phase of the forward auction for several reasons. The Commission believes that even with up to 50 percent impairment, particularly given the proposed availability of

discounts based on degree of impairment at the end of the assignment phase, bidders would find a license usable. At the same time, the Commission recognizes that there is a limit to the extent that impaired licenses reasonably can be considered fungible, and even assuming that bidders would be interested in bidding for highly impaired licenses, its goal of simplicity militates against creation of an additional generic category. Under the circumstances, the Commission believes that 50 percent represents a reasonable threshold. The Commission seeks comment on this proposal. If given the opportunity, would bidders be interested in bidding on licenses that are more than 50 percent impaired? If the Commission adopts the alternative proposal of strictly limiting Category 1, should the Commission modify the proposed range of Category 2 licenses or expand it to between one and 50 percent? Commenters who advocate alternative thresholds or approaches should address the potential tradeoffs associated with their proposed alternatives.

143. The Commission further proposes to incorporate a price adjustment into the auction system at the end of the assignment phase of the forward auction to account for varying degrees of predicted impairment to the licenses offered for sale, regardless of whether such licenses are in Category 1 or Category 2. Specifically, the Commission proposes to discount the final clock price by one percent for each one percent of predicted impairment. For example, under this proposal a 10 percent discount would be applied to a license that is 10 percent impaired following the clock phase of the forward auction impairment. The Commission proposes such price adjustments in order to help accommodate a range of values among generic licenses within a proposed category, while minimizing the number of bidding categories in the interest of simplicity. The Commission also seeks comment on an alternative approach, under which the proposed discount would be applied only to licenses in Category 2 in light of the wider range of degrees of impairment in that category.

144. The Commission also invites comment on how to treat heavily impaired spectrum blocks (i.e., those in which more than 50 percent of the population is impaired in a PEA) that the Commission does not propose to offer in the clock round of the forward auction. Should the Commission make such

“overlay” licenses available to bidders in the assignment phase in conjunction with adjacent licenses offered in the same PEA? Under this alternative, in the assignment phase, the Commission would bundle these heavily impaired licenses with the most impaired frequency-adjacent licenses. The Commission asks commenters to address tradeoffs of this alternative compared to its main proposal and, specifically, to address performance requirements in the context of heavily-impaired overlay licenses.

**iii. Implementation of the Spectrum Reserve**

145. Here the Commission seeks comment on implementing the market-based spectrum reserve at the time the final stage rule is satisfied, consistent with the decisions made in the Mobile Spectrum Holdings R&O to reserve a portion of the licensed spectrum made available in the forward auction for reserve-eligible entities and to determine the amount of reserved spectrum through a market-based process during the auction. The Commission proposes procedures for implementing the market-based spectrum reserve in various potential contexts, including how the Commission will offer Category 2 licenses and the presence of only one reserve-eligible bidder in a PEA.

**a. Determining the Number and Category of Reserved Licenses.**

146. The Commission proposes that the maximum number of reserved licenses, as set forth in the Mobile Spectrum Holdings R&O, will be based on the total number of Category 1 and Category 2 blocks offered in a PEA. For example, if there are 60 megahertz of Category 1 blocks and 10 megahertz of Category 2 blocks made available in a PEA, under its proposal the Commission will consider the available amount of spectrum offered in that PEA to be 70 megahertz, with a corresponding reserve of 30 megahertz.

147. The Commission proposes that only Category 1 blocks will be designated for bidding by reserve-eligible entities. The Mobile Spectrum Holdings R&O determined that the actual amount of reserved spectrum will be based on the quantity of blocks demanded by reserve-eligible bidders. Under the Commission’s proposal, the actual number of blocks reserved in a PEA will be based on demand for

Category 1 blocks by reserve-eligible bidders at the time the auction reaches the trigger, i.e., when the final stage rule is satisfied. That is, if demand for Category 1 blocks in a PEA by reserve-eligible bidders is less than the maximum reserved spectrum, then fewer reserved blocks will be available in that PEA. Consistent with this proposal, the actual amount of reserved spectrum can be no greater than that corresponding to the supply of Category 1 blocks in the PEA. The Commission seeks comment on this proposal. Alternatively, the Commission seeks comment on whether it should include Category 2 blocks in the spectrum reserve in any PEAs with fewer Category 1 blocks than in the maximum spectrum reserve, assuming sufficient demand for Category 2 blocks by reserve-eligible bidders at the time the auction reaches the final stage rule trigger. Under this approach, the total number of Category 1 and Category 2 blocks in the reserve would be no greater than the maximum spectrum reserve.

148. Overall, the Commission’s approach seeks to ensure that the need to offer fewer Category 1 blocks in certain PEAs in order to accommodate market variation does not reduce the benefits to competition and consumers from providing opportunities for multiple providers to gain access to low-band spectrum. First, because the Commission anticipates that most licenses offered for sale in the forward auction will fall into Category 1 the impact of the proposals should be limited to the relatively few markets that are affected by market variation. In such markets, however, the Commission believes its proposal to count both categories of licenses toward determining the maximum number of reserved licenses is consistent with the competition goals discussed in the Mobile Spectrum Holdings R&O, including facilitating access to below-1-GHz spectrum by multiple providers.

149. The Commission’s competition goals will be further accomplished by designating only Category 1 blocks for reserve-eligible bidders, which are likely to be more reliant on 600 MHz Band spectrum to expand coverage and to compete in the mobile wireless marketplace. As discussed in the Mobile Spectrum Holdings R&O, the Commission is striving “to promote competition by ensuring that in the near future, more providers would hold a sufficient mix of spectrum to compete robustly.” The Commission believes this proposal is also consistent with its statutory obligation to promote access to

spectrum for a variety of licensees, including entities seeking to serve rural areas or improve services in rural areas.

150. It would significantly complicate the auction to create an additional generic bidding category to implement separate reserved categories for both Category 1 and Category 2 licenses. Doing so would undercut the benefits from bidding for categories of generic licenses, potentially extending the length of the auction, necessitating additional procedures for dividing bidder demands, and making it harder for bidders to switch their demands across categories. Therefore, the Commission's proposed approach of reserving only Category 1 licenses for reserve-eligible bidders promotes good auction design and is consistent with its established policy to promote access to spectrum for a variety of licensees, including entities seeking to serve rural areas or improve services in rural areas.

151. One Reserve-Eligible Bidder. In the Mobile Spectrum Holdings R&O, the Commission indicated that it intended, after opportunity for comment in the Auction 1000 Request for Comment, not to allow reserve-eligible bidders to acquire more than 20 megahertz of reserved spectrum in a PEA unless there is another bidder for reserved spectrum in that PEA. The Commission does not believe the public interest benefits of a maximum of 30 megahertz of reserved spectrum would be realized without more than one reserve-eligible bidder in a PEA. In particular, the Commission explained in the Mobile Spectrum Holdings R&O that a maximum of 30 megahertz of reserved spectrum could permit at least two reserve-eligible bidders to acquire paired 5+5 megahertz blocks in a PEA for deployment of next-generation networks, with one of the bidders potentially acquiring two paired blocks (20 megahertz). The Commission also anticipated that a maximum of 30 megahertz—three paired 5+5 megahertz spectrum blocks—would facilitate competition among bidders seeking to acquire two paired 5+5 megahertz blocks. In contrast, more than 20 megahertz of reserved spectrum is neither necessary for a single reserve-eligible bidder to deploy next-generation networks nor likely to facilitate competitive bidding. Accordingly, the Commission proposes to limit the maximum amount of reserved spectrum in

a PEA to 20 megahertz if there is only one reserve-eligible bidder demanding blocks when the trigger is reached.

**b. Bidding on Reserved Licenses**

152. The Commission proposes specific procedures to govern bidding on the reserved licenses after the final stage rule is met. The Commission proposes to implement separate bidding for the reserved licenses in the clock bidding round that follows the round in which the final stage rule is met, regardless of whether the final stage rule is met in the course of regular clock bidding rounds or an extended round. Up to the point at which the auction reaches the spectrum reserve trigger, all bidders, including reserve-eligible bidders, will be bidding on a single category of Category 1 blocks in a PEA. In order to implement bidding on reserved spectrum after the final stage rule is met, the Commission proposes to split the Category 1 licenses in each PEA into two new categories, a reserved category, on which only reserve-eligible bidders may bid, and an unreserved category, on which any bidder may bid. Because a uniform clock price will apply to all the Category 1 spectrum blocks in a PEA at the time of the split, the clock price will be the same for both the reserved and the unreserved Category 1 blocks in the first bidding round after the auction reaches the spectrum reserve trigger. From that point forward, however, the Commission proposes to treat the reserved and the unreserved Category 1 blocks as separate bidding categories. That is, bids will be processed separately following the split for the license categories in each PEA of reserved Category 1, unreserved Category 1, and Category 2, as they were for Category 1 and Category 2 prior to the split. Prices for generic blocks in each category will be based on relative supply and demand for each, and thus may diverge based on the bidding in subsequent rounds.

153. The Commission proposes to allocate the demands for Category 1 blocks in each PEA among the available reserved and unreserved blocks. The auction system will have to allocate demand for that single category between the two new categories (reserved Category 1 and unreserved Category 1) of blocks as a starting point for bidding in the following round. Under the Commission's proposal, the auction system first will assign all demand by non-reserve-eligible bidders to unreserved Category 1,

and then will assign demand by reserve-eligible bidders to the reserved category up to the point where demand for reserved Category 1 blocks is equal to supply. The auction system will apply the remaining demand of reserve-eligible bidders to unreserved Category 1. Accordingly, the auction system will first allocate demand for one block to the reserved category for each reserve-eligible bidder in turn, then a second block, and so on until the total demands allocated to the reserved category equal the supply of reserved blocks. The Commission proposes to choose the order of reserve-eligible bidders pseudo-randomly. In the bidding rounds that follow the implementation of the spectrum reserve, bidders will be able to switch their bids between the separate categories of reserved Category 1, unreserved Category 1, and Category 2 blocks, subject to their eligibility for reserved blocks and procedures on acceptable bids proposed.

154. Once the Commission applies its proposed approach, demand in the reserved category will equal supply, and any excess demand for the pre-split Category 1 blocks will be allocated to the unreserved category. The Commission proposes to allocate demands in this way—as opposed to assigning all demand by reserve-eligible bidders to the reserved category—to avoid the possibility of excess supply for unreserved blocks after the split in the case that the pre-split Category 1 does not have excess supply, which could result in auction revenue declining below the level required by the final stage rule at a point at which the final stage rule had been declared satisfied.

## **B. Forward Auction Application Process**

155. The Commission’s general competitive bidding rules, as modified in the Incentive Auction R&O, apply to the forward auction. Those rules require that parties apply to participate in the forward auction and that applicants satisfy certain requirements before bidding in the auction. The Commission seeks comment on discrete issues relating to the upfront payment each applicant must make and on how an applicant must certify its eligibility to bid for reserved licenses if it wishes to do so. The Commission will provide detailed instructions for the pre-auction application process in the Procedures PN.

**i. Bidding Units**

156. Consistent with prior FCC spectrum license auctions, the Commission proposes to assign to each spectrum block that will be available in the forward auction a specific number of bidding units. The Commission proposes to use the bidding units for purposes of calculating minimum opening bids, upfront payments, and bidder eligibility, and for measuring bidding activity. Under the Commission's proposed approach, the number of bidding units for a given license will be fixed and will not change during the auction, regardless of price changes.

157. In assigning bidding units to licenses, the Commission proposes to use a weighted population method similar to what the Commission proposes for its "near nationwide" threshold. The Commission starts with the total population in each PEA. Because the 600 MHz Band Plan consists entirely of paired 5+5 megahertz blocks, bidding units do not need to reflect differences in bandwidth across licenses; thus, there is no need to use megahertz per population (MHz-pops), as the Commission typically does for spectrum license auctions. Further, the Commission proposes to assign Category 1 and Category 2 blocks in a PEA the same number of bidding units to facilitate bidding across categories. Hence, all generic licenses in a PEA would be assigned the same number of bidding units.

158. The Commission proposes to weight population using an index of relative prices for each geographic area based on data from previous auctions. Consistent with the approach the Commission used for Auction 97, the auction of Advanced Wireless Services (AWS-3) licenses, it will multiply the population of each PEA by an index value for the PEA. As the Commission did for Auction 97, it proposes to group the price index by deciles and apply the lowest index value in each decile to all PEAs in that decile. Appendix F of the Auction 1000 Request for Comment sets forth the indices and number of bidding units that would be assigned to licenses in each PEA under its proposed approach using currently-available data. The Commission further proposes to incorporate the final results of Auction 97 (the AWS-3 auction) in calculating the index of relative prices for PEAs that will be used to determine bidding units, upfront payments, and minimum opening bids.

159. By incorporating past prices, the Commission's proposed approach better reflects the relative weight bidders have assigned to the different markets in the past than would a calculation based solely on population. Consequently, service areas that have received similar winning bid amounts in past auctions will be similar to one another with respect to the activity rule. To simplify the number of units, the Commission proposes to divide the result of the calculation by 1,000 and round it using its standard rounding procedures for auctions. Specifically, the Commission would round numbers greater than 10,000 to the nearest thousand; numbers less than 10,000 and greater than 1,000 to the nearest hundred; numbers less than 1,000 and more than 10 to the nearest ten; and numbers less than 10 to the nearest one. All PEAs would have at least one bidding unit. Thus, the Commission proposes to calculate bidding units for most licenses as  $(\text{pops} * \text{index})/1000$ , rounded. Because there were no winning bidders for several licenses covering US territories and protectorates in past auctions, for licenses in the PEAs for Puerto Rico, Guam-Northern Mariana Islands, US Virgin Islands, and American Samoa, the Commission proposes to divide the results of the weighted population calculation by 2,000 and round the results. Finally, the Commission proposes to assign one bidding unit to licenses for the Gulf of Mexico.

## **ii. Upfront Payments**

160. In keeping with the Commission's usual practice in spectrum license auctions, it proposes that applicants be required to submit upfront payments as a prerequisite to being found qualified to bid. An upfront payment is a refundable deposit made by each bidder to establish its eligibility to bid on licenses. Upfront payments protect against frivolous or insincere bidding and provide the Commission with a source of funds from which to collect payments owed at the close of the auction. A Commission rule, 47 CFR 1.2106(a), requires that any auction applicant previously in default on a Commission license or previously delinquent on a non-tax debt to a Federal agency must submit upfront payments equal to 50 percent more than otherwise would be required.

161. The Commission proposes to base the upfront payment for each license on the number of bidding units associated with that license. Specifically, the Commission proposes an upfront payment amount of \$2,500 per bidding unit, rounded. These bidding unit amounts pertain to a single 5+5 megahertz generic license for each PEA. To the extent that bidders wish to bid on multiple generic licenses simultaneously, they will need to ensure that their upfront payment provides enough eligibility to cover more than one 5+5 megahertz generic license in a given PEA. The number of bidding units for a given license will be fixed and will not change during the auction as prices change. Appendix F of the Auction 1000 Request for Comment shows the upfront payment amounts that would be calculated based on current data. The Commission proposes to incorporate the final results of Auction 97 in the calculation of bidding units.

162. Under the Commission's proposed approach, a bidder's upfront payment will not be attributed to a specific license or licenses. Rather, the bidder may place bids on any combination of the licenses it selects on its application to participate in the forward auction, provided that the total number of bidding units associated with those licenses will not exceed its eligibility when it places the bid(s). Bidders will not be able to increase their eligibility during the auction; bidders only will be able to maintain or decrease their eligibility. Thus, in calculating its upfront payment amount and hence its initial bidding eligibility, an applicant must determine the maximum number of bidding units on which it may wish to bid in any single round and submit an upfront payment amount covering that total number of bidding units. The Commission seeks comment on these proposals.

163. For the forward auction, the Commission proposes to set a deadline for the submission of upfront payments that will occur after determination of the initial clearing target, based on commitments of reverse auction applicants. This proposed deadline will enable a participant to take into account the number of licenses in the initial clearing target when determining the amount of its upfront payment. The Commission notes that an applicant will be able to consider the amount of its upfront payment and prepare accordingly well in advance of this date. For example, an applicant would be able to determine

the number of licenses it is likely to seek in various PEAs prior to knowing the number of licenses that will be available. Nevertheless, given that the upfront payment will determine the participant's maximum bidding eligibility in the forward auction, the Commission concludes that it should require the submission of the upfront payment only after the determination of the initial clearing target.

### **iii. Eligibility for Spectrum Reserve**

164. The Commission proposes to require an applicant seeking to participate in the forward auction as a reserve-eligible entity to certify in its application that it is a reserve-eligible entity with respect to each PEA in which it wishes to be able to bid for reserved blocks. The Commission further proposes that an applicant must make this certification in its application and that it shall not be able to revise its certification thereafter. Under the Mobile Spectrum Holdings R&O, reserve-eligible entities may bid on unreserved spectrum blocks as well as reserved spectrum blocks. Nevertheless, applicants that otherwise would be eligible to bid on reserved spectrum blocks may prefer to forego reserved-eligible status generally, or with respect to licenses in particular areas. In particular, reserved spectrum blocks will be subject to restrictions on subsequent transactions to which unreserved spectrum blocks will not be subject. The approach the Commission proposes will enable potentially reserve-eligible applicants to forego reserve-eligible status on a PEA-by-PEA basis. In addition, by requiring applicants intending to bid for reserved spectrum blocks to affirmatively declare their eligibility to do so the Commission's proposed approach will avoid any subsequent ambiguity or uncertainty regarding an applicant's status.

### **C. Clock Phase Bidding Procedures**

165. The first phase of the forward auction will include the clock bidding rounds, and after the clock bidding for generic licenses ends in the final stage, the assignment phase will commence. The Commission proposes specific bidding procedures for the clock rounds of the forward auction. The Commission seeks comment on setting the minimum opening prices, setting prices between rounds of the auction and between stages of the auction. Consistent with a clock auction format with categories of

generic licenses, a uniform minimum opening price or clock price applies to all the blocks in a category and a PEA. The Commission proposes and seeks comment on specific types of bids that participants will be able to place in the forward auction, including how those types of bids will be processed by the auction system, as well as the activity rule that bidders must meet to retain their eligibility. The Commission proposes a number of changes to the procedures it has traditionally used when holding forward auctions, such as bid withdrawals and proactive waivers. The Commission is changing these procedures for this auction to reduce complexity and uncertainty about bidder demand for spectrum. The Commission seeks comment on what effect these changes could have on participation by small business in the forward auction. The Commission also sets out detailed proposals on implementing the extended round and seeks comment on those.

**i. Setting Prices in the Clock Rounds**

166. Minimum Opening Bids in the First Stage. At the beginning of the clock phase of the forward auction in the initial stage, a bidder will indicate how many blocks in a generic license category in a PEA it demands at the minimum opening bid price. The Commission proposes to establish initial clock prices, or minimum opening bids, for each license based on the number of bidding units associated with the license. The Commission's proposed approach is intended to be consistent with section 309(j) of the Communications Act, as amended, which calls for prescribed methods of establishing minimum opening bid amounts when FCC licenses are subject to auction, unless it determines that a minimum opening bid amount is not in the public interest.

167. Specifically, the Commission proposes a minimum opening bid amount of \$5,000 per bidding unit. This proposal is consistent with the precedent of the Commission's AWS-3 auction procedures, where it set the minimum opening bid amount at twice the upfront payment for each license. Because the number of bidding units for each license incorporates pricing information from previous auctions, this proposal appropriately adjusts opening bids to reflect value differences that bidders have placed on different geographic areas. Appendix F of the Auction 1000 Request for Comment shows the

minimum opening bid amounts that would be calculated based on current data. The Commission proposes to incorporate the final results of Auction 97 in the calculation of bidding units.

168. The Commission's experience in past auctions indicates that minimum opening bid amounts calculated in this manner will be an effective tool for accelerating the competitive bidding process, a particularly important goal for the incentive auction given the interdependency between the reverse and forward auctions. One of the primary purposes of a minimum opening bid is to speed up the course of an auction. By incorporating past pricing information into the Commission's calculation of minimum opening prices, it intends to reduce the number of rounds it will take for demand to equal supply in markets that have historically commanded relatively higher prices.

169. The Commission seeks comment on its proposal. If commenters believe that this approach will result in unsold licenses or unreasonable minimum opening bid amounts, they should explain why this is so, suggest an alternative approach, and explain why such an alternative is desirable. The Commission also seeks comment on whether it should discount minimum opening bids for licenses in Category 2.

170. Clock Price Increments Across Rounds. After bidding in the first round and before each subsequent round, the system will announce a clock price for the next round, which is the highest price to which bidders can respond during the round. The Commission proposes to set the clock price for each category available in each specific PEA for a round by adding a fixed percentage increment to the price for the previous round. As long as total demand for blocks in a category exceeds the supply of blocks, the percentage increment will be added to the clock price from the prior round. If demand equaled supply at an intra-round bid price in a previous round, then the clock price for the next round will be set by adding the percentage increment to the intra-round bid price.

171. The Commission proposes to apply an increment that is between five and 15 percent and generally to apply the same increment percentage to all categories in all PEAs. The Commission proposes to set the initial increment within this range, and to adjust the increment as stages and rounds

continue. The proposed five-to-15 percent increment range will allow the auction system to set a percentage that manages the auction pace, taking into account bidders' needs to evaluate their bidding strategies while moving the forward auction along quickly. The Commission also proposes that increments may be changed during the auction on a PEA-by-PEA or category-by-category basis based on bidding activity to assure that the system can offer appropriate price choices to bidders.

**ii. Acceptable Bids**

**a. Types of Bids**

172. Here the Commission proposes specific bidding procedures for the clock phase of the forward auction, and addresses how the auction system will process the proposed types of permitted bids. The Commission provides complete forward auction clock phase bid types and bid processing details in Appendix G of the Auction 1000 Request for Comment. As an initial matter, the Commission proposes that the auction system not allow a bidder to reduce the quantity of blocks it demands in a category if the reduction will result in aggregate demand falling below the available supply of licenses in the category. The alternative would risk significant reductions in aggregate forward auction proceeds from round to round, impeding progress toward satisfying the final stage rule. It could also potentially undermine a prior determination that the final stage rule had been satisfied. Under the ascending clock format adopted for the forward auction, a bidder will indicate in each round the quantity of blocks in each category in each PEA that it demands at a given price, indicating that it is willing to pay up to that price for its current quantity. In addition to making bids at the clock price, the adopted clock auction format will permit bidders to make bids at amounts smaller than the clock price (intra-round bids).

173. Under the Commission's proposal, if a bidder demands fewer blocks in a category than it did in the previous round, the auction system will treat the bid as a request to reduce demand which will be implemented only if aggregate demand will not fall below the available supply of licenses in the category.

174. Once a round ends, the auction system will process the bids submitted in the round and determine the extent to which there is excess demand for each category in each PEA in order to determine whether a bidder's requested change(s) in demand can be implemented.

175. In order to facilitate bidding for multiple licenses in a category, and to help bidders manage their bidding given the requirement that a request to reduce demand may not be accepted, the Commission proposes that bidders will be permitted to make the following three types of bids: simple bids, all-or-nothing bids, and switch bids. All three types of bids can indicate multiple quantities of licenses. Appendix G of the Auction 1000 Request for Comment provides examples of each of the proposed types of bids and discusses how the auction system would treat them under the Commission's proposal. First, a "simple" bid indicates a desired quantity of licenses in a category at a price (either the clock price or an intra-round price). A simple bid may be implemented partially if it involves a reduction from the bidder's previous demands, and aggregate excess demand is insufficient to support the entire reduction. Second, an "all-or-nothing" bid also indicates a desired quantity of licenses in a category, but allows the bidder to indicate that it wants the bid to be implemented fully or not at all. And, third, a "switch" bid allows the bidder to request to move its demand for a quantity of licenses from one category of generic licenses to another category within the same PEA. A switch bid may be applied partially, but the increase in demand in the "to" category will always match in quantity the reduction in the "from" category.

176. The Commission emphasizes that the proposed bid types will allow bidders to express their demand for blocks in the next clock round without running the risk that they will be forced to purchase more spectrum at a higher price than they wish. When a bid can be applied only partially, the uniform price for the category will stop increasing at that point, since the partial application of the bid results in demand falling to equal supply. Hence, a bidder that makes a simple bid or a switch bid that cannot be fully applied will not face a price for the remaining demand that is higher than its bid price. On the other hand, if a bidder uses an all-or-nothing bid to request a reduction that cannot be applied

because excess demand is insufficient to cover the entire requested reduction, the price for the category may continue to increase if there is any excess demand. In such cases, the Commission provides for an optional “backstop” bid to ensure the price for the category does not go above the amount the bidder specifies in its bid, as explained and illustrated with examples in Appendix G of the [Auction 1000 Request for Comment](#).

177. Because bids to reduce demand will not be accepted (or not fully accepted) to the extent they would bring demand below the available supply, and because in any given round some bidders may increase demands for licenses in a category while others may request reductions, the order in which the bids are considered can affect which bids are accepted. The Commission proposes that bids be considered by the auction system first in order of increasing “price point” (expressed as a percentage of the bidding interval for the round) and in the case of ties, then using a pseudo-random number applied to the bid when it is submitted. The Commission further proposes that bids not accepted because of insufficient aggregate demand or insufficient eligibility be held in a queue and considered, again in order, if there should be excess supply or sufficient eligibility later in the processing after other bids are processed.

178. More specifically, under the Commission’s proposed procedures, once a round closes, the auction system will process the bids by first considering the bid submitted at the lowest price point and determine whether it can be accepted given aggregate demand as determined most recently and given the associated bidder’s eligibility. If the bid can be accepted, or if it is a simple bid or a switch bid that can be only partially accepted, the number of licenses the bidder demands will be adjusted, and aggregate demand will be recalculated accordingly. If the bid cannot be accepted in part or in full, the unfulfilled bid, or portion thereof, will be held in a queue to be considered later during bid processing for that round. The auction system will then consider the bid submitted at the next highest price point, accepting it in full, in part, or not at all, given recalculated aggregate demand and given the associated bidder’s eligibility. Any unfulfilled requests will again be held in a queue, and aggregate demand will again be

recalculated. Every time a bid or part of a bid is accepted and aggregate demand has been recalculated, the unfulfilled bids held in queue will be reconsidered, in the order of their original price points (and by pseudo-random number, in the case of tied price points). The auction system will not carry over unfulfilled bid requests to the next round, however. The auction system will advise bidders of the status of their bids when round results are released.

179. After the bids are processed in each round, the auction system will announce new clock prices to indicate a range of acceptable bids for the next round. Each bidder will be informed of the number of blocks in a category on which it holds bids, the extent of excess demand for each category, and, if demand fell to equal supply during the round, the intra-round price point at which that occurred.

**b. No Bidding Aggregation**

180. In the Incentive Auction R&O, the Commission stated that it did not intend to incorporate package bidding procedures into the forward auction because of the additional complexity such procedures would introduce into the auction, but that the Commission would seek input in the Auction 1000 Request for Comment on an alternative to package bidding under which the Commission would create an aggregation of the largest PEAs in advance of the auction. The Commission has significant concerns with a “major markets” aggregation approach, however. The Commission tentatively concludes that such an approach would not be consistent with its goal of encouraging entry by providers that contemplate offering wireless broadband service on a localized basis. As the Commission discussed when adopting PEAs rather than the larger Economic Area (EA) service areas, offering single PEA licenses in the largest markets will best promote entry by the broadest range of potential wireless service providers. In addition, the Commission is concerned an aggregation approach would discourage bidders, particularly small or regional entities with an interest in only a subset of “major markets,” from participating in the forward auction. For these reasons, the Commission does not propose to adopt a “major markets” aggregation. The Commission invites comment on its tentative conclusion. Commenters supporting a “major markets” aggregation should explain how such an approach would be

consistent with the Commission's goals of promoting competition in the provision of mobile wireless services and broad participation in the forward auction.

181. In the event the Commission decided to adopt a "major markets" aggregation approach, it seeks comment on which PEAs should be included in the "major markets" aggregation, and on how to apply the market-based spectrum reserve to the aggregation.

### **iii. Activity Rule**

182. To ensure that the auction moves as quickly as possible, the Commission proposes to require that bidders maintain a fixed, high level of activity in each round of the auction in order to maintain bidding eligibility. Specifically, the Commission proposes to require that bidders be active on between 92 and 97 percent of their bidding eligibility in all regular clock rounds. The Commission proposes to calculate activity using bidding units. Thus, the activity rule would be satisfied when a bidder has bidding activity on blocks with bidding units that total 92 to 97 percent of its current eligibility in the round. If the activity rule is met, then the bidder's eligibility does not change in the next round. The Commission further proposes to calculate bidding activity based on the bids that are accepted by the auction system. That is, if a bidder requests a reduction in the quantity of blocks it demands in a category, but the auction system does not accept the request because demand for the category would fall below the available supply, the bidder's activity will reflect its unreduced demand. If the activity rule is not met in a round, a bidder's eligibility automatically would be reduced. The Commission invites comment on this proposal, in particular on where to set the activity requirement between 92 and 97 percent. Commenters may wish to address the relationship between the proposed activity rule and the ability of bidders to switch their demands across PEAs or across categories of licenses within a PEA. The Commission encourages any commenters that oppose an activity rule in this range to explain their reasons with specificity.

183. In addition, the Commission proposes that if subsequent stages of the auction are required, a bidder will begin the first round of a new stage with its eligibility reset to equal its bidding

activity when the final round of the previous stage concluded. This eligibility will be based on bidding in the extended round for licenses for which there was bidding in the extended round, and for other licenses on bidding in the last regular clock round.

184. The Commission does not propose to provide for activity rule waivers to preserve a bidder's eligibility. In previous FCC multiple round auctions, when a bidder's eligibility in the current round was below a required minimum level, the bidder was able to preserve its current level of eligibility with a limited number of activity rule waivers. The clock auction portion of the forward auction, however, relies on precisely identifying the point at which demand falls to equal supply to determine winning bidders and final prices. Allowing waivers would create uncertainty with respect to the exact level of bidder demand, interfering with the basic clock price-setting and winner determination mechanism. Moreover, uncertainty about the level of demand would affect the way bidders' requests to reduce demand are processed by the auction system. Under the Commission's proposal, bidders would be required to reconfirm their bids in every round.

#### **iv. Extended Round**

185. In the Incentive Auction R&O, the Commission provided for an extended bidding round "to increase the likelihood that the auction will conclude at the end of the current stage, thereby avoiding the need to move to another stage in which less spectrum would be available for licensing in the forward auction." The Commission proposes to implement an extended round whenever a round of the forward auction ends and (1) the demand for licenses in "high-demand" PEAs does not exceed the available supply, and (2) the final stage rule has not been met. The extended round will interrupt the clock phase of the forward auction, which will resume if bidding in the extended round satisfies the final stage rule. If the final stage rule is not satisfied at the conclusion of the extended round, the auction stage will end and a new stage will commence with a reduced clearing target.

186. The Commission proposes to base the extended round clock price on the additional proceeds needed to meet the final stage rule, which is consistent with the purpose of the extended round

of attempting to meet the final stage rule and avoid the need for a new stage with a lower clearing target. Specifically, the Commission proposes to increase the extended round clock prices for Category 1 in the “high-demand” PEAs in aggregate by 33 percent more than the additional proceeds needed to meet the final stage rule. The Commission proposes a percentage that is greater than the minimum amount required to meet the final stage rule to account for the possibility that, in some PEAs, demand may not be sufficient to increase prices to the minimum amount required, whereas in others, demand may be more than sufficient to meet the minimum, in order to increase the likelihood of satisfying the final stage rule.

187. The Commission further proposes to conduct extended round bidding only for Category 1 blocks in the “high-demand” PEAs with no excess supply. This approach is consistent with the Commission’s proposal to implement an extended round when bidding activity for such blocks stops in such areas (that is, when demand does not exceed supply). Because spectrum auctions typically reach near-final auction prices in such areas much sooner than in other areas, this approach will obviate the need to wait for bidding to stop in all areas before deciding that a subsequent stage is necessary.

188. The Commission proposes to permit bidders in the extended round to make a single simple bid for Category 1 blocks in each “high-demand” PEA, indicating a desired quantity of blocks, and it proposes to allow for intra-round bidding as in the regular clock rounds of the forward auction. Under the Commission’s proposal, in each “high-demand” PEA, a bidder can either maintain its current demand or request to reduce its demand by one block at a specified intra-round price point. The auction system will process requested demand reductions differently depending upon whether the final stage rule is met, in keeping with its proposed rule that bidders will not be allowed to reduce their demand if the reduction would result in demand falling below the available supply. Accordingly, if the final stage rule cannot be met in the extended round, so that the auction will move to a new stage with fewer available licenses, the system will process a demand reduction of up to one block per “high-demand” PEA, because there is little likelihood of demand being below supply when bidding resumes in the next stage.

However, if the final stage rule is met in the extended round, the system will not process any requested reductions in demand, to avoid reducing demand below supply at the current clearing target with the current supply of blocks.

189. Once bids in the extended round are placed, the Commission proposes that the auction system will consider the bids sequentially in ascending order of price points for the regular clock rounds of the forward auction. The auction system will process bids and set clock prices for the subsequent bidding round—either a regular clock bidding round with the spectrum reserve in place or the first round of a new stage—differently according to whether the final stage rule is satisfied. If the final stage rule cannot be met in the extended round, the auction system will allow for a single reduction and otherwise process bids as they are processed in regular clock rounds.

190. If the final stage rule can be met in the extended round, the auction system will process extended round bids only up to the lowest price point at which the rule is satisfied. Clock prices for the next round will be based on that price point, unless a reduction was requested at a lower price point in a PEA, in which case the clock price in that PEA will be based on the intra-round price at which the reduction was requested (but not accepted). Regular clock bidding rounds will resume for all categories in all PEAs, with the spectrum reserve in place. For those blocks not subject to extended round bidding, that is, non-“high-demand” PEAs as well as Category 2 blocks of the “high-demand” PEAs, rounds will resume with clock prices for the next round based on prices from the round preceding the extended round. If the final stage rule is not met, clock prices for the next round—that is, the first round of the new stage—will also be based on prices from the round preceding the extended round for blocks not subject to extended round bidding. Under the Commission’s proposed procedures, the price for blocks in the same category in a PEA will be the same for all bidders at the end of an extended round, as is also the case for the other clock rounds. Accordingly, in a PEA, clock prices for reserved spectrum blocks going into the next round will be the same as for unreserved spectrum blocks.

**v. Stopping Rule**

191. Consistent with the Commission’s practice of using stopping rules in multi-round auctions to ensure completion within a reasonable time, it proposes to employ a simultaneous stopping rule for the clock phase of the forward auction in the final stage. Under this proposal, all categories of licenses in all PEAs would remain available for bidding until the bidding stops on every category. More specifically, if the final stage rule has been met, with or without an extended round, the clock phase of bidding will end for all categories of licenses following the first round in which there is no excess demand in any category in any PEA. Since bidding will remain open on all categories of licenses until bidding stops on every category, it is not possible to determine in advance how long the forward auction will last. The Commission seeks comment on permitting new bids to be made in one additional bidding round following the first round in which there is no excess demand.

**vi. New Stage Transition**

192. The Commission proposes to initiate bidding in any subsequent stage of the forward auction based on the bidder demands and prices from the end of the previous stage. In some cases, these demands and prices will have been determined in the extended round, and in others, from the last regular clock round. The price increment in the first round of the next stage will be added to the last clock price from the previous stage, or to the intra-round price at which a reduction that brought demand down to equal supply was processed.

193. The Commission proposes that for categories of blocks for which all bidders indicated that they were willing to accept the full extended round price increment, bidder demands will carry over from the extended round. Because the Commission’s proposed procedures for processing extended round bids when the final stage rule is not met will allow at most one request for a reduction in demand to be accepted in each category, in categories where a reduction was accepted, bidder demands from the start of the extended round will carry over to the new stage for all but the bidder whose requested reduction was accepted. That bidder’s demand will reflect the reduction, consistent with extended round

bid processing. For blocks that were not included in bidding in the extended round, the Commission proposes that bidder demands that were accepted by the auction system at the end of the last regular clock round of the previous stage will carry over to the beginning of the next stage.

194. Under the Commission’s proposal, a bidder will begin the first round of a new stage with its eligibility reset to equal its bidding activity when the final round of the previous stage concluded. Because the re-optimization at the start of a new stage may “re-shuffle” the assignment of stations to the 600 MHz Band, the extent and location of impairments to the blocks available may change from stage to stage of the forward auction. The auction system will advise forward auction bidders of any such changes before bidding begins. Because the Commission recognizes that bidder demand for Category 2 blocks in a PEA may be reduced if the extent of impairments increase, the Commission proposes that the auction system will accept requests to reduce demand for Category 2 blocks in the first round of a new stage, even if the reduction will result in demand falling below supply for that category.

#### **D. Bidding Procedures in Assignment Phase**

195. In the Incentive Auction R&O, the Commission adopted a two-step forward auction procedure, with a separate assignment phase “in which bidders will bid for priority in selecting bands or for a preferred frequency within a geographic area.” Here the Commission proposes procedures to implement the assignment phase, which it also explains in detail in Appendix H of the Auction 1000 Request for Comment. Under the Commission’s proposal, winning bidders from the clock phase that have a preference for specific frequencies will have an opportunity to submit sealed bids for particular frequency blocks in a separate single assignment round for each particular PEA or group of PEAs. The Commission proposes that this assignment phase be voluntary: winning bidders in the clock phase of the forward auction need not participate in order to be assigned a number of licenses corresponding to the outcome of the clock phase. The Commission proposes to group bidding for multiple PEAs where possible, so as to reduce the number of separate assignment rounds required, and to sequence the bidding for the various PEAs.

196. In determining specific frequency assignments during the assignment phase of the forward auction, the auction system will take into account bid amounts as well as other efficiency objectives, such as maximizing contiguity for winners of multiple blocks in an area. Under the Commission’s proposed approach, these overall efficiency considerations will affect the way the auction system processes the bids to determine the optimal assignment of frequencies. The Commission seeks comment on these proposed objectives and their relative priority in determining the best way to structure bidding and bid processing in each assignment round.

**i. Grouping of PEAs**

197. The Commission proposes to conduct bidding for specific frequencies grouped by different geographic areas in each assignment round. This will reduce the complexity for the bidder and the auction system that would be inherent in considering simultaneously the preferences of multiple bidders for various configurations of Category 1 and Category 2 license blocks in hundreds of PEAs. However, to the extent that the set of clock-phase winning bidders and their winning bids for Category 1 and Category 2 blocks are consistent across a group of PEAs, the Commission proposes to conduct the single-round bidding jointly for multiple areas. Under such circumstances, joint bidding would not increase the complexity of the bidding or the winner determination process. Moreover, joint bidding can reduce the overall number of assignment rounds needed and facilitate assigning contiguous blocks to bidders that won multiple blocks in a group, potentially enhancing the efficiency of the assignment.

198. Specifically, the Commission proposes to group together: (1) “high-demand” PEAs with the same number of Category 1 and Category 2 blocks, where the same frequency blocks are in Category 2, and where the same bidders won the same quantities of Category 1 and Category 2 blocks; and (2) all PEAs other than the “high-demand” PEAs in a Regional Economic Area Grouping (“REAG”) with the same number of Category 1 and Category 2 blocks, where the same frequency blocks are in Category 2, and where the same bidders won the same quantities of Category 1 and Category 2 blocks. The Commission further proposes to group PEAs together when to do so will not create any conflicting

interests among bidders. This could occur, for example, if the bidder mix of generic blocks differs only in that there is an unsold license in one PEA but not in another. Under the Commission’s proposal, bidders would bid for their specific preferred frequencies across all the PEAs in a group, and the auction system will determine a frequency assignment that will apply to all the licenses in the group.

**ii. Sequencing of PEAs**

199. The Commission proposes to sequence assignment rounds so as to make it easier for bidders to incorporate frequency assignments from previously-assigned areas into their bid preferences for other areas, recognizing that bidders winning multiple blocks of licenses generally will prefer contiguous blocks across adjacent PEAs. To that end, the Commission proposes to conduct rounds for the largest groups of markets first to enable bidders to establish a “footprint” from which to work. Specifically, the Commission proposes to conduct assignment rounds sequentially, generally in order of “weighted-pops.” Under this proposal, the Commission will first conduct an assignment round for the largest PEA or PEA group, based on total weighted-pops, and continue in order of weighted-pops until specific frequencies have been assigned for all the “high-demand” PEAs (individually or in groups).

200. Once frequencies have been assigned for the “high-demand” PEAs, the Commission proposes to conduct for each REAG a series of assignment rounds for non-high-demand PEAs within that region, in descending order of weighted-pops for a PEA group or individual PEAs. The Commission further proposes, to the extent practical, to conduct the assignment rounds for the different REAGs in parallel, to reduce the total amount of time required.

**iii. Acceptable Bids and Bid Processing**

201. Under the Commission’s proposal, described in more detail in Appendix H of the Auction 1000 Request for Comment, bidders will be asked to assign a price to their various frequency preferences, consistent with their winning bids for generic blocks in the clock phase. The Commission proposes not to differentiate in the assignment rounds between licenses that were reserved for certain

eligible bidders pursuant to the Mobile Spectrum Holdings R&O and unreserved blocks. This proposed approach is consistent with the auction design the Commission adopted in the Incentive Auction R&O: bidders in the clock phase will have competed for generic blocks, not specific licenses. The Commission also believes this approach is consistent with its competitive goals in the Mobile Spectrum Holdings R&O, as winning bidders will be assured of low-band spectrum based on the results of the clock phase. Winners of either reserved or unreserved Category 1 blocks will be able to bid for the available frequencies in Category 1, and the auction system will assign specific frequencies without regard to the reserve-eligible status of the bidder.

202. In each assignment round, a bidder will be asked to assign a price to one or more possible frequency assignments for which it wishes to express a preference. The price will represent a maximum payment that the bidder is willing to pay, in addition to the base price established in the clock phase for the generic blocks, for the frequency-specific license or licenses. At the end of the assignment phase, the clock price will be discounted to the extent the licenses included are subject to impairments. The Commission proposes to apply a discount on the clock prices of generic blocks to reflect the varying degrees of impairment to the blocks within a category. Specifically, for a given frequency-specific license, the Commission proposes to reduce the base price for the assignment round by one percent of the final clock price for each one percent of impairment to the license. Under this proposal and the Commission's proposed assignment phase procedures, if a bidder indicates it is willing to pay an additional amount in the assignment round for a specific block that is available in the category, and it wins that license, the additional payment will be applied to a base price that reflects a discount from the final clock price for the category.

203. It may not be possible to assign contiguous blocks to all bidders within a PEA. Contiguity cannot be guaranteed because of the possibility that some contiguous blocks are in different categories due to the amount of their impairment, and in the case of clearing targets over 84 megahertz, TV Channel 37 will separate some blocks. Given this, the Commission proposes to use an optimization

approach to determine the winning frequency assignment for each assignment round. The Commission proposes that the auction system will consider a number of objectives aimed at assigning contiguous blocks fairly and to the extent possible. As set forth in Appendix H of the Auction 1000 Request for Comment, the Commission proposes a sequence of optimizations using the following objectives: (1) maximizing the number of bidders that won multiple blocks that are assigned at least two contiguous blocks; (2) minimizing for all bidders that won two or more blocks in the clock phase the number of blocks that are non-contiguous to any of the bidder's other blocks; and (3) maximizing the number of bidders that are assigned only contiguous blocks. Under the Commission's proposed procedures, the auction system will first solve or optimize for the first objective and use that outcome as a constraint in solving the second objective, which would then constrain solving the third objective. The winning bids in each assignment round will be bids for which the assignment satisfies these three constraints and for which the bidders in that round are willing to pay the most.

204. As described in Appendix H of the Auction 1000 Request for Comment, the Commission proposes that the additional price a bidder will pay for a specific frequency (above the discounted final clock price) will be calculated consistent with a generalized "second price" approach—that is, the winner will pay a price that would be just sufficient to result in the bidder receiving that same winning frequency assignment. This price will be less than or equal to the price the bidder indicated it was willing to pay for the assignment. The Commission proposes to determine prices in this way because it facilitates bidding strategy for the bidders, giving them an incentive to bid their full value for the assignment, knowing that if the assignment is selected, they will pay no more than would have been necessary to ensure that the assignment won.

#### **E. Additional Default Payment Percentage**

205. The Commission's competitive bidding rules provide that it shall establish the percentage of any defaulted bid that will be assessed as a payment owed by the defaulter in addition to the difference between with defaulted bid and a subsequent winning bid for the same license. In an auction

without combinatorial bidding, such as the forward auction the Commission proposes here, the percentage shall be between three and 20 percent. The Commission proposes that the percentage shall be 20 percent in the forward auction. The Commission tentatively concludes that the maximum amount is in the public interest, given the importance of deterring defaults in order to minimize the possibility that the auction will not generate shortly after its conclusion the full amount of the proceeds indicated by winning bids.

## **VI. EX PARTE**

206. This proceeding has been designated as a “permit-but-disclose” proceeding in accordance with the Commission’s ex parte rules. Persons making oral ex parte presentations are reminded that memoranda summarizing the presentations must contain summaries of the substance of the presentations and not merely a listing of the subjects discussed. More than a one or two sentence description of the views and arguments presented is generally required. Other provisions pertaining to oral and written ex parte presentations in permit-but-disclose proceedings are set forth in 47 CFR 1.1206(b).

## **VII. REGULATORY FLEXIBILITY ACT ANALYSIS**

207. As required by the Regulatory Flexibility Act of 1980 (RFA), 5 U.S.C. § 603, the Commission prepared an Initial Regulatory Flexibility Analysis (IRFA) in connection with the Notice of Proposed Rulemaking, “Expanding the Economic and Innovation Opportunities of Spectrum Through Incentive Auction,” 77 FR 69933, November 21, 2012 (Incentive Auction NPRM) and a Final Regulatory Flexibility Analysis (FRFA) in connection with the Incentive Auction R&O. While no commenter directly responded to the IRFA, the FRFA addressed concerns about the impact on small business of various auction design issues. The Commission seeks comment on how the proposals in the Auction 1000 Request for Comment could affect either the IRFA or the FRFA. Such comments must be filed in accordance with the same filing deadlines for responses to the Auction 1000 Request for Comment and have a separate and distinct heading designating them as responses to the IRFA and FRFA.

208. The IRFA and FRFA set forth the need for and objectives of the Commission's rules for the broadcast spectrum incentive auction; the legal basis for those rules, a description and estimate of the number of small entities to which the rules apply; a description of projected reporting, recordkeeping, and other compliance requirements for small entities; steps taken to minimize the significant economic impact on small entities and significant alternatives considered; and a statement that there are no federal rules that may duplicate, overlap, or conflict with the rules. The proposals in the Auction 1000 Request for Comment do not change any of those descriptions.

209. The Auction 1000 Request for Comment does, however, detail proposed procedures implementing those rules. The Commission seeks comment on how the proposals in the Auction 1000 Request for Comment could affect either the IRFA or the FRFA. These proposals include procedures for setting the initial broadcast spectrum clearing target, determining whether the final stage rule is satisfied and the steps triggered by that determination, determining how much market variation will be accommodated, and a process of moving from one stage of the auction to any subsequent stage(s), if necessary. The Auction 1000 Comment PN also addresses detailed proposals for setting opening prices, applying to participate in the reverse or forward auction, establishing bidding procedures for each auction, optimizing the final television assignment channel plan, providing information to forward auction bidders, grouping license blocks into categories for bidding, implementing the market-based spectrum reserve, repacking broadcasting stations in conjunction with the reverse auction, and assigning licenses with specific frequencies in the forward auction.

Federal Communications Commission

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Secretary.