

U.S. Environmental Protection Agency (EPA) Comment Summary and Response for Draft 2 ENERGY STAR® Pool Pumps Connected Criteria

Topic	Summary of Stakeholder Comments	EPA Responses
Optional vs Required Criteria	One stakeholder requested that EPA clarify which criteria in the document are optional and which are required.	The connected criteria contained in Section 4 are optional for ENERGY STAR certified pool pumps. However, for an ENERGY STAR pool pump to be recognized as having "connected functionality," the product must meet all of the requirements specified in Section 4. EPA has included this clarification at the beginning of the Draft 2 document.
Optimal Schedule Settings	One stakeholder noted that the most efficient pump schedule that also ensures adequate sanitation will be different by size of pool and region of the country.	EPA recognizes that optimal schedules vary based on physical and environmental conditions. The Draft 2 'connected functionality' recognition requirements do not specify specific schedules and are intended to provide manufacturers, consumers, and authorized third parties with the flexibility to make appropriate adjustments.
Block Diagram	<p>Stakeholders suggested the following clarifications and enhancements to the Figure 1. Connected Pool Pumps System (CPPS) diagram:</p> <ul style="list-style-type: none"> • Distinguish consumer communication versus DRED event notification • Show the CPPS "PUMP CONTROL" device physically separate from the pump itself, in an intermediary block, like in a Power Center configuration that represents a pool control system instead of just a pump control. • One stakeholder requested that EPA clarify that a pool pump with an open standard physical interface is sufficient and that a separate communications module is not required while another stakeholder suggested EPA note that "An open standard interface is always required at the premises, even in the event that an Internet/Cloud system is provided." • For balance, include a long-range communication example in the list to the right side of the diagram, such as "cellular network, AMI, or SCADA system" • Revise Note 1 under Figure 1 for clarification on allowable configurations: "These elements "either individually or together" could be within the pump controller, and/or an external communication module, a hub/gateway, or in the Internet/cloud." 	<p>EPA's responses to stakeholders' comments on the CPPS diagram are as follows:</p> <ul style="list-style-type: none"> • Demand Response Enabling Devices (e.g. smart meter) and consumer interfaces (HEMS) are both listed as examples under the "External Application / Device / System" communicating with the CPPS and are further referenced and specified in later requirements of Section 4. • The primary intent in including Figure 1 is to illustrate a Connected Pool Pump System (CPPPS) boundary and to indicate that open standard communications may be implemented using an external device (top drawing) or a modular or built-in device (lower drawing). In response to stakeholder comments, in the Draft 2 criteria, EPA has: <ol style="list-style-type: none"> 1. Added AMI and SCADA systems to the listed examples of external applications or services to which the product may connect, and 2. Revised Note 1 to add "either individually or together" as suggested. • EPA agrees that a CPPS that includes an open standards-based modular communication port that complies with the Section 4.3 Communications criteria need not also include a module. A note has been added to Section 4.3 to add clarity.

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<p>Open Standards Definition</p>	<p>One stakeholder requested EPA confirm that open standards are non-proprietary.</p> <p>In regards to the definition of open standards, another stakeholder commented 1) that the use of open standards may require payment of annual fees to open standards bodies; i.e., SGIP, ZigBee Alliance, OpenADR Alliance expect validation testing with select third parties and/or membership fees and that 2) ZigBee Smart Energy Profile and OpenADR have been piloted/tested primarily dictated by the needs of the utility program.</p> <p>A third stakeholder applauded EPA’s effort in this section commenting that interoperability and access for consumers cannot be realized without open standards and that specifications like this one accelerate the completion and maturation of standards. It is recognized that standards development processes may be slow and that, as a result, the capabilities of standards may lag behind the emergence of new functional interests in the marketplace. To address this, manufacturers and vendor groups often develop “extensions” to standards so that they can continue forward in an interoperable way.</p>	<p>In light of varied industry definitions, EPA has elected to provide a broad definition for open standards that aligns with program goals for connected functionality. While the definition allows significant implementation flexibility, it does not enable the use of proprietary communication standards to demonstrate compliance with Section 4.3 A).</p> <p>EPA appreciates stakeholders feedback on open standards as they apply to pool pumps.</p>

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<p>Section 4.3 Communications Requirement s: Open Standards, Access, and Premise Boundary</p>	<p>Stakeholders suggested that Section 4.3 be clarified to ensure that both an open standard CPPS communication (A) and open-access documentation are required (B).</p> <p>Two stakeholders commented that limited performance data available via an API is considered acceptable but control capability is not acceptable.</p> <p>Two stakeholders commented that open standards on the premises should not be required (one indicated that over 90% of pool owners have Internet access) while another stakeholder requested that an open standard interface always be required even if an Internet/Cloud system is provided. This stakeholder emphasized that open access within the physical premises of the home would help ensure that the customer is afforded the ability to choose which offer to participate in based on her own needs and wants. One stakeholder further indicated that the criteria are still unclear on the distinction of open standards use on-site vs. otherwise.</p> <p>One stakeholder additionally recommended that EPA carefully address how its connectivity requirements will safeguard customer data.</p>	<p>In Draft 2, EPA has revised language at the beginning of Section 4 in order to further clarify that all Section 4 criteria are required for an ENERGY STAR pool pump to gain optional connected recognition. In Section 4.3, EPA has:</p> <ol style="list-style-type: none"> 1. Clarified the Note 1 language to indicate that while products that enable local open standards-based communications are preferred, products that only enable open standards-based communications outside of the consumer's premises may also comply, and 2. Added Note 2 to indicate that products need not ship with an external communications module, if the included modular communications interface meets the Section 4.3.1 and 4.3.2 criteria. <p>Section 4.3 criteria apply to Energy Consumption Reporting, Operational Status, User Settings & Messages, and Demand Response; as EPA envisions potential DR and energy management applicability. Section 4.3 criteria are not mandated for Remote Management or Peak Period Avoidance to allow manufacturers to more selectively allow access to these functionalities that enable a more granular level of pump control as compared to DR. Additional connected capabilities above and beyond that defined by Section 4 are outside the scope of ENERGY STAR and are not subject to Section 4.3 criteria. Currently, a range of connected approaches are being explored in the nascent connected pool pump market. Accordingly, EPA believes it is ultimately in the consumer's interest for the market to be free to test a range of options, constrained only by the consumer-oriented objectives the ENERGY STAR program is seeking to advance. Accordingly, in Draft 2, EPA has continued to indicate a preference for products that enable on-premises open standards connectivity, while allowing alternate approaches that allow open standards connectivity only outside of the consumer's premises to also comply. EPA agrees that data security is an important issue for connected products, regardless of how they are interconnected. However important; data security, as it applies to entities that interconnect with the CPPS, is outside the scope of the ENERGY STAR program and as such; it would not be appropriate for EPA to include such criteria. That said, EPA encourages all entities that interconnect with connected consumer products to keep consumer privacy interests as a top priority in determining how data is used. EPA believes consumers should always retain ownership of CPPS data and those utilities and/or service providers that interconnect with the CPPS should act as trusted data custodians by keeping consumer privacy interests a priority.</p>

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Energy Consumption Measurements	<p>One stakeholder requested that EPA allow estimated energy calculation based on the motor's RPM and run time rather than require actual energy measurements because it would allow more devices to be monitored (i.e. single speed pumps) without the expense to consumers of additional flow meters or other measuring devices.</p> <p>A second stakeholder commented that Draft 1 indicates reported power usage shall be used for calculating the cost of the energy used. The stakeholder emphasized that EPA should account for power estimates varying greatly in accuracy from low speed operation (ex. 100 W) to high speed operation, with high speed (ex. 2000 W) being the most accurate due to the cubic power characteristic of the pump.</p> <p>Another stakeholder asked whether it is EPA's intention to inform the consumer of an aggregate value of energy consumption (kWh) exclusively or is real-time power consumption (W) an option. And the stakeholder commented that line 180 should reference Section 4.2 instead of Section 4.3.</p>	<p>In Draft 2, EPA has revised the Section 4.4 Energy Consumption Reporting section to be more explicit in that estimated reporting and/or reporting in units of real-time power is acceptable. The incorrect reference to Section 4.3 has been changed to 4.2.</p> <p>EPA appreciates the stakeholder feedback on the impacts to reporting accuracy associated with estimation and notes that consumption reporting is intended to broadly inform energy management functionality and utilities, rather than provide revenue-grade sub-metering. Further, manufacturers are required to include related information in the API including accuracy, units, and measurement interval in order to help ensure usefulness of this feature.</p>

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<p>Section 4.6: Operational status reporting</p>	<p>One stakeholder suggested that a significant amount of energy savings can be achieved by informing consumers that their pump run time is not optimized (i.e. should be adapted) for the current environment conditions (changing seasons, water and air temperature). A large majority of pool owners set a pump run time and never adjust it throughout the year-- the savings for these adjustments is larger than the reduction in energy consumption by monitoring clean/dirty filters. Backyard lighting and other connected equipment could be adjusted as daylight changes throughout the year.</p> <p>This stakeholder also noted that flow rate reporting to the consumer does not directly relate flow rate to energy consumption and that flow rate currently changes by position of valves (pool versus spa). The manufacturer suggested it can make this a notification of reduced flow rate, accumulated runtime and/or turnover. The stakeholder also commented that on a daily basis maintaining the set run time, accomplishes the daily turnover within practical measures.</p> <p>Another stakeholder recommended that EPA consider requiring reporting of “Operational status including off, on, pump speed, and flow rate” only if available.</p>	<p>Given that some pumps do not estimate Rate of Flow, EPA has revised Section 4.6. 1 A) to require reporting of device 1) On/Standby/Off mode status and 2) either pump speed, Rate of Flow, or both.</p> <p>While EPA has not added criteria related to informing consumers of opportunities to optimize pumping to match seasonal and/or environmental conditions; however, EPA encourages these manufacturer innovations that will maintain pool health while further reducing energy consumption.</p> <p>EPA has elected not to relax operational status reporting of only available data, as this functionality is deemed important for informing both utilities and energy management applications.</p>

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Section 4.6: Demand Response Status	<p>One stakeholder recommended that EPA require DR status information in preparation for, performance of, and completion of DR modes of response to include: % of full speed, any consumer override, and kW usage as available. For example, status information may consist of 15 minute data across the hours before, during, and after a DR event. And the stakeholder also recommended the manufacturer provide information to inform consumer and utility on pump behavior after a DR event (e.g., run-time adjustment to maintain pool health).</p> <p>Another stakeholder confirmed that DR status including delay load and temporary load reduction could be calculated and displayed.</p>	<p>As noted above, in draft 2, EPA has revised Section 4.6 status reporting criteria to allow reporting of pump speed and/or Rate of Flow. EPA further notes that:</p> <ol style="list-style-type: none"> 1. Availability for DR may be discerned through both consumption and operational status reporting, and 2. DR response and any consumer overrides may be determined from consumption reporting. <p>Run-time adjustment is not addressed by the Draft 1 criteria. For simplicity, in Draft 2, EPA has elected not to specify "make-up pumping" nor require additional associated communications. EPA, however, encourages manufacturers to implement make-up pumping and/or associated communications capability as they deem appropriate.</p>
Section 4.6: Program schedule reporting	<p>One stakeholder confirmed that they already report the program schedule including schedule times and scheduled operation. Another asked whether the controller is intended to be an operational scheduler, as well.</p>	<p>Connected criteria are included as a minimum set of features to enable compliant ENERGY STAR pool pumps to receive optional recognition as connected. While Section 4.6, includes criteria for reporting of pool pump programmed schedule, there is no criteria mandating remote scheduling functionality. However manufacturers are free to include this and other connected capabilities, above and beyond the Section 4 criteria.</p>
Section 4.6: Energy Use Messages	<p>Another stakeholder confirmed that they report estimated energy consumption both on the product and via a communication link.</p> <p>One stakeholder made the following editorial comments on the section:</p> <ul style="list-style-type: none"> • Line 216: does the term "product" refer to the controller, pump, and/or both? • Line 228: remove the word "to" after the word "or". 	<p>In response to this feedback, in Draft 2, EPA has included an example in Section 4.6.2.1, clarifying that "on the product" includes the pool pump and/or the pump controller.</p> <p>EPA acknowledges the typo noted in Line 228 of Draft 1. As included Note Box language is unique to each draft version, the affected language does not appear in the Draft 2 proposal.</p>

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Peak Period Avoidance	<p>One stakeholder noted that default schedules are not always appropriate for varying equipment set ups and regions of the country especially during different times of the year. If the local installer or consumer has adapted it, it may be for good reasons and another party would not want to "automatically" override it or default back to another setting.</p>	<p>In Draft 2 section 4.7A, EPA has replaced "By default" with "As shipped." This change is consistent with EPA intent that Peak Period Avoidance criteria applies to the product as delivered to consumers and/or installers. Scheduled operation, if active, should continue to follow the most recent schedule prior to the outage. In Draft 2, EPA revised associated language to indicate that CPPS' under scheduled control must continue to follow the most recent schedule in effect prior to the outage.</p>
Section 4.7 Peak Period Avoidance	<p>One stakeholder made the following comments and questions on Section 4.7 Peak Avoidance:</p> <ul style="list-style-type: none"> • Lines 265 and 266: Water quality may be compromised over an extended period of time. Consumer experience may be negatively impacted by extended peak period avoidance coupled with DR leading to frequent overrides or opt-out behavior. • In previous conversations among stakeholders, it's been stated that peak period avoidance would be disabled if an end device was enrolled in a DR program. Is this still the expectation or would peak period avoidance and DR be coupled? • Line 267: Consumer and/or consumer authorized third party is acceptable. • Lines 246 and 247: Consider defining a maximum outage period the controller must "hold" memory; 24 hours, 48 hours, or more? Based on electronics limitations, for example. • Table 2, Variable Speed/Flow: Regarding the Allowable Operation, confirm this requirement means a max speed or flow rate. For example, a pump with rated max speed of 3000rpm cannot run at a speed greater than 1000rpm to qualify. <p>A second stakeholder asked if consideration has been given to sanitation given that peak bather load likely corresponds with peak grid load.</p>	<p>The intention of the Connected Criteria is to allow benefits from Peak Period avoidance to continue even if the device is enrolled in a Demand Response program. EPA notes, however, that both Peak Period avoidance and Type 1 Demand Response allow reduced speed operation in multi and variable speed pool pumps (currently, no single-speed pool pumps are ENERGY STAR and EPA does not believe that current technologies enable single-speed pumps to qualify). EPA further notes that Peak Period Avoidance, as clarified in Draft 2, applies to the product as-shipped. Consumers and/or consumer authorized third parties are free to modify the pumping schedule, as needed.</p> <p>In Draft 2, EPA has revised Section 4.7C to indicate the CPPS must continue to follow the most recently configured pumping schedule prior to an outage of 24-hours or less. Retention of settings for at least 24 hours was intended to minimize consumer inconvenience, while allowing manufacturers to avoid the use of batteries to retain settings.</p> <p>The CPPS is not required to respond to a Demand Response request if doing so would compromise safety. The requirements are intended to ensure the CPPS is capable of providing all three types of responses. If a particular Demand Response event coupled with the default Peak Period Avoidance would result in insufficient pump operation for the adequate filtration of the pool, then the pump could reject the event request. EPA welcomes stakeholder comment on pumps' capability to respond as such in this scenario.</p> <p>Finally, the ENERGY STAR specification is applicable to only residential pool pumps between 0.5 and 4 horse power. As such, it is not intended to apply to commercial or municipal pools where regulations commonly require the pump to be operating whenever the pool is open.</p>

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Demand Response General	<p>One stakeholder asked if rolling 24-hour period means 12:00am to 11:59pm or does the 24-hour period start with the initiation of a DR event?</p> <p>In regards to overall demand response requirements, another stakeholder recommended that EPA address functionality to maintain integrity of pool (e.g., freeze protection). Pool pump operation in subfreezing temperatures requires running of the pump to prevent freezing. Additional functionality is needed to accommodate short-run considerations (e.g., freeze protect pool by running pump for 5 minutes every hour) in order for the pool pump to support DR. This stakeholder also suggested that EPA include response time with minimum delay as a requirement. For example, the Australian/New Zealand standard specifies response within 5 minutes of signal receipt. Shorter response time is potentially useful for more applications supporting the grid.</p>	<p>As clarified in the Draft 2 proposal, the 24-hour period starts with the initiation of a DR event.</p> <p>EPA notes that only the Type 2 DR response mandates termination of pumping for the pump types currently able to qualify (multi & variable speed). As the minimum Type 2 response duration is 20 minutes, EPA does not believe that additional provisions are necessary to enable freeze protection. Additionally, Draft 1 and Draft 2 proposals neither mandate, nor preclude manufacturers from implementing flow-recovery. While implementation and verification of flow-recovery criteria would be tedious and add test burden, manufacturers are encouraged to implement features such as this to ensure consumer satisfaction is maintained.</p> <p>In draft 2, EPA has included minimum latency criteria of 5 minutes for responses that entail termination of pumping and 5 seconds for all other responses. Latency is defined as the period from CPPS receipt of a requesting signal to a compliant operational response. EPA notes that CPPS' should respond as quickly as possible and that the longer 5 minute response time is intended as a maximum limit that enables graceful shutdown of other controlled equipment such as chlorinators and heaters that may be damaged if water flow is abruptly terminated.</p>

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Demand Response Type 1	<p>One stakeholder asked if EPA has considered the effect of a Type 1 (4 hour interruption of pumping) response on pool sanitation. Another stakeholder noted that the 4-hour minimum time period seems long, but may not affect consumer experience dramatically if DR event is called one per week, for example. If the frequency of DR events is too high, consumer experience may be negatively impacted. Flow recovery period would make up for lost filtration during DR event.</p> <p>Another stakeholder suggested the following changes for a Type 1 response:</p> <ul style="list-style-type: none"> • Multi-Speed: Pumping shall be “reduced (i.e., interrupted or curtailed)” to the lowest available speed • Variable Speed: Pumping shall be “reduced (i.e., interrupted or curtailed)” to no greater than a third of full speed • Drop the “1x per 24 hour” limitation. (Alternatively, though less desirable, change to “1x per 12 hour”.) • Eliminate the “4-hour minimum duration” and/or providing the ability to specify a minimum duration ranging from one hour to 12 hours. 	<p>Type 1 is only an interruption in the context of single-speed pool pumps. Currently, no single-speed pool pumps are ENERGY STAR certified and EPA does not believe that current technologies enable single-speed pumps to qualify. As such, within the context of multi and variable speed pool pumps, a Type 1 response permits continued, reduced speed operation. In draft 2, EPA has revised DR language in Table 2 that better clarifies EPA intent that responses shall not increase energy consumption. More specifically, additional language clarifies that inactive pumps may not turn-on during the response period and variable speed/flow pumps operating at less than 1/3 of rated speed/flow may not increase speed/flow during the response period.</p>
Demand Response Type 2	<p>In regards to the “time period of at least 20 minutes” for Type 2 response, the stakeholder asked if there is a maximum limit and commented that it seems more reasonable if it is a value less than an aggregate of 4-hours, for example.</p> <p>Another stakeholder made the following recommendations for a Type 2 response:</p> <ul style="list-style-type: none"> • Drop “3x per 24 hour” limitation. (Alternatively, though less desirable, change to “3x per 12 hour”). • Eliminate “20-minute duration” and/or providing the ability to specify a minimum duration ranging from one minute to 60 minutes. 	<p>Manufacturers may implement maximum DR response durations equal to or longer than the minimum response duration criteria. EPA encourages manufacturers to implement Type 1 and/or Type 2 DR responses that exceed the minimums, so long as they can be implemented without unduly impacting consumers. For Draft 2, EPA has elected to maintain the minimum response durations and frequencies proposed in Draft 1 and notes that these minimum durations were developed with stakeholder feedback in order to balance grid needs against consumer product performance expectations.</p>

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Demand Response Type 3	<p>In terms of avoiding an overall increase in energy consumption or decrease in daily pumped value, one stakeholder commented that pump controllers need to be more sophisticated; monitoring daily power consumption values to calculate operational schedule on DR event days. The stakeholder further asked EPA to clarify if “Energy consumption is not increased” (lines 295 and 296) means the controller will calculate the expected daily energy consumption since this may be different from day to day depending on the loading cycle. The stakeholder group questioned the likelihood of the net impact of a Type 3 response ultimately leading to a net increase in energy usage within a given billing cycle (or over the long term) for a particular customer acknowledging there will be times that an instantaneous increase in energy consumption will occur for load balancing purposes, but this increase should theoretically be more than offset by corresponding load shedding events. The stakeholder group noted that they will analyze and share with EPA actual data from utilities that will assess the risk and potential magnitude of consumers experiencing a net increase in energy use due to Type 3 responses. The stakeholder suggested that if energy consumption is to be limited then it should be compared to the scheduled operation for that month or billing cycle rather than day. For greater usability of Type 3 response for more uses cases, one stakeholder group recommended that EPA require energizing or increasing pumping to a specified percentage or maximum power. Another stakeholder asked if EPA has considered the effect of a Type 3 response (increased pumping speed) on potential bather entrapment (i.e. suction fitting flow ratings)?</p>	<p>In the Draft 2 proposal, EPA has replaced the Draft 1 energy requirement with criterion that requires Type 3 responses not exceed the planned daily pumping activity. Manufacturers commented that the controller would need to be exceedingly complex to estimate energy use for the day such that no products today have this capability and other stakeholders noted that the day to day energy consumption may change due to load variability (i.e. weekdays vs. weekends).</p> <p>In doing so, EPA expects manufacturers will be better positioned to implement Type 3 response at a lower incremental cost and utilities will be able to leverage the response with fewer limitations in order to, for example:</p> <ul style="list-style-type: none"> - Increase penetration of clean, night-time renewable sources such as wind; and - Shift pumping to lower cost periods to relieve grid stress and provide consumer savings. <p>In the coming months, CEE and EPRI are working to analyze and share with EPA, actual data that will assess the "risk and potential magnitude of consumers experiencing a net increase in energy use due to Type 3 responses." While EPA expects risk to be low, if this analysis instead indicates non-negligible risk, EPA will re-assess associated Type 3 criteria during the Version 2.0 pool pump specification development process.</p>

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<p>Utility Programs Behavior Change and 3rd Party Participation</p>	<p>One stakeholder commented that information-based “behavior change” demand response programs are emerging, and merit the support of EPA. In several states, demand response portfolios are increasingly adding new programs that communicate information (e.g. a peak price or reliability challenge) via a compelling consumer engagement technology (e.g. an in-home display, dashboard, or mobile app). However, these programs remain in the minority and direct load control programs are expected to remain common in many states for the foreseeable future. The stakeholder thus recommended that EPA require communication pathways that will support direct load control programs, variable pricing (TOU/ CPP/RTP) programs, and these emerging information based “behavior change” programs.</p>	<p>In its broad approach to connected, EPA has developed broad criteria designed to capture both direct consumer benefits associated with energy management as well as longer-term benefits that will accrue only when the connected product is enrolled into a signal-based DR program.</p> <p>Regarding behavior change programs, EPA envisions that CPPS' can provide behavioral energy management functionality in a system environment that leverages operational status and consumption reporting as well as remote management in order to both encourage behavioral change or to automatically alter pumping schedules to align with pre-set consumer expectations. For instance, if price >X, reduce pumping to 25% flow; if price >Y, terminate all pumping. As such, EPA believes that the current criteria will support both direct load control, as well as price and behavior-based programs.</p>
<p>Test Method Ability to Respond to Price-Based Signals</p>	<p>One stakeholder group suggested that DOE and EPA take steps to ensure that “connected” pool pumps are capable of receiving and responding to price signals as well as reliability-based signals. The stakeholder’s understanding is that the current U.S. Department of Energy (DOE) draft test procedure for DR functionality only addresses reliability-based signals, though time-based pricing is mentioned as a possible signal type. While reliability will be an important consideration for DR events, the price of energy will also be important and could more frequently determine DR events, particularly for purposes of delaying and shifting load. Consequently, a test method that can evaluate the appliance’s ability to respond to price signals will be necessary to verify that the consumer will capture the financial benefits of DR. This is especially true of cycle-based intermittent appliances. The consumer’s ability to shift load to lower price, off-peak periods would be greatly enhanced with price signal capabilities.</p>	<p>EPA appreciates this feedback on the importance of connected end devices being responsive to price signals, and/or schedules as time of use and other dynamic pricing programs become more prevalent. While the current capabilities have been mainly considered as responses to an event / reliability-based signals, it is feasible that pricing information could also be monitored by an upstream energy management system or service provider that leverages CPPS functionality, including status reporting, remote management and demand response in order to deliver price responsiveness.</p> <p>As residential variable pricing becomes more prevalent, EPA expects the market will respond with products that are able to directly receive and act upon price signals. EPA plans to monitor the market and, as such, may consider price responsiveness criteria, as appropriate, for future specification revisions.</p>

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Freeze Protection	<p>To further limit negative consumer impacts, one stakeholder group recommended EPA address functionality to maintain integrity of pool pump operation in subfreezing temperatures (e.g., freeze protection). Some regions during winter season will require this safeguard. The stakeholder is unable to propose a specific method for ensuring freeze protection at this time, but one possibility is that EPA would require running the pump at a specified regular interval. The stakeholder believes freeze protection is an important consideration that merits additional consultation with pool pump manufacturers, and ultimately with pool pump installers to ensure the required settings are achieved.</p>	<p>EPA expects that the product already has freeze protection built into the product that would override any DR event to ensure the product safely operates per the following provision included in Draft 1 and Draft 2 of the criteria: "The CPPS is not required to respond if doing so would compromise safety as determined by the manufacturer." EPA requests stakeholder feedback on the presence and operation of freeze protection and how it might be affected by the Peak Period operation requirements and any of the three Demand Response types.</p>