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Pool Controls Staff Report Joint Comments

Additional submitted attachment is included below.

August 31, 2022

California Energy Commission
Docket Unit
715 P Street
Sacramento, CA 95814

Topic: California Investor-Owned Utility Codes and Standards Enhancement Team Joint Comments on California Energy Commission Draft Staff Report Analysis of Flexible Demand Appliance Standards for Pool Controls

Docket Number:	20-FDAS-01
TN Number:	243783

Dear Commission Staff:

This letter comprises the comments of the Pacific Gas and Electric Company (PG&E), San Diego Gas & Electric (SDG&E), and Southern California Edison (SCE) in response to the California Energy Commission (CEC) Draft Staff Report Analysis of Flexible Demand Appliance Standards for Pool Controls.

The signatories of this letter, collectively referred to herein as the California Investor-Owned Utilities (CA IOUs), represent some of the largest utility companies in the Western U.S., serving over 32 million customers. As energy companies with a focus on safety, affordability, and reliability, we understand the potential of appliance efficiency standards to cut costs and reduce consumption while maintaining or increasing consumer utility of products. We recognize that flexible demand appliance standards could help support California's renewable energy goals, reduce greenhouse gas emissions, and improve grid reliability.

We appreciate this opportunity to provide the following comments on this draft staff report and look forward to continued engagement with the CEC and stakeholders on this topic.

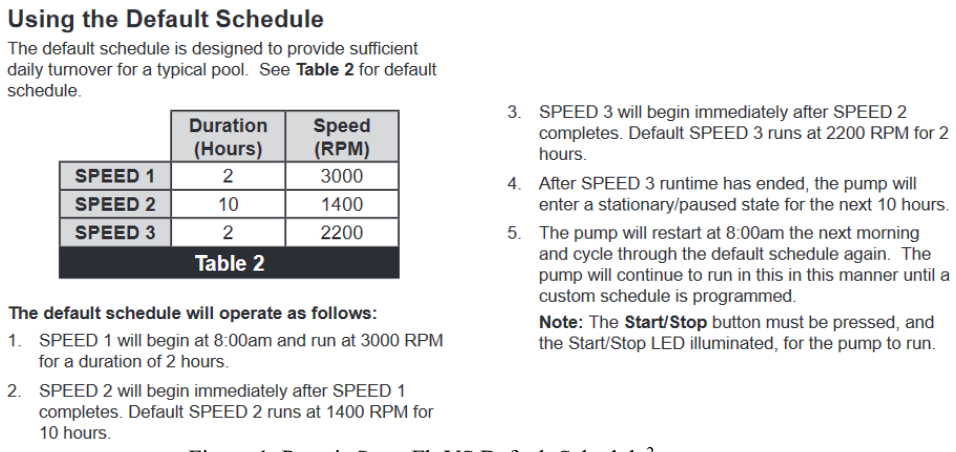
1. **The CA IOUs acknowledge the efforts of the CEC to put forth flexible demand appliance standards and recognize that the goal of the CEC's proposed standards is to achieve greenhouse gas emission reductions. We encourage the CEC to prioritize demand flexibility capabilities along with emissions reductions.**

The CA IOUs acknowledge the CEC's efforts to implement the statutory requirements for flexible demand appliance standards (FDAS) within the context of a broader statewide energy policy framework that enables progress toward a 100 percent clean electricity supply and that reduces greenhouse gas

(GHG) emissions. Senate Bill 49[1] (SB 49) states that the definition of flexible demand includes the ability to "schedule, shift, or curtail" demand "through direct action by the customer or through action by a third party, the load-serving entity, or a grid balancing authority, with the customer's consent." Additionally, this legislation states that FDAS should prioritize appliances for which electrical demand can be "controlled by load-management technology and third-party load-management programs." To better align with SB 49 and provide more benefits to California consumers and the grid, the CA IOUs urge the CEC to prioritize appliance flexible demand capabilities such as dispatchability, the ability to communicate with third parties like utilities and aggregators, and the ability to shed, shift, and modulate demand in response to grid needs, in addition to the goal of reducing GHG emissions. Additional work is needed to ensure that customer devices can receive and act upon signals, such as dynamic energy prices, GHG signals, and demand response event information. We recommend that the CEC collaborate with utilities, manufacturers, regulatory agencies, aggregators, and other stakeholders to develop processes to transmit rate and demand response information to flexible appliances, ensuring that customers get relevant information based on their current rate schedule, location, and customer class.

2. **The proposed default schedule could help lower GHG emissions; however, the fixed default operation period is not flexible and may not be appropriate in the future as rates and grid needs change.**

The CEC's default schedule proposes to shift high-demand operations to the six-hour period between 9 a.m. and 3 p.m. Product literature shows that some pool pumps are already equipped with default operation schedules that differ from this proposed window. For example, the Pentair SuperFlo variable speed pool pump is designed with the default schedule below. For this product, Speed 3 operates from 8 to 10 pm, overlapping with the peak load period of 4 to 9 pm in many California regions.



Using the Default Schedule

The default schedule is designed to provide sufficient daily turnover for a typical pool. See **Table 2** for default schedule.

	Duration (Hours)	Speed (RPM)
SPEED 1	2	3000
SPEED 2	10	1400
SPEED 3	2	2200

Table 2

The default schedule will operate as follows:

1. SPEED 1 will begin at 8:00am and run at 3000 RPM for a duration of 2 hours.
2. SPEED 2 will begin immediately after SPEED 1 completes. Default SPEED 2 runs at 1400 RPM for 10 hours.
3. SPEED 3 will begin immediately after SPEED 2 completes. Default SPEED 3 runs at 2200 RPM for 2 hours.
4. After SPEED 3 runtime has ended, the pump will enter a stationary/paused state for the next 10 hours.
5. The pump will restart at 8:00am the next morning and cycle through the default schedule again. The pump will continue to run in this in this manner until a custom schedule is programmed.

Note: The **Start/Stop** button must be pressed, and the Start/Stop LED illuminated, for the pump to run.

Figure 1. Pentair SuperFloVS Default Schedule[2]

Another example product with a pre-programmed default schedule is Hayward's TriStar variable speed pool pump, which has a default timer setting of 12:00 a.m. to 11:45 p.m.[3] This schedule promotes steady operation throughout the day, without accounting for variations in electricity costs or grid conditions. For pool equipment, default product operation will vary depending on the product goals and capabilities, and these default schedules may or may not be well suited to minimize GHG emissions or operation during peak electricity use periods or to support grid needs. Therefore, the CEC's proposed default schedule could help reduce GHG emissions by promoting load shifting to the late morning and early afternoon

[1] California Senate Bill 49 (2019)
[2] Pentair SuperFlo VST, SuperFlow VS, and SuperMax VS Variable Speed Pumps Installation and User Guide
[3] Hayward 1.85 THP VS Pump Family Owner's Manual, page 24.

when GHG emissions from electricity production are lower. Even so, this fixed period is not flexible enough to accommodate future changes in electricity use patterns, GHG emissions, electricity rates, and grid needs. For example, solar photovoltaic electricity generation has high variability at hourly and sub-hourly timescales, making it useful for controllable loads to be able to flex outside of pre-set time windows in support of grid reliability. Since the proposed default schedule is fixed, it does not align with other California initiatives, such as operation that is responsive to a universally accessible, dynamic economic signal envisioned by the California Public Utility Commission (CPUC) in their CalFUSE roadmap.[4] Appliances need to be able to use open and secure communication methods to operate flexibly and respond to signals, such as price and demand response event information. Therefore, the CA IOUs recommend that in addition to the default scheduling requirement, this FDAS regulation should require pool controls to be able to use open and secure communication protocols to respond to signals that would enable them to modify their operation in response to changing conditions, event signals and price signals.

The draft CEC analysis relies upon time-of-use (TOU) rates to calculate benefits from shifting the time of the pool equipment load to the proposed default period. This approach underestimates the total benefits of load shifting, since the cost of energy varies substantially more hour-per-hour than TOU rates do. To quantify the additional benefits associated with the dispatchability of pool controls in response to variable grid conditions, the CA IOUs recommend that the CEC evaluate the regulation's benefits using metrics that more thoroughly account for variations in energy costs and benefits by time of day, climate zone, and season – two such metrics are Time Dependent Valuation (TDV)[5], a methodology that has been used in the California Title 24 Building Energy Efficiency Standards process since 2005, and the CPUC's Total System Benefit (TSB) metric. When evaluating the proposal using these metrics, the CEC should consider an alternative proposal for pool controls that includes the ability to communicate using open and secure protocols and to respond to event and price signals. These features would maximize benefits and maintain GHG emissions reductions compared to operation under the currently proposed default schedule, especially in warm California climate zones where pools are most prevalent.

3. **The proposed standards would provide a basic level of connectivity for pool controls; however, without communication requirements, this connectivity may become obsolete in the future, creating stranded assets.**

The draft proposal defines connectivity as "any device that is capable of receiving TCP/IP signals from the internet." Although this proposed connectivity standard could provide a basic level of connectivity for pool controls, the proposed standard is not sufficient to provide long-term, widespread consumer benefit. For pool controls, there may be difficulty accessing internet signals due to limited Wi-Fi signal range or limitations in accessing a wired TCP/IP connection, and additional connectivity options may be useful, such as those that provide application-level interoperability and common provisioning steps. Additionally, the proposal does not require specific capabilities associated with the connectivity requirement. If connectivity is required, it would be useful to leverage the proposed connectivity feature to access updated utility rate, GHG, or demand response information, and to schedule or modify device operation in accordance with these signals. Therefore, the CA IOUs recommend extending the proposed connected device definition to allow for any open and secure connectivity pathway, which would allow for future adaptation to changing market conditions as new technology becomes available.

[4] CPUC White Paper and Staff Proposal on Advanced Strategies for Demand Flexibility Management and Customer DER Compensation.

[5] This approach is detailed in the California Investor-Owned Utilities' November 1, 2021 comment letter to the CEC on the Request for Information on Flexible Demand Appliance Standards.

4. **The CA IOUs support standards that would increase the deployment of flexible end-use technologies with two-way communication between the consumer and the grid, utility, or aggregator. Such communication should be based on open and secure standards and allow for several operational pathways.**

The CA IOUs support standards that would increase the deployment of flexible end-use technologies with two-way communication between the consumer and the grid, utility, or aggregator. The proposed regulatory language for pool controls FDAS does not include definitions or requirements that support two-way communication. Therefore, we recommend the addition of communication requirements in the standard. In accordance with SB 49, which states that the CEC's FDAS should prioritize appliances that are interoperable and open source, the CA IOUs propose that communication requirements should be based on open and secure standards and allow for several operational pathways, including device control via third-party aggregators enabled by cloud-to-cloud communication between aggregators and utility distributed energy resource management systems or demand response management systems.

For specific communications requirements, the CEC could leverage existing communications protocols used in California or nationwide. Examples of potential communication requirements that could be used by appliances include but are not limited to the following:

- The Institute of Electrical and Electronics Engineers (IEEE) Standard for Smart Energy Profile Application Protocol (i.e., IEEE 2030.5-2018),[6] which is a protocol that can be used to facilitate communication between distributed energy resources (DERs) and grid transmission and distribution systems for ensuring system reliability at the circuit level. This protocol is used for communication with customer-owned and operated DERs in compliance with CPUC's Electric Rule 21 tariff for distributed generation interconnection.[7] Currently, the market has not moved towards implementing this protocol in pool controls, but this could be considered as an option for future FDAS regulations for other end uses (e.g., smart inverters).
- California's 2019 building energy efficiency standards include demand responsive controls requirements for non-residential buildings. For FDAS, the CEC could consider alignment with the communications requirements of this code, which at a minimum require OpenADR 2.0a or b certification or inclusion on the CEC's list of certified demand responsive controls.[8]
- Finally, the CEC could align with connected product definitions (Section 4.1) and communications requirements (Section 4.2) in the Energy Star Pool Pumps Specification.[9] This specification includes a description of a connected pool pump system (Section 4.1.B), a definition for "open standards" (Section 4.1.D), and a requirement that communications with connected pool devices use open standards for all communications layers (Section 4.2.A).

Of these options, the CA IOUs recommend that the CEC consider alignment with the connected device and communications provisions in the Energy Star Pool Pumps Specification, which could be extended to pool controls. Energy Star is a standard vetted by a wide variety of stakeholders, and alignment with this Energy Star Specification would strengthen the FDAS for pool controls by promoting device dispatchability and allowing connectivity and communication requirements to remain flexible for future innovation. At least two brands already offer products that comply with Energy Star connected pool pump requirements and that would therefore also comply with FDAS without additional effort,[10] and additional software-based communications costs may be similar to the incremental cost of the CEC's current proposal. In alignment with the requirement in SB 49 to prioritize interoperable and open-source appliances, the Energy Star specification requires the use of open standards for communication. Section

[6] IEEE 2030.5-2018

[7] As an example, see Sheet 212 of PG&E's Electric Rule 21 tariff.

[8] California 2019 Building Energy Efficiency Standards Nonresidential Compliance Manual, Appendix D – Demand Responsive Controls. See page D-5.

[9] ENERGY STAR Version 3.1 Pool Pumps Final Specification, Section 4.1 and 4.2.

[10] ENERGY STAR Certified Pool Pumps. Connected feature available.

4.3 of the Energy Star specification also includes provisions to allow for remote management of devices and to provide feedback to consumers on device operation. This aligns well with the SB 49 requirement prioritizing appliances with "a user-friendly interface" and a "straightforward setup and connection process, such as remote setup by means of an internet website or application." The Energy Star requirements go further to protect the consumer and to ensure consumer consent compared to the proposed TCP/IP connectivity requirement, which does not ensure that open standards are used and does not necessarily prioritize consumer consent. An alternative proposal that aligns with Energy Star requirements could result in additional benefits compared to the draft CEC proposal, especially when evaluated using more robust metrics as noted in comment two above.

5. **The proposed standard for pool controls should be considered specific to this appliance. Future appliances in this rulemaking may require more sophisticated communications and control requirements.**

As noted above, the proposed FDAS for pool controls support GHG emissions reductions through alignment with time-variant electric rates, but they could be enhanced to support increased demand flexibility and to provide greater benefits to consumers and the grid as future grid needs evolve. Future FDAS requirements should be carefully considered individually, based on each appliance's specific costs, benefits, needs, and capabilities. For example, a default schedule may not be suitable for appliances like thermostats, where operation is driven by user comfort requirements and cannot be easily shifted to other time periods, or for appliances like electric water heaters that have unique thermal storage capabilities that can be leveraged for increased flexibility. Communications protocols like those discussed above will be needed to balance consumer amenity with appliance flexibility and to allow devices to respond to changing conditions. Additionally, the proposed pool controls regulation does not include testing requirements. For future FDAS, the CA IOUs would support testing requirements to ensure that communications and flexible demand capabilities operate as expected to provide consumer benefits. The CA IOUs urge the CEC to more clearly define flexible demand, include specific appliance capabilities that can be promoted by FDAS regulations, and work with stakeholders to ensure that FDAS appliances benefit both customers and the grid.

6. **The CA IOUs offer specific comments on the regulatory language proposed in the draft staff report.**

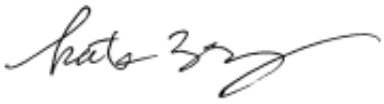
In line with the comments in this letter, the CA IOUs recommend specific changes to the proposed regulatory language for pool controls.

- In *Section 1687. Definitions*, we propose adding a definition for connected pool control by adopting the connected product definitions in Section 4.1 of the Energy Star Version 3.1 Pool Pumps Final Specification.
    - Current definition: "Connected device" means any device that is capable of receiving TCP/IP signals from the internet, with or without the connections through common home network equipment or radio broadcasting, by means of integrated or separate communications module.
    - Proposed definition: "Connected pool control" means any pool control that complies with the connected pool pump system definition in Section 4.1 of the Energy Star Version 3.1 Pool Pumps Final Specification.
- In *Section 1690. Appliance Specific Standards and Requirements*, we propose the following changes to the flexible demand appliance standards:
    - We propose expanded connectivity requirements aligned with the revised connected product definition proposed above.

- We propose adding communication requirements that align with Section 4.2 of the Energy Star Pool Pumps Specification. This includes the use of open standards for all communication layers and the ability to use a communication link to exchange data with external applications.
- We propose additional user interface requirements, including loss of connectivity notification, remote management and user alert capabilities in line with Sections 4.3 A and B of the Energy Star Pool Pumps Specification, and the ability to access, view and schedule operation using utility rate information, GHG signals, price signals, and demand response event information.

In conclusion, the California IOUs appreciate the CEC's effort to develop flexible demand appliance standards for pool controls, and we encourage the CEC to review and consider the recommendations in this letter. We thank the CEC for the opportunity to respond to this request, and we look forward to future opportunities for engagement, discussion, and collaboration.

Sincerely,



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