United States
Consumer Product Safety Commission

Fiscal Year 2026 Activity Update - Petition 25-1 for Rulemaking to Establish Requirements for Carbon Monoxide Alarms

September, 2026

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United States
Consumer Product Safety Commission

Memorandum

TO: The Commission
Alberta E. Mills, Secretary

DATE: September 25,2026

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FROM: Matt Brookman, P.E., Project Manager
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SUBJECT: Petition Requesting Rulemaking to Establish Requirements for Carbon Monoxide Alarms, Fiscal Year 2026 Voluntary Standards Activity Update

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I. Introduction

On December 18, 2024, the National Carbon Monoxide Awareness Association (NCOAA or Petitioner) submitted Petition 25-1 to the U.S. Consumer Product Safety Commission (Commission or CPSC) requesting that the Commission initiate rulemaking under the Consumer Product Safety Act, 15 U.S.C. § 2056, to address the Petitioner's claims of deficiencies in the UL Standards & Engagement (ULSE) standard, UL 2034, *Standard for Single and Multiple Station Carbon Monoxide Alarms,* associated with Carbon Monoxide (CO) exposure hazards.[1] The Petitioner is a member of the UL 2034 Technical Committee. Staff recommends that the Commission continue to defer action on the petition while staff engages in voluntary standards activity concerning the issues raised in the petition.

Petition 25-1 requests that CPSC initiate rulemaking to develop a rule that establishes the following performance and design requirements related to CO alarms:

A. CO alarms to sound when CO concentrations reach 15 ppm for 30 days or 30 ppm for one hour;
B. CO alarms to have digital displays of CO concentrations that are accurate to within ± 3 ppm, including accurate display of CO concentrations below 30 ppm;
C. Alarm and trouble alerts using voice signals in multiple language options;
D. In battery-powered alarms, a battery or batteries designed to last the lifetime of the alarm and battery tamper-proofing features; and
E. Simplified user manual design to improve familiarity, operation, and maintenance.

[1] https://www.cpsc.gov/content/CPSC-CO-Alarm-Petition-CP-25-1

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The Petitioner requests the Commission mandate these features to address potential effects from chronic low-level CO exposure and to enhance user familiarity with CO alarms and CO hazards. Currently, features such as digital displays, voice signals, and alarm "lifetime" tamper-resistant batteries can be found in various models of CO alarms on the market. The petitioner's request to mandate CO alarms to alert if concentrations reach 15 ppm for 30 days or 30 ppm for one hour are not currently allowed by UL 2034.

The UL 2034 standard applies to electrically operated single and multiple station CO alarms for use in ordinary indoor locations and unconditioned spaces. The alarms can be standalone devices or connected to a remote panel for building monitoring. Currently, compliant CO alarms are required to activate prior to an exposure that is assessed as likely to poison an individual and prevent their ability to take effective measures against the dangers associated with CO exposure. The current UL standard does not require digital displays, voice alarm signals, or lifetime alarm batteries, but also does not restrict their use.[2] The standard also provides instruction and marking requirements that were recently updated in the 5th addition with participation from the Petitioner.

On January 13, 2025, the Petitioner, as a member of the UL 2034 committee, proposed requirements B through E of the Petition to the committee for consideration.[3] The committee agreed to establish a task group to address these concerns. Under ULSE's process, the proposed requirements and claimed health effects presented by the Petitioner are being evaluated by subject matter experts, advocacy groups, and industry members within the committee to determine their validity and feasibility. Additionally, committee members discussed lower activation levels such as requirement A of the Petition; however, no specific activation levels were proposed. The task group began work on February 26, 2025.[4]

During the January 13, 2025 committee meeting, ULSE notified the UL 2034 committee that it will be initiating a harmonization project with the CSA Group to harmonize UL 2034 with CSA 6.19, *Residential Carbon Monoxide Alarming Devices*. The CSA Group, formerly known as the Canadian Standards Association, is Canada's largest standards development organization, dedicated to safety, social good, and sustainability. This process may lead to additional updates that address some of the Petitioner's requests. The committee began work on July 15, 2025 and CPSC staff are actively participating in this activity.[5] As of August 2026, the committee has developed draft language for a harmonized standard, which includes content related to the Petitioner's request. The draft harmonized standard is expected to be submitted to the UL 2034 and CSA 6.19 technical committees for review by the end of 2026.

On March 5, 2025, staff submitted a briefing package to the Commission with the recommendation to defer action, noting ongoing voluntary standards activity related to the Petitioner's proposed requirements.[6] Subsequently, on March 14, 2025, the Commission voted to defer the petition and directed staff to work through the voluntary standards process to improve the safety of CO alarms.

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[2] UL 2034 provides requirements for digital displays, including display value and accuracy specifications.
[3] https://www.cpsc.gov/s3fs-public/01-13-2025-UL2034-STP-Meeting-Log-Petition-Proposals-and-CSA-Harmonization.pdf?VersionId=rkeG1EbKdxMv3r5wqxtiG5ZBLJ6mog5I.
[4] https://www.cpsc.gov/s3fs-public/02-26-2025-UL-2034-TG-Meeting-Log-Displays-Voice-Alarm-manual-and-device-markings-and-10-year-batteries.pdf?VersionId=X_MKaMrL21OZux8jYr793gAQktpygaiH
[5] https://www.cpsc.gov/s3fs-public/07-15-2025-UL-2034-CSA-6-19-Harmonization-Committee-Meeting.pdf?VersionId=i7eNbgmyXhDDOTY88iF7vpd0_dZ0gmAy
[6] https://www.cpsc.gov/s3fs-public/Ballot-Vote-Petition-Requesting-Safety-Standard-for-Carbon-Monoxide-Alarms-Deter-Agency-Action.pdf?VersionId=SZZXUF1CVTQnihw3Iq8DkkpX5ETa9qsj

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Concurrent to the efforts in the UL 2034 task group to address the concerns of the Petitioner, the committee for UL 2075, *Gas and Vapor Detectors and Sensors*, convened a task group to evaluate a proposal for new requirements for portable, personal low-level CO monitors proposed during the same UL 2034 committee meeting where the Petitioner made their initial proposals on January 13, 2025. This proposal seeks to address similar concerns regarding low-level CO exposure. On April 10, 2025, the UL 2075 task group met to begin defining the work needed to incorporate requirements for low-level CO monitoring devices.[7] Subsequently, the committee began work through multiple task groups to address different sections of the standard. CPSC staff is actively involved in the development of these requirements and the task groups continue to make progress.

In addition to ongoing voluntary standards activity within UL 2034, UL 2075, and the UL 2034 / CSA 6.19 Technical Harmonization Committee, the Fire Protection Research Foundation (FPRF) published a review of CO alarm and detection thresholds in January of 2026.[8,9] The purpose of this review was to determine if new information was available regarding the dangers of CO exposure at different levels for various populations. It was intended to identify knowledge gaps and provide recommendations to address them. Stakeholders participating in various standards development groups are reviewing the report to potentially validate the existing alarm thresholds or support changes to UL 2034 through voluntary standards development processes. The report summarized a subset of information available regarding acute CO exposure and associated symptoms. Chronic exposure to CO was excluded from the study. The potential impact of chronic exposure on consumers has been difficult to study due to limited reporting, differentiation of symptoms from other illnesses, and comorbidities.[10]

II. Discussion

Carbon monoxide is a colorless, odorless, and poisonous gas that results from the incomplete combustion of fuels, such as natural or liquefied petroleum (LP) gas, gasoline, oil, wood, coal, and other fuels. Fuel burning appliances such as furnaces, water heaters, stoves, charcoal grills, and portable generators emit CO in various amounts. The amount of CO emitted from any appliance may increase if it is not operating properly due to circumstances such as poor maintenance, inadequate ventilation, or faulty exhaust pathways.

At a population level, the health effects from exposure to CO are informed by the resultant concentration of carboxyhemoglobin (COHb) in blood, which, in turn, depends upon CO concentration in the air, an individual's duration of exposure, age-based activity patterns, exposure factors, general health, and disease status. CO combines with the body's hemoglobin (Hb) with an affinity about 250 times that of oxygen, forming COHb and interfering with oxygen uptake, delivery, and use by the cells. Generally, in healthy individuals, no perceptible health effects or symptoms occur at COHb levels below 10 percent. Symptoms associated with COHb blood levels at or above 10 percent, in most healthy individuals, include headache, fatigue, nausea, and cognitive impairment. Loss of consciousness, coma, and death

[7] https://www.cpsc.gov/s3fs-public/04-10-2025-UL-2075-TG-Meeting-Low-Level-Portable-CO-Monitoring-Device-Requirements.pdf?VersionId=cRXxzfTjPSp4wk179ityb6Euw74NwMIh
[8] https://www.nfpa.org/education-and-research/research/fire-protection-research-foundation/projects-and-reports/a-review-of-the-carbon-monoxide-alarm-and-detection-thresholds
[9] https://content.nfpa.org/-/media/Project/Storefront/Catalog/Files/Research/Research-Foundation/Reports/Detection-and signaling/RFAReviewCOAlarmDetectionThresholds.pdf?rev=678fe66ef80049e59f6b5eeae914fa8a
[10] Comorbidity is the simultaneous presence of multiple medical conditions or diseases in an individual.

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can occur at COHb levels greater than 20 percent; but for healthy adults, CO deaths typically require levels above 50 percent COHb.[11] Sensitive subpopulations such as pregnant women, young children, and individuals with pre-existing cardiac disease are more likely to experience various health effects at levels below 10% COHb.

Based on weight of evidence, COHb continues to be a useful biomarker capable of predicting the probability of health outcomes in populations. COHb levels are dependent on duration of exposure and CO concentration. The relationship to these variables has been mechanistically validated through updated versions of the Coburn-Foster-Kane (CFK) model.[12,13,14] The CFK model is a physiologically-based toxicokinetic equation used to predict COHb levels in the blood resulting from exposure to CO. It describes how CO is taken up, transported, and eliminated by the body based on measurable and variable physiological parameters. Despite limitations of COHb as a predictor of health outcomes after CO exposures for individuals, differences in CO exposures and COHb levels in population groups make COHb levels useful for setting CO limits that can protect sensitive subpopulations, as well as the population overall.

CPSC's Directorate of Epidemiology staff continues to report on estimates of fatalities associated with CO poisoning from consumer products. Its latest report found evidence of an upward trend in non-fire CO deaths for the 11-year period from 2012 through 2022.[15] The estimated annual average number of unintentional, non-fire CO poisoning deaths from 2020 through 2022 was 238. This reporting largely focuses on acute poisonings; that is, those for which health effects occur immediately or in the near-term after higher CO exposures. Subacute poisonings, which the petitioner also focuses on, occur at lower and variable exposures, over longer periods of time. The petitioner asserts that these effects include adverse cardiovascular, developmental, and neurological outcomes. Data for these subacute poisonings are more limited.

The following discussion provides an overview of each proposal in the Petition and an update on the related voluntary standards activities up to August 28, 2026.

A. Alarm Activation at 15 ppm for 30 Days or at 30 ppm for One Hour

The Petitioner is requesting that the Commission promulgate a rule that will require CO alarms to activate if the CO concentration is measured to be 15 ppm for a duration of 30 days or is measured to be 30 ppm

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[11] Inkster S.E. Health hazard assessment of CO poisoning associated with emissions from a portable, 5.5 kilowatt, gasoline-powered generator. Washington, D.C.: U.S. Consumer Product Safety Commission, 2004

[12] https://www.mdpi.com/2305-6304/14/6/488

[13] https://archive.org/details/micro_IA40243214_1464/page/n3/mode/1up

[14] https://nepis.epa.gov/Exe/ZyNET.exe/9100KXTI.TXT?ZyActionD=ZyDocument&Client=EPA&Index=Prior+to+1976&Docs=&Query=&Time=&EndTime=&SearchMethod=1&TocRestrict=n&Toc=&TocEntry=&QField=&QFieldYear=&QFieldMonth=&QFieldDay=&IntQFieldOp=0&ExtQFieldOp=0&XmlQuery=&File=D%3A%5Czyfiles%5CIndex%20Data%5C70thru75%5CTxt%5C00000013%5C9100KXTI.txt&User=ANONYMOUS&Password=anonymous&SortMethod=h%7C-&MaximumDocuments=1&FuzzyDegree=0&ImageQuality=r75g8/r75g8/x150y150g16/i425&Display=hpfr&DefSeekPage=x&SearchBack=ZyActionL&Back=ZyActionS&BackDesc=Results%20page&MaximumPages=1&ZyEntry=1&SeekPage=x&ZyPURL

[15] https://www.cpsc.gov/content/Non-Fire-Carbon-Monoxide-Deaths-Associated-with-the-Use-of-Consumer-Products-2022-Annual-Estimates

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for one hour. The Petitioner claims that there is an unreasonable risk of injury from chronic low-level CO poisoning. These activation limits are intended to address the potential health effects that the Petitioner claims.

The UL 2034 standard has never required alarm activation at these lower levels and corresponding exposure durations. The first edition of UL 2034, published in 1992, established activation criteria that can be found in Table 1. Concentrations and exposure durations were based on a healthy population with a COHb limit of 10 percent. Just prior to the 2nd edition, the 1st edition was revised to change the false alarm resistance requirements, which included a requirement that the alarms shall not activate to an exposure of 15 ±3 ppm over 30 days. These criteria were changed again in the 2nd edition to the current requirements, in part due to repeated reports of nuisance alarms related to the false alarm resistance specifications. The Petitioner is requesting that the current activation requirement be lowered to ULSE's initial adjustment of 15 ppm for 30 days, however, this has never been an activation requirement in the standard. Instead, it was a false alarm resistance requirement for a brief period.

Table 1. UL 2034 1st Edition CO Sensitivity Requirements

UL 2034 CO Concentration vs. Time for Alarm Test Points Based on 10 % COHb	
Concentration, ppm	Maximum Response Time, minutes
100	90
200	35
400	15
False Alarms – CO Concentration Resistance Specifications	
Concentration, ppm	Exposure time, (no alarm)
100 ±5	5 minutes
15 plus 3, minus 5	480 minutes

Existing alarm activation requirements, established in the 1996 2nd edition, can be found in § 41.1.1 of the current 5th edition of UL 2034 and are listed in Table 2. The alarm signal must activate within the response times corresponding to the concentrations at or above 70 ppm as specified in Table 2. In addition to the primary alarm signal at CO concentrations of 70 ppm or greater, the standard allows an optional pre-alarm signal for gas concentrations below 70 ppm, but above 30 ppm. A compliant alarm may be designed to alert to concentrations within this pre-alarm range. A pre-alarm signal can alarm after 1 hour of exposure. The pre-alarm signal is unique from a trouble signal or primary alarm signal and is intended to provide early notification of the presence of CO prior to activation of the primary alarm signal. The Petition incorrectly asserts that a CO alarm may only alert to concentrations between 30 and 69 ppm if concentrations remain in this range for 30 days, rather than 1 hour as the standard specifies. The Petitioner's request for CO alarms to sound when CO concentrations reach 30 ppm for 1 hour is similar to the lower limit of the pre-alarm specification currently in UL 2034.

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Table 2. UL 2034 5th Edition CO Sensitivity Requirements

UL 2034 CO Concentration vs. Time for Alarm Test Points Based on 10 % COHb	
Concentration, ppm	Response Time, minutes
70 ±5	60-240
150 ±5	10-50
400 ±10	4-15
False Alarms – CO Concentration Resistance Specifications	
Concentration, ppm	Exposure time, (no alarm)
30 ±3	30 days
70 ±5	60 minutes

Incorporating activation levels at and below 30 ppm has yet to be thoroughly examined by the current UL 2034 task group; however, it is part of the considerations for the development of new digital display requirements. New digital display requirements were the focus of task group work in 2025, which was prioritized by the Petitioner. The task group began work on this feature February 26, 2025, and will continue development after the harmonization process with CSA 6.19 is complete. Changes to display requirements may impact the requirements for lower alarm activation levels. Alarm activation levels will need to account for lower-level CO display concentrations averaged over multiple days that are intended only to alert the user to potential hazards prior to alarm activation.

Related to the Petitioner's proposal for adding lower CO concentration alarm activation levels, the UL 2075 technical committee is developing requirements for portable low-level CO monitors. Portable low-level CO monitors are devices used for measuring CO that can be transported by the user and are intended for personal safety. These requirements include notification at CO concentrations below 30 ppm. Alert and alarm activation concentrations proposed for portable low-level CO monitors may support corresponding requirements for CO alarms within the scope of UL 2034.

The FPRF review of CO alarm and detection thresholds, published in January of 2026, is under review by UL 2034 committee members. While this report compiled many studies together, it is missing epidemiological studies which are primarily considered in CPSC's chronic hazard guidelines. The FPRF report concluded that the correlation between COHb measurements and associated health effects, specifically referring to the CFK model, was not a reliable predictor of clinical outcomes. However, this analysis incorrectly applies individual-level limitations to challenge population-level uses of COHb levels for decision-making. Evidence from clinical, occupational, and international standards aligns around COHb ranges at which sensitive populations may begin to experience measurable cardiovascular impacts.[16,17,18] Population-level determinations, including for sensitive subpopulations, rather than individual-level responses will ultimately inform choices about potential CO exposure activation levels and their effectiveness at preventing injuries and deaths. Staff notes that UL 2034 and international standards

[16] Sources such as the Agency for Toxic Substances and Disease Registry (ATSDR), NIOSH, and the American Conference of Governmental Industrial Hygienists (ACGIH) support a COHb range of approximately 3 to 6 percent as the onset of adverse health effects in sensitive populations.

[17] https://www.atsdr.cdc.gov/toxprofiles/tp201-c3.pdf

[18] https://www.cdc.gov/niosh/chemicals/pel88/pell-pages/630-08.html

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(e.g. CSA 6.19 and BS EN 50291) already rely on COHb-informed toxicokinetic methods such as the CFK model for determining alarm thresholds intended to prevent dangerous exposures over time.

Furthermore, the FPRF review on its own does not demonstrate a significant health hazard. The data presents health implications at levels lower than the current activation limits, but the focus is on a sensitive subpopulation. Determining whether this presents a significant health hazard to consumers depends upon duration and concentration of exposure, as well as the percentage of the population that could be affected. The significance of incremental reductions of adverse health outcomes with lower level and higher duration CO exposure is a continuum. While reduced exposures can improve safety, the benefit applies to fewer people within the population. The data from this FPRF review, supplemented by information from other standards organizations or government agencies may provide support at the voluntary standards level for either maintaining the existing activation points in UL 2034 or potentially indicate the need to incorporate one or more reduced activation levels such as those proposed by the Petitioner.

B. Digital Display Requirements Including Accuracy Within 3 ppm and Display of Concentrations Below 30 ppm

The Petitioner proposes that CO alarms should be required to have a digital display that is accurate to within 3 ppm of the exposure concentration and should numerically display concentrations below 30 ppm. The Petitioner states that this may allow susceptible populations, such as those with an affected pre-existing disease, to make more informed choices that limit or change their CO exposures based on the values displayed.

Currently, UL 2034 does not require digital displays, but does not prohibit them. The standard requires indicators of CO to be accurate to within ±30 percent of the indicated amount and displays must indicate the CO concentration for the levels listed in Table 1. The Petitioner states that UL 2034 requires digital displays to read 0 ppm unless CO concentrations are above 30 ppm. The Petitioner continues that this is deceptive to consumers because there may be CO concentrations in the air that are higher than 0 ppm when the concentration is between 0 and 29 ppm. However, the Petitioner is incorrect on this point. The standard does not allow a display to indicate 0 ppm. If the measured CO concentration is below 30 ppm, the display must not indicate any value.

The UL 2034 task group began work on changes to the digital display requirements on February 26, 2025. During this and subsequent meetings, members discussed display requirements in CSA 6.19, accuracy limitations, consumer understanding of CO hazards, display features, and updating guidance provided with the alarms. These topics are part of the consideration for requirements in the harmonized UL 2034/CSA 6.19 standard.

Part of the UL 2034 task group's discussion is the harmonization process with CSA 6.19. The CSA 6.19 standard includes display requirements and permits CO alarms with low-level indication to display concentrations below 30 ppm. At the March 18, 2025 UL 2034 task group meeting, most members of the task group agreed with requiring digital displays and aligning other display requirements with CSA 6.19, which may incorporate the display of low-level CO concentrations.[19] The Petitioner agreed that this is a reasonable compromise for new digital display requirements. The harmonization committee held its first

[19] https://www.cpsc.gov/s3fs-public/03-18-025-UL-2034-TG-Meeting-Log-Displays-Voice-Alarm-manual-and-device-markings-and-10-year-batteries.pdf?VersionId=Ii0ugx6n1CzmBVCmPfFSsizMDvIZkAhg

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meeting on July 15, 2025. CPSC staff is currently participating in this process. As of August, 2026, permitting CO alarms to display concentrations below 30 ppm is part of the draft harmonized standard.

Display accuracy was discussed and reviewed by technical experts in the task group. Both UL 2034 and CSA 6.19 require a display accuracy of ±30 percent of the quantity indicated. For devices with low-level CO indication, CSA 6.19 requires that the digital display indicate a value ±5 ppm of the test concentration below 30 ppm. The group's consensus is that an accuracy of ±30 percent is reasonable as a general requirement based on the capability of current sensor technology. Further discussion is needed regarding the additional requirement in CSA 6.19 for CO alarming devices with low-level CO indication.

Consumer understanding of CO hazards and associated health effects will have an impact on the proposed changes to UL 2034. Prior to initiating the harmonization process in 2025, the UL 2034 technical committee discussed the type of information that should be displayed, such as CO concentration in PPM, or some other indication of a hazard that might be better understood by the user. Closely associated with the information provided by the digital display, the group is developing new language to be incorporated into user manuals and labeling of the CO alarm that will correspond to the proposed changes to display requirements. This topic is discussed in section E below.

C. Alarm and Trouble Alerts Using Voice Signals in Multiple Language Options

The Petitioner is requesting a requirement for CO alarms to have alarm and trouble alerts that use voice signals, with multiple language options. UL 2034 neither requires nor prohibits the use of voice alerts. In fact, several alarm manufacturers, including First Alert, Kidde, Nest, X-Sense, and Knox, currently offer this feature. Staff continues to monitor the CO alarm market, and the voice alert feature has become more prevalent over the past several years.

Prior to beginning the harmonization process with CSA 6.19, the Petitioner chose to focus the task group's efforts on digital display requirements as the priority among the four proposals. During the harmonization process, further development of the requirements within UL 2034 as a separate standard from CSA 6.19 is on hold. The UL 2034 task group intends to resume this discussion upon completion of the harmonization process.

D. Lifetime Battery Requirement with Tamper-Proofing Features for Battery Powered Alarms

The Petitioner seeks a requirement for battery powered alarms to have batteries that last the full manufacturer-specified life of the alarm and to require tamper-proof features. Regardless of the power supply, the UL standard requires alarms to have a minimum 3-year useful life. Currently, there are several models of CO alarms in the market that are designed to operate with a non-replaceable and inaccessible battery that will last the life of the alarm. Some of these alarm models have up to a 10-year useful life. All of these alarms are required to have tamper resistant features.

UL 2034 does not require batteries to last the specified life of the alarm. The standard allows alarms to use replaceable batteries. Although UL 2034 does not require the use of a sealed, non-replaceable battery for all in-scope alarms, it does require this type of battery to be the primary power source for CO alarms intended to be used in commercial vehicles. Regardless of which battery type is used, the standard requires them to power the alarm for at least 12 months. CPSC currently recommends

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consumers replace alarm batteries at least once a year on alarms with replaceable batteries, which is congruent with this standard's battery life requirement.[20]

The current standard provides several requirements to ensure alarm batteries are tamper resistant and to prevent alarm deactivation. For example, if an alarm with a non-replaceable battery is deactivated, the alarm unit must be resistant to being reinstalled onto its base. One method to prevent the alarm from being reinstalled onto the base is to block one of the mounting tabs with the deactivation switch when the alarm is deactivated. When either a non-replaceable or user-replaceable battery is used, the standard requires readily apparent and prominent indication if the alarm is deactivated, or the battery is removed. According to the standard, if an alarm is deactivated either due to the alarm reaching its end-of-life, tampering, or removal of the battery, the alarm must provide an indication via one of the following:

1. A visible warning flag when the battery is removed and the cover is closed;
2. A swing-out or pull-out battery compartment that will remain open if it does not have a battery installed;
3. An audible or a combination audible and tactile trouble signal for AC powered CO alarms using battery back-up;
4. A method to resist reinstallation of the unit if the battery is removed or if the alarm is deactivated;
5. An audible, combination audible or tactile, or visual signal at the control panel.

The UL 2034 committee has not yet initiated efforts to address the proposed inclusion of requirements for 10-year sealed, non-replaceable batteries. This feature was discussed briefly; however, the Petitioner prioritized digital display requirements over new requirements for battery-operated CO alarms. The task group will continue working with the Petitioner on their proposals once the harmonization process with CSA 6.19 is complete.

E. Simplified User Manual Design to Improve Familiarity, Operation, and Maintenance.

The Petitioner requests mandatory changes to user manuals and device markings to improve user familiarity, operation, and maintenance. The Petitioner's request does not provide specific requirements but rather makes generalized suggestions for improvements to the standard.

UL 2034 currently has requirements for user instructions and device markings. These include information about the hazards of CO and exposure symptoms; a description of audible and visual signals; what to do when the alarm activates; alarm features; installation, operation, and maintenance; and recommendations for individuals with medical problems to use devices that provide audible and visual signals for CO concentrations below 30 ppm, among other requirements. Furthermore, in December 2023, the Committee approved a Petitioner-submitted update to the instruction and marking requirements in the standard. The 5th edition of UL 2034 was subsequently published on June 4, 2024. The 2024 changes included improvements to marking layout, simplification of guidance for what actions occupants should take in the event of an alarm, elimination of obsolete requirements, and implemented marking permanence requirements. These changes appear to address the Petitioner's concerns regarding simplification of the information provided and user comprehension. The UL 2034 technical committee

[20] https://www.cpsc.gov/Safety-Education/Safety-Education-Centers/Carbon-Monoxide-Information-Center/CO-Alarms?language=en.

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continues to develop the requirements in these areas to further improve the information provided to the user.

User manual requirements are part of the ongoing work in the UL 2034/CSA 6.19 harmonization process. The draft document combines critical requirements from both standards and will undergo review by both standards committees by the end of 2026.

The task group for UL 2034 has focused on changes to the requirements for digital displays. Some of the proposed changes to the digital display requirements warrant additional information in the user manual and device markings. Accordingly, the task group was developing language to be incorporated into the user manual that describes the actions a consumer should take based on the information provided by the digital display. This information is intended to address gaps in consumers' knowledge of CO hazards and associated health issues.

The harmonization committee, as part of the development of the draft language, is working to clarify the requirements for labeling and user manuals between UL 2034 and CSA 6.19 to ensure that the requirements are effective and present the appropriate information.

III. Conclusion

Petition 25-1 requests that the Commission initiate rulemaking under the Consumer Product Safety Act, 15 U.S.C. § 2056, to address the Petitioner's claims of deficiencies in UL 2034, *Standard for Single and Multiple Station Carbon Monoxide Alarms,* associated with CO exposure hazards. Subsequently, the Petitioner submitted proposals to the UL 2034 Technical Committee for four of the five requirements outlined in the Petition. The first requirement proposed in the Petition regarding lower alarm activation levels of CO was discussed within the committee and can be evaluated as part of the ongoing voluntary standards activity. The committee formed a task group to address the proposals following the meeting on January 13, 2025.

Efforts to evaluate and address the Petitioner's proposals within the UL 2034 task group are on hold until the harmonization process with CSA 6.19 is complete. However, the harmonization process has evaluated changes related to the petitioner's requests for improved display and user manual requirements. The draft harmonized standard that will be proposed to both technical panels includes provisions for digital displays to indicate concentrations below 30 ppm. Additionally, the draft harmonized standard includes updated requirements for labeling and user manuals to account for existing requirements in both standards. Parallel to these activities, UL 2075 is considering requirements for portable low-level CO monitors, which can influence new performance requirements for UL 2034 CO alarms. Finally, the FPRF published the literature review for CO alarm and detection thresholds, which may be an influential tool for the evaluation of changes to UL 2034 alarm activation levels. The following is a summary of activities for each of the Petitioner's requests.

Petition Request A: *CO alarms to sound when CO concentrations reach 15 ppm for 30 days or 30 ppm for one hour.*

> This request has not yet been fully addressed by the UL 2034 technical committee; however, it is part of the considerations for the ongoing development of new digital display requirements. The UL 2075 technical committee for gas and vapor detectors and sensors is developing performance requirements for portable low-level CO monitors, which are intended to address

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similar exposure concerns. The work in UL 2075 on alert and alarm activation levels for low-level CO monitors aligns with an evaluation of this request. Furthermore, the FPRF has published their literature review on CO alarm and detection thresholds, which is currently being used to inform future standards development and further support assessment of this request.

Petition Request B: *CO alarms to have digital displays of CO concentrations that are accurate to within ± 3 ppm, including accurate display of CO concentrations below 30 ppm.*

The UL 2034 task group began working on this issue on February 26, 2025. The standards harmonization process for UL 2034 and CSA 6.19 is proposing to incorporate the requirements from CSA 6.19, which includes provisions for digital displays to indicate concentrations below 30 ppm. This activity is ongoing. Upon completion of the harmonization process, the UL 2034 task group intends to continue discussing accuracy requirements, display functions, and updating user manuals and device markings to reflect new display capabilities. Once this work is complete, the task group intends to begin work on new battery requirements, the addition of voice alerts, and continue to improve the requirements for instructional literature.

Petition Request C: *Alarm and trouble alerts using voice signals in multiple language options.*

The UL 2034 committee has not addressed this request. This feature is currently available in some CO alarm models in the U.S. market. The UL 2034 committee formed a task group to evaluate this proposal, however, the Petitioner, as chair of the task group, prioritized digital display requirements among the four proposals made to the committee.

Petition Request D: *In battery-powered alarms, a battery or batteries designed to last the lifetime of the alarm and battery tamper-proofing features.*

The UL 2034 committee has not addressed the request to require batteries that last the useful lifetime of the CO alarm. This feature was discussed briefly; however, the Petitioner, as chair of the task group formed to evaluate the Petitioner's proposals, prioritized digital display requirements over new requirements for battery-operated CO alarms. Lifetime batteries are available in some CO alarm models in the U.S. market and battery tamper-proofing features are already required by the standard. The task group intends to revisit this request once the harmonization process and evaluation of display requirements is complete.

Petition Request E: *Simplified user manual designed to improve familiarity, operation, and maintenance.*

The task group for UL 2034 has focused on changes to the requirements for digital displays. Proposed changes to display functionality necessitate updates to the user manual and device labeling. Prior to the initiation of the UL 2034/CSA 6.19 harmonization process, the task group was developing new language to guide users on how to interpret and respond to digital display readings, which aligns with the intent of this request. The harmonization committee has reviewed the requirements for marking and labeling within UL 2034 and CSA 6.19 to ensure that proposed harmonized requirements remain consistent and effective.

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IV. Staff Recommendation

Staff recommends that the Commission continue to defer Petition CP 25-1 and staff will continue participation in ongoing voluntary standards activities and related research.

Since the petition was filed on December 18, 2024, substantial, coordinated voluntary standards activity has been underway in UL 2034 and related standards to address most of the petitioner's concerns. These activities include: (1) a UL 2034 task group formed January 13, 2025 to take up the petitioner's proposals; (2) an active UL 2034/CSA 6.19 harmonization project initiated July 15, 2025 with staff participation, now with draft language under review that would allow numerical display of CO levels below 30 ppm; (3) parallel work in UL 2075 to develop requirements for portable low-level CO monitors; and (4) the Fire Protection Research Foundation (FPRF) literature review (January 2026) now informing alarm threshold discussions. Collectively, these efforts are reasonably likely to address the petition's objectives in a timely manner.

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