



**Statement of  
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**Before the**

**House Energy and Commerce Committee**

**Subcommittee on Commerce, Trade and  
Consumer Protection**

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Good morning, Chairman Rush, Ranking Member Whitfield, and Members of the Subcommittee on Commerce, Trade and Consumer Protection. My name is Robert J. Howell, and I am the Assistant Executive Director for the Office of Hazard Identification and Reduction at the U.S. Consumer Product Safety Commission (“CPSC”). I appreciate the opportunity to testify before you this morning regarding H.R. 1796, the Residential Carbon Monoxide Poisoning Prevention Act, and the overall dangers of carbon monoxide poisoning. The testimony that I will give this morning is mine and reflects the views of my technical staff. The testimony has not been reviewed or approved by the Commission and may not necessarily reflect the views of the Commission.

In my role at CPSC, I oversee the technical work of the agency within the directorates for Engineering Sciences, Epidemiology, Economic Analysis, Health Sciences and Laboratory Sciences. My office is responsible for the collection and analysis of death and injury data associated with consumer products, which include fuel-burning products such as heating systems, engine driven tools, gas appliances, and portable generators and related products, including carbon monoxide alarms. My office also is responsible for analyzing product safety performance, developing technological solutions to address product safety concerns, and working with those stakeholders involved in developing voluntary standards designed to improve consumer product performance.

## **I. Carbon Monoxide: The Silent Killer**

Carbon monoxide (CO) 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. The health effects related to CO depend upon its concentration in blood, which in turn depends on its concentration in air, the duration of exposure, and each individual’s general health.<sup>1</sup>

Some symptoms of CO poisoning may mimic common illnesses, such as influenza or colds: thus, there likely is a high incidence of initial misdiagnosis by physicians and victims. Patients are frequently unaware of exposures to CO, and health care providers may not always consider CO poisoning as a cause of such non-specific symptoms.

For example, picture an apartment complex with a faulty furnace. As CO seeps inside of that apartment or home, the residents will begin to feel sick. At first, maybe they will just believe they are coming down with the flu, as they experience mild nausea and headaches. The symptoms then worsen as the CO continues to concentrate and dizziness and disorientation set in. This is the critical moment. If the residents do not exit their dwellings and get to fresh air, then unconsciousness is the next stage. If the furnace does

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<sup>1</sup> Carbon monoxide combines with hemoglobin (Hb) with an affinity about 250 times that of oxygen, forming carboxyhemoglobin (COHb) and interfering with oxygen transport, delivery and utilization. Generally, there are no perceptible health effects or symptoms in healthy individuals at COHb levels below 10 percent. Symptoms associated with blood levels at or above 10 percent COHb include headache, fatigue, nausea, and cognitive impairment. Loss of consciousness, coma, and death can occur at COHb levels greater than 20 percent, although for healthy adults CO fatalities typically require levels above 50 percent.

not shut down, or a carbon monoxide alarm fails to warn the occupants, serious injury or death is likely to occur. That is why properly operating CO alarms should be installed in all residences.

## **II. CO Poisoning Incidents: Recent Trends**

CPSC staff estimates that there were 180 unintentional non-fire CO poisoning deaths in 2006 associated with consumer products with 71 percent of these deaths occurring in homes. Consumer products often associated with CO fatalities include fuel-burning appliances such as furnaces, portable generators, portable propane heaters, gas ranges, gas water heaters, and charcoal and gas grills.

Gas furnaces and boilers have historically been a leading cause of CO deaths associated with consumer products. From 2004 to 2006, they accounted for almost half (43%) of the estimated 69 CO deaths associated with the gas fueled appliances.

However, a significant increasing trend in consumer product-related, non-fire CO fatalities from 1999 to 2006 is attributable to generators. Portable generator-related deaths have increased more than 350 percent in recent years, from an average of about 16 deaths per year, from 1999-2001, to about 75 deaths per year in the period 2004-2006. During the three-year period 2004-2006, 41 percent of consumer product-related CO poisoning deaths (an average of about 75 deaths annually) were generator-related and 35 percent (an average of 63 deaths per year) were heating system-related.

Regardless of the type of appliance involved in the incident, CPSC data also show that CO poisoning and death are much more likely to occur in homes with no functioning CO alarms.

## **III. CPSC Response to CO Poisoning from Consumer Products**

To address the non-generator related CO hazard, CPSC staff has employed a three-fold approach: (1) reducing or eliminating CO production at the source, (2) alerting consumers to the presences of hazardous CO levels if they occur; and (3) educating consumer to the hazards posed by CO.

In its efforts to reduce CO deaths, CPSC staff has taken the approach of limiting CO levels in the home to the lowest possible level achievable taking into account the limitations of combustion appliance technology and the detection capabilities of low-cost CO alarms. Avoidance of nuisance appliance shutdowns and alarm activations has been a primary concern. Historically, we have had good success, but more needs to be done.

When cooking or heating appliances are kept in good working order, they produce little CO. Improperly operating appliances can produce fatal CO concentrations in the home. Proper installation, operation, and maintenance of fuel-burning appliances in the home are the most important factors in reducing the risk of CO poisoning. In addition to the

proper use and upkeep of appliances that are potential CO sources, CO alarms provide a valuable second line of protection.

CPSC recommends that every home have a CO alarm in the hallway near the bedrooms in each separate sleeping area. The CO alarms should be battery-operated or plug-in with battery back-up. The CO alarms should be certified to the requirements of the most recent Underwriters Laboratories (UL) standard for CO alarms. Consumers should test CO alarms frequently and replace batteries annually. CPSC reaches out to the media and consumers about the dangers of carbon monoxide through many venues. Twice a year CPSC reminds consumers to check their CO alarms when they adjust their clocks for daylight saving time and to change the alarm batteries annually.

We also publish annual press releases on the importance of maintaining home heating systems, using CO alarms meeting the requirements of the UL 2034 standard, and installing CO alarms outside every sleeping area in the home. Our “rapid response” media alerts are issued when an oncoming storm is likely to spur power outages, as happened in the recent historic snowfalls here in the Northeast. We also have several publications on our Web site aimed at warning consumers about carbon monoxide poisoning. Consumers may download these publications or order free copies.

In addition, this year we are developing a poster contest for middle school students - the collection of contest submissions is anticipated in 2011. The goal is to educate students and families and generate awareness across the country about poisonous carbon monoxide.

The Commission has also taken action to warn consumers of the specific danger posed by the improper operation of portable generators. In January 2007, the Commission issued a final rule making a portable generator labeling requirement mandatory on units manufactured on or after May 14, 2007. The mandatory warning label informs purchasers that “Using a generator indoors CAN KILL YOU IN MINUTES; “Generator exhaust contains carbon monoxide. This is a poison you cannot see or smell;” “NEVER use inside a home or garage, EVEN IF doors and windows are open;” “Only use OUTSIDE and far away from windows, doors and vents.” The warning label also includes pictograms indicating the danger of CO emissions from portable generators for consumers who may not understand the written warnings. However, labels are only part of the answer; vigorous action is needed to limit the amount of carbon monoxide produced by portable generators.

To lower the CO poisoning risk associated with portable generators, the approach the agency is taking is similar to the approach CPSC takes with many other products, which is to reduce the risk at its source. In December 2006, the Commission directed staff to investigate methods to address the CO hazard associated with portable generators and published an Advance Notice of Proposed Rulemaking (ANPR).

CPSC staff is working expeditiously and making excellent progress to develop and demonstrate a “proof of concept” for technology that would lower the risk of CO

poisoning associated with portable generators. Under a contract with the University of Alabama (UA), CPSC and UA staff have worked to develop two prototype portable generators. The first prototype is designed to operate with significantly reduced CO emissions in the exhaust. The prototype design incorporates electronic fuel injection (EFI), which is a proven, well-understood technology. The prototype generator was subjected to a durability test program to ensure it would perform while achieving the desired emission rates throughout the entire advertised useful life of the generator and not adversely affect generator performance.

A second prototype was developed that uses the same CO-emission reduction strategy as the durability-tested unit but incorporates programmed logic that can distinguish when engine performance is affected by operation in an enclosed space and shuts the engine off. This is a tamper-proof safety feature intended to further limit consumers' exposure to CO when the product is used in an enclosed area.

In tandem with the University of Alabama contract, we are also working with our federal partner – the National Institute of Standards and Technology (NIST) – to develop the requirements for a potential proposed rule limiting CO emissions from portable generators, the criteria for which will be based on health effects. To do this, NIST is testing the two University of Alabama prototype generators in a garage attached to a house set up to measure how CO moves from the garage into the rest of the house. This set-up, with the generator operating in an attached garage, is a common fatal consumer incident scenario. The results from these and other tests, conducted by NIST, will be used by CPSC staff to evaluate the efficacy of the prototypes, and compared to tests run with off-the-shelf commercially available generators, in creating survivable conditions for occupants in the house.

To date, the work on prototype generators that can reduce the risk of CO poisoning has been very promising. However, it likely will take another two years of additional testing and modeling before the Commission is ready to consider a proposed rule to regulate CO emissions from portable generators.

#### **IV. H.R. 1796**

CPSC staff supports the goals of H.R. 1796. CO alarms save lives. They do that by warning consumers of the presence of CO before the onset of its debilitating effects. CPSC staff believes that the current edition of UL 2034 is an effective standard, and that products meeting those requirements provide adequate protection against CO poisoning. CPSC staff worked closely with UL on the development and subsequent revisions to UL 2034. Making conformance to UL 2034 mandatory will provide a level playing field for CO alarm manufacturers and will give CPSC greater authority to keep non-complying CO alarms out of the U.S. market.

CPSC staff also supports the provisions in H.R. 1796 for a state grant program for carbon monoxide alarms. Reportedly, only 35 percent to 50 percent of U.S. households have CO alarms. CPSC is a small agency with a big mission. Working with state and local

authorities is critical to amplifying our message on the dangers of carbon monoxide poisoning. Getting CO alarms into more American homes – both existing and new construction – will save lives.

However, I should stress that our support of H.R. 1796 does not diminish the need for manufacturers of generators and gas appliances to design and build products in a manner that provides the greatest level of protection to consumers from CO exposure. We will continue to pursue our current initiatives to ensure that this is accomplished. We believe these initiatives, along with passage of H.R. 1796, will provide a comprehensive approach to addressing the risks to the American consumer from carbon monoxide.

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Mr. Chairman, thank you again for the opportunity to testify on H.R. 1796 and the overall issue of CO dangers. CPSC continues to work aggressively to reduce deaths and injuries associated with carbon monoxide poisoning from consumer products under our jurisdiction, and we appreciate the Subcommittee's awareness of this critical issue. I would be happy to answer any questions at this time.