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UNITED STATES GOVERNMENT

Memorandum

U.S. CONSUMER PRODUCT SAFETY COMMISSION

TO : John Liskey, New Project Identification Team
OPM

DATE: March 24, 1981

FROM : Sandra Shimasaki, CACA

SUBJECT: Input for Gas-Fired Appliances Position Paper

Reference is made to your memorandum dated March 11, 1981 in which you requested a summary of the section 15 cases from 1974 to the present which deal with gas-fired appliances.

Attached are summary charts by the product categories you supplied. I have also included an "Other Products" category for those products which did not seem to fit neatly into the specific products listed. There are a total of 63 section 15 ID files relating to gas-fired appliances. Related ID files are noted.

Let me know if you have any questions or wish to discuss.

cc: Catherine Cook
Dave Thome
Betty Fees
File

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GAS CONNECTORS, VALVES, CONTROLS

ID Number Company Name	Product	Defect/Hazard Corrective Action
[redacted]	Solenoid Valve for gas ranges	Possible gas leak due to porous casting in solenoid valve. Possible fire hazard. Recall/repair. (Related file--74-88)
[redacted]	[redacted] combination controls for use on LP hot water heaters	Safety valve interlock may fail. Possible fire and explosion hazard. Recall/repair or replacement. (Related file--74-116)
[redacted]	1/2" gas stop (main shut-off valve) intended for use in residential gas lines	Defective screws may not hold the gas valve together resulting in a slow gas leak. Possible fire hazard. Recall/repair.
[redacted]	Combination gas valves on gas furnaces and space heaters	Brittle roll pins may break at lower than specified force. Roll pins support automatic pilot safety valve lever assembly and are pivots for lever assembly when magnet "locks up" or drops out. If pin breaks, excessive gas leakage may occur. Possible fire hazard. Recall/repair.
[redacted]	Gas Valves	Lacquer used to confine the epoxy potting compound is possibly improperly applied internally to electromagnetic operator. Possible electric shock hazard. Recall.
[redacted]	LP Gas Valve	Line interrupter valve is covered with rubber disc to create a firm seal. If valve not properly chlorinated, under certain conditions of use the rubber may peel away from the disc portion of valve thereby creating a less than tight fit when valve reclosed. Possible gas leak and fire hazard. Recall/repair.

ID Number Company Name	Product	Defect/Hazard Corrective Action
[redacted]	Burner Valve for free standing gas ranges	Holes in control panel are misaligned so as to allow the burner control stems to make contact with the range surface control panel thus interferring with the controlling of gas flow. Possible gas leak and fire even when knob is in off position. Recall/repair. (Related file--76-147)
[redacted]	Gas Burner Valve	Burner intended for converting oil furnace to gas furnace. Valve has internal bleed and does not need gas bleed tube. Due to assembly error bleed tube was installed and could result in gas leak. Possible fire hazard. Recall/repair.
[redacted]	Combination gas valve	Gas valve may fail in open position. Under certain circumstances the result would be an overheat condition or possible fire within the vestibule area of furnace or possible fire spreading to surrounding areas. Recall/replace. (Related files--78-14
[redacted]	Gas Valves on gas ovens	A dirt screen in the safety control valve could work loose due to mechanical shock and prevent the valve from closing. Recall/repair. (Related files--79-94/III, 79-95/III, 79-96/III)
79-172 [redacted]	Gas Connectors	Gas connectors are subject to shearing or weakening. Possible gas leakage. Recall/replacement.

ID Number Company Name	Product	Defect/Hazard Corrective Action
[redacted]	Thermostat controls for LP gas water heaters	Potential fire/explosion hazard. Recall/replacement. (Related files--80-100, 80-101)
[redacted]	Combination gas control valves on LP gas furnaces, space heater, boilers	Safety valve may fail to close properly, if the pilot light goes out and there is a call for heat, the main gas valve opens and raw gas will be supplied to the burner. Potential fire/explosion hazard. Recall/replacement of valves on LP appliances.

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GAS FURNACES & BOILERS

ID Number Company Name	Product	Defect/Hazard Corrective Action
[redacted]	Gas Furnace	Potential fire hazard due to cracks in the heat exchanger and displacement of natural gas when unit is ignited after being off for an extended period. Recall/repair.
[redacted]	Counterflow furnace	Construction defect involving lower limit switch. Possible fire hazard. Recall/repair.
[redacted]	Furnaces using [redacted] Controls gas controls	Possible overheat condition, possible fire within the vestibule area of furnace, or possible fire spreading to surrounding areas. (Related file--78-13) Recall/repair.
[redacted]	Furnaces using ITT General Controls gas controls	Same as above
[redacted]	Furnaces manufactured with BDP gas valves	Tabs which hold the thermo-mag operating arm pin in place may fracture causing valve closure failure. If pilot light goes out, unignited gas will flow into residence. Recall/replacement.
[redacted]	Gas furnace	There may be minute deposits of cadmium in ceramic coating of heat exchanger. May be possible that cadmium is driven off in a gaseous form when exchanger is heated. Closed as less than substantial product hazard.
[redacted]	Gas furnace	Thermal limit switch may be miswired to fan. In overheat situation, thermal limit switch will cut off fan instead of gas valve. Recall/repair.

ID Number Company Name	Product	Defect/Hazard Corrective Action
[redacted]	Gas furnace	Modified flue damper device nullifies the furnace safety limit switch, will not shut off main gas valve if blower motor fails. Potential overheating of furnace. Recall/replacement.
[redacted]	Gas furnace	Pilot lighter tube may fracture and could cause sudden ignition and flaring of accumulated gas from the unlit furnace with possible ignition of materials outside the furnace. (Related file--79-45)
[redacted]	Gas furnace	Same as above file--79-7.
[redacted]	Sealed combustion gas furnace (mobile home)	If gas pressure in furnace is raised above set level, and there is a leak in the furnace, the flue products might flow into the living space. Recall/repair.
[redacted]	Gas furnace	Gas leakage in valves could result in asphyxiation, explosion or flame roll-out. Recall/replace valves.
[redacted]	Power supply switch for gas furnace	Part of electric terminal on each end of power supply switch is exposed when the blower access panel is removed. Possible electric shock hazard. Recall/repair.
[redacted]	Gas furnace	Staff believes that excessive carbon monoxide can be discharged into residence if furnace's internal flue connector corrodes to the point that the flue connector is porous and there is incomplete combustion in the gas furnace.

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GAS WATER HEATERS

ID Number Company Name	Product	Defect/Hazard Corrective Action
[redacted] Co.	LP gas water heater	Water heaters utilize [redacted]. (Related file--74-115) Potential fire/explosion hazard. Recall/repair.
[redacted]	Commercial water heaters	Possible escape of fuel gas through a failure of a pneumatic temperature control conduit. Possible fire hazard. Recall/repair.
[redacted]	LP gas water heaters	Water heaters utilize [redacted] controls. (Related file--80-66) Potential fire/explosion hazard. Recall/repair.
[redacted]	LP gas water heaters	Water heaters utilize [redacted] controls. (Related file--80-66) Potential fire/explosion hazard. Recall/repair.
[redacted]	Gas fired water heaters	Possible defect in main burner many result in sooting and possibly incomplete combustion. Recall/repair.

GAS RANGES AND/OR OVENS

ID Number Company Name	Product	Defect/Hazard Corrective Action
[redacted]	Built-in gas ovens	Loose fitting connection between shut off valve and pressure regulator. Possible gas leakage and fire hazard. Recall/repair.
[redacted]	Gas range	Failure of thermostat bolt assemblies could cause gas leakage. Possible gas leakage and fire hazard. Recall/repair.
[redacted]	Gas oven	Gas line may contact electrical terminal. Possible gas leak and fire hazard. Recall/repair.
[redacted]	Gas range	Possible solenoid gas valve leak. Possible fire hazard. Recall/repair. (Related file--74-89)
[redacted]	Gas range	Possible short circuit of power cords used. Potential electric shock hazard. Recall/repair.
[redacted]	Gas range with oven	Assembly line defect. Screw may puncture gas line (aluminum) tube. Screw may tend to plug hole, or may work loose causing leak. Possible fire hazard. Recall/repair.
[redacted]	Gas wall oven (double oven)	Gas valve installed in oven may fial to close due to dirt build up on valve seat which may result in gas leakage into oven. Possible fire hazard. Recall/ repair.

ID Number Company Name	Product	Defect/Hazard Corrective Action
[redacted]	Gas range with broil burner in upper oven	Incorrect wiring of control system may cuase delayed ignition of broil burner in upper oven. Possible flash or explosion due to delayed ignition of accumulated gases. Recall/repair.
[redacted]	Gas range with oven	Holes in control panel are misaligned so as to allow the burner control stems to make contact with the range surface control panel thus interferring with the controlling of gas flow. Possible gas leak and fire even when knob in in off position. Recall/repair. (Related file--76-157)
[redacted]	Gas range and oven	Aluminum tube can inadvertently be misaligned during assembly permitting the storage drawer runner to chafe or puncture the tube. (Tube is charged with gas only when range is being used to bake.) Possible gas leak and fire hazard. Recall/repair.
[redacted]	Gas convectionaire ranges	Gas leak could occur at one or more of the top burner valves and continue after burners are shut off. Ignition source could cause accumulated gases to explode. Recall/repair.
[redacted]	Gas ranges	Ranges incorporate [redacted] gas valve. See 79-91/III. Recall/repair.
[redacted]	Gas ranges	Ranges incorporate [redacted] gas valves. See 79-91/III. Recall/repair.
[redacted]	Gas ranges	Ranges incorporate [redacted] gas valve. See 79-91/III. Recall/repair.
[redacted]	Self-cleaning gas ranges	Possibly defective broiler burner system may cause burns to user due to delayed ignition. Recall/repair.

GAS CLOTHES DRYERS

ID Number Company Name	Product	Defect/Hazard Corrective Action
[redacted]	Electric and gas clothes dryers	Bakelite buttons on timer shafts may crack. Possible electric shock hazard. Recall/replace timer.
[redacted]	Gas clothes dryer	Possible ungrounded enclosure could under certain conditions pose a electric shock hazard. Recall/repair.
[redacted]	Commercial gas clothes dryer	Misapplied wire connectors on motor cord may create an electric shock hazard. Recall/repair.

GAS PIPES, PIPE FITTINGS & DISTRIBUTION SYSTEMS

ID Number Company Name	Product	Defect/Hazard Corrective Action
[redacted]	Brass gas cocks	Gas leak which may lead to fire hazard. Recall/refund or credit.
[redacted]	Gas cocks	Gas leak which may lead to fire hazard. Recall/refund or credit.
[redacted]	Gas cocks	Gas leak which may lead to fire hazard. Recall/refund or replace.

PROPANE GAS TANKS & FITTINGS

ID Number Company Name	Product	Defect/Hazard Corrective Action
[redacted]	Valves used on propane cylinders (often used on outdoor barbeque grills or heating rural homes)	Improperly compounded rubber O-ring will take a permanent set. Propane gas can leak along valve stem. Recall/repair.

LP FUELED PRODUCTS--GRILLS, STOVES, PORTABLE HEATERS

ID Number Company Name	Product	Defect/Hazard Corrective Action
[redacted]	Propane gas range	Range hood can cause pressure on gas knob allowing gas build-up. Possible fire hazard. Recall/labeling.
[redacted]	LP gas grill	Possible gas leakage if fittings are not tightened in accordance with instructions. Potential fire hazard. Recall/refund or replacement.
[redacted]	Two burner propane stove	Gas leak from hose connection. Potential fire hazard. Recall/replace hose.
[redacted]	Portable propane gas grill	Potential gas leakage from regulator bonnet cap. Recall/repair.

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BUTANE FUELED PRODUCTS--GRILLS, STOVES, PORTABLE HEATERS

ID Number Company Name	Product	Defect/Hazard Corrective Action
[redacted]	[redacted] Portable butane stove	Gas leak in the assembly of product. Potential burns and fire hazard.

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OTHER PRODUCTS

ID Number Company Name	Product	Defect/Hazard Corrective Action
[redacted]	Gas space heaters and blower kit	Possible shock hazard from blower assembly if insulation fails. Recall/replacement.
[redacted]	Heating & Air Conditioning unit cap assembly kit (gasket component)	An improperly formed gasket may allow the main gas valve to remain open oven after the thermostat has been satisfied. Could result in excessive heat to electrical components which could cause a fire within the unit. Recall/replacement.
[redacted]	Acetylene cylinders as part of Uniweld gas welding outfits	Gas valves on certain acetylene cylinders have improperly drilled safety holes. During intense heat, cylinder may explode. Recall/replacement.
[redacted]	Vented gas heater	Baffle damage and an alignment problem in assembly may result in potential carbon monoxide poisoning. Recall/repair.

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UNITED STATES GOVERNMENT

Memorandum

U.S. CONSUMER PRODUCT SAFETY COMMISSION

Mar 25 1 25 PM '81

TO : John Liskey, Program Manager, New Project Identification, OPM
Through: Kenneth R. Rashid, AED for Communications

DATE: MAR 25 1981

FROM : Norm Rosen, Program Planner, CED NAR

SUBJECT: Gas-Fired Appliances Position Paper

In past information and education programs, the Directorate for Communications has extensively addressed the hazards associated with certain gas-fired appliances. These hazards are also the subject of a number of publications currently being distributed by CPSC.

The Flammable Products and Ignition Sources I&E program was conducted in FY 76, 77, 78, 79 and 80 to alert consumers to the risks of injury associated with certain flammable product types and to try to effect attitudinal and behavioral changes in relation to selection, use and maintenance of these products. Two of the product categories addressed by the program were gas space heaters and ovens, ranges and stoves. Over 800,000 copies of publications were distributed by the Commission and another 150,000 copies were reprinted and distributed by multiplier groups. Some of the major hazards addressed by these publications include gas leakage and explosions, burns from surface contact, and fires from flame contact.

A public service announcement for television was developed in 1975 on the subject of ovens and ranges. The PSA, featuring Charlie Cuisine, addressed several hazards, including the proper technique for lighting a gas range.

Listed below are the publications currently being distributed by Communications that address the hazards associated with various gas-fired appliances.

Fact Sheet	Key Points Covered
#9: Kitchen Ranges	Product: Gas ranges Hazards: explosion of leaking gas, surface contact burns, proper lighting technique
#13: Carbon Monoxide	Product: unvented gas space heaters and heating equipment in disrepair Messages: yearly inspection of equipment, venting of equipment to outside

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#65: Gas Water Heaters	Hazards: use of flammable liquids around water heater, surface contact burns
#73: Clothes Dryers	Hazards: CO poisoning from improper venting, fires (from lint ignition)
#79: Furnaces	Hazards: CO poisoning from blocked vents, use of flammable liquids near furnace, improper lighting of pilot light

Publication	Key Points Covered
A Catalog of Flammable Products and Ignition Sources A Guide to Flammable Products and Ignition Sources for Elementary Schools A Guide to Flammable Products and Ignition Sources for Secondary Schools A Guide to Flammable Products and Ignition Sources for Adult Consumers The Hazard Hunt (film slide presentation) What You Should Know About Home Fire Safety	Products: gas space heaters, gas ranges Hazards: explosion of leaking gas, contact burns, CO poisoning
Caution! Choosing and Using Your Gas Space Heater	Hazards: improper ventilation improper lighting technique, explosion of leaking gas, use of flammable liquids near heater

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UNITED STATES GOVERNMENT

Memorandum

U.S. CONSUMER PRODUCT SAFETY COMMISSION

TO : Robert L. Northedge, Branch Director, ESES DATE: APR 9 1981
For: John Liskey, OPM

FROM : C. L. Willis, ESES CLW for

SUBJECT: Gas-Fired Appliances Position Paper

Attached are two engineering discussions submitted in response to your request for various assigned inputs leading to the development of a position paper on gas-fired equipment.

Because I have strong feelings on the topic, I would like to take this opportunity to underscore my support for the efforts underway to focus on gas-fired equipment and accessories. As I have previously discussed with the NPI Program Manager, I strongly recommend that a project be established with a generic name and description (similar to the position paper subject) without discussing specific products. I especially believe that specific products should not be mentioned in the Operating Plan and that, to the contrary, the staff should be free (or at least freer than it has been) to select for attention those products that will optimize the staff's efforts. There are two principal reasons for my beliefs.

First, flexibility in approach is needed where, as here, a large number of diverse products are involved. In the past, the tendency has been to specify individual products in the Operating Plan. From my personal knowledge, I know that this has had the effect of reducing the staff's effectiveness in dealing with gas-fired appliances. It limits the staff's efforts to the named products only, except where a single manufacturer's product requires quick analysis under the PSA program. As a result, in the approximately seven months I have served as the engineering Technical Officer for space heaters, I have seen several issues relating to the safety of gas equipment not mentioned in the Operating Plan that I thought were important but not necessarily suited for PSA. These represent missed opportunities for the Commission to help bring about safety improvements. In some cases, it would not be unusual for a single missed opportunity to affect several different types of gas appliances or accessories.

Whether these missed opportunities represent issues that are raised in ANSI subcommittees or in other forms, they typically occur throughout the year and cannot be predicted. Sometimes they can be dealt with quite easily without major impact on CPSC resources, if only the CPSC structure had the flexibility to permit some resource expenditures. Therefore, the staff should have the flexibility to put effort where it would seem to optimize use of our resources. I do not ask that control over the expenditure of staff resources be abandoned or that goals not be set for a year's accomplishments. I only argue for the existence of a general project similar in name to the subject of the position paper, so that the staff's every move is not cast in the concrete of the operating plan. Just exactly how the staff's decisions would be made is a different subject that should also be addressed.

Just as it would reduce the effectiveness of the PSA program to require that the workers predict and specify in advance, in the Operating Plan, what products they will examine during the coming year from the myriad of possibilities, so also would the staff's effectiveness be diminished if it were limited to selecting in advance specific pieces of gas equipment from the myriad of potential problem products.

The second principal reason for my support of a general project involves a dilemma in which I have found myself for several months. It is known around the Commission that I am the "gas man" in engineering. As such, all PSA work involving gas-fired appliances or accessories comes to me. These have involved diverse hazards related to gas use. However, in the gas area (apart from the PSA work) I have only one other item in the Operating Plan: unvented gas space heaters. In fact, I can't do a credible job being the "gas man" who is able to deal with all comers without being involved in some activities not related to space heaters or to specific brands being investigated under the PSA banner. For example, I need to keep up with what is happening in the field and ANSI subcommittees, I need to learn more about the technology, I need to meet with people and discuss a variety of topics, and so forth. None of these activities relate directly to space heaters and none relate to specific PSA cases. And yet, in another sense, they relate to all gas-fired products and accessories. So I have a need for my work to be brought within the umbrella of a general project such as the one I have proposed; much of the work I do truly is general in nature.

I suspect that such a change would benefit more than myself. There may be others within the Commission who have a similar problem.

Item 5.C: "Summary of CPSC Sponsored Technical Research Relating to Gas-Fired Appliances"

In July 1974, the CPSC contracted with Calspan Corporation for an investigation of safety standards for certain flame-fired appliances. Specifically, the contractor was to consider furnaces, ranges, dryers and hot water heaters.

The objective of the program was to determine the existence, applicability, adequacy, and effectiveness of safety standards covering the design, construction, installation, operation and maintenance of those products. The program was divided into four tasks:

1. Classification of appliances within each group.
2. Collection and compilation of safety standards.
3. Identification of hazards.
4. Review and evaluation of the safety standards for the products associated with an identified hazard.

The work was completed in February 1976. The information developed during the period of the contract formed much of the nucleus of the current CPSC knowledge of flame-fired equipment. Major hazards discussed were fires, contact burns, and carbon monoxide poisoning. References 1 through 4 are the reports that resulted from this seminal project.

In 1977 and 1978, the Commission funded a contract investigation of energy saving devices and the standards for those devices. This work also was conducted by Calspan Corporation. A number of vent dampers, flue gas heat extractors, and alternative ignition devices were studied in detail. Examined in somewhat less detail were residential clothes dryer exhaust diverters, water heater insulation kits, extended draft hoods and commercial clothes dryer exhaust recirculators.

The reports that resulted from the work on energy saving devices, references 5 and 6, were widely circulated in the industry for their consideration and comments; they provide valuable reference material even today.

In 1980, the Calspan Advanced Technology Center completed a study whose purpose was to determine the feasibility of additional safety systems for home heating systems to eliminate the carbon monoxide hazard. As noted in the final report, reference 7, the study identified a device known as a "spill switch" for installation on draft hoods where heated flue products could be detected as they accidentally enter the surroundings of the appliance. When the spill switches detect the presence of the flue products, they shut down the appliance. The report, which recommended that gas-fired central heating systems incorporate spill switches, has been widely circulated to the industry through mailings by the various ANSI Z21

subcommittees and has appeared on the agendas of numerous subcommittee meetings.

In 1978, the National Bureau of Standards completed work for the CPSC to explore the levels of carbon monoxide emitted by unvented gas fueled space heaters under conditions that may be experienced in the field and to determine the effectiveness of an oxygen depletion sensor (ODS). The program was initiated in response to testimony before the Commission in opposition to a proposed rule that would have banned unvented gas-fired space heaters. In the testimony, it was claimed that a ban was unnecessary because an ODS could be used to eliminate or reduce the hazard. The results of the testing are presented in reference 8.

Also in 1978, the National Bureau of Standards completed work on a project whose objectives were to determine the effectiveness of a proposed room temperature limiting device (TLD) for use with unvented gas-fired space heaters. The TLD is a temperature-sensitive switch that shuts down the heater when room temperature exceeds a selected fixed temperature. It was developed with the intention of offering an indirect control of room carbon monoxide level. Among the conclusions presented in the final report, reference 9, are that the ODS would be more effective than the TLD in preventing the development of severe carbon monoxide levels in the home.

In line with its concern over the problem of carbon monoxide poisonings in the home, the CPSC asked the NBS to conduct a study to determine the feasibility of developing a low cost residential carbon monoxide detector. The study concluded in January 1980 that a low cost residential carbon monoxide detector was not feasible at that time but that, due to the rapid development of relevant technology, such a detector may become possible within a few years. The report, reference 10, also recommended that the feasibility be reevaluated annually in light of the rapid technological development.

Engineering has conducted a fairly large number of examinations of individual gas-fired appliances and accessories for such appliances in connection with its support function to the "Section 15 group." Since the Fall of 1980, when the current engineering Technical Officer began, Engineering has provided some level of analysis dealing with two gas furnaces, three vent dampers, a water heater, three combination controls (thermostat control units) for water heaters, one combination control for a gas furnace, a butane lantern, and flexible connectors used in the home to hook up appliances. (It would take a major effort to produce the record of PSA support in Engineering prior to that time.)