LOG OF MEETING

SUBJECT: Meeting of Z21 Ad Hoc Working Group on Rangetop Cooking Fires

DATE: August 24, 2000

PLACE: Radisson Hotel Southwest
Cleveland, OH

DATE OF LOG ENTRY: October 17, 2000

SOURCE OF LOG ENTRY: Andrew Trotta, ESEE AMT

CPSC PARTICIPANTS:
Ron Medford, Office of Hazard Identification and Reduction
Andrew Trotta, Engineering Sciences Directorate

NON-CPSC PARTICIPANTS:
Lenore Berman, Underwriters Laboratories
Lee Bishop, General Electric
Tim Brooks, Whirlpool
Norman Chiu, General Electric
Joe Erdelsky, Invensys
Rick Fort, CSA International
Sharon Franke, Good Housekeeping Institute
Joe Howver, Harper-Wyman
Sue McCarthy, CSA International
Wayne Morris, Association of Home Appliance Manufacturers
Issac Sargunam, Maytag
Bob Stack, CSA International
Rick Seib, Whirlpool
And others

SUMMARY:

This was the second meeting of the Z21/(Interim CSA) Joint Ad Hoc Working Group on Range Top Cooking Fires. The Z21 Subcommittee on Standards for Domestic Gas Ranges established the Working Group (WG) in response to an August 1999 request from CPSC to consider changes to the standard to address cooking fires. The WG chairman, Joe Erdelsky, presided over the meeting. Robert Stack, who is the CSA International staff member responsible for administrating the WG meetings, will issue the minutes of the meeting. One month before the meeting, Mr. Stack circulated the following six proposed agenda items to the WG members for discussion at the August 24 meeting:

1. Consider Tentative Scope For The Cooking Fires Working Group
2. Consider Consumer Product Safety Commission (CPSC) Staff prepared societal cost for fires originating from the ignition of cooking materials on range tops.
3. Consider reports forwarded from Consumer Product Safety Commission staff: Phase IV – Experimental Control System Feasibility Demonstration, And Development Of A Control System For Preventing Food Ignition On Gas Ranges
4. Consider Suggested Early Draft Of Standards Coverage For Cooking Fires
5. Consider Suggested Definitions For "Event Prevention" And "Event Management"
6. Consider Report On Activities At UL 858 STP Meeting Of June 27, 2000

Prior to the meeting, Item 2 was withdrawn from consideration by the working group. For the Z21/83 Committee and those subcommittees and working groups under its jurisdiction, it is committee policy not to evaluate safety matters and standards development in the context of cost.

Agenda Topic 1. The group discussed the scope of the working group. The version that was agreed upon was:

SCOPE: The working group will investigate possibilities for recommendations to the Z21.1, Household Cooking Gas Appliance standard, for the purpose of Event Prevention and Event Management of surface cooking fires for ranges and cooktops, and rationale statements for recommended revisions.

Agenda Topic 3. The WG discussed the report on results of an experimental gas range control system that Energy International, Inc. (EI) developed in February 2000 with funds from CPSC. The control system was developed to address the issue of igniting food on a surface cooking unit. Since representatives from EI were not able to attend the meeting, AHAM and its members requested that a separate meeting with EI be held to address particular issues related to the EI work.

The WG also discussed establishing a partnership between CPSC and interested AHAM members to contract an independent consultant to study the feasibility of potential changes to range designs to address cooking fires. Parameters of interest would include reliability, durability, manufacturability, cost, efficacy in preventing/containing fires and effect on cooking performance. Two phases of work were proposed. Phase 1 would be primarily a paper study of existing technologies, including the experimental systems developed through CPSC and would be funded mainly by CPSC. Phase 2 would be a follow-up of promising technologies including prototyping and field evaluations and would be funded by AHAM members.

From the discussion on the cooperative effort, the group proposed four motions that were voted on and approved by the WG.

Motion 1: The WG approves concept of joint managed/funded CPSC/industry contract to provide independent assessment of feasibility.

Motion 2: The WG will review the scope of work for the agreement by 9/1/2000.

Motion 3: WG recommends combining with Underwriters Laboratories (UL) 858 Standards Technical Panel (STP) for future meetings related to surface cooking fires.

Motion 4: WG recommends that UL defer any standards development relating to the issue of surface cooking fires pending completion of the contracted study.

Agenda Topic 4. At the April 24, 2000 meeting, a task group was established to develop definitions for the terms, "Event Prevention" and "Event Management" that the WG had proposed as two approaches to addressing the problem of cooking fires -- the former relating to preventing the fire from occurring, the latter relating to containing the extent of the fire spread. The group also agreed to look at pass-fail criteria that a system would need to meet to be considered successful. Wayne Morris reported on the progress of the task group, which met in a July 28, 2000 telephone conference. The task group primarily discussed requirements of "success criteria" with the results as attached.

Members of the WG suggested that the list should be re-titled "Technical Feasibility Performance Goals" to more accurately reflect the purpose of the list to extend beyond requirements that would be in the standard. Additional discussion was deferred to making written comments on the document.

AHAM also presented information on ignition temperatures of fats and oils. The information was obtained primarily from the Institute of Edible Shortening and Oils.

Agenda Topic 5. Discussion on the definitions for "event prevention" and "event management" was deferred because the items were not covered by the task group during the July 28, 2000 teleconference due to time limitations.

Agenda Topic 6. The UL representative reported that the minutes of the UL 858 Standards Technical Panel meeting on June 27, 2000 detail the activities of the panel during the meeting. She also indicated that she would relate the requests from Motions 3 and 4 to the STP Chairman, Don Grob, for action.

Range Safety Success Criteria

DRAFT August 22, 2000

The success criteria must be used to determine the feasibility of a fire prevention or management system.

The device shall demonstrate that it will:

1. Cooking performance and reliability tests shall be conducted with new and used cast iron, ceramic, glass, stainless steel, stainless steel—copper clad, aluminum, aluminum—copper clad. The following sizes: 9" skillet, 12" skillet, 1 quart, 2 quart, & 4 quart sauce pans, 8 quart water boiling pot, and 12" by 12" aluminum griddle with non-stick coating. Sauce pans should be of light weight, approximately 20-22 gauge and 12-14 medium gauge. Used pans shall have no less than __% inward and outward bottom curvature. [Curvature to be specified.]

2. Using the pans specified in # 1, conduct the following cooking tests. Cooking times at comparable control settings for controlled and uncontrolled burners shall not be extended more than __%.

- blackening meat and fish fillet in skillet,
- stir frying vegetables and meat in 1 tbs. oil in wok,
- boiling 1, 2, and 4 quarts of water in appropriately sized pans,
- heating and simmering commercially available tomato based pasta sauce in 1 and 2 quart pans.
- a heat recovery test, such as frying three consecutive batches of french fries.
- boiling 8 quarts of water and maintaining a boil for 4-6 hours.

3. Perform as designed for twice the designed life of the range. Depending on the use of safety components, it is recommended that all devices have a minimum of 100,000 cycles of operation.

4. Control components shall be removed and reinstalled 2,000 times without need for re-calibration. This is based on one disassembly operation for cleaning per week for 20 years with a 100% safety factor applied.

   Burner should be cleaned thoroughly at a rate equivalent to once per day with normal cleaning cloths, sponges, scrubbing pads, dishrags, and standard household cleaners. The performance of the device should not change after 15,000 cycles of cleaning. This equates to a cleaning sequence of once per day, for 20 years with a 100% safety factor.

   All tests for performance and reliability shall be performed on used burners and components (described in #9) after cleaning with water and common household cleaners (e.g., 409, Fantastic) applied with a washcloth.

   If sensor devices are integral with a burner bowl and able to be removed for cleaning, they should be disassembled and cleaned using a normal household dishwasher for 2,000 cycles.

   If wires or probes extend through the surface of a burner bowl, the bowl should be able to contain spills and liquids to the same level as a burner bowl not containing such protrusions.

5. Control components shall perform as designed after dragging a 12 inch diameter, cast iron, with a heavy pattern or ribbed surface. The pan should be drawn across the burner with a horizontal motion of 4-6 inches a minimum of 50,000 times. This is based on 2-3 times per day, for 20 years with a 100% safety factor.

   In the case of a sensor attached to the heating element, where disassembly is allowed for cleaning, 2,000 removal and re-assembly operations are to be conducted. The heating element should be re-

seated using a 12 inch, cast iron skillet placed on the burner in the "off" position. A downward (not impact) force of ____lbs (____N) should be applied to seat the burner.

6. Where electronic controls are used, they shall comply with all applicable requirements of UL 858, 858A and ANSI Z21.1 for temperature extremes and abnormal operations.

7. All tests for performance and reliability shall be on the following cooking designs: gas burner, coil element, solid cast iron element, smooth top ceramic/glass with halogen and radiant elements, open and sealed element gas ranges.

8. All tests for performance and reliability shall be performed on the 6 inch, 9 inch, and 12 inch diameter burners of the following energy ranges:
   gas burners: 5,000 to 16,000 BTU; and coil elements electric: 1200 W to 2600 W.

9. All tests for performance and reliability shall be performed on new and used burners and control components. Used components and burners shall be tested with each of the following contaminants: soil build-up, oxidation, water and grease, baked on or burnt-on food materials.

   The burned on food mixture shall either be that shown in ANSI Z21.1 or AHAM ER-1-1992 Section 8.6. The food mixture should be applied with a brush to the top of any surface burner element and especially to any sensor mechanism. The burner should be operated through several cycles to burn the food mixture onto the surface. The sensor shall detect all required safety parameters without change in calibration.

10. Depending on the type of sensor technology chosen, performance and reliability tests shall be performed in the following environmental conditions: with hood fan on "high" setting approximately 250-300 CFM, in 85% humidity, 20% humidity, and altitudes of 3000 feet.

11. For any fire management system which is mounted above the range, the device shall comply with UL923 (microwave oven) Fire Isolation Test (UL923 sect. 49) for any flame management or extinguishing device:
    a. The surface temperature of any point of the top building cabinet should not exceed 300C (572F) and
    b. A fuse rated 3A connected between exposed dead-metal parts of the cooking appliance and ground should not open.

12. Any components applied to a gas range shall show no degradation of safety or performance when shut-down of the range element or the range is applied. Any shut-down of a gas valve shall allow safe re-start without attention by service personnel.

13. Any safety device shall be added to the range in such a way as to make defeat, tampering, or bypassing by a consumer impossible under normal use and abuse conditions. Any attempt to by-pass the system should result in the inoperability of the range.