MEETING LOG
DIRECTORATE FOR ENGINEERING SCIENCES

SUBJECT: Industry Activities to Address Water Heater Ignition of Flammable Vapors

PLACE: American Gas Association Laboratories, Cleveland, OH

MEETING DATE: February 14-16, 1995

LOG ENTRY SOURCE: Donald W. Switzer DWS

ENTRY DATE: February 21, 1995

COMMISSION ATTENDEES:

Donald W. Switzer	ES

NON-COMMISSION ATTENDEES:

Greg Wills	American Gas Association Laboratories (AGAL)
Peter Pascatore	Arthur D. Little, Inc. (ADL)

MEETING SUMMARY

ADL has been contracted by the Gas Research Institute (GRI) to develop a test protocol to screen water heater resistance to igniting flammable vapors. The protocol will be provided to the ANSI Z21 water heater subcommittee to be used as the basis for a standard test method in the ANSI Z21 residential water heater standard. The purpose of this meeting was to allow CPSC staff to examine the test setup and to participate in the test program. CPSC staff visited the test facility at AGAL and assisted in data collection. It was agreed that CPSC staff would not attempt to review or interpret data until all the data has been collected and statistically analyzed.

The goal of the current phase of testing is to characterize the vapor cloud resulting from a gasoline spill located in the vicinity of a residential gas-fired water heater. For the purpose of this testing 35,000 BTU/hr water heater was installed in a small room and a predetermined amount of gasoline was spilled approximately 30 inches from the base of the water heater. Additional tests will use a 75,000 BTU/hr water heater. Flammable vapor concentration were determine at 10 locations in the room. Sample points were located at various heights in front of, behind, and on each side of the appliance. Samples points were located at several heights at each location and samples were drawn successively and analyzed for total hydrocarbons. Mixing in the room was provided by moving a plywood cutout in the shape

of either a child or adult toward and away from the appliance three times each minute. Tests were run with winter and summer blend gasoline, and spill size was either 1/2 or 1 gallon, as specified in the test matrix. The concentration profile was plotted as a function of time at each sample location for each test. Test duration was nominally one hour, or until the vapor concentration fell below the lower explosive limit.

CPSC staff was present three days. During this time approximately ten tests were run. The results of the tests were not analyzed because they represent only a portion of the test matrix, and because the data must be statistically analyzed. However, a casual examination of the data did not reveal any unexpected results. CPSC staff is satisfied with experimental procedures used and test setup employed.