

Date: Thu, 01 Aug 2002 11:28:01 -0700  
From: PHMC\_Lessons\_Learned@rl.gov  
Subject: Yellow Alert: Propane Fire within a Biological Safety Cabinet

**Title: Yellow Alert- Propane Fire within a Biological Safety Cabinet**

Identifier: 2002-CH-BNL-MED-0003 Date: July 23, 2002

**Lessons Learned Statement:** Laboratory personnel working with Bunsen burners or other open flame devices must be aware of surrounding combustible material/equipment and ensure that it does not come into contact with the flame.

**Discussion of Activities:** A research technician in the Medical Department at Brookhaven National Laboratory used a gas-supplied Touch-O-Matic Bunsen burner within a Biological Safety Cabinet (BSC). The technician noticed a burning odor and saw smoke coming from the supply line behind the attached flame guard. Fire/Rescue (F/R) was notified via the emergency number and responded within 3 minutes. Upon arrival F/R discovered the supply line was melted, and the interior of the BSC was on fire. The propane gas supply was turned off outside the BSC, and the flame was extinguished.

**Analysis:** The Touch-O-Matic Bunsen burner is built such that a platform is connected to the burner itself. A flame is only produced when the user's hand rests on the platform. When the user's hand moves away, only a pilot light burns. The Touch-O-Matic Bunsen Burner also provides a continuous flame when the platform is pressed and slightly twisted. A guard surrounds the flame to protect surrounding objects from coming in contact with the flame. It was noted during the investigation that the guard was turned in the opposite direction (to protect the research technician). In addition, the supply hose (thick-walled, rubber-vacuum hose) was of a sufficient length to cause "looping" when the burner is moved closer to the propane outlet. As the hose "looped," it came in contact with the open flame, causing it to melt and allowing the propane gas to escape and come in contact with the flame. The technician attempted to shut off the gas supply, but could not due to its close proximity to the flames. See the Touch-O-Matic Bunsen burner setup at: <https://sbms.bnl.gov/lessons/1172/1172e291.pdf> Upon arrival the F/R Group found an in-line shutoff valve behind the BSC and shut off the gas supply, thus extinguishing the flames. This shutoff valve was behind the BSC, which is an atypical configuration. Propane shutoff is normally accomplished at the point of use, or via the main building shutoff. Isolation via the main building shutoff would have taken approximately 4 hours for the propane elimination from the building because the shutoff is on the East side of Building 490, and the laboratory where the fire took place is on the West side. Damage was confined to equipment within the BSC and the glass on the sash.

**Recommended Actions:** The Medical Department Chairman e-mailed departmental staff, instructing the research staff to inspect supply hoses in service. All supply hoses will be a minimum, useable length, and hoses, which have the possibility of "looping," will be mechanically secured, or loops will be weighted down to keep them away from the flame. All users of this type of Bunsen burner will be instructed on the proper positioning of the flame

guard. The Medical Department is actively pursuing installing a shutoff valve for each laboratory using Bunsen burners and clearly marking the valve's location so it is easily visible.

Estimated Savings/Cost Avoidance: The mitigation of a potentially serious fire

Priority Descriptor: Yellow - Caution

Work/Function: Fire Protection, Safety Design

Hazard: Fire/NFPA/Smoke

ISM Core Function: Analyze Hazards, Develop/Implement Controls

Originator: Brookhaven National Laboratory

Contact: Robert L. Colichio, Life Sciences, Bldg 490, Upton, NY 11973 (631)344-8440

Authorized Derivative Classifier: N/A

Reviewing Official: N/A

Key Words: fire, propane, Bunsen burner

References: Line Organization Incident Investigation Report MO-02-01

**FOLLOW-UP ACTIONS:** Information in this report is accurate to the best of our knowledge. As a means of measuring the effectiveness of this report, please contact the originator of significant actions taken as a result of this report or of any technical inaccuracies you find. Your feedback is appreciated.