PS 402-18 Analysis of Historical Industrial Hygiene Data: A Case Study Involving Benzene Exposures at a Petrochemical Manufacturing Facility (1974-1999). *J. Sahmel, K. Devlin, T. Ferracini, M. Ground, ChemRisk, Inc., Boulder, CO; A. Burns, ChemRisk, Inc., Pittsburgh, PA; D. Paustenbach, ChemRisk, Inc., San Francisco, CA.*

Objective: Benzene is commonly-used as a raw material for organic chemicals, and may be a byproduct of chemical processes at manufacturing facilities. The facility under evaluation used petroleum-based raw materials to produce chemicals such as polyethylene and polypropylene, waxes and adhesives, and alcohols and aldehydes. The purpose of the present analysis was to describe typical benzene air concentrations from the 1970s to the 1990s during routine operations at the facility. The analysis also included an exposure reconstruction with quantitative estimates of personal benzene exposure by division, department, and job title.

Methods: A total of 3,607 benzene samples were available. Normalized 8-hour TWA personal exposure samples (n=2359) for benzene were collected between 1974 and 1999. Eight-hour TWA data were classified by division, department, and job title and were analyzed by time periods demined by changes in the OEL for benzene and key process changes that likely influenced employee exposures at the facility.

Results: The mean benzene concentration of all normalized 8-hour TWA personal samples was 0.54 ppm. The mean benzene concentrations found in all divisions were below the contemporaneous OELs for benzene (10 ppm for the period from 1974 to 1986 and 1.0 ppm for the period from 1987 to 1999). There were also decreases in mean benzene concentrations when the data were evaluated according to key process changes (1974 to 1983, 1984 to 1991, and 1992 to 1999).

Conclusions: The results confirmed a high quality industrial hygiene program at the facility, which included full shift routine monitoring for benzene across all relevant divisions beginning in the mid 1970s. The robust nature of this dataset provides quantitative exposure values which are likely to be useful for estimating benzene exposures at similar facilities.