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Benzene exposure in refinery workers: ExxonMobil Joliet, Illinois, USA (1977-2006).

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Abstract
While petroleum industry studies have indicated low benzene exposure potential for refinery workers, most provide limited data for assessing job or task-related benzene exposures. This study characterizes job and taskspecific airborne benzene concentrations and variability over time for the ExxonMobil refinery in Joliet, Illinois from 1977 to 2006. A database of 2289 industrial hygiene air samples, including 1145 non-task (_180 min) personal samples and 480 task-related (<180 min) personal samples, were analyzed. Samples were grouped by operational status, job, and task. Benzene concentrations were determined for each job category and task bin, with additional analyses conducted to determine whether benzene concentrations changed over time. The results indicate that the benzene concentrations for non-task and task samples were relatively low. For all non-task samples, the arithmetic mean benzene concentration was 0.12 part per million (ppm). The most frequently sampled workers (process technicians during routine operations) had an arithmetic mean benzene concentration of 0.038 ppm. The most frequently sampled task bin (blinding and breaking) had an arithmetic mean benzene concentration of 1.0 ppm. This study provides benzene air concentration data that can be used in combination with job histories to reconstruct historical benzene exposures for workers at the Joliet Refinery over the past 30 years.

Keywords
benzene, refineries, exposure assessment, industrial hygiene