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Airborne concentrations of benzene for dock workers at the ExxonMobil refinery and chemical plant, Baton Rouge, Louisiana, USA (1977-2005).

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Objectives Benzene is a natural constituent of crude oil and natural gas (0.1–3.0% by volume). Materials that are refined from crude oil and natural gas contain some residual benzene. Few datasets have appeared in the peer-reviewed literature characterizing exposures to benzene at specific refineries or during specific tasks. In this study, historical samples of airborne benzene collected from 1977–2005 at the ExxonMobil Baton Rouge, Louisiana, USA, docks were evaluated.

Methods Workers were categorized into 11 job titles, and both non-task (≤180 min sample duration) and task-related (<180 min) benzene concentrations were assessed. Approximately 800 personal air samples (406 non-task and 397 task-related) were analyzed.

Results Non-task samples showed that concentrations varied significantly across job titles and generally resulted from exposures during short-duration tasks such as tank sampling. The contractor – tankerman job title had the highest average concentration [N=38, mean 1.4 parts per million (ppm), standard deviation (SD) 2.6]. Task-related samples indicated that the highest exposures were associated with the disconnection of cargo loading hoses (N=134, mean 11 ppm, SD 32). Non-task samples for specific job categories showed that concentrations have decreased over the past 30 years. Recognizing the potential for benzene exposure, workers at this facility have been required to use respiratory protective equipment during selected tasks and activities; thus, the concentrations measured were likely greater than those that the employee actually experienced.

Conclusions This study provides a job title- and task-focused analysis of occupational exposure to benzene during dock facility operations that is insightful for understanding the Baton Rouge facility and others similar to it over the past 30 years.

Key terms *exposure assessment; industrial hygiene; marine transport.*