

DEVELOPMENT OF A RETROSPECTIVE JEM FOR BENZENE IN THE NORWEGIAN OIL AND GAS INDUSTRY

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Objectives Upstream petroleum workers are exposed to benzene through contact with crude oil and natural gas. By using available monitoring data and information on determinants of benzene exposure we developed a job-exposure matrix for benzene to be used in a study of haematopoietic malignancies among 28 000 offshore workers.

Methods Monitoring reports on benzene (1981–2007) were gathered from 38 offshore installations. Supplementary information on task-specific determinants of exposure was obtained through company visits. This information was used to estimate benzene exposure for 29 relevant job categories in four time periods by: 1) Use of determinants to rate tasks by exposure intensity 2) Rating of job categories based on intensity, frequency and duration of performed tasks 3) Assignment of exposure estimates to job categories/time periods based on available air measurements and relative exposure rating.

Results Personal measurements indicated relatively high benzene exposure during tasks when flow lines are opened, such as work in the flotation package (arithmetic mean 1.04 ppm, 0.09–2.33 ppm), filter maintenance (1.18 ppm, 0.01–3.43 ppm), and cleaning operations (3.04 ppm, < LOD–17 ppm). Full shift exposure for various job categories was generally low (0.02–0.8 ppm), but these data did not cover all relevant job categories and time periods.

Conclusions The available quantitative data and information on exposure determinants was used to rank the 29 job categories relative to each other in respect to full shift exposure for the four time periods. Estimated values for the last decade will be validated against recent measurements not included in the present dataset.