

REPORT SUMMARY

PNNL-26041, Analysis of Respirator Cartridge Performance Testing on

Hanford Tank SY-102

Test Dates: July 8-10, 2016

The use of self-contained breathing apparatus (SCBA) has been implemented for workers in the tank farms. SCBA weighs about 30 lbs. and increases the ergonomic risk. Switching from SCBA to respirator cartridge masks could protect workers from tank vapors and gases while reducing ergonomic risk. Until air-purifying respiratory protective equipment has been tested, the results reviewed, and APR use is approved by a third party, workers will rely on SCBA.

The purpose of this report is to summarize the results of Pacific Northwest National Laboratory's (PNNL) *Analysis of Respirator Cartridge Performance Testing on Hanford Tank SY-102* (PNNL-26041). PNNL tested the performance of two respirator cartridges: the 7422-SC1 multipurpose cartridge and the 7422-SD1 multipurpose cartridge. Both cartridges are manufactured by Scott.

The cartridges were tested following the experimental method as defined by OSHA ([OSHA Link](#)) PNNL detailed the testing which “was conducted over a period from July 8-10, 2016, using headspace vapors from Hanford tank SY-102 under static conditions fed to a respirator cartridge test stand developed by WRPS in collaboration with HiLine Engineering (Richland, Washington)”(pg.iii). The cartridges were tested on separate days. Sorbent tubes, the most widely used collection media for sampling hazardous gases and vapors in air, were used to collect samples of the vapor stream entering and exiting the respirator cartridge. The samples were analyzed for chemicals of potential concern (COPC) concentrations.

PNNL reported that “...none of the COPCs indicated breakthrough behavior above 10% [occupational exposure limit] OEL during the 16-hour testing period” (pg. iv). PNNL recommended “...up to 16 hours for change-out times for the 7422-SC1 and 7422-SD1 cartridges” in APRs used by workers at SY-102. Furthermore, “additional respirator cartridge evaluations” should be performed in order to “determine proper respiratory protection requirements” (pg. iii). [Click here to view the full report.](#)