

## REPORT SUMMARY

### ***PNNL-26243, Analysis of Respirator Cartridge Performance Testing on the***

### ***702-AZ Primary Exhauster for the Hanford AY/AZ Tank Farms***

***Testing dates: August 26-27, 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 the 702-AZ Primary Exhauster for the Hanford AY/AZ Tank Farms* (PNNL-26243). PNNL tested the performance of two respirator cartridges: the 7422-SC1 multipurpose cartridge and the 7422-SD1 multipurpose/P100 particulate 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 from August 26–28, 2016, on a slipstream from the 702-AZ exhauster, 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 “only ammonia appeared to break through above 10% of its OEL after 12 hours for the SCOTT 7422-SD1 cartridge” (pg.iii). Although the SCOTT 7422-SC1 cartridge testing did not exceed 10% OEL, the outlet concentrations of ammonia were rising near the end of the test. For the purposes of this test, PNNL recommended that the service life of 12 hours be considered for both cartridges. Furthermore, “additional respirator cartridge evaluations” should be performed in order to “determine proper respiratory protection requirements” (pg. iii). View the full report at this link here.

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