U.S. Department of Energy
Office of River Protection
P.O. Box 450
Richland, Washington 99352

0060943

03-ED-175

DEC 15 2003

Mr. A. W. Conklin, Head
Air Emissions and Defense
Waste Section
State of Washington
Department of Health
P.O. Box 47827
Olympia, Washington 98504

RECEIVED
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EDMC

Dear Mr. Conklin:

REQUEST FOR EXEMPTION FOR THE 168-HOUR TEST REQUIRED UNDER 40 CODE OF FEDERAL REGULATIONS (CFR) 52, APPENDIX E, FOR STACKS 296-P-48, 296-P-23, AND 296-P-47

In a series of meetings held during October and November 2003 with the State of Washington Department of Health (WDOH), the appropriateness or necessity of specific line requirements contained within the technology standards specified in Washington Administrative Code 246-247, "Radiation Protection – Air Emissions," were discussed. Some of the requirements and/or methods specified in the technology standards are recognized as dated and archaic technically, having been promulgated as much as 30 years or more ago. Other requirements are intended for uses specific to nuclear power plants or nuclear fuel reprocessing facilities where generally a more rigorous approach to protect the public, the worker, and the environment is necessary than that needed at a nuclear facility such as the Tank Farms.

Attached is technical justification that provides the rationale for exemption of Tank Farm portable exhausters from the monitoring system test procedures of 40 CFR 52, Appendix E. To support the immediate needs of accelerated single-shell tank waste retrieval projects, exemption to the 168-hour test is sought for Portable Skid-Mounted Exhausters POR-03 (Stack 296-P-48), POR-007 (Stack 296-P-23), and POR-008 (Stack 296-P-47).

ORP has attached the justification and is requesting WDOH's concurrence of this exemption. If you have any questions, please contact me, or your staff may contact Dennis W. Bowser, Environmental Division, (509) 373-2566.

Sincerely,

Roy J. Schepens
Manager

ED:DWB

Attachment

cc: See page 2

cc w/attach:
B. G. Erlandson, BNI
E. S. Aromi, CH2M HILL
D. J. Carrell, CH2M HILL
C. J. Kemp, CH2M HILL
J. Cox, CTUIR
S. Harris, CTUIR
B. Becker-Khaleel, Ecology
S. L. Dahl, Ecology
J. L. Hensley, Ecology
O. S. Wang, Ecology
J. A. Bates, FHI
W. E. Green, Jr., FHI
P. Sobotta, NPT
M. F. Jarvis, RL
R. Jim, YN
J. Martell, WDOH Richland Office
Administrative Record
Environmental Portal, LMSI

Attachment
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Justification for Waiver to Stack Flow Monitoring System Performance Testing for Tank Farms Portable Exhausters POR-03, POR-007, and POR-008

Justification for Waiver to Stack Flow Monitoring System Performance Testing for Tank Farms Portable Exhausters POR-03, POR-007, and POR-008

Purpose:

This technical justification provides the rationale for exemption from the test procedures of 40 Code of Federal Regulations (CFR) 52, Appendix E, for waste tank ventilation systems with a stack flow measurement system component design that is identical to previously successfully tested ventilation systems. Specifically, exemption is sought for Portable Skid-Mounted Exhausters POR-03 (296-P-48), POR-007 (296-P-23), and POR-008 (296-P-47) utilized by the Tank Farm Contractor (TFC).

Background:

Compliance with 40 CFR 52, Appendix E, "Performance Specifications and Specification Test Procedures for Monitoring Systems for Effluent Stream Gas Volumetric Flow Rate," is required by Washington Administrative Code 246-247-075, "Monitoring, Testing and Quality Assurance," when a permanently installed flow rate measurement system is used for emissions reporting purposes on radioactive air emission units. The code appendix defines a test procedure used to determine the accuracy of the installed flow rate measurement system compared to manual flow rate measurements, and criteria are established to evaluate acceptability of the system.

The test involves an initial 168-hour conditioning period followed by a 168-hour performance and operational test period. During the operational test period, 14 volumetric flow rate measurements are taken simultaneously using both the installed flow rate measurement system and the applicable manual reference method of 40 CFR 60, Appendix A, "Standards of Performance for New Stationary Sources." The manual flow measurements are used to determine the relative accuracy of the installed flow measurement system, the zero drift and calibration drift of the installed flow measurement system are determined and the orientation sensitivity of the system measurement probe within the stack is obtained by taking flow measurements at different probe angular displacements. The installed flow rate measurement system is considered acceptable for use in emissions reporting if the results of these tests are within the established acceptance criteria.

Justification:

Repetition of this extensive testing should not be necessary for installed flow measurement systems with identical stack configuration and component design. The test involves flow measurement at the stack and, therefore, is independent of the exhauster location. From a technical standpoint, qualification testing of the installed flow measurement system for one exhauster qualifies all exhausters with identical stack configuration and flow measurement system component design.

The stack configuration, flow measurement devices, and flow instrumentation are identical for all of the "saltwell" portable exhausters. This set of exhausters includes:

- POR-03 (296-P-41),
- POR-04 (296-P-43),
- POR-05 (296-P-44),
- POR-06 (296-P-45),
- POR-007 (296-P-23),
- POR-008 (296-P-47).

The 168-hour test has been performed on Portable Exhausters POR-04, POR-05, and POR-06 (documented in RPP-14759, *Portable Exhauster (POR-05) 168 Hour Air Flow Test Data Sheets and Results*, and in work packages WS-99-00132, WS-99-00605, and 2E-01-00650). Subsequent stack flow measurement system qualification testing for the other three portable exhausters should not be necessary.

A similar approach was accepted by the Washington State Department of Health for qualification of the shrouded probe used for particulate sampling of the exhaust stack emissions on the portable exhausters. The installed sampling probes on all the portable exhausters are identical in design. One probe was qualified in accordance with American National Standards Institute (ANSI)/Health Physics Society N13.1-1999, *Sampling and Monitoring Releases of Airborne Radioactive Substances From the Stacks and Ducts of Nuclear Facilities*, which served as the basis for qualification of all the other identical probes and stack configurations, with no further qualification testing required. This qualification is documented in PNNL-11701, *Generic Effluent Monitoring System Certification for Saltwell Portable Exhauster.*

Accuracies of current flow measurement systems have improved substantially since the 40 CFR 52, Appendix E, testing was developed and codified. The latest revision of the code is dated 1975. The manufacturer's published accuracy and reliability for the subject systems can be taken with a high degree of confidence based on their quality assurance program and verification testing of critical characteristics. The zero drift and calibration drift tests are also not necessary based on this accuracy and reliability of modern instrumentation. These drift tests are also impractical because they must be performed with the exhauster operating; however, the resultant zero flow indication would activate exhauster low flow interlocks that cannot be bypassed, thus shutting down the exhauster. Loop accuracies for the installed flow measurement systems on the portable exhausters are calculated in RPP-15253, *Portable Exhauster Set Point Justification and Set Points (POR-03, POR-04, POR-05, POR-06, POR-008)*. The calculated values of 2.51 percent for the 500 ft^3/min. portable exhausters and 1.08 percent for the 1,000 ft^3/min. portable exhausters are well within the acceptance criteria of 10 percent of the mean reference value established in 40 CFR 52, Appendix E, Table E-1.

Repetition of the probe orientation sensitivity test should not be necessary for the installed flow measurement systems on the portable exhausters. With a maximum calculated loop accuracy of 2.51 percent, inaccuracies caused by probe misalignment of up to 7.5 percent would still result in flow measurement accuracies within the 168-hour test acceptance criteria of 10 percent of the mean reference value. This value of 7.5 percent is much greater than the probe orientation sensitivity acceptance criteria of 4 percent. In accordance with ANSI N13.1, manual flow measurements are taken annually to verify that the accuracy of the installed flow rate measurement system is still within the 10 percent acceptance criteria. Inaccuracies caused by probe misalignments would be detected and accounted for in this annual measurement. During installation, leveling the probe valve body to give a parallel orientation with the stack ensures correct orientation of the probe to within the manufacturer's recommended tolerance of ±3°. This value was determined by the manufacturer based on rotation tests that resulted in insignificant deviations from flow indication at the correct probe alignment. In summary, the probe orientation sensitivity test for the portable exhausters does not add significant value based on the following:

- The high degree of accuracy inherent in the installed flow rate measurement system,
- Annual accuracy verification of the installed flow rate measurement system in accordance with ANSI N13.1,
- Reliable installation procedures that ensure that the probe is installed to the manufacturer's recommended tolerance of ±3°.

In lieu of conducting the extensive tests of 40 CFR 52, Appendix E, on the three subject portable exhausters, the stack flow shall initially be measured manually by the TFC using pre-existing stack flow measurement procedures while simultaneously recording the reading from the stack flow measurement system indicator. A comparison shall be made to ensure the two results agree within 10 percent of each other. The test shall be repeated annually in accordance with ANSI N13.1.