Enclosure - RAI Part 2 Responses for the TRISO-X Environmental Report Supplement

RAI ER Supplement - 6

Provide additional information on the validation of the quality of radiological stack effluents

Section 6.1.1.1 of the ER states that each stack is equipped with a gaseous effluent radiation monitor (GERM). However, there is no information regarding the means or methods for validating or providing quality assurance of the gaseous effluent measurements. Normally, the radiological environmental monitoring program (REMP) provides validation of routine effluent measurements and accidental releases.

In this license application, TRISO-X proposes a facility with no routine ground level releases. All routine effluents are released from the stacks. The proposed REMP provides ground level monitoring of ambient air at locations close to the stacks. The proposed "fence line" REMP measurements are not sensitive to stack releases. The proposed REMP can detect accidental ground level releases, but not routine or accidental stack releases.

TRISO-X should provide additional information about how routine or accidental stack release measurements are validated or how quality assurance is otherwise provided. For example, do the GERM monitors include redundant channels for automated measurements? Do the GERM monitors or other monitoring capabilities include independent grab sampling capability? Are there other methods of providing independent validation or quality assurance measurements of the GERM monitor results? To summarize, please provide additional information that describes how the quality of GERMs measurements are determined or established.

TRISO-X Response to RAI ER Supplement - 6

License Chapter 9, Section 9.5 describes the TRISO-X Environmental Monitoring Program. Compliance with 10 CFR 20.1301 is achieved using the option provided in 10 CFR 20.1302(b)(2)(i) to demonstrate that the annual average concentrations of radioactive material released in gaseous effluents at the boundary of the unrestricted area (the point of stack discharge) do not exceed the values specified in Table 2 of Appendix B to Part 20. Demonstration is accomplished by calculation and validated by measurement (continuous representative sampling at the point of stack discharge). Fenceline monitors are not used to validate effluent measurements of the stack discharge.

The stack monitoring system consists of two sample filter media which pull exhaust from a common shrouded probe sample nozzle within the stack. One sample filter is equipped with a radiation detector, processor, and computer system which represents the automated continuous monitoring portion of the system. The other sample filter is used for grab samples and “for-record” samples that support effluent monitoring reports in accordance with 10 CFR 70.59. The monitoring system measures process flow within the stack and sample flow through both sample filter media to ensure the sample flow is representative of stack flow.

The monitoring system is designed using the guidance in Regulatory Guide 4.16 Rev. 2, *Monitoring and Reporting Radioactive Materials in Liquid and Gaseous Effluents from Nuclear Fuel Cycle Facilities,* and operated and maintained using the guidance for quality assurance in Regulatory Guide 4.15, Rev. 2, *Quality Assurance for Radiological Monitoring Programs (Inception through Normal Operations to License Termination)-Effluent Streams and the Environment.* The monitoring system is also designed in accordance with ANSI N42.18-2004, *Specification and Performance of On-Site Instrumentation for Continuously Monitoring Radioactivity in Effluents*, and ANSI/HPS N13.1-2011, *Sampling and Monitoring Releases of Airborne Radioactive Substances from the Stacks and Ducts of Nuclear Facilities*. One-time

testing of the as-built system is performed in accordance with ANSI/HPS N13.1-2011 to demonstrate the acceptability of the sample extraction location for nozzle placement and sample transport evaluations for maintaining representative sampling. Periodic radiation detector calibration is performed at defined intervals using NIST-traceable calibration sources. Periodic checksource testing is also performed at defined intervals.

Design, operation, and maintenance of the monitoring system using the above-mentioned regulatory guidance and standards provides reasonable assurance of the quality of the monitoring system measurements.