September 7, 2004

Mr. Paul E. Benneche, Acting Director
Nuclear Reactor Facility
University of Virginia
P.O. Box 400322
Charlottesville, VA 22904-4322

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION CONCERNING UNIVERSITY OF VIRGINIA FINAL STATUS SURVEY REPORT, LICENSE NO. R-66 (TAC NO. MB8233)

Dear Mr. Benneche:

We are reviewing your Final Status Survey Report (FSSR) for Facility Operating Licenses No. R-66 and R-123 for the University of Virginia Reactors. The FSSR was submitted on June 18, 2004. During our review of your FSSR, questions have arisen for which we require additional information and clarification. Please provide responses to the enclosed request for additional information within 60 days of the date of this letter. In accordance with 10 CFR 50.30(b), your response must be executed in a signed original under oath or affirmation. Following receipt of the additional information, we will continue our evaluation of your FSSR.

If you have any questions regarding this review, please contact me at 301-415-1631.

Sincerely,

/RA/

Daniel E. Hughes, Project Manager
Research and Test Reactors Section
New, Research and Test Reactors Program
Division of Regulatory Improvement Programs
Office of Nuclear Reactor Regulation

Docket No. 50-62/396

Enclosure: As stated

cc w/enclosure: Please see next page

cc:

Department of Environmental Quality
Office of Grants
Management/Intergovernmental Affairs
629 East Main Street, Sixth Floor
Richmond, VA 23219

Dr. William Vernetson
Director of Nuclear Facilities
Department of Nuclear Engineering
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Office of the Attorney General
900 East Main Street
Richmond, VA 23219

Virginia Department of Health
Radiological Health Program
P.O. Box 2448
Richmond, VA 23218

Dr. Ralph O. Allen, Chairman
Reactor Decommissioning Committee
University of Virginia
Environmental Health and Safety
P.O. Box 3425
Charlottesville, VA 22904

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REQUEST FOR ADDITIONAL INFORMATION
UNIVERSITY OF VIRGINIA RESEARCH REACTOR
DOCKET NO. 50-62/396

Specific Comments

1. Section 4.2.3, Page 4-8, First Paragraph (UVA 2004a)—A composite of 19 systematic soil samples from the Waste Tank Excavation was analyzed for hard-to-detect radionuclides (HTDR) and presented in Table 4-3, Page 4-9. Nineteen appears to be an extraordinarily large number of samples to form a composite. The potential exists that some HTDRs present in individual samples would be masked using this approach. Please justify the composite sampling approach.

2. Section 4.5.3, Page 4-33, First Paragraph (UVA 2004a)—Activity determined in Room M008 where Ni-63 is the contaminant is noted as ranging up to 34,982 dpm/100 cm^2. Section 7.6 of the Master Final Status Survey Plan (UVA 2004b) notes that Tc-99 is used for instrument calibration, except for facilities contaminated with Ni-63. However, the calibration source to be used is not noted. Appendix B of the Final Status Survey Report provides final survey data worksheets. For Room M008 (survey units 7 and 38), the efficiency for the 43-68 gas flow proportional (GFP) detector is 0.065. Final survey data worksheets for other areas of the facility, which are calibrated to Tc-99, show efficiencies of approximately 0.10, which is a typical efficiency for a GFP detector with a 0.8 mg/cm2 window. It appears that the stated efficiency of 0.065 may be an overestimation of an expected Ni-63 calibration with a 0.8 mg/cm^2 window. Please provide information pertaining to the calibration source used for the Ni-63 contaminated Room M008 and also include the window thickness used for the GFP detectors.

3. Section 4.6.3, Page 4-38, Fifth Paragraph (UVA 2004a)—Table 4-6, Page 4-41, provides the results of concentrations of HTDRs in a composite soil sample from the exterior soil area. Based on these results, the last sentence of the paragraph states: "These results confirm that significant concentrations of hard-to-detect radionuclides of facility origin are not present in site soils." First, the result for Sr-90, 0.72 pCi/g, when compared to its screening $DCGL_W$ of 1.7 pCi/g (42% of the guideline) does seem significant. Second, while not explicitly stated, it appears to be implied from the text that the 17 samples summarized in Table 4-15, Page 4-40, were used in the one composite sample analyzed for HTDRs. Seventeen seems to be an extraordinarily large number of samples to be used to form a composite. In addition, it is possible that a small number of the 17 samples could have concentrations of Sr-90 exceeding the screening $DCGL_W$. Please justify the composite sampling approach and ensure that Sr-90 concentrations are not a concern.

4. Section 4.8.3, Page 4-63, First Paragraph (UVA 2004a)—Gross gamma levels of interior surface soils were elevated with an ambient level as high as 40,000 counts per minute (cpm). The report notes that the sensitivity of the 2" x 2" NaI detector is adequate to meet the $DCGL_S$ of 3.8 pCi/g for Co-60 and 11 pCi/g for Cs-137. The sensitivities of this detector are adequate in a nominal background field, for example 10,000 cpm, however, as the background increases, the sensitivity will decrease. It is possible that in the high background field the sensitivity could be calculated to be higher than the $DCGL_S$, especially for Co-60. Please re-evaluate the sensitivity of the 2" x 2" NaI detector when used in the high background field.

5. Section 4.8.3 (UVA 2004a)—This section provides the results and conclusions for the Special Soils Areas. In general, the assessment approach used in this section is not consistent with the MARSSIM or with Section 4.6 that assessed the exterior soil areas. All soil results were compared to the Co-60 $DCGL_{surrogate}$ of 3.4 pCi/g. This modified Co-60 $DCGL_W$ was developed based on a single sample from the Underground Waste Tank Excavation Addendum 001 (UVA 2004c). The mixture used to develop this DCGL did not have any detectable Cs-137. However, a Cs-137 level of 7.10 pCi/g (Table 4-22, Page 6-64) was identified at sample location 3 from the remediated soil areas beneath the reactor pool. This result shows that the Co-60 $DCGL_{surrogate}$ of 3.4 pCi/g is not applicable to this soil area. Please re-evaluate the application of the Co-60 surrogate $DCGL_W$ and consider employing the unity rule as was done in Section 4.6.3.