UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION I
475 ALLENDALE ROAD
KING OF PRUSSIA, PENNSYLVANIA 19406-1415

April 8, 2008

Docket No. 030-03766 License No. 06-00807-01
Control No. 142056

Martin Poitzsch
Departmental Research Director (Sensor Physics)
Schlumberger-Doll Research
One Hampshire Street
MD-B313
Cambridge, MA 02139

SUBJECT: SCHLUMBERGER-DOLL RESEARCH, REQUEST FOR ADDITIONAL INFORMATION CONCERNING APPLICATION FOR AMENDMENT TO LICENSE, CONTROL NO. 142056

Dear Mr. Poitzsch:

This is in reference to your letter dated February 20, 2008, requesting to amend Nuclear Regulatory Commission License No. 06-00807-01. In order to continue our review, we need the following additional information:

1. Section 1.1 of the "Final Radiological Status Report, Schlumberger-Doll Research, Old Quarry Road, Ridgefield, Connecticut 06877-4108" dated November 20, 2007 (Final Report) states that assessments were done of wells in the ARL Building high bay area. Describe this area, the potential source term of radioactivy, the wells (location, depth, construction, distance from source term, etcetera), the original purpose of the wells, and the basis for including well water in the final status survey of your Ridgefield facility.

2. Section 1.2 of the Final Report states that lead pigs, lead bricks, tools etc remain at the Ridgefield facility. Provide data from surveys or other supporting information that demonstrate that remaining equipment does not have residual contamination from past activities with radioactive materials.

3. Section 2.0 of the Final Report states that licensed materials consisted exclusively of sealed sources. This section further states that "no characterization of potential activation products had ever been performed, so it was not possible to set isotope contamination limits."

   a. A review of past amendments of your license, inventory records, and licensing documents indicate that you possessed up to 2 microcuries of unsealed americium-241 (Am-241) beginning in 1973. Describe where unsealed Am-241 was used, and any other relevant description of the activities with this material.

   b. The NRC screening value that demonstrates facilities would meet the license termination criteria in Subpart E of 10 CFR 20 is 27 disintegrations per minute per 100 square-centimeters area (dpm/cm^2) total Am-241, of which not more

than 10% is removable. Confirm that you will use the screening value as your criteria for residual contamination in areas where unsealed Am-241 was used. Alternately, you may propose a site specific derived concentration guideline level (DCGL) instead of the screening value, using the guidance in NUREG-1757, "Consolidated NMSS Decommissioning Guidance" (NUREG-1757) and NUREG-1575, "Multi-Agency Radiation Survey and Site Investigation Manual" (MARSSIM). The NUREG-1757 was first published in 2003, and the MARSSIM was first published in 1997; both documents have since been revised, and supercede NUREG/CR-5849, "Manual for Conducting Radiological Surveys in Support of License Termination" (NUREG/CR-5849) referenced in Section 3.4 of the Final Report.

c. For the areas of your facility in which unsealed Am-241 was used, you should use the guidance in NUREG-1757 to determine if those areas are considered Class 1, Class 2, or Class 3 areas. The number of sampling and survey points required varies according to the Class. Describe any additional surveys you plan to do to demonstrate that residual contamination levels meet the license termination criteria in facilities where unsealed Am-241 was used.

d. If no characterization of activation products was performed in the past, either such characterization must be done at this time, or a theoretical assessment must be done of probable activation products and quantities/concentrations from accelerator work that was done at your Ridgefield facility. The most restrictive radionuclide with a half-life greater than 120 days should be used as the conservative limit for residual contamination due to activation in the absence of other release criteria. In addition, activation contamination may exist throughout a volume of material (such as concrete) so volumetric contamination limits may be needed and volumetric sampling may be required. At this time, the NRC does not have any default limits for volumetric contamination. Because the use of accelerators is currently regulated by the State of Connecticut, confirm that you will contact them, prior to release of your facility for unrestricted use, to determine acceptable criteria for residual contamination from activation products at your facility.

4. Section 3.4 of the Final Report states that surveys were performed using guidance from NUREG/CR-5849. Current NRC guidance for decommissioning of facilities is found in NUREG-1757. NUREG-1757, Volume 2, Appendix B describes alternate surveys which are acceptable for demonstrating that certain facilities meet the license termination criteria for many unsealed radionuclides, and your NUREG/CR-5849 surveys are acceptable to detect residual contamination at the NRC screening values for most beta- and gamma-emitting radionuclides. However, they are not acceptable for unsealed Am-241. Confirm that you will use NUREG-1757 guidance for any future surveys of the Ridgefield facility.

5. Sections 4.0 and 5.0 of the Final Report states that no residual contamination distinguishable from background was detected. Based on a review of the data in the attachments, the minimum detectable activities and the background radiation levels of the surveys were not sufficiently sensitive to detect Am-241 at the NRC screening

levels. Confirm that this section will be revised after additional investigation of residual contamination from Am-241 and activation products is completed.

6. Attachment B states that the Minimum Detectable Activity (MDA) was calculated using RadCalc Version 1.1. An internet search of this name identified at least four different software programs by this name. Please provide the mathematical calculation used by your software to determine the MDA. The MDA calculation should meet NRC guidance.

Current NRC regulations and guidance are included on the NRC's website at www.nrc.gov; select **Nuclear Materials; Medical, Academic, and Industrial Uses of Nuclear Material;** then **Regulations, Guidance, and Communications.** You may also obtain these documents by contacting the Government Printing Office (GPO) toll-free at 1-866-512-1800. The GPO is open from 7:00 a.m. to 8:00 p.m. EST, Monday through Friday (except Federal holidays).

We will continue our review upon receipt of this information. Please reply to my attention at the Region I Office and refer to Mail Control No. 142056. If you have any technical questions regarding this deficiency letter, please call me at (610) 337-5040.

If we do not receive a reply from you within 30 calendar days from the date of this letter, we will assume that you do not wish to pursue your application.

Sincerely,

Original signed by Dennis R. Lawyer

Betsy Ullrich
Senior Health Physicist
Commercial and R&D Branch
Division of Nuclear Materials Safety

cc:
Zilo Zhou, Ph.D., Radiation Safety Officer
State of Connecticut

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