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June 2, 2006

Licensing Assistance Team
Division Of Nuclear Materials Safety
U.S. Nuclear Regulatory Commission, Region I
475 Allendale Road
King of Prussia, PA 19406-1415

Subject: Byproduct Material License Renewal Application

Dear Sir or Madam:

Please accept the following information regarding:
License No.: 29-28005-01
Docket No: 03029879
Control No: 137295
Response to request by D. Lawyer of NRC for information regarding requested exemption
Prepared by James R. Matey, Sarnoff Corporation, jmatey@sarnoff.com

1) A reason why the exemption is needed and why it is in the public interest to grant this exemption:

We are seeking an exemption from a requirement to classify a small Am-241 calibration source as unsealed radioactive material subject to decommissioning funding. This requirement only came to light during the processing of our recent license renewal application.

The Am-241 AMR.151 source is a small, (current calibrated activity 11.4 micro-Curie), calibrated source that we use to calibrate the instruments that we routinely use for wipe tests, surveys and experiments. It is one component of our Amersham QCR-2 calibrated gamma source set. It is particularly valuable because it provides a relatively pure gamma at a known, stable intensity at an energy at which we need to calibrate.

Sarnoff has been in possession of this source set for more than 20 years under previous licenses. Until the most recent renewal, no issue had been raised regarding the classification of the source: it had been regarded as a sealed source. During that period, there were no issues of safety regarding this source. During that period the source was subject to

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the same wipe test requirements as our other sealed sources and passed the wipe tests on every occasion.

Granting this exemption will enable us to continue to make calibrations of our equipment in a timely manner. We avoid the need to send equipment out for calibration and thereby reduce downtime. For some instruments that cannot be conveniently moved, it avoids the need to have a calibration source brought to our site – and the corresponding risks resulting from transport of such a source. The risk from our continuing possession of the source is minimal. The activity is equivalent to that of ~ 10 smoke detectors and the source is subject to stringent controls, as discussed below. Alternatives would likely increase the risk of exposure/contamination to the public over that of the status quo.

2) A description of specific compensatory safety measures that will provide a level of protection equivalent to the regulation from which the exemption is requested:

The Am-241 AMR.151 source is an ion exhange bead sealed in a rectangular plastic package. The package is stored in a shielded box (with other similar calibration sources comprising the QCR-2 source set) provided by the vendor. The box is stored in a locked cabinet in the radiation safety lab at Sarnoff. The radiation safety lab door is locked and posted off limits to non-authorized personnel. The cabinet and radiation safety lab are routinely surveyed, in accordance with the terms of our license.

The source has been and will be tested for leakage on the same schedule required by our license for all sealed sources. The source is kept under the same inventory control required by our license for all sealed sources

3) A discussion of reasonable alternatives that have been considered by the licensee and why they have not been implemented. One of the alternatives discussed should be if the exemption is not granted:

a. Dispose of the current source and purchase a source that meets current sealed source criteria. To the best of our knowledge, there are no small (~10 microcurie) calibrated Am-241 sources that meet current sealed source criteria. We would need to purchase a much larger source. A larger source would not be suitable for most of our calibration needs and would likely increase the risk of exposure by our staff. It would also be more difficult to dispose of when our program is eventually decommissioned.

b. Dispose of the source and contract with an outside vendor to provide calibrations. Calibrations would be less timely and would entail more downtime for equipment that is sent off site for calibration. For some instruments that cannot be conveniently moved, the vendor would need to bring a source to our site – with the corresponding risks resulting from

transport of such a source. The risk from our possession of the source is minimal. The activity is equivalent to that of ~ 10 smoke detectors and the current source is subject to stringent controls. This approach would likely increase the risk of exposure or contamination over the status quo.

c. Keep the source and classify it as unsealed radioactive material subject to decommissioning funding. This would require us to obtain financial assurance for a fixed amount or do a decommissioning plan to determine a dollar amount of financial assurance. Then we would have to obtain a bond, letter of credit, line of credit, cash or other financial instrument. This option seems to be out of proportion to the risk.

d. Obtain one or more smoke detectors or other licensable Am-241 source and cross calibrate it with our current source. Then dispose of the current perfectly good source in a licensed landfill. This option would result in potentially reduced accuracy in our instrument calibration operations (due to smaller source activity and loss of accuracy and precision) and the disposal of a useful calibrated source.

4) Please state when you obtained the Am-241 AMR.151 source, the current activity of the source, the latest leak test of the source, and any incidents associated with the use of this source:

Acquired: 2/15/1985
Current Activity: 11.4 microcuries (5/31/06)
Last leak test: 6/1/2006
No incidents. Source was subject to the same wipe test requirements as our other sealed sources and passed the wipe tests on every occasion. There have been no safety incidents with this source.

5) Please list any other sources similar to the Am-241 AMR.151 source that have been used under the license. Please provide the same information as requested in item #4:

We have no other sources that are precisely similar to the AMR.151 source. These are the sources in our inventory that are most similar, in our opinion.

The Amersham QCR-2 source set contains the following isotopes, all at nominal 10 micro-Curie activity at the time of calibration, all are ion exchange beads encapsulated in plastic. Several have decayed to undetectable levels of activity. We include the Am-241 AMR.151 source in the table for completeness.

Nuclide	Nominal Activity (microCi)	Calibration date	Half life (years)	Current activity (microCi)
Am-241	11.800	1-Apr-1985	433.00	11.407
Ba-133	11.640	1-Apr-1985	10.80	2.989
Co-57	10.830	1-Apr-1985	0.74	0.000
Co-60	11.250	1-Apr-1985	5.27	0.694
Cs-137	11.960	1-Apr-1985	30.00	7.332
Hg-203	20.350	1-Apr-1985	0.13	0.000
Mn-54	10.140	1-Apr-1985	0.86	0.000
Na-22	10.800	1-Apr-1985	2.60	0.038
Y-88	11.730	1-Apr-1985	0.29	0.000

We also have two, sealed, uncalibrated Am-241sources:
2 milli-Curie Am-241 source, Amersham model AMC-21, acquired 2/22/1984
10 milli-Curie Am-241 source, Amersham model AMC-2084, acquired 3/19/1985

All of these sources (excepting those which are decayed to background) were most recently wipe tested on 6/1/2006. They have been subject to wipe testing on the schedule provided for in our licenses and have passed wipe testing on every occasion. There have been no safety incidents with these sources.

6) Please estimate the expected length of time the Am-241 AMR.151 source would be used:

Sarnoff has been engaged in licensed activities under the current Radiation Safety Officer for more than 20 years. We have no plans to shutdown the radiation safety program or curtail our ability to carry out research and development using licensed materials. At this moment, our use of licensed materials is minimal due to the current mix of research contracts – we are currently using sealed sources for tests of silicon sensors. Our use of licensed materials fluctuates in response to the needs of our government and commercial clients. We periodically review our needs for licensed materials. In our most recent review, we decided to go forward with a renewal of our license and maintain our capability in this area at least through the next renewal of our license.

Very truly yours,

Therese Perrette, CIH, CSP
Sarnoff Corporation