

Trip Report
July 23, 2010

Memorandum to: License File
American Radiolabeled Chemicals
Maryland Heights, MO

License No: 24-21362-01:
Docket No: 030-20567

Thru: Christine Lipa, Chief *Christine Lipa 7/23/10*
NRC, Region III, Division of Nuclear Materials Safety
Materials Control, ISFSI, and Decommissioning Branch

From: Katie Streit, Health Physicist *Katie Streit 07/23/10*
Materials Control, ISFSI, & Decommissioning Branch
(MCIDB)
Division of Nuclear Materials Safety, Region III

Date of Trip: July 6 to 8, 2010

Purpose of Visit: **SUPPORT NRC CONTRACTOR PERFORMING
EVALUATION OF LICENSEE'S AIR SAMPLING
PROGRAM**

Trip On-site Participants:
NRC Region III

- Mike McCann, Senior Health Physicist
- Katie Streit, Health Physicist

Southwest Research Institute (SwRI)

- Jim Durham, Principal Engineer
- Khaled Edrisi, Principal Technician

American Radiolabeled Chemicals (ARC)

- Regis Greenwood, CHP, Radiation Safety Officer
- Surendra Gupta, Ph.D., President
- Kyle Gerad, Health Physicist

Discussion: On April 30, 2009, American Radiolabeled Chemical (ARC) submitted a license renewal to the NRC for review (ML091250272). In the renewal, ARC described their operating effluent air sampling system, and an air sampling system for a future iodine synthesis laboratory. To facilitate a timely license renewal the NRC employed a health physics contractor, Southwest Research Institute (SwRI), to perform an evaluation of the licensee's air sampling system. On July 6 to 8, 2010, MCID staff conducted a site visit at ARC to escort SwRI personnel during the performance of the air sampling activities and effluent monitoring system assessment.

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The contractor set up air samplers to independently verify ARC's effluent sampling system. The SwRI staff placed one air sampler in each of the Building 100 and 300 stacks. These air samplers were collected for approximately eight hours. A total of five air samplers were placed in fume hoods (three in Building 300 and two in Building 100), and air was sampled for approximately 6 hours. The fume hoods were selected based on ARC's descriptions of current operations, and was focused on the highest activity and diverse uses. A sampler was also placed in the first floor conference room in building 400 to be used as a site background. The background sample was planned to run for 24 hours but the two pumps were found to have stopped overnight after only running for approximately 10 and 16 hours. The contractor will evaluate the results and determine if the collection time was adequate for the assessment.

The SwRI sampling system contained two independent trains. The first train was similar to ARC's impinger train utilizing a bubbler system with two vials of sodium hydroxide (NaHO). Although this system was similar to ARC's, it was different due to the higher volume of airflow and used a lower molarity, 0.25 molar rather than 1.0 molar used by ARC. Additionally, SwRI used a carbon absorbent to analyze for organic and basic molecules. The licensee's RSO indicated that an evaluation had been done that demonstrated that organic releases were a small fraction of their operational effluent release and that the NaOH bubbler system should collect the primary effluents of interest released from the site. The RSO committed to providing the NRC and the SwRI with this report. The contractor also observed the sampling trains in buildings 100, 300, and 400, and reviewed air sampling data from effluent stack releases from Buildings 100/200 and 300 and the air intake for Building 400 for the year 2009. The licensee was requested to provide the spreadsheet calculations used to generate the air concentrations, and dose results.

It was also noted that ARC uses the second vial results in the NaOH bubbler sampling train to provide the sampling efficiency since it determines the amount that has cleared through the first vial. The NRC and the contractor had questions in regards to the efficiency calculation when the second vial results were equal to the first vial results. ARC stated they had completed an evaluation previously to determine the calculation and assumptions used in this scenario and committed to providing the evaluation to the NRC.

It was noted that air sampling media for the Building 400 air samplers were being collected approximately every two weeks. Review of the 2009 Building 400 sampling data identified some sampling periods that were 6 weeks between sample collections. The RSO indicated that the samples are counted for 100 minutes. In the licensee's application dated August 19, 2003, it is indicated that the samples in Building 400 are to be sampled every week and that the samples would be run for 180 minutes. The RSO was informed regarding this NRC observation. The RSO believed the license amendment document was out of date, and that this issue would be reviewed. This observation was provided to the Materials Inspection Branch Chief. This issue will be followed up during the next materials inspection.

Finally, through discussions with the RSO and health physics technicians at ARC, it was determined that ARC uses sample results from Building 400 to comply with 10 CFR 20.1302 and 10 CFR 20.1101 (d). The stack releases from buildings 100/200 and

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building 300 are still sampled, but the sample results are not used for calculating public dose. This observation will be followed up during the current license renewal and next NRC inspection. ARC agreed to provide to the NRC the technical information that supports their current public dose sampling approach.

Conclusion

Currently, ARC committed to provide the NRC with several documents, including:

- 1) The spreadsheet calculations used to generate and document the air concentrations for measured stack releases during the NRC's on-site evaluation. The information will include the raw sampling results.
- 2) The spreadsheet calculations used to generate and document the air concentrations derived from air sampling results Building 400. The licensee will also submit calculations and supporting assumptions used for determining public dose for air samplers placed on Building 400, including wind rose data from the nearby international airport and a report showing the location of wake effects and Gaussian distributions of emissions from the stacks.
- 3) The licensee's technical documentation and evaluations that demonstrates that organic releases were a small fraction of operational effluent releases.
- 4) Information regarding how the licensee's effluent and bubbler efficiency calculations account for unmonitored organic compounds.

The NRC's contractor will provide the NRC with a report of the sample results, their findings, and their evaluation of the air effluent system.

End of trip report.

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