



## Department of Energy

Washington, DC 20585

August 31, 2016

Dr. Mark Peters  
President and Laboratory Director  
Battelle Energy Alliance, LLC  
Idaho National Laboratory  
2525 North Fremont Avenue  
Idaho Falls, Idaho 83415-3695

NEL-2016-01

Dear Dr. Peters:

The Office of Enterprise Assessments' Office of Enforcement has evaluated a nuclear safety incident involving the unplanned release of airborne contamination within the Idaho National Laboratory (INL) Fuel Manufacturing Facility, as reported in the Department of Energy's (DOE) Occurrence Reporting and Processing System under NE-ID--BEA-FMF-2014-0001, dated October 13, 2014. Based on this evaluation, the Office of Enforcement identified concerns that warrant management attention by Battelle Energy Alliance (BEA).

The specific concerns relate to the release of airborne contamination from the Advanced Fuel Cycle Initiative (AFCI) glovebox in the Fuel Manufacturing Facility during the period August 26 through 28, 2014. During arc melting operations, radioactive contamination, predominantly americium-241 (Am-241) from previous metal processing, became airborne, migrated through the AFCI glovebox barrier, and entered the AFCI enclosure where workers were located. Continuous air monitors (CAMs) in the AFCI enclosure alarmed four times during, or immediately after, this job evolution. However, there was no removable surface contamination outside of the AFCI glovebox that often confirms a possible leak. As a result, no action was taken and the alarms were inaccurately viewed as not attributable to airborne radioactivity.

On September 24, 2014, transuranic material was discovered on filters collected from the AFCI enclosure during the time period August 26 through 28, 2014. After becoming aware of these results, BEA took action to evacuate the AFCI enclosure and post it as an airborne radiation area (ARA). BEA initiated an investigation of the event and also conducted special bioassays for all personnel who were working under the radiological work permit or had access to the AFCI



enclosure during that time frame. These bioassays determined that nine workers each received radiological uptakes for a committed effective dose less than 100 millirem.

BEA completed its investigation of the event on November 17, 2014. The investigation included a direct causal analysis, but did not include the formal cause analysis that BEA's issues management procedure requires for this type of event. BEA also analyzed the performance of the AFCI enclosure CAMs. Partly due to software limitations, at the time of the release these CAMs were set to detect uranium-235 and plutonium-239, and BEA's analysis indicated that this monitoring would also identify any Am-241 release. However, subsequent analysis revealed that the combination of software limitations and the selection of isotopes resulted in unexpected CAM response during the event. BEA then released a lessons-learned report to the DOE complex, since the CAM response in this situation was unknown to the vendor and others who used the equipment.

While programmatic work in the AFCI glovebox was halted, BEA conducted a thorough search for the source of the glovebox leakage, which was completed in December 2015. Helium leak testing identified seven locations on the glovebox as leak sources, with the oxygen analyzers being the primary source. Following repairs to the glovebox and testing in early 2016, the ARA posting for the AFCI enclosure was ended and AFCI glovebox operations returned to normal.

The Office of Enforcement reviewed this event and the subsequent response by INL. This review identified weaknesses in several areas, including: (1) timely processing of AFCI enclosure air filters; (2) causal analysis; (3) monitoring of the AFCI enclosure to detect changes in radiological conditions; (4) AFCI radiation surveys and decontamination; (5) AFCI glovebox annual surveys; and (6) identification of job-specific air monitoring requirements. The actual nuclear safety consequences of this event were low, but DOE views seriously any event in which workers receive unplanned radiological uptakes. In this instance, the hazards associated with Am-241 migration through the AFCI glovebox barrier were not properly understood and controlled before work started.

The Office of Enforcement has elected to issue this Enforcement Letter to convey its concerns about the radiological release from the AFCI glovebox and subsequent uptakes by INL personnel. DOE considers this event to be a preventable nuclear safety matter, and it is the Department's expectation that BEA will fully implement the corrective actions needed to prevent recurrence. Issuance of this Enforcement Letter reflects DOE's decision not to pursue further enforcement activity against BEA at this time. In coordination with the Office of Nuclear Energy and the Idaho Operations Office, the Office of Enforcement will continue to monitor BEA's efforts to improve nuclear safety performance.

This letter imposes no requirements on BEA, and no response is required. If you have any questions, please contact me at (301) 903-7707, or your staff may contact Mr. Jon Thompson, Director, Office of Nuclear Safety Enforcement, at (301) 903-1134.

Sincerely,



Steven C. Simonson

Director

Office of Enforcement

Office of Enterprise Assessments

cc: Richard Provencher, DOE ID  
Sherry Kontes, BEA