

February 8, 2012

Mr. Jay Laughlin, Chief Nuclear Officer  
and Head of Technical Services  
National Enrichment Facility  
P.O. Box 1789  
Eunice, NM 88231

SUBJECT: RESPONSE TO REPLY TO NOTICE OF VIOLATIONS 2011-201-01 AND  
2011-201-02

Dear Mr. Laughlin:

This letter refers to your correspondence dated November 11, 2011, REPLY TO NOTICE OF VIOLATION (NOV) 70-3103/2011-201, in reply to our October 5, 2011, Inspection Report and NOV. Your correspondence addressed Violations A and B in the NOV. Specifically, NOV 70-3103/2011-201-01 was issued because Louisiana Energy Services, National Enrichment Facility (LES NEF) did not apply the criteria stated in Section 3.2.5.2 of its Safety Analysis Report (SAR) in determining that criticality in an array of failed centrifuge machines was not credible. NOV 70-3103/2011-201-02 was issued because LES NEF did not identify or analyze a credible accident sequence leading to criticality in a cascade, or establish items relied on for safety (IROFS) sufficient to ensure that such a criticality would be highly unlikely and that the cascade would remain subcritical under credible abnormal conditions.

In your reply to the NOV, you accepted the violations, stated the corrective actions that have been taken, the corrective actions that will be taken, and the date when full compliance will be achieved. We have reviewed your reply to our Notice and acknowledge your acceptance of the violations and the reasons stated therein. Your corrective actions included revising the methodology for determining that an event is not credible, in accordance with Revision 1 of NUREG-1520, "Standard Review Plan for the Review of a License Application for a Fuel Cycle Facility," and then revising Section 3.4.3.8.1 of your Integrated Safety Analysis (ISA) Summary accordingly. You further stated that the changes to Section 3.4.3.8.1 of your ISA Summary will be made using the technical basis in Attachment 1 to your November 11, 2011, letter. With regard to the corrective actions that have been and will be taken, we will need additional information before closing the NOV.

While the guidance in Revision 1 to NUREG-1520 is generally acceptable to the staff, we have remaining questions about your implementation of this methodology, specifically whether the accident sequence involving a criticality in a failed centrifuge array meets your criteria for an incredible event. The violation will therefore remain open, and we plan to review additional information during our routine criticality safety inspection currently scheduled for the March-April 2012 timeframe. We expect that at that time, the actual revised text of Section 3.4.3.8.1 of your ISA Summary will be available for inspection. During that inspection, we will examine your technical basis provided in Attachment 1 of your November 11, 2011, letter, specifically including the following issues:

- It is unclear, for each event listed as being “independent,” whether it is considered to be independent from the preceding event, from all preceding events, from all subsequent events, or from all other events listed in the table.
- Event #2, involving air in-leakage, is listed as being independent from Event #1, crash of a single centrifuge. The justification stated is that “Operating experience shows no correlation that a crash leads to in-leakage.” However, you have stated in discussions with inspectors that you do not routinely post-mortem failed centrifuges to look for the presence of accumulated material or air in-leakage. In addition, you have also stated that there are events resulting from a cascade breach that could result in centrifuge failures. Therefore, it is unclear whether Event #2 is truly independent from Event #1, or whether Event #2 could precede and precipitate Event #1.
- Event #4 is listed as being independent. If this means it is considered independent from Event #2, this appears to contradict your previous statements that there are events that could cause failure of multiple centrifuges.
- Event #10 involves formation of a cluster of four adjacent failed centrifuges with air in-leakage sufficient to cause uranium deposits to form. You listed this event as being independent. However, you previously considered (Events #2, 4, 6, and 8) air in-leakage and concluded it was independent from machine failure. Adding Event #10 appears to double-count the air in-leakage scenario, as this had been previously considered for each of the four machines in the array separately.
- Events #11, 12, 13, and 14 all involve failure of operators to notice abnormal cascade behavior. However, there is no associated required action to actually do anything to prevent the accident sequence from progressing. An understanding is needed of the operator actions, values at which those actions would be triggered, and time frames associated with those actions, resulting from this process monitoring, to evaluate whether these events have any bearing on the accident sequence likelihood.
- Events #11 and 12 both involve operators noticing an increase in vent frequency. Events #13 and 14 both involve operators failing to notice a trip or change in indication, from the Medium Frequency System. These events are considered to be independent. It is not readily apparent why events relying on common instrumentation used to detect process abnormalities are independent.
- Section 3.2.5.2 of your SAR states that “The fact that an event is not ‘credible’ must not depend on any facility feature that could credibly fail to function.” It is not apparent how the instrumentation relied on in Events #11 – 14 is consistent with this commitment, or why it should not be IROFS in accordance with Title 10 of the *Code of Federal Regulations* (10 CFR) 70.61(e).
- Events #15 and 16 involve failure to take the required annual cascade sample due to air in-leakage. It is unclear what requires this sample to be taken, and on what frequency, what leakage rate would be required to preclude the sample from being taken, and how that compares to the leak rate necessary for the long-term accumulation of uranium sufficient to cause criticality.
- Event #18 does not appear necessary for a cluster of four failed machines to exceed the subcritical  $k_{\text{eff}}$  limit of 0.95 for flooding. It is unclear why it is included in this table.

- The accident scenario considered in this table (and in the analysis ETC4156706) revolves around having a cluster of four failed machines, completely filled, under the worst-case moderation (with H/U = 7), and flooded up to 60 cm. It is not apparent that this is the only case that could result in criticality. Other configurations may be more or less likely than the one analyzed herein. It is therefore not clear that the most conservative case, with regard to likelihood, has been evaluated.

The NRC staff considers it essential that the information needed to address these issues will be available at the time of the inspection. We will plan to contact you with more specific access requirements prior to the inspection, including access to documents, personnel, and facilities having this information.

In accordance with 10 CFR 2.390 of NRC's "Rules of Practice," a copy of this letter will be available electronically for public inspection in the NRC Public Document Room or from the Agencywide Document Access and Management System (ADAMS). ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/ADAMS.html>. (the Public Electronic Reading Room).

If you have any questions concerning this letter, please contact Thomas Marenchin at (301) 492-3209 or via e-mail to [Thomas.Marenchin@nrc.gov](mailto:Thomas.Marenchin@nrc.gov) or Christopher Tripp, at (301) 492-3214. or via e-mail to [Christopher.Tripp@nrc.gov](mailto:Christopher.Tripp@nrc.gov).

Sincerely,

**/RA/**

Thomas Hiltz, Chief  
Technical Support Branch  
Division of Fuel Cycle Safety  
and Safeguards  
Office of Nuclear Material Safety  
and Safeguards

Docket No. 70-3103  
License No. SNM-2010

cc: See attached list

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