

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

August 16, 2019

TO: Christopher J. Roscetti, Technical Director
FROM: Matthew Duncan and Brandon Weathers, Resident Inspectors
SUBJECT: Oak Ridge Activity Report for Week Ending August 16, 2019

Nuclear Criticality Safety: In April, CNS revised the criticality safety approval procedure in part to clarify how fissile material activities are identified, evaluated, approved, and implemented. The current version now specifies that equipment containing less than 350 grams of fissile material that is physically isolated from other fissile-bearing equipment or components and physically separated by at least two feet from other fissile equipment does not require a nuclear criticality safety approval document.

There has been an ongoing effort to clean out unused equipment and excess material from some areas in Building 9212. Last month, nondestructive assay was performed on what appeared to be a portable dry vacuum system that has apparently not been operated for several decades. It is unclear when and how it was moved into its current location but was known to be stored in various locations in the wing. Similar units are used in Building 9215. The results of the nondestructive assay indicated that it could contain greater than 350 grams of ^{235}U given the uncertainty of the measurement, but less than 700 grams of ^{235}U . Most of the ^{235}U is on a demister upstream of a HEPA filter. Once operations personnel became aware of the results they took the appropriate actions for an abnormal condition involving fissile material. A different type of portable dry vacuum system is covered under a general criticality safety evaluation for containers and material handling. As this is not explicitly covered under a current criticality safety evaluation, CNS determined this was a nuclear criticality safety deficiency.

In order to clean out the bulk of the ^{235}U and prepare the portable vacuum system for disposal, CNS plans to revise the criticality safety evaluation via a document change notice or create a technical deviation. Another deficiency discovered during the cleanout effort occurred when personnel discovered several large bags being stored outside of an approved array containing what appeared to be bags loaded with contaminated material originating from fissile processes. After the fact finding meeting, the resident inspector walked down the area and confirmed that most excess material and standalone equipment has been removed and placed in appropriate storage arrays if necessary.

There were two nuclear criticality safety issues discovered in Building 9206 last week during an internal assessment. Several cardboard boxes were discovered by operations personnel that appeared to violate the large geometry exclusion area control, which prohibits containers larger than four liters. They were quickly removed per guidance from the nuclear criticality safety engineer. When measured, at least one was much larger than allowed at approximately nine liters. This was considered a deficiency. The other issue was considered a minor noncompliance and involved overlapping mop heads, prohibited by a procedure establishing general nuclear criticality safety requirements for enriched uranium operations chemical areas. Mop heads may be placed flat on the floor and no spacing is required, but they cannot be stacked or overlap. Personnel responded appropriately upon discovery.