DEFENSE NUCLEAR FACILITIES SAFETY BOARD

February 14, 2020

TO: Christopher J. Roscetti, Technical Director
FROM: Matthew Duncan and Brandon Weathers, Resident Inspectors
SUBJECT: Oak Ridge Activity Report for Week Ending February 14, 2020

DNFSB Staff Activity: D. Shrestha was on site to provide resident inspector augmentation.

Nuclear Criticality Safety: CNS completed an internal assessment of the effectiveness and implementation of the management responsibilities associated with the nuclear criticality safety program at Y-12, primarily focusing on selected requirements from ANSI/ANS-8.19, *Administrative Practices for Nuclear Criticality Safety*. It resulted in two findings, two weaknesses, seven positive observations, and six opportunities for improvement. The two findings were for not performing this assessment within the allowed triennial periodicity and for improper closure of findings from a previous assessment that resulted in repeat findings. Some of the positive observations were in reference to: (1) improved relationships between criticality safety engineers, criticality safety officers, and operations personnel, (2) operators' understanding of limits and postings, and (3) improved staffing and discretionary funding. The recent event in Building 9212 involving failure to promptly notify nuclear criticality safety personnel demonstrates that challenges remain regarding relationships between criticality safety engineers, criticality safety officers, and operations personnel (see 2/7/20 report).

One of the weaknesses was the adequacy of managing impacts of process changes on downstream operations. An event occurred this week where operators noticed an unexpected condition of material floating and a stratified layer developing in a phase separator. The operators stopped the solution transfer to the phase separator, established administrative control, and notified nuclear criticality safety personnel. The solution being transferred was from several input streams that were poured into tanks upstream of the phase separator. One of the inputs was from the analytical chemistry laboratory and is suspected to contain byproducts from chemical sampling analysis performed by the laboratory. At the fact finding, there was discussion of a process change made in the analytical chemistry laboratory related to how these byproducts are processed prior to sending them to Building 9212. At this time, it does not appear that this process change fully analyzed all potential impacts in downstream processes or facilities.

Building 9215: As part of the continued evaluation of enriched uranium accumulation in out-of-service equipment, a field walkdown was performed this week in Building 9215. The resident inspector accompanied NPO and CNS personnel from the nuclear criticality safety engineering, and nuclear material control and accountability organizations on this walkdown. Historical non-destructive assay data showed that some out-of-service systems contain more than 700g U-235, which is the single-parameter subcritical mass limit. A few of the out-of-service systems are large and consist of multiple components. Two of these large systems still contain liquid. There are several pieces of equipment that are difficult to obtain non-destructive assay measurements without disassembling the equipment. Corresponding field walkdowns have been completed for Buildings 9204-2E and 9720-5 (see 1/31/20 report). The Building 9204-2E walkdown identified one out-of-service system that requires additional non-destructive assay measurements to determine whether it contains U-235.