

## DEFENSE NUCLEAR FACILITIES SAFETY BOARD

March 2, 2001

**TO:** J. Kent Fortenberry, Technical Director  
**FROM:** Paul F. Gubanc and David T. Moyle, Oak Ridge Site Representatives  
**SUBJ:** Activity Report for Week Ending March 2, 2001

Staff members Martin and Graham visited Y-12 to review two software quality assurance issues.

A. Y-12 Software Quality Assurance: The staff reviewed the software quality assurance for two safety-related software applications. On a positive note, the dismantlement process software is simple with only a few lines of code, which should be relatively easy to verify and validate. Conversely, the EUO reduction process software consists of approximately 2500 lines of code. It does not appear that code complexity was evaluated to determine the required functional tests (only 8 were performed). Furthermore, there is no evidence of unit testing or integration testing of the code. During a demonstration of the development version of the code, loading and execution errors occurred which resulted in a gross miscalculation of reaction pressure (the major safety related aspect of the program). These errors were not observed when the programmer loaded the version of the code under configuration control, but he asserted that there should have been no differences between the two versions. It appeared relatively easy to move between the two environments such that there is some concern for the viability of the gatekeeper function of the Y-12 software configuration management system. Additionally, we discovered that the program would accept negative values for material moisture content and subsequently calculate lower pressures. Such errors would likely be caught by required independent checks of program output prior to each reduction run, but it would be prudent to internalize some acceptable data range controls in the software itself. (1-C, 2-A)

B. Y-12 Enriched Uranium Operations (EUO): The management self-assessment for reduction and primary extraction pour-up was completed on Friday and resulted in 12 findings and 11 observations. No findings were written against operations observed. One of the most significant findings identifies some of the problems with the startup plan and its integration with the procedures which we identified in last week's report. BWXT intends to begin its ORR on Monday. (2-A)

C. Y-12 Fissile Material Handling: On Wednesday, Mr. Gubanc walked down the nuclear facilities to confirm their implementation of compensatory measures for qualified (vice certified) fissile material handlers as committed to in BWXT's February 23<sup>rd</sup> letter to YAO. While minor variations were noticed, five of the six major nuclear facilities had each implemented the same basic control; oversight personnel had to be capable of intervening to prevent actions that could affect criticality safety. By contrast, Building 9215 management had issued no standing order, had provided very loose guidance to its two oversight personnel, and had tasked each overseer to cover multiple locations; some in separate rooms. Our concerns were voiced individually to both YAO and BWXT management. On Thursday morning, Mr. Gubanc found the situation largely unchanged. On Thursday afternoon, Mr. Gubanc met jointly with YAO and BWXT management to assure a very clear communication of expectations, to dispel misunderstandings of what was occurring on the floor with first-hand observations, and to express significant concern over the apparent lack of YAO and BWXT attention to ensure a consistent standard was being applied across the plant. On Friday, YAO and BWXT continued to work towards a common approach at 9215; fissile material handling was stopped except for one evolution witnessed by both YAO and Mr. Gubanc. This evolution was adequately controlled. Mr. Gubanc will continue to follow this issue. (2-A)

cc: Board Members