

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

April 9, 1993

MEMORANDUM FOR: G.W. Cunningham, Technical Director

COPIES: Board Members

FROM: J.J. McConnell, Oak Ridge Program Manager

SUBJECT: Trip Report to the Oak Ridge Y-12 Plant

1. **Purpose:** This report documents a review of radiological controls at the Oak Ridge Y-12 Plant. The review was conducted by J. McConnell (DNFSB Staff) and T. Quale (Outside Expert) on April 7-8, 1993. The review focussed on implementation plans for DOE Order 5480.11, "Radiological Protection for Occupational Workers" and the DOE Radiological Control Manual, as well as action plans to improve radiological controls in areas identified by audits and occurrence reports.
2. **Summary:**
 - a. Compliance With Radiological Controls Requirements: Senior DOE Oak Ridge Field Office (DOE-ORO) and Martin Marietta Energy Systems (MMES) radiological controls managers stated the opinion that many DOE Radiological Control Manual mandatory requirements are "good management practices" which will not necessarily be implemented at the Y-12 Plant due to insufficient resources. There are numerous instances where Y-12 is not in compliance with DOE Order 5480.11, the DOE Radiological Controls Manual, or consensus standards. In many of these cases there is no documented technical justification for the condition and no compensatory measures are in place. It appears that, in the radiological controls area, DOE-ORO and MMES have not fully internalized the principles of DNFSB Recommendation 90-2.
 - b. Occurrence Reporting: The combination of radiological control practices and occurrence reporting practices at Y-12 result in some occurrences, as defined by DOE Order 5000.3A, "Occurrence Reporting and Processing of Operations Information" not being identified to MMES and DOE-ORO management. This condition exists due to policies such as treating company issued clothing as anti-contamination clothing, and allowing workers to attempt personal decontamination several times before notifying the health physics organization.
3. **Background:** Personnel from both DOE-ORO and MMES briefed the staff on actions being taken to improve radiological control practices at Y-12 and to come into compliance with DOE requirements on the subject.

4. **Discussion:** In several instances, action plans to address deviations from the requirements, which have extended schedules for implementation, do not provide interim or compensatory actions. The Oak Ridge Field Office manager stated in a memo to NE-1 that it will cost \$132 million (one time) and \$67 million annually to implement DOE Order 5480.11 and the Radiological Control Manual at all ORO sites. The MMES Y-12 Plant Radiation Protection Upgrades Manager stated that the organization and budget to implement the Radiological Control Manual will be severely limited in FY 94 when compared to current levels. In general, the plans presented to the DNFSB staff lacked technical justification for actions taken and decisions made to defer or take no action. Specifically, it appears that DOE-ORO and MMES do not feel they have the resources to implement many of the mandatory requirements of the DOE Radiological Control Manual. Some of the areas in which MMES is farthest from-being in full compliance with the requirements of these instructions include contamination control, training, and occurrence reporting.

a. Contamination- Control: Some of the most basic tenets of contamination control (as discussed below) are not being followed in many facilities at Y-12. This condition greatly increases the possibility of the spread of contamination to uncontrolled areas and the unnecessary exposure of personnel to contamination. The existence of these conditions also points to weaknesses in the Y-12 As Low As Reasonably Achievable (ALARA) program required by DOE Order 5480.11, section 9.a.

1. Personnel Monitoring: The Radiological Controls Manager for MMES at Y-12 stated that personnel monitoring is not currently required at egress points from all routinely occupied loose surface contamination areas at Y-12, as required by DOE Order 5480.11, section 9.g.(4).(c) and Articles 221 and 338 of the Radiological Control Manual. Although he stated that actions are underway to resolve this problem by the end of the fiscal year and 137 of the 157 required boundary control stations are in place, no compensatory actions have been identified to prevent the inadvertent spread of contamination in the interim. The DOE Health Physics Manual of Good Practices for Uranium Facilities, section 5.2.6, states that monitoring of personnel and equipment should be performed prior to exit from controlled areas and is essential prior to exit from contaminated areas. This manual states that these controls are necessary to prevent the spread of contamination to uncontrolled areas. As demonstrated by the following information provided during the briefings, this type of spread is routinely occurring at the Y-12 Plant. The Health Physics Technicians (HPTs) who would provide this monitoring support currently conduct about 11,000 random contamination surveys of personnel, vehicles, and material outside radiological control areas per month. On average, these surveys identify between one and four contaminated personnel, six to eight contaminated vehicles and twenty items of contaminated material per month; yet the source of these contamination events is not routinely identified or

eliminated. MMES does have an ongoing program to survey all facilities at Y-12 and perform decontamination when required.

2. Anti-Contamination Clothing: Personnel in some known loose surface contamination areas at Y-12 (including areas where there is no egress monitoring) normally wear only lab coats and shoe covers as anti-contamination clothing. This condition exists despite the fact that survey results reveal the use of coveralls, as suggested by DOE Order 5480.11, would minimize the chance of contaminating personal and company issued clothing. The MMES action plan to develop protective clothing requirements (as described during the brief) will not be implemented until FY 1994 and does not include compensatory actions.
 3. Break Areas: In some cases, personnel are allowed to exit posted contamination areas and enter eating areas after surveying only their hands and donning a clean lab coat and shoe covers over potentially contaminated clothing. The DOE Health Physics Manual of Good Practices for Uranium Facilities, section 5.3.3, states "Protective clothing shall not be allowed in uncontrolled areas such as offices, lunch rooms, control rooms, etc." This practice is also contrary to standard industry practice. The need to continue this practice, which can lead to ingestion of radioactive contamination, has not been technically justified.
 4. Personnel Decontamination: There are numerous boundary control stations at Y-12 where personnel are required by procedure to wash their hands before monitoring for potential skin contamination. This procedure violates Article 338 of the DOE Radiological Control Manual and standard commercial industry practice. The need to continue this procedure has not been technically justified and is inconsistent with other boundary control stations at Y-12 which conform with Article 338. When personnel detect skin contamination, they are allowed to wash their hands up to three additional times (in sinks which drain to the sanitary sewer) before notifying the radiological controls organization. Only then do the HPTs attempt to quantify the extent of contamination. These practices are inconsistent with Article 541 of the DOE Radiological Control Manual.
- c. Training: Current training procedures and practices at Y-12 do not ensure Radiation workers complete all radiation safety training required by DOE Order 5480.11 prior to being allowed unescorted access to radiological areas.
1. Facility Specific Training: MMES facility managers stated that the facility managers are responsible to select the set of radiological training modules necessary for unescorted access into their facilities. MMES radiological controls managers stated that while subject matter experts review each module for technical accuracy, they do not review the set of modules

selected by the facility managers to ensure the modules identified cover all required training aspects. Consequently, the training does not necessarily require practical skills demonstrations (applied training) as is suggested by DOE Order 5480.11 and required by the DOE Radiological Control Manual.

2. Core Radiation Worker Training: Core radiation worker training (supplied by headquarters in December 1992) is not yet implemented at Y-12. Based on information provided to the DNFSB staff in the brief, this training will not be implemented until FY 94 and will not be complete, for existing workers, until FY 96 or FY 97 (the Implementation Plan presented by MMES has an internal inconsistency).
- d. Occurrence Reporting: Several of the reporting requirements of DOE Order 5000.3A, DOE "Occurrence Reporting and Processing of Operations Information," have not yet been implemented by MMES. This situation potentially deprives MMES and DOE-ORO management of important information.
1. Skin Contamination: Attachment I of DOE Order 5000.3A requires that an occurrence report be issued for "Any case where personnel or personnel clothing (not protective clothing) receives confirmed contamination." Existing procedures at some Y-12 facilities require personnel to wash their hands prior to performing personnel monitoring at the exit to a contaminated area. Further, the standard practice at Y-12 to be followed when personnel skin contamination is detected during monitoring at a boundary control station allows personnel to wash their hands up to three more times, if necessary, to attempt to remove contamination. Therefore, a total of four attempts at decontamination can be performed without notifying radiological personnel. If the contamination is removed during this process, it is Y-12 policy that radiological controls personnel need not be notified and an occurrence report is not initiated even though DOE Order 5000.3A requires the initial confirmation of personnel contamination to be reported.
 2. Clothing Contamination: Policy at Y-12 allows personnel who detect contamination on company issued clothing to simply change the company issued clothing without reporting the condition to the health physics organization. This policy is contrary to guidance in Article 325 of the Radiological Control Manual which states, "Company-issued clothing, such as work coveralls and shoes, should be considered the same as personal clothing. Company-issued clothing should not be used for radiological control purposes." The policy also could result in occurrences as defined in DOE Order 5000.3A (see d.1 above) not being identified.
 3. Revised DOE Order 5000.3B: The sections of revised DOE Order

5000.3B Attachment I which address radiological requirements for issuing occurrence reports now reference the requirements of the DOE Radiological Control Manual. MMES Y-12 radiological controls personnel and occurrence reporting personnel have estimated that implementing the Radiological Controls Manual requirements for personnel monitoring and the new occurrence reporting requirements could result in 7,800 additional reportable events of personnel contamination per year at the Y-12 Plant.

- 5. Future Staff Action:** The actions listed below are intended to provide follow-up on the concerns identified above.
- a. Occurrence Reporting: A separate staff review of radiologically related occurrence reports and internally reported Y-12 "Alerts" will be conducted to determine: 1) If any additional radiological problems exist and, 2) the status of implementation of the requirements of DOE Order 5000.3A and 5000.3B (when implemented).
 - b. Corrective Action Plans: The staff will follow DOE's, MMES's, and MK Ferguson's plans to upgrade radiological practices at Y-12 closely. The Staff will review these plans for adequacy, timeliness, and technical justification when the information is available.
 - c. The DNFSB Staff will follow the implementation of DNFSB Recommendation 91-6 at Y-12 closely.