

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

September 14, 1993

MEMORANDUM FOR: G.W. Cunningham, Technical Director

COPIES: Board Members

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

SUBJECT: Training and Qualification at Oak Ridge

1. **Purpose:** This report provides information concerning training and qualification of DOE Oak Ridge Operations Office (DOE-OR), DOE Y-12 Site Office (YSO), and Martin Marietta Energy Systems (MMES) personnel collected during a review at the Y-12 Plant held on August 11-13, 1993. DNFSB staff members J.J. McConnell and R. Arcaro and Outside Experts R. West and J. Drain conducted the review.
2. **Summary:**
 - a. **Training:** The MMES Training Implementation Matrix is not approved and will be revised and resubmitted. Training consists almost exclusively of compliance training to meet OSHA, General Employee Training and other site common requirements. There is no continuing training programs for operators and supervisors. Job skill training and basic fundamentals training are not defined. This status of the training program is similar to that noted during a DNFSB staff visit of July 1992. The rate of progress appears to indicate that insufficient assets have been assigned to basic fundamental training and job skill technical training. Additional efforts are also required in procedure writing, system labeling, configuration management, and maintenance of as-built drawings, all of which need to be coordinated to implement upgraded training in a timely manner.
 - b. **Qualification:** Current operator qualifications consist of compliance training and conduct of on-the-job checkouts under observation which are recorded on Performance Documentation Checklists (PDCs). Organizations recently promulgated lists of courses and PDCs needed for qualification at various levels of assignment. Essentially all of the reviewed qualification records fail to provide evidence that operators considered qualified meet all of these qualification requirements. No overall evaluation of knowledge of persons being qualified is being conducted and future plans for such an evaluation are not defined.
 - c. **Certification:** There is no program to certify fissionable material handlers and supervisors. Definitive plans are lacking for certification and the concept of certification appears to be misunderstood by plant management.
 - d. **Records:** Training records generally consist of poorly organized collections of

training results which are very difficult to audit. They contain little beyond compliance training and PDCs. The examinations contained in the records are not challenging. Completed PDCs lack evidence of demonstrated knowledge. There are no records for determining proficiency status of operators.

- e. Level of Knowledge Interviews: Personnel interviews showed knowledge deficiencies in process specifics, the Lockout/Tagout (LO/TO) procedure, procedures for working on or near energized equipment, radiological protection, criticality safety, and basic fundamentals. Personnel completing PDCs could not describe basic system operation and interrelations with other systems. Operators report that system prints are too inaccurate to validate LO/TOs. In general, operators were unfamiliar with oral interviews and indicated that this method of examination is not widely used at Y-12.
- f. DOE YSO Training: Y-12 Site Facility Representatives (FRs) are not qualified. An action plan is being developed to complete procedures for FR qualification and training needs analyses for the remaining YSO technical staff in April 1994. A request has been submitted to DOE for 4 more FRs.

3. Discussion:

a. Training:

- 1. Training Implementation Matrix: The MMES Training Implementation Matrix is not approved after two major rewrites. MMES submitted the latest version in March 1993. DOE-OR provided comments and another rewrite is in progress with a planned resubmission date of September 1993. MMES has received approval of an accreditation plan which was revised recently to complete in September 1995. The contractor has expended significant effort towards the accreditation process despite the fact that an approved implementation plan does not exist to meet current DOE Order 5480.20 training requirements.
- 2. Training Organization: A March 1993 training reorganization increased the central training group's compliance training and record maintenance responsibilities. The full range of responsibilities of this central group is not completely defined. The facility training managers are still responsible for developing and conducting job skill training but their staffs were reduced to support central training. The central training staff is organized to provide, primarily, compliance training, but is tasked also to assist the individual facility staffs in preparing job training. The central training staff resources to provide this training support are very limited and lack job specific training skills.
- 3. Training Development: No basic fundamental or job skill technical training is required for qualification. Efforts are underway to develop fissile material

worker and supervisor courses. The supervisor course is expected to be on line in about six months, but commencement of the worker course is in doubt because of insufficient instructors. The first Radiation Worker II course was taught in June and the next is planned to start in August.

No record of increased depth of training for supervisors exists in the records of Disassembly and Special Materials (DSM) and Maintenance Organizations. Essentially no courses are provided in the area of their technical expertise. Training for supervisors is required to be of increased depth by DOE Order 5480.20, Chapter IV, Section 5.c. No continuing training program exists and no information is available concerning plans for instituting the program.

Many operating procedures require upgrading to meet DOE conduct of operation standards. The associated PDCs also need to be revised to reflect the information in the new procedures. MMES is not planning to complete revised operating procedures until late 1995. It is unclear how new qualification standards can be put in place in a timely manner with this late completion date for the revised operating procedures and consequently the associated PDCs.

4. **Examinations:** The format for written and oral examination of qualification candidates is not defined and some managers state that a final, comprehensive examination is not required for qualification. Individual course tests and PDCs are being used to meet the intent of Chapter I paragraph 8. of DOE Order 5480.20 which states that written examinations and operational evaluations shall be prepared and administered for the qualification of operators and supervisors. The individual course tests and PDCs do not examine the integrated knowledge of an operator or supervisor.

Review of records and interviews reveal several training weaknesses. The quizzes on compliance training are, in general, not challenging, and the interviews show operators have a poor long-term (up to 12 months) retention of subject matter. The PDCs give no suitable record of the knowledge level demonstrated in that they contain no indication of the questions asked, answers provided or evaluation of responses as required by DOE Order 5480.20 Chapter I paragraphs 8.b. and 16.a.(4).

5. **Maintenance Training:** Training on safety-related systems for maintenance personnel consists of classroom work sometimes and the completion of a PDC. This training and checkout focuses on a particular operation of the safety-related system and does not include all required training of DOE Order 5480.20, Chapter I, Section 7.g.(2). These persons, however, are considered qualified to work on section of the equipment outside of the evolution on which trained.

b. **Qualification and Certification:**

1. **Qualification:** Operator qualifications for all of the activities reviewed consist of performing assigned jobs under instruction and, after recommendation of a qualified operator, completing satisfactorily a PDC under the observation of an OJT Supervisor. Verification of adequate knowledge level by senior facility management is not required. The PDCs are simple checklists to verify that correct procedural steps are performed and require little or no demonstration of understanding of the process being conducted. There is no requirement for or record of prerequisites (medical, experience, and education), job skill training, written examination, or comprehensive oral examination. A standard qualification card has not been developed and the managers who were interviewed do not have an understanding of the format of such a guide.
 2. **Certification:** No procedures exist for certifying fissionable material handlers and their supervisors as required by DOE Order 5480.20, Chapter I, Section 6.c.. There is no process for verifying proficiency of operators, fissionable materials handlers and fissionable material handler supervisors as required by DOE Order 5480.20, Chapter IV, Section 6.
- c. **Training and Qualification Records:**
1. **Organization:** Training records consist of a collection of certificates of courses attended and PDCs completed for operator qualifications. In some records the various documents are separated by type but in most they are assembled in a folder in no specific order and are difficult to audit, contrary to DOE Order 5480.20, Chapter I, Section 16a. This requirement states, "Qualification and certification of personnel shall be documented in an easily auditable format." The only readily available records of training and qualification are a chronological listing of completed courses and PDCs for each operator. These listings contain numerous discrepancies. There is no site procedure for maintaining these records. There is no system for determining the status of proficiency for operators.
 2. **Documentation:** Most organizations have a list of requirements to be completed for an individual's level of assignment (e.g., fissile supervisor, fissile worker, non-fissile supervisor and rad worker). The records reviewed of reportedly qualified persons do not contain evidence that all items of the listed requirements are complete. The only evidence of qualification on a particular process is a PDC for that operation. Lists of personnel qualified and proficient to perform various shift tasks are not available to ensure proper assignment of operators.
- d. **Training Assessment:** There is no formal program to evaluate training. Student comments are reviewed at the end of a course, but no long-term data is maintained. Infrequent observations of instructors is conducted but no record of results could be

found. Approximately one year ago a surveillance of the tagout program produced recommendations of changes to associated training, but no other similar examples could be found.

- e. **Interviews:** Interviews of Enriched Uranium Organization personnel, except for one with a cognizant engineer, showed little understanding or adequate knowledge of radiological controls fundamentals, process knowledge, or fundamentals of chemistry or nuclear physics associated with their job positions. NDT experts interviewed were good to excellent in their specialties, but were weak in radiological controls fundamentals and nuclear physics. Responses to Conduct of Operations questions suggest that the several tagout systems in use at Y-12 may create problems.

Interviews of four people from DSM revealed knowledge weaknesses in the areas of radiation principles and criticality safety. One operator who recently completed a PDC for operation of an assay meter could not describe the principles of operation of the equipment. Another operator was unable to discuss the operating principles of leak check equipment on which he was qualified.

Interviews of five maintenance personnel provided evidence of knowledge deficiencies with regard to confined space entry procedures, Lockout/Tagout (LO/TO) procedures, radiological protection, work on or near energized circuits, and criticality safety. Interviews indicated that maintenance personnel rely almost solely on Health Physics personnel for their radiation protection. Personnel describing the method for verifying a LO/TO did not plan to use system prints because they consider them to be too inaccurate. Two electricians who had recently requalified to work on safety-related systems could not provide a general description of the systems as required by DOE Order 5480.20, Chapter I, Section 7.g.(2)

- f. **DOE-YSO Training:** Neither of the two YSO Facility Representatives (FRs) are formally qualified. The Site Office published a procedure in August 1992 setting forth mandatory training requirements for FRs. The procedure lacks any facility specific requirements a year after initial promulgation and provides for no overall evaluation of knowledge. The procedure allows 24 months to complete the mandatory requirements. Personnel working to complete the requirements are still allowed to function as fully qualified FRs. An action plan for FRs, published in July 1993, provides for Oak Ridge Institute of Science and Education (ORISE) support in developing a FR training and qualification program. Completion of the FR qualification program and training needs analyses for the remaining technical staff and supervisors is scheduled for April 1994. No schedule exists for incumbents to complete the new procedure.

4. Future Staff Actions:

- a. **Federal Employee Training and Qualification:** The staff will review the plan to

reorganize the Operations Office Training Department (due by September 30, 1993) when it is completed. The staff will also review the results of the YSO training needs assessment due in April 1994 and any measures taken to upgrade facility representative training in the interim.

- b. Contractor Training and Qualification: The staff will review the revised MMES TIM when it is available and track implementation of the TIM after it is approved by DOE-OR. The staff will follow efforts to refine the qualification process and implement oral examinations. The staff will also evaluate plans to certify fissile material operators. The staff will follow MMES plans to train and qualify personnel (in accordance with DOE Order 5700.6C Criterion 2) for whom DOE Order 5480.20 is not applicable.
- c. Improved Procedures: Quality procedures are a prerequisite for quality training. The staff will review the plans and process to upgrade procedures at Y-12.