TRAINING AND QUALIFICATION OF WASTE MANAGEMENT AND REMEDIAL ACTION PERSONNEL AT THE OAK RIDGE NATIONAL LABORATORY

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ABSTRACT

Training of personnel at Department of Energy (DOE) reactor and nonreactor nuclear facilities has significantly changed over the past few years. With the increased attention to the conduct of training for reactor and nonreactor personnel, DOE has established guidelines for training based on the performance-based training process. Performance-based training has been identified as a very effective method of ensuring that these personnel are properly trained and qualified to perform their specific tasks safely and efficiently.

To enforce the new training methodology, management as well as operations personnel must be aware of the ever increasing regulatory liabilities and operations responsibilities and of the importance of maintaining a fully qualified staff to operate the facilities. Facility managers at each of the facilities must ensure that personnel are properly trained and qualified to perform their job duties. Operations personnel must be familiar with the processes associated with their particular facilities in order to perform their jobs in a safe and environmentally sound manner.

To ensure safe and efficient operations, a comprehensive training and qualification program is essential. Design and development of the training curriculum for the Waste Management and Remedial Action Division (WMRAD) of the Oak Ridge National Laboratory (ORNL) consisted of a job, task, and needs analysis and a thorough review of operating procedures. After completion of the necessary analyses, a comprehensive training program has been developed for personnel in each of the operating areas.

A document, *Waste Management and Remedial Action Division Training Plan,* has been developed by the WMRAD Training Department. This plan identifies and defines training requirements for different waste operations and support groups within the division and, in addition, identifies individual training requirements within each group based on job-specific tasks. This training consists of three independent areas: environmental, safety, and health (ES&H) training; performance-based training on standard operating procedures; and division training requirements.

To ensure that personnel have completed all training and retraining requirements, the WMRAD Training Department has also developed, and currently maintains, several data base systems. A data base systems manager generates daily, weekly, and monthly reports for review by operations supervision to ensure that only qualified personnel operate and maintain the waste management facilities.

INTRODUCTION

With changes occurring so rapidly in the commercial nuclear industry, the Nuclear Regulatory Commission (NRC) and the American National Standards Institute (ANSI) have established minimum requirements for training and qualification of nuclear power plant personnel. In short, they have adopted the Institute of Nuclear Power Operation's (INPO's) performance-based training accreditation program.

Performance-based training is a systematic approach to training that is based on the tasks, knowledge, and skills required for competent job performance. Using the performance-based training approach, training materials developed are directly related to the independent tasks performed at each facility. This training methodology provides trainees with the specific information needed to perform the tasks. Since the training is based solely on job requirements to perform the independent tasks instead of the opinion of others not directly involved with the processes, the content of training is always pertinent and training materials change less frequently.

DOE, which recognizes the need to enhance the training programs currently in place at government facilities and realizes the successful results obtained from performance-based training methods, has mandated that training programs for its reactor and nonreactor nuclear facility personnel be conducted using the performance-based approach.

Since their inception, the performance-based training programs have enhanced the job performance of operators and technicians throughout the DOE community and have increased employee awareness of the risks and regulatory liabilities associated with particular tasks. Using the performance-based approach has also significantly reduced the amount of audit findings associated with improper or lack of training.

GOALS AND OBJECTIVES

The ORNL WMRAD training program was developed to ensure that fully qualified personnel operate and maintain the waste management facilities and surplus contaminated facilities at ORNL in a safe and environmentally sound manner. The program also ensures that training, testing, documentation, etc., are in compliance with DOE national and corporate requirements. The broad objectives of the program are to provide knowledge of specific fundamentals that may be required of personnel in order to understand and implement procedural tasks; to provide knowledge of specific procedural requirements that must be met by all personnel while performing routine tasks; to promote the health and safety of all ORNL WMRAD personnel; to ensure that waste operations and remedial action personnel are aware of their responsibilities and regulatory liabilities; to expand personnel knowledge of the waste management and surplus facilities and their processes and equipment; and to provide a formalized, auditable program that meets the intent of DOE Orders and other regulatory requirements.

WMRAD PROGRAM DESIGN, DEVELOPMENT, AND IMPLEMENTATION

The approach used in designing and implementing the WMRAD training program was based on guidance from DOE Orders 5480.18A and 5480.20. The intent of the WMRAD training program is to comply with federal, state, and local requirements as well as corporate policies and procedures. One good example of a major source of federal and state requirements is the Resource Conservation and Recovery Act (RCRA) of 1976. RCRA was enacted to control hazardous waste from cradle to grave, therefore ensuring environmentally sound operations. Our program was designed to keep management and operations personnel aware of such regulations and of the associated training responsibilities.

The WMRAD training program design is based on the results of a formal job/task analysis performed for each of the operating groups. The purpose of the WMRAD job/task analysis was to develop a comprehensive list of tasks performed by the waste management technicians/operators/foremen/supervisors. The job/task analysis for each of the waste operation areas consisted of thoroughly reviewing the various waste operation procedures, developing an initial task list from the procedures, and organizing the tasks into specific job or duty areas. The tasks on the task list were assumed to require initial training and/or retraining.

The WMRAD Training Department, along with management and field supervision, statistically evaluated the list of tasks on the basis of frequency, difficulty, and importance. (The importance of a task is determined by performing a risk assessment, which formally analyzes the effect a task may have on the overall operations of a facility and addresses health and safety concerns.) After the evaluation, determination was made as to the amount of initial training and retraining required to qualify personnel to work independently on the task.

After the initial development, proper maintenance of the job/task analysis is accomplished through active involvement of facility management and training. When operations personnel develop a new procedure or revise a current procedure, the training manager is issued a controlled copy of the document. The procedure is reviewed by Training Department staff and necessary additions or revisions are incorporated into the job/task analysis. The end result of the job/task analysis identified the need for Environmental, Safety, and Health (ES&H) regulatory training, operating procedures training, on-the-job training, and divisional required training.

The ES&H regulations training programs at ORNL are conducted by the Technical Resources and Training Department and Energy Systems Training Department in accordance with federal, state, and local requirements. The ES&H programs used at ORNL are developed and reviewed by training specialists and compliance personnel to ensure completeness and accuracy. Outside ES&H programs are also used but must be approved before use by one of the technical training organization(s).

The operating procedures training is designed, developed, and conducted by the WMRAD Training Department in cooperation with line management and the operating organization. The Training Department develops a procedures-use exercise (PUE) for each procedural task requiring training to ensure the trainee has the knowledge to perform a task. If the task requires the trainee to demonstrate performance, an on-the-job training (OJT) checklist is developed and completed to ensure the trainee has mastered the skill(s). Before its use, the training material developed is reviewed for completeness and accuracy by several training professionals, subject matter experts, management, and field supervision. Such interactions assist the WMRAD Training Department in developing and maintaining a program that is complete, accurate, and useful. After initial issue of the program material, the WMRAD Training Department assigns training staff who are responsible for ensuring that the exercises and checklists are kept up to date and completed within the required time frame. This requires revising and updating lesson plans, PUEs, and OJTs whenever revisions are made to the operating procedures. The program requires a great deal of maintenance; however, it consistently meets the requirements of the federal and state regulations and the intent of the DOE orders. Auditors often classify this program as exceptional.

Implementation of the ORNL WMRAD training program is accomplished by the WMRAD training staff along with the operations supervisors and foremen assigned to each of the operating groups. Implementation involves working with supervision to identify personnel within the operating groups who are required to complete all or portions of the program. Once personnel who need training or retraining are identified, they are enrolled in course offerings (scheduling is required for ES&H regulatory-based training) or provided with materials for self-paced study, such as the PUEs, which must be completed by the trainee with assistance from the training support staff and the appropriate WMRAD personnel. The trainee returns the completed material to his or her supervision. The supervisor delivers the material to the Training Department upon receipt for grading and remediation, if necessary. Upon successful completion of the knowledge-based portion of the program, OJT must then be scheduled and administered by the training support staff or the operating group's field foreman or supervisor, if necessary. The trainee is allowed and encouraged to make use of the current operating procedure during the OJT exercise, but is not permitted to make use of the OJT checklist. The checklist is to be completed and signed by the trainee, trainer, and the appropriate WMRAD section supervisor. All elements of the training program must be successfully completed and documented before granting qualification or allowing an operator or technician to work independently.

To keep the training programs current, managers in WMRAD are required to work closely with training personnel to keep them up to date on procedure or process changes. Using the services of a documentation management center, procedures generated or revised by WMRAD are issued to management, the operating organization, and the Training Department. When the Training Department receives the revision or addition, the formalized training development begins. The Training Department is required to develop and issue the formal revisions to operations training material within 60 days of the procedure issue date. However, during the process change time and the time required to develop training material, the waste management supervisor must ensure that employees have the most current information to perform their duties. To achieve this goal, the WMRAD field supervisor briefs employees on any changes before that shift assignment. This briefing is documented and kept in individual files to assure that personnel have been

notified of such changes. The control of procedures and training in this manner ensures facility managers that employees are performing their duties with the latest information. Additionally, by using this performance-based training approach the ongoing and continuing training programs are maintained and updated to reflect changes to policies and procedures as they occur.

THE WMRAD TRAINING PLAN

This training plan provides employees with a current listing of what training is required or suggested to qualify within each operating group. If training is required, the trainee must complete that portion; if suggested, qualification may be granted without completion, although typically the trainee will complete suggested training during his or her employment. The plan also details the content and structure of the ES&H regulatory training, the regulatory source used in determining the requirement, the audience required to attend, the approach used in conducting the training, and any testing or exercises required to be completed by the participant. With the requirements outlined and available to each employee within WMRAD, there is less confusion regarding training requirements. To make the plan user-friendly, tables have been prepared that outline each group's required ES&H regulatory, performance-based, and division training requirements. Examples of such training requirements are shown in Tables I and II. Additionally, contacts are listed in the plan to assist personnel with specific questions regarding training issues.

CONTROL OF THE PROGRAM

To control a program of this magnitude, it is essential to have current information on each employee. The WMRAD Training Department is matrixed to the division Personnel Department. Summary reports are issued to provide the Training Department with an updated list of new employees and transfers within the division. The list is reviewed by the training manager and training assignments are then issued. To track the training and reassignment of each operator, technician, supervisor, foreman, manager, and support person, it is essential to have a data base management system that is versatile. To manage the volume of training for WMRAD operating personnel, daily entry and maintenance of the system is required. The data base management system used by the WMRAD Training Department is capable of generating the various reports required to keep personnel in qualification and generate additional reports requested by management. The system operator currently generates an average of 25 reports per month. These reports range in level of detail from one to several hundred pages. Reports are distributed to management to keep them informed of progress as well as monthly and quarterly deficiencies. Weekly reports are issued to the training manager to ensure the smooth flow of information between the operating groups and management.

In addition to the maintenance and development of the data base system, the WMRAD Training Department provides services to the operating organizations including scheduling, rescheduling, and confirmation of training from other organizations.

CONCLUSION

Applying performance-based training in the WMRAD is complex but rewarding. Performance-based training provides a program that is comprehensive and detailed enough to ensure safe operations at DOE facilities. Performance-based training provides a program that remains current and keeps information flowing for all staff members who have a need to know. By using performance-based training, management ensures that all current, relevant information is passed on to the personnel performing the tasks. The structured training system used at ORNL has added an element of pride in the operations organizations as tasks are performed accurately and safely. WMRAD audits of training and training material have become less complex and very successful. Having a plan to identify needs, requirements, and control and documentation assists the employer and supervisors in tracking their training requirements and also assists the auditors in evaluating how those requirements are met.

The author wishes to express her gratitude to E.D. Copenhaver and J.L. Pierce, who assisted in the technical review and preparation of this document.

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TABLE I
ESH Regulatory Training for the Group

Title	Manager	Supervisor/ Foreman	Technical Staff	Operator	Technician	Administrative Staff	Retraining/ Frequency
General Employee Training	R	R	R	R	R		R-2 year
Radiation Workers		R	R*	R	R		R-2 year
ALARA (As Low As Reasonably Achievable)	S	S	S	S	S		S-2 year
Radiation Work Permit	S	R	S				As needed
Resource Conservation and Recovery Act (RCRA)	R	R	R	R	R		R-Annual
SARA/OSHA Basic Training for General Waste Site Workers	R	R	R	R	R		R-1 time
SARA/OSHA Training for Managers and Supervisors	R	R	R*				R-1 time
SARA/OSHA Annual Refresher Training	R	R	R	R	R		R-Annual
Solid Low-Level Waste Generator Training	S	R	S	R	R		R-2 year
Transuranic Waste Generator Training	S	R	S	R	R		R-2 year
Satellite Waste Generator Training	S	R	S	R	R		R-Annual
Waste Minimization Training	S	S	S	S	S		
Department of Transportation Training	R-1	R-1	R-1	R-3	R-3		R-2 year
Forklift Training		R		R	R		R-3 year
Lockout/Tagout for Authorized Personnel,	R	R	S	R	R		R-Annual
Safety Work Permit	S	S	S				As needed
Industrial Safety for Supervisors	S	S	S				S-2 year
Confined Space Training (Module A)	R	R	S	R	R		R-2 year
Confined Space Training (Module B)	R	R	S	R	R		R-2 year
Confined Space Training (Module C)	R	R	S*				R-1 time
ORNL Respiratory Protection Training	R	R	R	R	R		R-Annual

WMRAD TRAINING FOR THE GROUP								
Title	Manager	Supervisor/ Foreman	Technical Staff	Operator	Technician	Administrative Staff	Retraining/ Frequency	TMIS No.
CPR	R	R	R	R	R		Annual	1952
First Aid	R	R	R	R	R		3 year	2855
Emergency Response Training (ERT)	R	R	R	R	R		Annual	

TABLE II
PUE Qualification Training for the Group

Title	Manager	Supervisor/ Foremen	Technical Staff	Operator	Technician	Support Staff	Retraining/ Frequency	TMIS No.
Hazardous Waste Operations Manual (401)	R**	R**	R	R	R		R-2 year	7492
Hazardous Waste Identification and Classification Procedure (401.1)	R**	R**	R	R	R		R-2 year	7281
Hazardous Waste Packaging and Off-Site Shipment (401.2)	R**	R**	R	R	R		R-2 year	921
Bldg. 7667, Chemical Detonation Facility Operating Procedure (401.4)	R**	R**	R	R	R		R-2 year	7261
Pressurized Drum Handling Procedure (401.5)	R**	R**	R	R	R		R-2 year	2803
Chemical Decontamination Operations Procedure (401.6)	R**	R**	R	R	R		R-2 year	7263
Hazardous Waste Packaging and On-Site Transfer Procedure (401.7)	R**	R**	R	R	R		R-2 year	7265
Building 7651, Clean Oil Storage Pad Operating Procedure (401.8)	R**	R**	R	R	R		R-2 year	7283
Building 7652, Hazardous Waste Storage Facility Operating Procedure (401.9)	R**	R**	R	R	R		R-2 year	7285
Building 7653, Chemical Waste Storage Facility Operating Procedure (401.10), etc.	R**	R**	R	R	R		R-2 year	7287

OJT QUALIFICATION TRAINING FOR THE GROUP								
Title	Manager	Supervisor/ Foreman	Technical Staff	Operator	Technician	Support Staff	Retraining/ Frequency	TMIS No.
Identifying And Classifying Hazardous Wastes (401.1)		R*	R		R		R-2 year	7282
Prepares/Ships Bulk Package [200.10] (401.2)		R*		R	R		R-2 year	1826
Prepares/Ships Lab Packs [200.20] (401.2)		R*		R	R		R-2 year	1827
Performing Facility Operations at Building 7667, Chemical Detonation Facility (401.4)		R*		R	R		R-2 year	7262
Handles Pressurized Drums/Nonradioactive Waste Drums [500.10.10] (401.5)		R*		R	R		R-2 year	6061
Handles Pressurized Drums/Radioactive Waste Drums [500.10.20] (401.5)		R*		R	R		R-2 year	6062
Handles Pressurized Drums/Vents Nonradioactive Pressurized Drums [500.20.10] (401.5)		R*		R	R		R-2 year	6063
Handles Pressurized Drums/Vents Radioactive Pressurized Drums [500.20.20] (401.5)		R*		R	R		R-2 year	6064
Performing Chemical Decontamination Operations As Required in Site Emergencies (401.6)	R	R*		R	R		R-2 year	7264
Packaging and Transferring Hazardous Waste at ORNL (401.7), etc.		R*		R	R		R-2 year	7266

R- Required training.
S- Suggested training.
1- D.O.T. Level 1.
3- D.O.T. Level 3.
*- Job-specific.
**- Exempted if author or approver.