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BUILDING THE BASIS FOR A COMPREHENSIVE RADIATION PROTECTION PROGRAM FOR A MULTI-PROGRAM LABORATORY

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ABSTRACT

During the last two years an explicit, workplace-specific training has been developed, implemented and documented for all radiation workers. In addition to the radiation worker personnel located at reactors, accelerators, radiochemical laboratories, and waste treatment areas, we have been extending training to other personnel who work in areas where a lesser potential for radiological/chemical exposure exists. These additional workforces include construction crews, site restoration crews, contracted special services such as scoping and site characterization teams, and short-term visitors. Based on these needs, we have been developing a comprehensive, integrated approach to radiation protection training suited for a multi-purpose research laboratory such as the Oak Ridge National Laboratory.

INTRODUCTION

Requirements for technical environmental health and safety training are ever increasing, creating a complex and overlapping training environment for all DOE contractors. Figure 1 shows just how rapidly the health and environmental regulatory picture has been changing. Though our radiation protection training mandates come directly from DOE Orders, the DOE Orders[1] reflect this growth in health and environmental regulation over the last two decades and are changing to match the increasing attention to health protection, risk assessment, information and training as related to personal, corporate and governmental responsibility.

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[1]U.S. Department of Energy Orders 5480.5, 5500.2, 5500.3, 5481.1B, and 5480.2.

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TRAINING ORGANIZATIONAL STRUCTURE

The responsibility for Environmental, Safety and Health (ESH) Training is coordinated through the Technical Resources and Training (TRT) Program of the Environmental Compliance and Health Protection Division. This includes training related to radiation protection, hazardous materials, industrial hygiene, safety, and environmental management. By placing this training program in an interactive role with the technical staff responsible for compliance and guidance in the above subject areas, access to the daily operational concerns and compliance needs is assured. This is clearly an evolving program, and not yet fully developed or implemented.

Flexibility in coordination, content, and delivery is key to the successful implementation of an environmental, safety and health training program at ORNL. In coordinating the training efforts, it is necessary to advise the individual organizations or facilities on the regulatory needs for training and on the specific components of a satisfactory program. TRT may also develop and implement the needed programs for the organizations. In some instances, training from outside contractors may be substituted for in-house training. When this occurs, TRT approves its use and examines the appropriateness of the course offered. Through this function we also provide some consistency in the training content presented, while addressing the subject areas at several levels.

Because this is a developing program, it is a continuing process to determine when to implement training and what level of content to present.

RADIATION PROTECTION TRAINING

ORNL radiation protection training has been developing into three major areas: (1) training the radiation protection technicians; (2) training the radiation workers, including those at the nuclear facilities, construction forces, and other subcontractors operating on-site; and (3) on-going awareness training for the general employee.

RADIATION PROTECTION WORKERS

At ORNL the radiation protection staff serves a vital role in protecting personnel and their surrounding environment from the hazards of radiation. These individuals rely on their technical knowledge, skills, and work-related experience to survey and monitor various project-related activities. In addition to performing surveillance tasks they must also provide guidance in project design, development, and implementation. These combined

efforts assure that protective measures are taken in accordance with applicable standards and regulations. Those needs, although not totally inclusive, are outlined in Table 1.[2]

A crucial element that enhances the skills of the worker is the ORNL performance-based training program.[3] The program incorporates job-specific information on the diverse facilities and activities monitored with basic fundamentals of radiation protection. Successful completion of this program includes passing both a qualification exam and an on-the-job skills review.

The technicians providing on-site radiation protection coverage have completed their qualification training; and the technicians providing personnel monitoring have begun work on formal qualification. Because the groups providing personnel monitoring services are responsible for the thermoluminescent dosimetry badging, the whole-body counter, the radioassay laboratory, dosimetry records, and the calibration facility, very specific training is required. Some off-site training is being used to fulfill some of these training requirements.

RADIATION WORKERS AND GENERAL EMPLOYEES

At our Laboratory, the wide range of activities and types of facilities in the individual operating and research organizations create widely varied needs in radiation protection. Our TRT training staff interacts with the organization's training coordinators and our radiation protection staff assigned to those organizations to develop these programs. Some are required to meet the training mandates of the Reactor and Nonreactor Nuclear Facilities training orders,[4] but others are not as specifically ordered.

To date, information on radiation protection has been developed at three different levels of detail to meet the needs of the various work groups within these divisions. We are attempting to develop a training program designed to the needs of each operating group, whether or not they are operating reactors

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[2]J. S. Abercrombie and B. C. Thorpe, "Preparing the Radiation Protection Worker to Meet Multiple Needs," to be published in Proceedings of the Oak Ridge Model Conference, October 13-16, 1987, Oak Ridge, Tennessee.

[3]Copenhaver, E. D. and others. Technical Qualification Requirements and Training Programs for Radiation Protection Personnel at Oak Ridge National Laboratory. ORNL/TM-10119, Martin Marietta Energy Systems, Inc., Oak Ridge National Laboratory, April 1986.

[4]U. S. Department of Energy Orders 5480.5, and 5480.6.

or non-reactor nuclear facilities. We are now offering training to members of fifteen ORNL organizations.

Because of the increasing work on monitoring and characterization of the laboratory environment and the resulting potential for contamination during this work, we have implemented training on several levels for ORNL workers and subcontractors in construction-related work.[5,6] In this first year of the program, many subcontractors have received one or more levels of this training.

The orientation level general employee training is now being given to all new employees at ORNL.[7,8,9] There is a need to retrain existing employees, but most of them will receive more specialized training as we work directly with the individual organizations.

RETRAINING OPTIONS

Because Technical Resources and Training is a relatively new program, retraining has not been a major focus of our training agenda to date. We are considering two retraining options:

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[5]Edith Jones, "Contingency Planning and Emergency Response in Construction Activities: Training the Construction Worker," to be published in Proceedings of the Oak Ridge Model Conference, October 13-16, 1987, Oak Ridge, Tennessee.

[6]Edith Jones and D. Allen White, "Keeping Safety and Health Up Front: Training For Project Planning and Implementation," to be published in Proceedings of the Oak Ridge Model Conference, October 13-16, 1987, Oak Ridge, Tennessee.

[7]Emily Copenhaver and Benny Houser, "Radiation Protection Training For Diverse General Employee Populations," ORAU-280, Oak Ridge Associated Universities, March 1987.

[8]D. Allen White and Emily Copenhaver, "General Employee Training: Course Development and Implementation," to be published in Proceedings of the 11th Annual Training Resources and Data Exchange (TRADE) Conference, October 26-28, 1987, Atlanta, Georgia.

[9]Edith Jones and Emily D. Copenhaver, "General Employee Training: Initial Needs Assessment," to be published in Proceedings of the 11th Annual Training Resources and Data Exchange (TRADE) Conference, October 26-28, 1987, Atlanta, Georgia.

- Intermittent training followed by re-examination, or
- Re-examination followed by remedial training.

We will use the first option for the more comprehensive courses and the second option for shorter, more general courses. In the Radiation Protection Technician Program, the intermittent training will be addressing new tasks and issues such as using the computer to do many of the radiation record-keeping functions, combined with iteration of basic principles. In the General Employee Training Program, we are including the updating of the general program where the specific job-related training is updated. For those personnel who do not require additional specific job-related training, we are considering re-examination on the basic information, followed by retraining for those who score below 70 of 100 points.

SUMMARY

A comprehensive, integrated approach to radiation protection training suited for a multi-purpose research laboratory has been developed by using consistent criteria for training content, testing, and documentation. However, retaining flexibility in the coordination, content and delivery of the programs has been necessary. The program is currently being implemented. Retraining options are also being considered and the most suitable of those implemented.

Table 1. Radiation Protection Needs at ORNL

A. SURVEILLANCE TASKS

1. Routine Surveys
2. Job-Site Monitoring
3. Personnel Monitoring

B. ADMINISTRATIVE TASKS

1. Equipment Clearances
2. Zoning Determinations
3. Shielding Calculations

C. OPERATIONAL SUPPORT TASKS

1. Laboratory Operations
2. Construction Projects
3. Plant Emergencies

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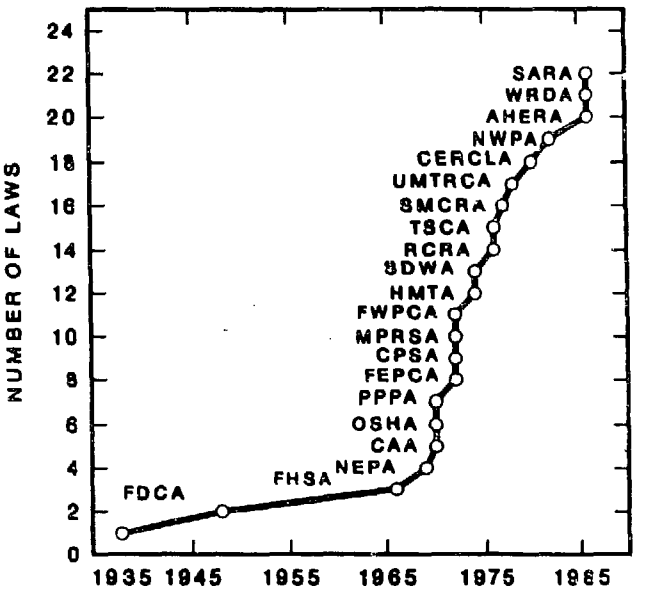
Figure 1

GROWTH OF HEALTH AND ENVIRONMENTAL PROTECTION LAWS



FDCA	- FEDERAL DRUG AND COSMETICS (1938)
FIFRA	- FEDERAL INSECTICIDE, FUNGICIDE, AND RODENTICIDE (1948,1972, 1975, 1983)
FHSA	- FEDERAL HAZARDOUS SUBSTANCES (1966)
NEPA	- NATIONAL ENVIRONMENT POLICY (1969)
PPPA	- POISONIOUS PACKAGING PREVENTION (1970)
OSHA	- OCCUPATIONAL SAFETY AND HEALTH (1970)
CAA	- CLEAN AIR (1970, 1977)
FWPCA	- FEDERAL WATER POLLUTION CONTROL (CLEAN WATER) (NOW WATER QUALITY) (1972, 1977, 1987)
MPRSA	- MARINE PROTECTION, RESEARCH, AND SANCTUARIES (1972)
CPSA	- CONSUMER PRODUCT SAFETY (1972)
FEPCA	- FEDERAL ENVIRONMENTAL POLLUTION CONTROL (1972)
SDWA	- SAFE DRINKING WATER (1974,1977, 1986)
HMTA	- HAZARDOUS MATERIALS TRANSPORTATION (1974, 1984)
RCRA	- RESOURCE CONSERVATION AND RECOVERY (1976, 1979)
TSCA	- TOXIC SUBSTANCE CONTROL (1976)
SMCRA	- SURFACE MINE CONTROL AND RECLAMATION (1977)
UMTRCA	- URANIUM MILL TAILINGS RADIATION CONTROL (1978)
CERCLA	- COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION, AND LIABILITY ACT (1980)
NWPA	- NUCLEAR WASTE POLICY ACT (1982)
AHERA	- ASBESTOS HAZARD EMERGENCY RESPONSE ACT (1986)
WRDA	- WATER RESOURCES DEVELOPMENT ACT (1986)
SARA	- SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT (EXTENSION OF CERCLA) (1986)

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