

HAZARDOUS MATERIALS MANAGEMENT AND EMERGENCY RESPONSE TRAINING CENTER AT HANFORD

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ABSTRACT

The Hanford Site will provide high-fidelity training using simulated job-site situations to prepare workers for known and unknown hazards. Hanford is developing the Hazardous Materials Management and Emergency Response (HAMMER) Training Center to operate as a user facility for the site, region and international labor unions. The center will focus on providing hands-on, realistic training situations. The Training Center is a partnership among U.S. Department of Energy (DOE); its contractors; labor; local, state, and tribal governments; Xavier and Tulane Universities of Louisiana and other Federal agencies. The hands-on training aids at HAMMER is justified based on regulatory training requirements, the desire for enhanced safety, and the commitment to continuous improvement of training quality.

INTRODUCTION

The Hazardous Materials Management and Emergency Response (HAMMER) Training Center will provide state-of-the-art training in occupational safety and handling toxic hazardous materials. It will serve as the missing link between classroom and on-the-job training. HAMMER has created the strongest partnership with labor and other stakeholders within the U.S. Department of Energy (DOE). This partnership will serve DOE well in the cleanup of the Hanford site. The 80-acre hands-on training and education facility for hazardous material workers will operate as a demonstration model for cleanup across the DOE complex. HAMMER is needed for the next 30 years at Hanford where the main activities will involve the handling and cleanup of toxic substances.

DOE must meet its high standards for safety for the thousands of workers involved in these activities with systematic training appropriate to their tasks and the risks associated with these tasks. HAMMER will meet the challenge with explicitly designed hands-on, practical training in realistic situations for radioactive and mixed hazardous-radioactive materials. Tulane and Xavier Universities of Louisiana will provide the educational leadership for the development of a workforce skilled to work safely and effectively in hazardous environments. They will focus on the development, testing and evaluation of curricula. Skills based training programs will be developed utilizing new and innovative training and educational methods. These methods include; hands-on, performance based techniques; the use of functional equipment and instrumentation; competency-based testing and continuing education. Programs will be offered at the associate, bachelors and graduate degrees.

HAMMER will link fundamental training programs to advanced training programs that teach skills required for transferring cutting edge technology in waste management to industry and vice-versa. Courses will be offered to graduate students in environmentally oriented programs, including scientists and graduate students who are involved in research on hazardous materials and the commercialization of technology.

HAMMER creates a partnership among DOE; its contractors; labor; local, state, and tribal governments; and selected institutions of higher education. The Hanford Atomic

Metal Trades Council (HAMTC) and the Central Washington Building and Construction Council give their undivided support of the training center along with five International Union Presidents.

BACKGROUND

HAMMER is a joint initiative between DOE and local officials. Recent federal and state laws require specific training for all persons who may work with or come into contact with hazardous materials. Foreseeing this, local government officials explored the idea of a central specialized shared-training facility with the Hanford Site. The Tri-County Fire Commission and the Benton-Franklin Regional Council requested that DOE conduct a feasibility study of HAMMER through Congressman Sid Morrison.

The DOE subsequently asked Westinghouse Hanford Company (WHC) to evaluate the HAMMER Training Center proposal. The evaluation, completed in November 1989, found HAMMER to be feasible. This study found that within the United States only a small number of facilities provide integrated technical training in a hands-on environment. This is grossly inadequate to train the thousands of people who require training at Hanford and throughout the Northwest region (8).

Public concern about hazardous material shipments is high and well documented in the Northwest. Recent public surveys showed that the public does not support the transportation of waste to and from the Hanford Site. These surveys found that more than 56% of Washington and Oregon state residents believe that leaving waste at the Hanford Site is safer than transporting it for permanent disposal. The states believe HAMMER could solve many of these transportation emergency response concerns. As such, the state representatives actively participate in HAMMER and are members of the HAMMER Steering Committee (2). Tribal governments are often not prepared to respond to radiation accidents on their reservations, as documented in a 1990 Nuclear Regulatory Commission survey (6). Tribal emergency response concerns have continually been raised to DOE. HAMMER will address many of the tribal needs for emergency response training (2).

Labor has joined the HAMMER partnership. The HAMTC and the Central Washington Building and Construction Council give their undivided support of the training center. On an international level, support has been secured from Sheet Metal Workers International Association, Oil Chemicals and Atomic Workers, International Union of Operating Engineers and Operative Plasterers' Cement Masons' International Association of the United States and Canada and the United Brotherhood of Carpenters. Unions want to share in the HAMMER core programs, props, and facilities using their own specialized trainers, training programs, and props as valuable adjuncts to the core program (2).

Analyses as part of the original feasibility study combined with dated from additional users also indicate that there is considerable demand for a training facility such as the HAMMER Training Center. Estimates of the magnitude of this demand are as follows (7, 2, 8):

- Potential DOE and contractors' students:
 - 4,000 Hanford Site workers handling hazardous materials (plus retraining/turnover)
 - 150 Hanford fire fighters and emergency responders
 - 250 Mutual Aid responders that respond to Hanford emergencies.
- Other Federal agencies, state, tribal and local workers and responders beyond the Hanford Site work force:
 - 30,000 Potential hazardous materials workers and fire fighters
 - 1,800 Hazardous materials responders
 - 5,000 "Niche" training drawing nationally
 - 800 Hazardous materials incident commanders.
- Organized labor and others beyond the permanent Hanford Site work force:
 - 20,000 Organized labor
 - 1,000 Responders, scientists, and technicians
 - 10,000 Private, public, and other government sectors.

ENHANCED SAFETY, CONTINUOUS IMPROVEMENT, AND REGULATORY REQUIREMENTS

The hands-on props at HAMMER can be justified based on regulatory training requirements, the desire for enhanced safety, and commitment to continuous improvement of training quality. All three elements must be considered because the regulations tend to describe broad goals but lack detailed guidance. The diversity of hazards, settings, and work tasks in environmental cleanup operations and the uncontrolled nature of the pollutants call for more in depth and focused skill training. The comprehensive HAMMER Training Center will permit the combination of classroom lecture for providing basic knowledge and hands-on skill development and in settings that can provide challenges similar to those in the actual work environment.

HAMMER can ensure the following:

- Provide training appropriate to Hanford Site needs

- Create a highly-skilled work force for meeting the cleanup needs of the broader complex
- Support the diversification of the regional economy surrounding the Hanford Site.

A high quality of performance on the part of Hanford Site workers and others trained is expected as the outcome of the following central characteristics of the training program formula provided by the HAMMER Training Center:

- Focus on the hazards and tasks associated with hazardous and radiological materials management and emergency response pertinent to DOE site cleanup and restoration activities
- Accreditation of training for DOE site cleanup activities that will establish standards
- Hands-on, true-to-the-work-setting experience provided by the HAMMER props.

These three characteristics of the HAMMER Training Center concept serve to ensure that the regulatory standards also will not become "a ceiling as well as a floor" with respect to the training provided to Hanford Site workers and others. This is fitting and proper because of DOE's commitment to continuous improvement in the operation of its sites, and the recognized need to prepare workers as completely as possible for dealing with the known and unknown hazards associated with environmental cleanup and restoration (8).

In March 1989, Title 29 Code of Federal Regulations Occupational Safety and Health Administration 1910 rules and National Fire Protection Association (NFPA) Standard 472 defined professional requirements for responders to hazardous materials incidents. Two general types of training are addressed for hazardous materials; 1) training for hazardous waste site workers, and 2) training for emergency response organizations. Site workers include both workers and managers. Emergency response organizations include fire departments, law enforcement agencies, emergency medical services organizations, and others (7).

The law requires training at various levels for essentially all persons who may work with or come into contact with hazardous materials. The regulations cover private enterprises and federal, state, and municipal governments. The law went into effect in March 1990 (7). These new requirements are driven by the Superfund Amendments and Reauthorization Act of 1986 (SARA) Title II rules, which identify far-reaching training requirements for emergency planning, community "right-to-know" education, and emergency response (7).

NFPA Codes and Standards are written to ensure that minimum safety and health standards are specified for the organization, training and education, vehicles and equipment, protective clothing and equipment, emergency operations, facility safety, and medical requirements of fire departments. Meeting these training standards, particularly those that have a requirement to demonstrate by actual use, entails the use of facilities ranging from class rooms and administrative space to highly specialized hands-on structures (3).

On November 16, 1990, the Hazardous Materials Transportation Uniform Safety Act (HMTUSA) of 1990 was signed into law (5). It has several new provisions for emergency response planning and training. HAMMER will help comply with the planning and training provisions of the HMTUSA. It will be designed and built to allow flexibility and adaptability

to meet the national emergency response curriculum being developed (8).

ARMY CORPS OF ENGINEER WILL DESIGN AND CONSTRUCT HAMMER

The important feature of **HAMMER** will be its capability to provide high-fidelity training situations using the various props and simulated job-site conditions. The importance of the training props for quality training is supported by the literature on the bases of training effectiveness and high levels of transfer from training to the actual job. Props and simulations can serve to provide the immediate and precise feedback that is important to the speed and retention of learning. **HAMMER** also affords the opportunity to observe students actually performing skills and tasks allows for a more objective evaluation.

The Army Corps of Engineers (Army Corps) will design and construct the **HAMMER** Training Center. The budget planning cycle will be compressed. The Army Corps is currently finalizing the functional design criteria and construction management plan outlining a streamlined process for design and construction. The Army Corps has also participated in a tour of diverse federal, labor, and private training centers across the country for design information and lessons learned to build a state-of-the-art facility (1).

The functional design criteria was developed with significant input from the site, region, state and national users. The criteria was then validated through a series of small group interviews with representatives of future **HAMMER** trainee populations to further refine the functional design criteria. Additional information for use in developing the **HAMMER** facility design concept was also obtained. Eleven separate interview sessions were conducted with 24 managers/engineers and 37 workers involved in the planning, supervision and training, and site work related soil and water cleanup, solid waste cleanup, tank farm operations and cleanup, facility decontamination and decommissioning, emergency response, and hazardous wastes transportation.

Realism for hands-on training will be obtained via simulated hazardous material handling and incident sites. The scenarios will include props, hazardous materials transport and storage equipment mockups, and emergency response equipment to simulate potential incidents given various conditions. The field training laboratories and props will be multipurpose and flexible. Hazardous materials props include the following:

- Buried and above ground tank props
- Well sampling station
- Characterization remediation site and trench site
- Buried simulated wastes
- Equipment decontamination pad
- Junction diversion box with tank
- Craft specific indoor training buildings
- Simulated flammable liquids and gases training facilities, and props
- Radiological training props
- Generic hazardous materials holding and transportation props (i.e., petroleum tanks, tank trucks, rail cars, and pipelines)
- Spill containment simulation area

- Laboratory area for chemical compound training and laboratory emergency response training
- Respiratory equipment training facilities.

Hanford Fire Department and mutual aid fire department training will be incorporated into **HAMMER**. A new facility is needed to fully and adequately train and test fire department personnel in all aspects of fire suppression, rescue, salvage, and hazardous material incident control and mitigation. The limited training facilities currently available to the Hanford Fire Department are lacking the hands-on training aids that **HAMMER** can provide, such as (3):

- Flammable solids burn, liquid and gas burn pads
- Training tower with live fire capability on one or two floors
- Simulations of laboratory and process spaces
- Mock-up doors, windows, and roof structures
- Hazardous material spill or leak containment area
- Driver and fire evolution training and testing area.

Practical exercises will allow various entities responsible for management, control, and recovery to work together. The proposed facility will also be sited to allow construction and simulation of tunnel and bridge incidents, which can limit access by responders and complicate control and recovery operations. Support facilities are required including ten classrooms, administrative offices, lunchrooms, shower rooms, runoff containment and separation facilities, ample parking space, and appropriate storage areas.

TULANE AND XAVIER UNIVERSITIES OF LOUISIANA

As a major component of **HAMMER**, Tulane and Xavier Universities of Louisiana will provide education leadership for the development of a DOE workforce skilled to work safely and effectively in hazardous environments associated with cleanup. These two universities are among the top four universities in the country involved in environmentally related research programs. The Tulane/Xavier Center for Bioenvironmental Research (CBR) is an interdisciplinary collaborative team in scientific and policy research providing the needed scientific resource base and a prime host for **HAMMER**. The CBR's nationally recognized educational programs will be piloted at Hanford to ensure an effective and productive future DOE workforce. Tulane/Xavier's expertise brings a valuable focus on human health issues.

Special attention will be focused on gaps in current training/educational programs. A curriculum will be designed which will utilize new training and assessment techniques that assure the cost effectiveness of the **HAMMER** programs. Typically, courses will be designed in "block" fashion, so they might be taken in self-contained units and offered by Union and other quality training providers. This design will support continuing education programs and will be integrated into higher education curricula. The Hanford Site will serve as the pilot DOE site for program implementation.

The **HAMMER** program will also facilitate the retraining of individuals in environmental restoration and waste management. Safety training for environmental restoration and waste management will be integrated into worker training/education programs and precollege programs at Hanford in response to

requests from Union Leadership. Tulane/Xavier's expertise brings a valuable focus on non-traditional education.

Associate, Baccalaureate, Bachelors, Masters, and Doctoral programs will be developed. Basic training programs will be linked to advanced training programs required for transferring cutting edge technology in environmental restoration and waste management to industry. Courses will be offered to students in environmentally oriented programs and to scientists and graduate students who are involved in research on hazardous materials and the commercialization of technology. To meet current urgent needs, Tulane/Xavier will collaborate with Columbia Basin College, Pasco, Washington, to provide a seamless curriculum for students seeking Bachelor's Degrees in Environmental Management.

There are currently 250 graduates from Columbia Basin College's two year Hazardous Waste Technician program who need access to a Bachelors Degree Program in Environmental Management.

HAMMER TEMPORARY FACILITY

A temporary facility has been secured for HAMMER through the Port of Benton's incubator program. This temporary facility has three classrooms to serve the Union Grantees training their workers through a DOE/National Institute of Environmental Health Sciences Grant. These nationally recognized programs for the Hazardous Waste Operations, Westinghouse School of Environmental Excellence, Columbia Basin College courses in Hazardous Waste Technician and other training and education programs. The temporary facility also houses the small HAMMER Organization including project, program and outreach.

HAMMER OPERATES AS A PARTNERSHIP WITH THE STAKEHOLDERS

HAMMER will operate as a partnership. Oversight and policy for HAMMER will be at the direction of the HAMMER Steering Committee. The Steering Committee is made up of representatives from HAMTC, Building and Construction Trades Council, Oil, Chemical and Atomic Workers Union, International Union of Operating Engineers, Operative Plaster's and Cement Mason's International Association, Washington and Oregon state, the Confederated Tribes of the Umatilla Indian Reservation, Yakima Indian Nation, Nez Perce Tribe, various local governments, the fire service, and community development.

Labor has a compelling interest and has demonstrated competency in HAMMER-type training. Labor adds valuable expertise and resources, including knowledge from lessons learned and nationally recognized training programs. The participation of Labor also provides economies of scale and broadens the support for the necessary capital and operating funds. Broad-based support has been secured from many individual unions and major labor councils (2). Five International Union Presidents currently preside on the Steering Committee.

The Federal Emergency Management Agency is interested in using HAMMER as their West Coast National Fire Academy. As such, the Federal Emergency Management Agency will bring their courses to HAMMER which will provide the fire service industry more regional access and relieve the overloading at National Fire Academy in Maryland. Meetings with the Environmental Protection Agency (EPA) found

a strong need within the Agency for access to a hands-on training center and expressed support for the concept and interest in using HAMMER. A senior EPA official sits on the HAMMER Steering Committee. The Department of Transportation has emergency response training money from the new HMTUSA. Early discussions with the Department of Transportation indicate interest in considering the use of the HAMMER facilities as a pilot project for the HMTUSA. A senior Department of Transportation official also sits on the HAMMER Steering Committee.

THE ASSOCIATED HAMMER COSTS

DOE will include a capital budget line item funding to begin in Fiscal Year (FY) 1995 for project/construction management detailed design and construction. The costs were estimated by the Army Corps at 29.5 million over three year period. An itemized cost estimate was prepared for 40 items, including building and props; construction management, and planning, engineering and design. The costs are estimated for a compressed construction schedule to implement HAMMER in parallel with DOE's substantial efforts to develop its site training programs and related props and facilities in support of the waste cleanup programs. Long term operating costs are being finalized at this time.

During FY 1994, expense funds will be used to complete preliminary design, formalize the partnership arrangements with labor, states, and local organizations; identify and pursue additional Federal, state, and private partnerships; develop education programs with Xavier and Tulane; continue the outreach with labor, states, tribal, and local government officials; operate a temporary facility; and continue the specialized training activities for Northwest responders.

The Hanford Site spends over \$50 M/yr training 17,000 employees without adequate props or classroom space. HAMMER will represent less than 6% increase in cost for significant increases in the productivity and safety associated with state-of-the-art props. The costs associated with inadequate training are increased health and safety risks including occupational fatalities as identified by the Office of Technology Assessment (4).

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