

**DEVELOPMENT AND IMPLEMENTATION OF TRAINING
PROGRAMS FOR HAZARDOUS SUBSTANCES**

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INTRODUCTION

In 1988, the National Institute for Occupational Safety and Health (NIOSH) entered into an Interagency Agreement with the National Institute of Environmental Health Sciences (NIEHS) to conduct a continuing education program in hazardous substance training. The authority for this program is established in Section 311 (a)(1)(B) of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) of 1980 as amended by Section 209 of the Superfund Amendments and Reauthorization Act (SARA) of 1986. In 1993, the program was expanded to include graduate academic training to further meet the needs of professional personnel. This program is being conducted through supplemental training grants to the NIOSH Education and Research Centers (ERCs).

TARGET AUDIENCE

As specified in SARA, the target audience is as follows:

1. State and local health and environmental agency personnel, and,
2. Other professionals engaged in the management of hazardous substances.

The training is intended to prepare professional personnel to properly carry out their responsibilities in the hazardous substance response and site remediation activities authorized by SARA. This workforce is in continuing need of training through continuing education courses as well as more intensive academic coursework with specialization in the occupational and environmental health and safety field.

HAZARDOUS SUBSTANCE CONTINUING EDUCATION PROGRAM (HST)

A. Program Characteristics

This program is a component of the continuing education program within the ERCs and includes the following elements:

- Coordination of training activities with Agencies responsible for cleanup, enforcement, and training of personnel under CERCLA/SARA and other relevant groups;
- A specific plan to develop and implement a program of instruction over the approved project period;
- A Project Director with demonstrated capacity for providing leadership in conducting training in the handling, managing, or evaluation of hazardous substances, and with education and/or experience in the hazardous substance field;
- A project staff with demonstrated experience and technical expertise to develop the curricula and provide quality training;
- The implementation of short courses and continuing education programs for State, and local health and environmental professionals and other professionals involved in evaluating, managing and handling hazardous substances; and
- Evaluation of the program that shall include a determination of whether the regional needs for training professionals are being met.

B. Program Update

A Request for Applications (RFA) was issued by NIOSH in March 1988. The RFA was reissued in March 2000 to update program requirements and funding. As of July 2009, twelve grantees listed in Table I are carrying out hazardous substance continuing education training programs.

Figure I lists the number of hazardous substance training courses offered by twelve ERCs and the number of trainee-days over the last 20 yr. period. A total of 2,358 courses have been offered consisting of 85,819 trainee-days. Overall, 43,857 students have completed courses. Beginning in 1991, a portion of each award to the ERCs has been specifically earmarked for trainee tuition and fee support for state and other public sector professionals. This financial assistance continues to be awarded annually by grantees. NIOSH grantees provided student support to 1,194 trainees in the current reporting period.

Table II provides a listing of courses offered by the ERCs in the ERC budget period of July 1, 2008-June 30, 2009. Courses ranged from 0.3-5 days in length, covering a diversity of topics. Several ERCs provide 8 HR, 24HR and 40 hour courses of instruction including hands-on-training which meets the OSHA requirements (29 CFR 1910.120) mandated under SARA. The courses certifying hazardous materials managers continue to be offered by several ERCs; however, during this reporting period, some new courses were conducted, such as, Hazardous Response Excellence: Safety and Security Workshop; Health Risk Emerging Technology; Mold Recognition, Identification and Remediation; Making Foreclosure Rehabs Work; Radiological Hazards for Public Health Workers; Biosafety; and, Applied Industrial Toxicology. The California/North ERC continues to focus courses on pesticide exposures and pesticide control in the region and present courses to a very diverse working population. The Harvard ERC tailors courses to EPA and DOT employees in the Region. They continue to offer Basic and Advanced Cameo training along with courses, such as, Radiation Safety Officer Training for Laboratory Personnel, and a four-day course, entitled, Radiological Emergency Planning: Terrorism, Security and Communication. One course, Environmental Health and Safety Academy for Educational Institutions, was conducted in Houston by the Texas ERC. Three of the grantees also work jointly with NIEHS-sponsored Worker Health and Safety Training Programs by utilizing joint faculty and by providing support to state and local health and environmental professionals who attend these courses.

Courses continue to draw students from State and local governmental agencies. Profile data through 1994 from 2,343 students indicate that major employers were State Governments (22.4%), Service Industries (20.6%), Local Governments (17.2%), and Federal Government, excluding Military (6.9%). State and local governments and the private sector continue to provide most of the course trainees. No new data has been collected; however, grantees provide verbal updates at workshops and indicate that the targeted trainees continue to be State and Local Government employees.

HAZARDOUS SUBSTANCE ACADEMIC TRAINING PROGRAM (HSAT)

A. Program Characteristics

The purpose of this program is to offer a series of academic courses to prepare occupational safety and health professionals for practice, with a specialization in hazardous substances. The intent is to provide a concentration in the hazardous substance field within the academic curriculum. A 3-year developmental

period was provided to include a needs assessment, curriculum development, and program implementation. The program is intended to be a specialty area within the existing ERC Industrial Hygiene core programs. The program components include:

- A needs assessment directed to the overall contribution of the training program toward meeting the job market for qualified state, local and other professional personnel;
- A training plan to satisfy the regional needs for training;
- A formalized curriculum which includes minimum coursework toward achievement of a degree, training objectives, course descriptions, course content, and didactic and field experiences;
- A competent and experienced Program Director and staff; and
- A plan to evaluate the overall effectiveness of the training.

B. Program Update

A Request for Applications (RFA) was issued by NIOSH in August, 1992. Nine grantees were successful in receiving initial awards in February, 1993. During the first year, grantees began developing and conducting programs while carrying out needs assessments in their respective Regions. The RFA was reissued in April 2000 to update program requirements, terminology, and funding. A new review criterion was added calling for collaboration with state and Federal agencies, including EPA. As of July 2009, ten grantees listed in Table I are conducting academic training programs.

All grantees have developed an HSAT emphasis or concentration within existing programs. Trainees who enter this track must take a specific group of HSAT-related courses. Most grantees have developed new coursework and/or modified existing courses for this concentration. All trainees who are supported by the HSAT Program must successfully complete a 40-hour Hazardous Waste Operations training course, or equivalent, to meet the requirements of 29 CFR 1910.120 (e)(3)(i).

In the first full academic year (1993-94), approximately 30 students received support through this grant program. In the previous academic year (2008-2009), 42 students were supported. Table III provides a summary of recent grantee activities. The following table is a summary of grantee activities over the past 5 years (July 2004 - June 2009).

Year	# Academic Courses	# HSAT/ Total Students	# CE Courses/ HSAT Students	# HSAT Funded Students
04-05	72	184/1238	9/15	39
05-06	69	148/962	8/14	41
06-07	78	166/1197	7/16	42
07-08	82	170/1172	12/19	46
08-09	77	151/1137	5/8	42
Totals	378	819/5706	41/72	210
Mean	76	164/1141	8/14	42

2009 WORKSHOP SUMMARY

Twenty two Annual Workshops have been conducted and hosted by the grantees since the initiation of the program. The last workshop, held in Anaheim, CA on February 10, 2009 provided a forum for exchange of information and issues related to hazardous substance training. At this meeting 21 faculty and Continuing Education Program Directors from both the Hazardous Substance Training (HST) and Hazardous Substance Academic Training (HSAT) Programs met jointly to discuss their programs as well as emerging issues in the field.

Overviews and updates were presented by several Agencies and Organizations, including the National Institute of Environmental Health Sciences (NIEHS), which did not send representatives to the meeting but presented to the group via conference line, and the International Association of Fire Fighters (IAFF).

The NIEHS representatives presented background information on the Superfund Basic Research Program and interaction with the NIOSH HST/HSAT grantees. The representative from the Worker Training Program presented an update of the program including the naming of a new NIEHS Director, the funding status, the green jobs program, the upcoming terrorism conference held in Cincinnati in April 2009, earthquake and preparedness tools, SBIR and DOE update, and future directions.

The Program Director for the International Association of Fire Fighters (IAFF) outlined the background and status of the emergency response training program supported by NIOSH. This included a list of accomplishments regarding the number of trainees taking courses; revisions to the First Responder Operations course; the addition of new instructors as well as Canadian instructors; and the establishment of the Instruction Resource Center. Future plans are targeted to the development of a more structured feedback program for instructors; streamlining the registration process; continued work on the evaluation process; and, continuation of the recommendations from the 2007 Evaluation and Transfer Study.

There was a brief update and discussion of the NIOSH National Workforce Needs Assessment between grantees, NIOSH and staff from the advisory group who were at the meeting. The project is being

conducted using Westat, a Maryland contract research organization. The questionnaire is now being prepared for submission to OMB for approval. It follows the establishment of focus groups held throughout the country which targeted specific disciplines. It was agreed that this is an important step in driving future NIOSH training needs.

Several presentations were on the agenda at the meeting. The New York ERC/ HST Director presented the four -day toxic tour which has been a highlight of the HST program for the past several years. This tour also included a representative from NIOSH. Two presentations were made by occupational safety and health personnel from Southern California (one represented the Occupational Safety Solutions Organization). These included topics on pandemic flu and its impact on small businesses, and the training of longshoremen regarding the handling and management of hazardous substances at Los Angeles Ports.

Industrial hygiene and safety staff at Disneyland concluded the meeting with a presentation of their handling of hazardous materials and the importance of safety procedures at the resort. They discussed occupational health and safety issues and noted the variety of toxic materials present such as, asbestos, chromium laden paints and lead.

During the workshop, both the HST trainees and HSAT trainees broke into individual groups for their respective annual business meetings, following which summaries were presented when the groups reconvened. Highlights of the HST meeting included discussion of reporting procedures to NIOSH, the mandate to issue scholarship funds for state trainees, and the issue of conducting CCHM review courses using content materials from the Association of Hazardous Materials Professionals. The HSAT Directors requested more time for future business meetings in order to address academic and other issues. Minutes of both meetings were taken and will be made available to all Program Directors of NIOSH HST and HSAT programs.

At the conclusion of the meeting and at the request of NIOSH, the group agreed that a small subcommittee should be established to identify topics for future workshops in order to be of value in the development of the agenda.

PERFORMANCE SUMMARY

During the most recent year for which data is available, the following program outputs were established:

1. For the HST Program (2008-09 academic year)
 - 12 ERC grantees participated in the Program
 - 8,194 trainee-days of training were delivered
 - 136 courses were presented
 - 3,880 persons were trained
 - \$87 was the average cost/trainee-day*

2. For the HSAT Program (2008-2009 academic year)
 - 10 ERC grantees participated in the Program

- 78 academic courses were presented
- 1137 graduate students were trained, including 151 students receiving trainee financial support
- \$61,235 was the average cost/academic program*

*These costs are expressed in training grant award funds only and include the cost of trainee support.

Table I

**NIOSH Hazardous Substance Training (HST) and
Hazardous Substance Academic Training (HSAT)
Program Grantees - July 2009**

1. Grantee: Alabama Education and Research Center
University of Alabama at Birmingham
School of Public Health
1665 University Blvd.
Birmingham, AL 35294-0022

Center Director: R. Kent Oestenstad, Ph.D.
HST Program Director: Elizabeth H. Maples, Ph.D.
HSAT Program Director: Claudiu Lungu, Ph.D.

2. Grantee: Northern California Education and Research Center
University of California, Berkeley
School of Public Health
140 Warren
Berkeley, CA 94720-7360

Center Director: John R. Balmes, M.D.
HST Program Director: Barbara Plog, MPH

3. Grantee: Southern California Education and Research Center
University of California, Los Angeles
School of Public Health
650 Young Drive South
Los Angeles, CA 90095-1772

Center Director: William C. Hinds, Sc.D.
HSAT Program Director: Nola Kennedy, Ph.D.

4. Grantee: Cincinnati Education and Research Center
University of Cincinnati
Department of Environmental Health
3223 Eden Ave.
P.O. Box 670056
Cincinnati, OH 45267-0056

Center Director: Carol H. Rice, Ph.D.
HSAT Program Director: Carol H. Rice, Ph.D.

5. Grantee: Harvard Education and Research Center
Harvard School of Public Health
665 Huntington Avenue
Boston, MA 02115

Center Director: David C. Christiani, M.D.
HST Program Director: Stephen N. Rudnick, Sc.D.
HSAT Program Director: Stephen N. Rudnick, Sc.D.

6. Grantee: Johns Hopkins Education and Research Center
Bloomberg School of Public Health
Johns Hopkins University
615 N. Wolfe St.
Baltimore, MD 21205
- Center Director: Jacqueline Agnew, Ph.D.
HST Program Director: Mary Doyle, MPH
7. Grantee: Illinois Education and Research Center
University of Illinois at Chicago
School of Public Health
2121 W. Taylor St.
Chicago, IL 60612-7260
- Center Director: Lorraine M. Conroy, Sc.D.
HST Program Director: Leslie A Nickels, MEd
HSAT Program Director: Steven Lacey, Ph.D.
8. Grantee: Michigan Education and Research Center
University of Michigan
School of Public Health
1420 Washington Hts.
Ann Arbor, MI 48109-2029
- Center Director: Thomas G. Robbins, M.D.
HSAT Program Director: Stuart A. Batterman, Ph.D.
9. Grantee: Minnesota Education and Research Center
University of Minnesota
School of Public Health
Box 197, 420 Delaware St., N.E.
Minneapolis, MN 55455
- Center Director: Susan G. Gerberich, Ph.D.
HST Program Director: Ruth Rasmussen, MS, MPH
HSAT Program Director: Peter C. Raynor, Ph.D.
10. Grantee: New York/New Jersey Education and Research Center
Mt. Sinai School of Medicine
One Gustave L. Levy Pl.
P.O. Box 1057
New York, NY 10029-6574
- Center Director: Jacqueline Moline, M.D., MSc
HST Program Director: Mitchell Rosen, MS (Univ. of Medicine & Dent. of New Jersey)
HSAT Program Director: Mark Goldberg, Ph.D. (Hunter College)

11. Grantee: North Carolina Education and Research Center
University of North Carolina at Chapel Hill
School of Public Health
1700 Airport Rd.
Chapel Hill, NC 27599
- Center Director: Bonnie Rogers, DrPH
HST Program Director: Kathleen Buckheit, MPH
12. Grantee: South Florida Education and Research Center
University of South Florida
College of Public Health
13201 Bruce B. Downs Blvd.
Tampa, FL 33612
- Center Director: Thomas Bernard, Ph.D.
HST Program Director: Hana Osman, Ph.D.
13. Grantee: Texas Education and Research Center
UTH-HSC
School of Public Health
P.O. Box 20186
Houston, TX 77225
- Center Director: Sarah A. Felknor, Ph.D.
HST Program Director: Robert Emery, Dr.PH
14. Grantee: Utah Education and Research Center
University of Utah
School of Medicine
391 Chipeta Way
Salt Lake City, UT 84108
- Center Director: Kurt Hegmann, M.D., MPH
HST Program Director: Connie Crandall, MBA
HSAT Program Director: Rodney R. Larson, Ph.D.
15. Grantee: Washington Education and Research Center
University of Washington
School of Public Health and Community
Medicine
P.O. Box 357234
Seattle, WA 98195-7234
- Center Director: Noah S. Seixas, Ph.D.
HST Program Director: Steve Hecker, MSPH
HSAT Program Director: John C. Kissel, Ph.D.

TABLE II

**Hazardous Substance Training Courses
Conducted by ERCs – Budget Period 2008-2009 ***

- Respirator Fit Testing Workshop (1 day- 3 courses)
- Alabama Public Employees Safety Conference (1 day)
- Air Sampling for Toxic Substances (2 days)
- Alabama Society Hazardous Materials Manager-Meeting (.2 days)
- Hazardous Awareness Workshop for the Municipal Workforce (1 day)
- Hazards of Pesticides to Emergency Response Personnel (.2 days- 3 courses)
- Change Out Schedules for Chemical Cartridge Respirators and Respirator Update (2.2 days)
- Green Science Policy Symposium, The Fire Retardant Dilemma, Part VII (1 day)
- Spanish Train-the-Trainer Workshop-Pesticide Safety Educators in CA, AZ, Mexico and Tribal Communities (2 days)
- English Train-the-Trainer Workshop- Pesticide Safety Educators in CA, AZ, Mexico and Tribal Communities (2 days)

- Safer Alternatives for Pest Control in Agriculture: Making the Public Health Case for Change (1 day)
- Recognition, Management and Reporting of Pesticide Illnesses (.2 days- 2 courses)
- Essentials of Hazardous Materials Management (3 days)
- Confined Space Awareness for Managers (1 day- 3 courses)
- Radiological Emergency Planning: Terrorism, Security and Communication (4 days)
- Basic Hands-On CAMEO Training (3 days)
- Advanced Hands-On CAMEO Training (3days)
- Radiation Safety Officer Training for Laboratory Professionals (5 days)
- 16 Hr. Nanotechnology (2 days)
- 8 Hr. Emergency Response Refresher (1 day- 3 courses)
- 24 Hr. Industrial Emergency Response (3 days)
- 2 Hr. PPE/Respiratory Protection/Fit Testing Course (.2 days)
- Occupational Health and Safety Case Studies (.2 days)
- 40 Hr. Technician Course (5 days)
- Hazardous Response Excellence-Safety and Security Workshop (1 day)

- 18 Hr. Health Risk Emerging Technology (2.2 days)
- Permit Required Confined Space Training (2 days)
- What's New in Waste Management (1 day)
- Essentials of Hazardous Materials Management Overview (3 days)
- Investigating Environmental Public Health Hazards (2 days)
- OSHA Hazardous Waste Operations and Emergency Response Refresher Training (1 day)
- Confined Space Course (1 day)
- Confined Space Awareness Training (.5 days)
- HAZWOPER Awareness and Right to Know (.5 days)
- Management of a Major Chemical Incident (2 days)
- For Emergencies Only? Successful Respiratory Protection Program Implementation: March 2009 (1 day-2 courses)
- Mold Recognition, Identification and Remediation (2 days)
- Confined Space and Retrieval (1 day)
- Making Foreclosure Rehabs Work (.5 days)
- Emergency Response to All Hazards: June 2009 (.5 days)

- Chemical Hazards for Public Health Workers- Online- (.5 days)
- Radiological Hazards for Public Health Workers- Online- (.5 days)
- Annual Refresher for Health and Safety for Hazardous Waste Site Personnel (1 day- 7 courses)
- Health and Safety for Hazardous Waste Site Investigation Personnel (5 days)
- Resource Conservation and Recovery Act (1 day- 2 courses)
- 24 Hr. Hazardous Materials Technician (3 days- 7 courses)
- 40 hr. HAZWOPER (5 days- 14 courses)
- 8 Hr. HAZWOPER Refresher (1 day- 19 courses)
- Industrial Hygiene Sampling for Hazardous Substances (5 days)
- Fundamentals of Environmental Health for Hazardous Substances (5 days)
- Indoor Air Quality for Hazardous Substances (3 days)
- Mold Assessment and Remediation (3 days- 2 courses)
- Respiratory Protection (5 days- 2 courses)
- Biosafety (3 days- 2 courses)
- Applied Industrial Toxicology (3 days)

- Radiological Hazards (5 days)
- NIMS and HAZWOPER Incident Commander (6 days, 1 day)
- Hazmat Decon Procedure Train-the-Trainer (2 days)
- Radiation Topics for HST (1 day)
- Chemical Hazards and Disaster Preparedness (5 days)
- Nuclear and Radiation Hazards (5 days)
- Environmental Regulations (1 day)
- Indoor Air Quality (3 days)
- Environmental Risk Assessment (3 days)
- RCRA Hazardous Waste Generator Requirements (.5 days)
- 4 Hr. DOT Hazmat Shipper Requirements (.5 days)
- Certified Hazardous Materials Manager Course (4 days)
- HAZWOPER Site Supervisor (1 day)
- 8 Hr. Hazardous Waste Operations and Emergency Response (1 day-14 courses)
- Laser Safety (.5 days)
- Oil and Gas Safety Conference (2 days)
- Comprehensive Management of Hazardous Substances (5 days)
- Management of Hazardous Nanoscale Substances (2 days)
- Essentials of Hazardous Materials (3 days)
- Radiation Safety Officer (5 days)
- Chemistry for the Non-Chemist (1 day)

- DOT Hazardous Material Transportation (2 days)
- DOT Hazardous Materials Refresher (1 day)
- Hazardous Materials Incident Command (2 days)
- Chemical Hazards in the Workplace- (3 days)
- Air Monitoring for Toxic Substances (2 days)
- Transportation of Dangerous Goods: Compliance with International Air Transportation Association (IATA) (3 days)
- Hazardous Materials: Incident Command Refresher (1 day)
- Chemical Compatibility and Storage (1 day)
- Annual Hazardous Waste Refresher (1 day-8 courses)
- Supervising Hazardous Waste Operations (1 day)
- Essentials of Hazardous Materials Management (1 day)
- Chemical Reactivity Hazards Laboratory Scale Recognition and Control (1day-3 courses)

* Reporting period of 7/1/2008-6/30/2009.

Table III. Summary of NIOSH ERC/HSAT Grantee Activities February 2010

ERC	Start Date	HSAT Related Courses Offered (July 2008 - June 2009)			HSAT Funded Students ²		
		# of Academic Courses Offered ¹	# of HSAT Students/Total Students Enrolled	# of CE Courses/HSAT Students	2006-2007	2007-2008	2008-2009
AL	07-96	6	14/92	1/1	3	3	4
CA/S	07-94	7	14/71	2/3	4	1	3
CIN	02-93	5	11/43	0/0	3	4	5
HARV	02-93	5	6/84	0/0	2	3	2
IL	02-93	17	16/135	0/0	4	3	2
MI	02-93	15	46/389	1/1	11	10	7
MN	02-93	6	14/65	0/0	2	5	3
NY/NJ	02-93	4	5/52	1/3	6	9	8
UTAH	02-93	4	12/32	0/0	4	4	4
WA	02-93	8	13/174	0/0	5	3	4
TOTALS		77	151/1137	5/8	42	46	42

¹ Does not include research and thesis courses.

² Includes fully funded + partially funded students.

Figure I

HST Trainee-Days / Courses* Offered by ERCs FY 1989-2008

