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The Hazard Communication Program applies to all BWXT Y-12, L.L.C. (BWXT Y-12) employees who may be exposed to hazardous chemicals under normal conditions of use or in a foreseeable emergency.

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Page: 1 of 28

BWXT
Management Control

Subject: Hazard Communication Program Instruction

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This document has been reviewed by an Authorized Derivative Classifier and UCNI Reviewing Official and has been determined to be UNCLASSIFIED and contains no UCNI. This review does not constitute clearance for public release.

Pamela A. Slaughter 12/15/00
Signature & Date

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REVISION LOG

Revision Date	Revision Description	Affected Pages
12/11/00	DM/R #01-ESH-06; Non-Intent Modification	All
	Changed typographical error on page 2 of Appendix E	25
11/01/00	Procedure Blue Sheet changes - Changed Lockheed Martin Energy Systems and LMES to BWXT, Y-12, L.L.C.	Throughout
08/16/00	On Record	
05/31/00	On Record	
04/04/00	On Record	
09/21/99	On Record	

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SCOPE

The Hazard Communication Program applies to all BWXT Y-12, L.L.C. (BWXT Y-12) employees who may be exposed to hazardous chemicals under normal conditions of use or in a foreseeable emergency. The Hazard Communication Program applies to all hazardous chemicals used at the BWXT Y-12 Complex, including the following:

- o Hazardous chemicals procured and generated in the workplace; and
- o Consumer products used in quantities that exceed those of an average consumer.

Specifically **excluded** from the Hazard Communication Program are:

- o Hazardous waste regulated under the Resource Conservation and Recovery Act (RCRA);
- o Samples of unknown composition taken for analysis;
- o Non-occupational use of food, drugs (including medical services drugs and preparations), and cosmetics intended for personal consumption by employees while in the workplace (e.g., first aid supplies);
- o Tobacco and tobacco products;
- o Hazardous materials regulated by Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) as the focus of removal and/or remediation;
- o Wood and wood products, including lumber that will not be processed, where the only hazard they pose to employees is the potential for flammability or combustibility (wood or wood products which have been treated with a hazardous chemical covered by this instruction, and wood which may be subsequently sawed or cut, generating dust, are not exempted);
- o Ionizing and non-ionizing radiation;

NOTE: If radioactive material presents hazards such as chemical toxicity or a physical hazard (corrosive, flammable, compressed gas), then the requirements of the Hazard Communication Program apply to the chemical hazards of the radioactive material. An example of a radioactive material that has chemical toxicity characteristics is uranium.

- o Articles;
- o Biological hazards;
- o Laboratory operations regulated under 29 CFR 1910.1450, *Occupational Exposure to Hazardous Chemicals in Laboratories*; and
- o Nuisance particulates where the chemical manufacturer or importer can establish that they do not pose any physical or health hazard covered under this section.

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SCOPE (cont.)

- o Any consumer product or hazardous substance, as those defined in the Consumer Product Safety Act and Federal Hazardous Substances Act respectively, labeled by the manufacturer, where it can be shown that it is used in the workplace for the purpose intended by the chemical manufacturer or importer of the product, and the use results in a duration and frequency of exposure which is not greater than the range of exposures that could reasonably be experienced by consumers when used for the purpose intended.

Criteria for management of hazard communication for construction/service subcontractors shall, at a minimum, meet the requirements contained in this instruction, and shall be included in contract specifications.

STRATEGY

This Instruction outlines the methods for communicating to workers the potential hazards of chemicals used in the workplace. These methods include employee training, container labeling, and use of Material Safety Data Sheets (MSDSs).

Awareness level hazard communication training is provided for all BWXT Y-12 personnel during General Employee Training (GET). Additional hazard communication training (*Hazard Communication Level I Training* or equivalent) is provided based upon the potential for exposure to hazardous chemicals. **Work area (job-specific) hazard communication training is provided by the responsible supervisor upon the employee's initial entry into the work area or facility with hazardous materials and whenever a new chemical hazard is introduced into the work area.**

Labeling shall be used to identify hazardous chemicals and associated hazards.

Material Safety Data Sheets for hazardous chemicals used in work areas must be accessible to employees, service subcontractors, and visitors. The MSDS provides detailed hazard information for chemicals purchased from the manufacturer and chemicals produced as byproducts or manufactured in the workplace. The responsible supervisor of each work area shall develop a list of the hazardous chemicals used in the work area. This list and corresponding MSDSs shall be readily available to workers for review.

Industrial Hygiene will be the lead discipline assisting the line organizations in the implementation of the Hazard Communication Program. Industrial Hygiene will determine policy and direction.

REQUIREMENTS

The Hazard Communication Program shall comply with 29 CFR 1910.1200 and 1926.59.

A. General Requirements

1. Supervisors shall evaluate their work areas and identify the hazardous chemicals (either liquid, solid, or gas) to which workers are potentially exposed. This activity should be repeated when a new chemical is introduced to the work area.

NOTE: If needed, the supervisor should consult with Industrial Hygiene for assistance in identifying and evaluating personnel exposure to hazardous chemicals. Personal Protective Equipment shall be prescribed in accordance with Y73-116INS, Personal Protective Equipment Program.

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REQUIREMENTS (cont.)

A. General Requirements (cont.)

2. A hazardous chemicals list for each work area shall be available.
3. Supervisors shall ensure that personnel are properly informed/trained, containers of hazardous chemicals are properly labeled, and MSDSs are readily available for every hazardous chemical being used in the work area. (Refer to Requirements section B, C, and D for additional information.)
4. Requesters of subcontracted services shall ensure that potential hazards to subcontractors are identified during the job planning stage and that they are included in contract specifications in accordance with Y73-164PD, *Service Subcontract Safety and Health Management Program*.
5. Requesters of subcontracted services shall ensure that MSDSs for hazardous chemicals owned or used by BWXT Y-12 and present or likely to be present in the work area are made available to the subcontractor.

B. Training

1. Each employee shall receive information and training on the hazardous chemicals in his or her work area at the time of initial assignment, whenever a new chemical hazard is introduced into the work area, and whenever it is determined that an employee has not retained the information necessary to accomplish his/her responsibilities under this instruction.

NOTE: Hazardous chemicals, including but not limited to carcinogens, associated with new and non-routine tasks shall be identified in accordance with Y15-012, *Hazard Identification Planning*.

2. Each employee potentially exposed to hazardous chemicals shall receive *Hazard Communication Level I Training* or equivalent and Work Area Specific Training (refer to Appendix B).

C. Labeling of Hazardous Chemicals

1. Containers of hazardous chemicals shall be labeled in accordance with Appendix C.

NOTE 1: Containers of hazardous chemicals which have a manufacturer's label do not require additional labeling. However, containers must be labeled immediately if the manufacturer's label is inadequate, defaced, or removed.

NOTE 2: Where the size, shape, or usage of the container prevents use of hazard labels, alternative methods of conveying warnings shall be developed.

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REQUIREMENTS (cont.)

C. Labeling of Hazardous Chemicals (cont.)

2. Portable/secondary containers of hazardous materials are not required to be labeled when all three of the following conditions are met.
 - o The initial/primary container is properly labeled,
 - o The hazardous material is intended only for the immediate (within one work shift) use of the employee who performs the transfer, and
 - o The container is continuously under the control of the employee who performs the transfer.

Portable/Secondary containers left unattended shall be labeled in accordance with Appendix C.

This section does not require labeling of the following chemicals:

- o Any pesticide as such term is defined in the Federal Insecticide, Fungicide, and Rodenticide Act, when subject to labeling requirements of the Act and labeling regulations under that Act by the Environmental Protection Agency (EPA);
- o Any substance or mixture as such terms are defined in the Toxic Substances Control Act (TSCA), when subject to the labeling requirements of that act by the Environmental Protection Agency;
- o Any food, food additive, color additive, drug, cosmetic, or medical or veterinary device or product, intended for use as ingredients in such products (e.g., flavors and fragrances), as such terms are defined in the Federal Food, Drug, and Cosmetic Act, or the Virus-Serum-Toxic Act of 1913, and regulations issued under those Acts, when they are subject to the labeling requirements under those Acts by either the Food and Drug Administration or Department of Agriculture;
- o Any consumer product or hazardous substance as those terms are defined in the Consumer Product Safety Act and Federal Hazardous Substances Act respectively, when subject to a consumer product safety standard or labeling requirement of those Acts, or regulations issued under those Acts by the Consumer Product Safety Commission; and,
- o Agricultural or vegetable seed treated with pesticides and labeled in accordance with the Federal Seed Act and labeling regulations issued under that Act by the Department of Agriculture.

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REQUIREMENTS (cont.)

D. Material Safety Data Sheets (MSDS)

1. An MSDS shall be obtained or developed for each hazardous chemical used and/or to which workers may be potentially exposed in the work place.

NOTE 1: Material Safety Data Sheets contain hazard determinations based upon information available to the chemical manufacturer. Because MSDS's for the same material may be prepared by more than one manufacturer, the information may vary between MSDSs and may provide conflicting recommendations on the hazards and methods for controls. When discrepancies in MSDSs are discovered, the cognizant subject matter expert(s) (e.g., Industrial Hygiene, Fire Protection Engineering, Industrial Safety) should be contacted to resolve the discrepancies and determine the controls appropriate for the specific intended use.

NOTE 2: The hazard information contained in the MSDS is generic and based upon the properties of the material and is not tailored to specific circumstances of processes where it will be used. The hazard evaluation provided by an MSDS is not a substitute for the Integrated Safety Management process of hazard identification and analysis. (Refer to Y15-012, *Hazard Identification Planning*, and Y73-043, *Job Hazard Analysis*, for additional hazard analysis information.)

NOTE 3: MSDSs are obtained when a chemical is first purchased and may not have been recently updated. If supervisors have questions about whether the information on the MSDS is current, they should contact the chemical manufacturer to determine if an updated MSDS is available. If the manufacturer provides an updated MSDS, the supervisor should forward a copy to Industrial Hygiene.

2. Material Safety Data Sheets for each hazardous chemical in the work place shall be readily accessible during each work shift. Access may be either through hard copies obtained from Industrial Hygiene, the BWXT Y-12 HazCom Program Manager, the Plant Shift Superintendent (PSS), or through the BWXT Y-12 computerized MSDS data base.

NOTE 4: Supervisors must ensure that employees can obtain an MSDS without any hindrances. Common hindrances which may be encountered include: hard copies not accessible during off shifts, requiring employees to go through an individual who is inaccessible, and employee's lack of knowledge in obtaining an MSDS from the computerized data base.

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INTERFACES

A. Industrial Hygiene

1. Maintain the BWXT Y-12 instruction for the Hazard Communication Program.
2. Provide technical guidance and regulatory interpretations to ensure consistent implementation of the Hazard Communication Program.
3. Serve as liaison between BWXT Y-12 and the Department of Energy (DOE) on company-wide matters relating to hazard communication.
4. Provide technical assistance and implementation guidance to supervisors and safety and health professionals.
5. Assist, upon request, in classifying the hazard for chemicals synthesized or manufactured in the workplace.
6. Resolve issues regarding hazard ratings and carcinogen designations. (Refer to Appendix D and Appendix E for guidelines.)
7. Resolve MSDS discrepancies and assist in determining the controls appropriate for the specific intended use of the hazardous material.
8. Perform annual review of the organizations to evaluate implementation and ensure compliance with the Hazard Communication Program.
9. Provide subcontract oversight to ensure implementation of the Hazard Communication Program by subcontractors.
10. Provide employees with copies of workplace MSDSs upon request.

B. BWXT Y-12 HazCom Program Manager

1. Maintain the BWXT Y-12 MSDS database.
2. Obtain MSDSs from chemical manufacturers.
3. Provide MSDSs to personnel upon request.
4. Provide training to system users who require MSDSs.

C. Center for Continuing Education (CCE)

1. Conduct *Hazard Communication Level I Training* for employees covering: (1) the use of MSDSs, (2) labeling requirements, (3) physical and health hazards posed by chemical exposures, and (4) details of the Hazard Communication Program.
2. Conduct hazard communication training for supervisors that provides information on program oversight and responsibilities for implementation, as specified in this instruction and equips them to provide work area specific training.

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INTERFACES (cont.)

- C. Center for Continuing Education (CCE) (cont.)
3. Maintain documentation of all CCE conducted hazard communication training.
- D. Service Subcontractor Requester
1. Request assistance from appropriate personnel to evaluate planned activities, identify potential chemical hazards, and identify safety and health requirements and controls.
 2. Provide service subcontractors with lists of hazardous chemicals that may be encountered in proposed work areas.
 3. Ensure copies of MSDSs for all hazardous chemicals that may be encountered in work areas are provided to construction/service subcontractors.
- E. Supervisor
1. Maintain a hazardous chemicals list for each work area supervised, including hazardous chemicals that are synthesized, blended, produced as byproducts, or manufactured in the workplace. Provide this list to Industrial Hygiene.
 2. Ensure that appropriate MSDSs are accessible to employees prior to commencing work that involves hazardous materials.
 3. Contact the chemical manufacturer to determine if an updated MSDS is available when unsure of whether the information on the MSDS is current.
 4. Contact the cognizant subject matter expert(s) (e.g., Industrial Hygiene, Fire Protection Engineering, Industrial Safety) when discrepancies or conflicting recommendations on the hazards and methods for controls in MSDSs for the same material are discovered.
 5. Inform the BWXT Y-12 HazCom Program Manager of hazardous chemicals for which no MSDSs are available (Bldg 9106, MS 8023; or call 574-1590).
 6. Forward new or revised MSDSs to the BWXT Y-12 HazCom Program Manager.
 7. Ensure that all hazardous chemicals used in work areas are properly labeled in accordance with Appendix C.
 8. Attend *Hazard Communication Level I Training* or equivalent when the potential for exposure to hazardous chemicals is present.
 9. Complete *Hazard Communication for Supervisors Training* if supervising workers in facilities with hazardous materials.
 10. Determine which employees require *Hazard Communication Level I Training* beyond General Employee Training (GET) awareness training based upon their potential for exposure to hazardous chemicals. (Refer to Appendix B.)

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INTERFACES (cont.)

E. Supervisor (cont.)

11. Provide and document work area specific training (refer to Appendix B) to employees: (1) upon the employee's initial entry into the work area, (2) whenever a new chemical hazard is introduced into the work area, or (3) whenever an employee has not retained the information necessary to accomplish his/her responsibilities under this instruction.

NOTE: Training documentation must be maintained in a readily retrievable format.

12. Ensure a hazard classification is accomplished for all chemicals synthesized or manufactured in the workplace.

F. Employee

1. Attend *Hazard Communication Level I Training* or equivalent and work area specific training when required.
2. Safely handle, use, and store all hazardous chemicals as instructed.
3. Consult supervisor for information about hazardous chemicals in the work area.

G. Procurement

1. Request MSDSs for materials identified as hazardous and forwards MSDSs received to the BWXT Y-12 HazCom Program Manager.

SOURCE DOCUMENTS

- C S/RID Sub-Element 19.01.01, BWXT Y-12 ID Number 10454
- C S/RID Sub-Element 19.02, BWXT Y-12 ID Number 10459

IMPLEMENTING ELEMENTS

Training

Training (refer to Appendix B) shall be utilized as a method for conveying hazard communication requirements to the workers. All BWXT Y-12 employees who work on-site for ten days or more per year shall receive awareness level training during GET. Personnel with potential exposure to hazardous chemicals shall also receive *Hazard Communication Level I Training* or equivalent and work area specific hazard communication training.

Container Labeling

Containers of hazardous chemicals shall be properly labeled. The labels shall identify the chemical contained therein and appropriate hazards according to Appendix C.

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IMPLEMENTING ELEMENTS (cont.)

Material Safety Data Sheets

Material Safety Data Sheets shall be readily available for each chemical being used in the work area. The MSDSs provide specific information such as physical and chemical properties, physical hazards, health hazards, signs and symptoms of exposure, primary routes of exposure, whether the chemical is a carcinogen, precautions for safe handling and use, generally applicable control measures, and emergency and first aid procedures.

APPENDICES

APPENDIX A	Definition of Terms
APPENDIX B	Hazard Communication Training
APPENDIX C	Container Labeling Instructions
APPENDIX D	Hazard Classification Guide
APPENDIX E	Hazard Rating Tables

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Appendix A
Definition of Terms
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Article - a manufactured item that:

- o is formed to a specific shape or design during manufacture;
- o has end use function(s) dependent, in whole or in part, upon its shape or design during end use;
- o does not release or otherwise result in exposure to a hazardous chemical under normal conditions of use (e.g., solid metal, pencils or pens, etc.); and
- o does not pose a physical hazard or health risk to workers.

Carcinogen - for the purpose of this instruction, a carcinogen is defined as a substance which meets one of the following criteria:

- o identified as a carcinogen by the chemical manufacturer;
- o a chemical substance regulated as a carcinogen by the Occupational Safety and Health Administration (OSHA) Standard 29 CFR 1910 Subpart Z;
- o specified as confirmed human carcinogens (A1), or suspect human carcinogens (A2), by the American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Values and Biological Exposure Indices;
- o has been evaluated by the International Agency for Research on Cancer (IARC), and found to be a carcinogen or potential carcinogen; and
- o listed in the National Toxicology Program's (NTP) *Annual Report on Carcinogens* (latest edition).

Chemical Name - the scientific designation of a chemical in accordance with the nomenclature system developed by the International Union of Pure and Applied Chemistry (IUPAC) or by the Chemical Abstracts Service (CAS) rules of nomenclature or a name which will clearly identify the chemical for the purpose of conducting a hazard evaluation.

Combustible Liquid - any liquid having a flashpoint at or above 100 deg. F (37.8 degree C) but below 200 deg. F (98.3 deg. C), except any mixture having components with flashpoints of 200 deg. F (98.3 deg. C) or higher, the total volume of which make up 99 percent or more of the total volume of the mixture.

Consumer Product - Any product or hazardous substance, as those terms are defined in the Consumer Product Safety Act (15 U.S.C. 2051 et seq.) and Federal Hazardous Substances Act (15 U.S.C. 1261 et seq.) respectively.

Container - any bag, barrel, bottle, box, can, cylinder, drum, reaction vessel, storage tank, or the like that contains a hazardous chemical. For purposes of this instruction, pipes or piping systems, and engines, fuel tanks, or other operating systems in a vehicle are not considered to be containers.

Employee - for the purposes of the Hazard Communication Program, a worker who may be exposed to hazardous chemicals under normal operating conditions or in foreseeable emergencies. Workers such as office personnel who encounter hazardous chemicals only in non-routine, isolated instances are not covered.

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Exposure - an incident in which an employee is subjected in the course of employment to a chemical that is a physical or health hazard, including possible exposure. "Subjected," in terms of health hazards, includes any route of entry (i.e., inhalation, ingestion, skin contact or dermal absorption).

Flammable - a chemical that falls into one of the following categories:

- o "Aerosol Flammable": an aerosol that, when tested by the method described in 16 CFR 1500.45, yields a flame projection exceeding 18 inches at full valve opening or a flashback (a flame extending back to the valve) at any degree of valve opening,
- o "Gas Flammable": (A) A gas that, at ambient temperature and pressure, forms a flammable mixture with air at a concentration of thirteen percent (13%) by volume or less; or (B) A gas that, at ambient temperature and pressure, forms a range of flammable mixtures with air wider than twelve percent (12%) by volume, regardless of the lower limit.
- o "Liquid Flammable": any liquid having a flashpoint below 100 deg. F (37.8 deg. C), except any mixture having components with flashpoints of 100 deg. F (37.8 deg. C) or higher, the total of which make up 99 percent or more of the total volume of the mixture.
- o "Solid Flammable": a solid, other than a blasting agent or explosive as defined in 1910.109(a), that is liable to cause fire through friction, absorption of moisture, spontaneous chemical change, or retained heat from manufacturing or processing, or which can be ignited readily and when ignited burns so vigorously and persistently as to create a serious hazard. A chemical shall be considered to be a flammable solid if, when tested by the method described in 16 CFR 1500.44, it ignites and burns with a self-sustained flame at a rate greater than one-tenth of an inch per second along with its major axis.

Hazard Warning - any words, pictures, symbols, or combination thereof appearing on a label or other appropriate form of warning which conveys the hazard(s) of the chemical(s) in the container(s) including target organ effects.

Hazardous Waste - a waste or combination of wastes as defined in 40 CFR 261.3 or those substances defined as hazardous wastes in 49 CFR 171.8.

Hazardous Chemical - (for the purposes of this instruction, "hazardous chemical" and "hazardous material" are used interchangeably) a chemical is considered to be hazardous if it:

- o is listed in Subpart Z of 29 CFR 1910.1000;
- o has a threshold limit value (TLV) established by the American Conference of Governmental Industrial Hygienists (ACGIH) in the latest edition of its annual list;
- o is a physical hazard (flammable, combustible, compressed gas, explosive, organic peroxide, oxidizer, pyrophoric, unstable, or water reactive) as those terms are defined by 29 CFR 1910.1200;
- o is a health hazard (carcinogens, toxic or highly toxic agents, reproductive toxins, irritants, corrosives, sensitizers, hepatotoxins, nephrotoxins, neurotoxins, agents which damage the lungs, skin, eyes, or mucous membranes) as those terms are defined in 29 CFR 1910.1200.

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Health Hazard - a chemical for which there is statistically significant evidence, based on at least one study conducted in accordance with established scientific principles, that acute or chronic health effects may occur in exposed employees. The term "health hazard" includes chemicals which are carcinogens, toxic or highly toxic agents, reproductive toxins, irritants, corrosives, sensitizers, hepatotoxins, nephrotoxins, neurotoxins, agents which act on the hematopoietic system, and agents which damage the lungs, skin, eyes, or mucous membranes.

Identity - any chemical or common name indicated on the material safety data sheet (MSDS) for the chemical. The identity used shall permit cross-references to be made among the required list of hazardous chemicals, the label, and the MSDS.

Labeling Guide - a BWXT Y-12 generated document which contains information about a chemical, including carcinogen listing, record identification (RECID), and target organ(s). The Labeling Guide cannot be used alone but must be used in conjunction with the manufacturer's MSDS.

Label - means any written, printed, or graphic material displayed on or affixed to containers of hazardous chemicals.

Laboratory Scale - work with substances in which the containers used for reactions, transfers, and other handling of substances are designed to be easily and safely manipulated by one person. "Laboratory scale" excludes those workplaces whose function is to produce commercial quantities of materials.

Laboratory Use of Hazardous Chemicals - the handling or use of such chemicals in which **all** of the following conditions are met: (1) chemical manipulations are carried out on a "laboratory scale;" (2) multiple chemical procedures or chemicals are used; (3) the procedures involved are not part of a production process, nor in any way simulate a production process; and (4) "protective laboratory practices and equipment" are available and in common use to minimize the potential for employee exposure to hazardous chemicals.

Material Safety Data Sheet (MSDS) - a technical bulletin, prepared in accordance with 29 CFR 1910.1200 which contains information about a hazardous chemical such as chemical composition, chemical and physical hazard, and precautions for safe handling and use.

Trade Secret - any confidential formula, pattern, process, device, information, or compilation of information that is used in an employer's business and that gives the employer an opportunity to obtain an advantage over competitors who do not know or use it.

Work Area - any room or defined space in a workplace where employees are present and performing work.

Workplace - a job site or project at one geographical location containing one or more work areas.

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Appendix B
Hazard Communication Training
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1. General Employee Training (GET)

The Department of Energy (DOE) requires all persons employed either full-time or part-time at a DOE nuclear facility to be trained in nine subject areas to establish an initial baseline knowledge of safe work practices and other pertinent information. This is the first and most basic level of training for persons who work at BWXT Y-12 for a period that exceeds ten working days per year. The material covered includes:

- o General Topics: BWXT Y-12 policies/procedures, quality assurance, facilities, emergency preparedness/fire protection, security/badging.
- o GET HazCom: Policies/procedures and safe work practices relating to hazardous chemicals and substances.
- o General Employee Radiation Training (GERT): Basic radiation safety, types/sources of radiation, dose limits, biological effects/risks, embryo/fetus protection, employee responsibilities, as low as reasonably achievable (ALARA), and radiological emergencies.

2. General Hazard Communication (*Hazard Communication Level I Training*)

BWXT Y-12 workers identified as having potential occupational chemical exposures are provided with *Hazard Communication Level I Training* or equivalent. This is performance-oriented training designed to ensure that personnel have the skills to find and understand chemical hazard information, know who to contact if information is unclear, and know how to protect themselves against chemical hazards.

Topics covered are:

- o The Federal Hazard Communication Standard;
- o The Hazard Communication Program;
- o Chemical forms and exposure routes;
- o Physical and health hazards and control measures;
- o Material Safety Data Sheets;
- o General container labeling and BWXT Y-12 labeling requirements.

NOTE 1: *Hazard Communication Level I Training* shall be required every two years.

NOTE 2: This material is covered in Hazardous Waste Operations and Emergency Response (HAZWOPER) training; therefore, employees completing HAZWOPER 24-hour or 40-hour Training are exempt from *Hazard Communication Level I Training*.

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3. Supervisor Training

Supervisors who oversee workers in facilities with hazardous materials are provided *Hazard Communication for Supervisors Training*. This training will equip supervisors (or their delegates) to conduct employee Work Area Specific Training.

Topics covered are:

- o Hazard Communication and Laboratory Standards;
- o Supervisor's responsibility for Hazard Communication;
- o Documentation procedures for work area specific hazard communication training;
- o Pre-job briefing requirements, lessons learned, Job Hazard Analysis, and use of PPE and controls;
- o Available resources at BWXT Y-12 for work area specific hazard communication training.

4. Work Area Specific Training

This training is presented to employees who work with hazardous chemicals by the manager (supervisor) or manager's delegate. Work area specific training (including the hazards of non-routine tasks) must be completed when an employee is first assigned to the work area and before the employee works with the hazardous chemical. Work area specific training must be updated whenever a new chemical hazard is introduced to the work area. Several standard training programs are available for categories of chemical hazards. If these training programs are used they must be customized with work area specific information, so that the total training covers at least the following:

- o The location of the chemical inventory;
- o The hazards associated with the chemicals on the chemical inventory;
- o The processes or operations involved with the chemical and the location and contents of any documentation forms required (e.g., Standard Operating Procedures, etc.);
- o How to access an MSDS for the chemical;
- o The physical effects of the chemical (e.g., flammability, corrosiveness);
- o The short-term and long-term effects, including target organs, of the chemical;
- o Proper labeling for the chemical;
- o How to detect the presence or release of the chemicals in the work area such as visual, odor, continuous monitoring device, and monitoring performed by industrial hygiene personnel;
- o General and specific work area control measures for handling the chemicals;

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4. Work Area Specific Training (cont.)

- o General and specific personal protective equipment required when dealing with the chemicals (e.g., gloves, aprons, goggles);
- o Emergency procedures for a spill or release of the chemical;
- o The location of the written Hazard Communication Program; and
- o The hazards associated with chemicals in unlabeled pipes in the work area.

Supervisors who participate in *Hazard Communication Training for Supervisors Training* are provided information containing work area specific training documentation forms, as well as standard training programs for several categories of chemical hazards that may be customized for his/her specific work area.

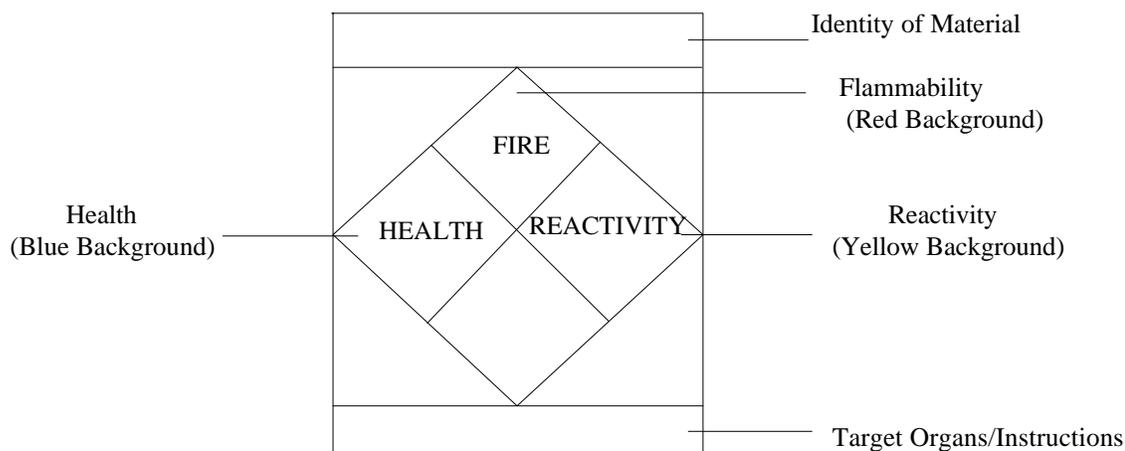
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Appendix C
Container Labeling Instructions
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Secondary/transfer containers which do not meet the exclusion criteria in Section C.2, must be labeled using the BWXT Y-12 approved hazardous material label illustrated below. Information for completing a label must be obtained from the BWXT Y-12 Labeling Guide or by contacting Industrial Hygiene.

An alternate system of communicating the required hazard warning information may be implemented in a work area after being approved by BWXT Y-12 HazCom Program Manager or designee.

NOTE: Original containers provided by the manufacturer/distributor do not require additional labeling as long as the label remains legible, identifies the contents, and has an appropriate hazard warning. If the original label is missing or illegible, the work area supervisor shall ensure that an appropriate label is placed on the container.



- | | |
|---------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Identity of Material: | List the chemical name or trade name of the chemical. The name on the label must match the chemical name or synonym listed on the Labeling Guide. |
| Health, Fire, and Reactivity Ratings: | A numerical rating scheme has been adopted to provide the chemical user with the general hazard information. The ratings are provided on a four segment label, color coded to represent the different hazard categories. Each class of hazard is rated on a scale of 0 to 4, with 4 being the most serious. The rating to be listed on the label must be obtained from the Labeling Guide. (See Appendix D, <i>Hazard Classification Guide</i> and Appendix E, <i>Hazard Rating Tables</i> for explanation of numerical rating scale.) |
| Target Organs/
Instructions: | List any special hazards exhibited by the material and the associated target organ(s) if known/applicable. Refer to BWXT Y-12 Labeling Guide for appropriate information. |

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Hazard Classification Guide
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The purpose of this guide is to provide criteria for assigning codes to hazardous materials indicating the order of severity for each hazard class (health, flammability, reactivity, special) in accordance with NFPA 704, *Identification of Hazards of Materials*. This shall be indicated by the use of one of five numerical ratings ranging from 4 indicating severe hazard or extreme danger to 0 indicating little or no hazard.

A. Health Hazard

1. Scope of Category

The health hazard category deals with the capacity of a material to cause either direct or indirect injury to a person when brought into contact with that material. The capacity of a material to cause injury may vary with the nature of contact, the duration of exposure, or the state of the material. Contact may be of short (acute) or long (chronic) duration. The physical state of the material may be in the form of a gas, liquid, or solid. The health hazard category deals only with the inherent properties of the material.

Note: Health hazard evaluation shall be based on non-fire situations since the primary concern is employee health under normal working conditions.

2. Determination of Hazard Class

- a. Refer to the MSDS for hazard-related information.
- b. Obtain the TLV for the material. Use Table E.1, *Hazard Level Determined from TLV* to determine the level if the TLV is available. The table summarizes the meaning of the hazard level number (code) and shows the relationship of the TLV to the hazard level.
- c. Use Table E.2, *Hazard Levels Determined from Relative Toxicity Criteria* to determine the level if the MSDS and TLV are not available.
- d. A review of health hazard potential can be obtained from Industrial Hygiene.

3. The formula for rating pure chemicals shall apply to the constituents of mixtures in the following cases:

- a. Mixtures containing greater than or equal to 0.1 percent of an OSHA/ACGIH human carcinogen - H=4.
- b. Mixtures containing greater than or equal to 0.1 percent of a suspect human carcinogen - H=3.
- c. Mixtures containing hazardous ingredients (other than human/suspect human carcinogens) that have greater than or equal to 1.0 percent but less than 10 percent subtract 1 from the hazard rating of that constituent (as indicated in the tables to this Appendix) prior to assigning the rating of the material.

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A. Health Hazard (cont.)

- d. Mixtures containing greater than or equal to 10 percent of a hazardous material will receive the full rating of the most hazardous constituents of the mixture. In determining whether materials are in the greater than or equal to 10 percent range, consideration should be given to synergistic/additive effects. Then the percentages should be added and the highest rating of the most hazardous constituents of the mixture should be assigned.
- e. In assigning hazard ratings to items that give a TLV for respirable dust, multiply the respirable dust TLV by 2 to convert from respirable dust to total dust to assign the health rating. This rating is compared to health hazard rating tables in this Appendix.
- f. If the percent composition of a product is not listed on the MSDS then the rating will be assigned based on the most hazardous material in the mixture.
- g. A carcinogen designation shall be assigned if the material meets any of the following criteria:
 - o identified as a carcinogen by the chemical manufacturer;
 - o a chemical substance regulated as a carcinogen by the Occupational Safety and Health Administration (OSHA) Standard 29 CFR 1910 Subpart Z;
 - o specified as confirmed human carcinogens (A1), or suspect human carcinogens (A2), by the American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Values and Biological Exposure Indices;
 - o it has been evaluated by the International Agency for Research on Cancer (IARC), and found to be a carcinogen or potential carcinogen; and
 - o listed in the National Toxicology Program's (NTP) *Annual Report on Carcinogens* (latest edition).
- h. Aerosols shall receive the fire rating of the flash point of the most flammable constituent of the mixture.
- i. If the information on the MSDS states the material is capable of creating a dust explosion, a rating of F=1 will be assigned and a statement added to the MSDS stating that the material in sufficient quantity is capable of creating a dust explosion hazard.
- j. If the product does not have information that meets the requirement of the hazard rating criteria, the ratings will be done on the professional judgement of the HazCom Program Manager or designee.
- k. Health rating for metal fume fever is H=2.

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B. Flammability Hazard

1. Scope of Category

The flammability hazard category deals with the susceptibility of a material to burning. Since a material may burn under one set of conditions but not under another, the form or conditions of the material or presence of other material affects the hazard. Nevertheless, some materials are so inherently flammable that they are hazardous regardless of form or condition.

NOTE: Flammability hazard evaluations shall be based on non-fire situations since the primary concern is employee safety from flammability under normal working conditions.

2. Determination of Hazard Level

- a. Refer to the MSDS for hazard-related information.
- b. Use Table E.3 to determine the flammability class.
- c. A review of flammability hazard potential can be obtained from the Fire Protection Engineering Department.

C. Reactivity Hazard

1. Scope of Category

The reactivity hazard category deals with the susceptibility of a material to release energy rapidly, whether by self-reaction or by a violent eruptive or explosive reaction caused by contact with water (moisture), air or light.

NOTE: When evaluating materials for reactivity, it should be emphasized that many materials are highly reactive with water (moisture), air, or light. Such materials include hydrosulfides, strong acids, several alkali-metal compounds, anhydrides, inorganic amides, phosphides, sulfides, and phosphorous compounds.

Reactivity hazard evaluations shall be based on non-fire situations since the primary concern is employee safety from the effects of reactivity under normal working conditions.

2. Determination of hazard level

- a. Refer to the MSDS for hazard-related information.
- b. Use Table E.4 to determine the reactivity level.
- c. A review of reactivity hazard potential can be obtained from the HazCom Program Manager or designee.

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D. Special Hazards

1. Scope of Category

Materials exhibiting special hazards include corrosives, irritants, oxidizers, poisons, carcinogens, water-reactive materials, and peroxidizable materials.

2. Determination of Hazard

- a. Refer to the MSDS and/or manufacturer's container label for any special hazard associated with the material.
- b. A review of special hazard potential can be obtained from the HazCom Program Manager or designee.

3. Peroxidizable Hazard

- a. If a material is peroxidizable, indicate it with "Peroxidizable" on the purchase requisition.
- b. The materials are divided into two groups based on normal safe life (shelf life) of the material after opening, when it is properly handled and stored as follows:

Group 1 Peroxidizable Materials - Safe for 3 Months

Group 2 Peroxidizable Materials - Safe for 12 Months
- c. Ensure that each container of peroxidizable material has a "Peroxidizable Materials" label, Form UCN-12731 affixed, and that the date received is noted on it. Enter the date opened and the number of months to test/discard the material.

Group 1 Peroxidizables (Safe for 3 Months)	Group 2 Peroxidizables (Safe for 12 Months)	
Isopropyl Ether Divinyl Acetylene Vinylidene Chloride Potassium Metal Sodium Amide Sodium-Potassium Alloy (NaK)	Ethyl Ether Tetrahydrofuran Dioxane Acetal Methyl-i-butyl Ketone Ethylene Glycol Dimethylether Vinyl Ethers Dicyclopentadiene Cumene Tetrahydronaphthalene Methyl Acetylene	Cyclohexene Methylcyclopentene Styrene Butadiene Tetrafluoroethylene Chlorotrifluoroethylene Vinyl Acetylene Vinyl Acetate Vinyl Chloride Vinyl Pyridine Chloroprene

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Appendix E
Hazard Rating Tables
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TABLE 1
HEALTH HAZARD LEVELS DETERMINED FROM TLV

Source: Adapted from H. Hodge and J. H. Sterner, AIHA Round-table Discussion Group, April 1947 Buffalo NY

HAZARD LEVEL	COMMON TERM	ACUTE EFFECTS	CHRONIC EFFECTS	GAS/VAPOR TLV ^a (PPM) ^b	PARTICULATE TLV (mg/M ³) ^c
4	Extreme health hazard	Exposure may be potentially life threatening	Exposure may be potentially life threatening (including human carcinogens, mutagens, and teratogens) ^d	<1	<0.25
3	High health hazard	Major temporary or permanent injury potential	Major permanent injury (including suspect carcinogens, mutagens, teratogens)	\$1 #10	\$0.25 #2.5
2	Moderate health hazard	Minor temporary or permanent injury (includes nonlife threatening substances for the majority of exposed workers) ^e	Minor temporary or permanent injury	>10 #250	>2.5 #5.0
1	Slight health hazard	Minor injury readily reversible (including asphyxiants)	Minor injury readily reversible	>250 #1000	>5.0 #10.0
0	Relatively harmless	Materials which produce toxic effects only under the most unusual conditions or from an overwhelming dosage		>1000	>10

^aTLV - The time-weighted average concentration for a normal 8-hour workday and a 40-hour work week, to which nearly all workers may be repeatedly exposed, day after day without adverse effect.

^bMaterials which are gases or vapors and have TLVs expressed both in terms of parts per million parts of air (PPM) and milligrams per cubic meter of air (mg/M³) are classified according to their ppm limits, since this always places them in a higher toxicity category.

^cRanges should only be used to classify those materials normally occurring as particulate.

^dIncludes substances which bear a significant relationship to the development of cancer in man.

^eAllergens are rated according to their sensitizing potential rather than the severity of an allergic reaction upon re-exposure to a substance by a sensitized worker.

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TABLE 2**HEALTH HAZARD LEVELS DETERMINED FROM RELATIVE TOXICITY CRITERIA**

Source: Adapted from H. Hodge and J. H. Sterner, A.I.H.A. Round-table Discussion Group, April 1947, Buffalo, NY

RATING	COMMON TERM	ACUTE	CHRONIC	LD₅₀^c SINGLE ORAL DOSE RAT (mg/kg)	4-hr. VAPOR EXPOSURE MORTALITY 2/6-4/6 RATS (PPM)	LD₅₀ SINGLE APPLICATION TO SKIN OF RABBITS (mg/kg)
4	Extreme health hazard	Exposure may be life threatening	Exposure may be potentially life threatening (including human carcinogens, mutagens, and teratogens) ^a	#1	#10	#5
3	High health hazard	Major temporary or permanent injury; may threaten life	Major permanent injury (including suspect carcinogens, mutagens, teratogens)	>1 #50	>10 #100	>5 #43
2	Moderate health hazard	Minor temporary or permanent injury (includes nonlife threatening substances for the majority of exposed workers) ^{bc}	Minor temporary or permanent injury	>50 #500	>100 #1000	>43 #340

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**TABLE 2 (cont.)
HEALTH HAZARD LEVELS DETERMINED FROM RELATIVE TOXICITY CRITERIA**

RATING	COMMON TERM	ACUTE	CHRONIC	LD₅₀^c SINGLE ORAL DOSE RAT (mg/kg)	4-hr. VAPOR EXPOSURE MORTALITY 2/6-4/6 RATS (PPM)	LD₅₀ SINGLE APPLICATION TO SKIN OF RABBITS (mg/kg)
1	Slight health hazard	Minor injury readily reversible (including asphyxiants)	Minor injury readily reversible	>500 #15,000	>1000 #100,000	>340 #22,600
0	No significant health hazard	Materials which produce toxic effects only under the most unusual conditions or from an overwhelming dosage		>15,000	>100,000	>22,600

^a Includes substances which bear a significant relationship to the development of cancer in man.

^b Allergens are rated according to their sensitizing potential rather than the severity of allergic reaction upon re-exposure to a substance by a sensitized worker.

^c LD₅₀.- Lethal dose 50% - That level at which 50% of the exposed population die.

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TABLE 3
FLAMMABILITY RATING CRITERIA

Source: Adapted from NFPA 704M and 325M

RATING	COMMON TERM	RATING CRITERIA
4	Extremely Flammable	<ul style="list-style-type: none"> o Any liquid or gaseous material which is a liquid while under pressure and having a flash point below 73EF (22.8EC) and a boiling point below 100EF (37.8EC). o Materials which because of their physical form or other conditions can form explosive mixtures with air such as dusts of combustible solids and mists of flammable or combustible liquids.
3	Highly Flammable	<ul style="list-style-type: none"> o Liquids having a flash point below 73EF (22.8EC) and having a boiling point at or above 100EF (37.8EC). o Liquids having a flash point at or above 73EF (22.8EC) and below 100EF (37.8EC). o Solid materials in the form of coarse dusts, fibers, or shredded form which may burn rapidly but which generally do not form explosive atmospheres in air.
2	Moderately Flammable	<ul style="list-style-type: none"> o Liquids having a flash point above 100EF (37.8EC), but not exceeding 200EF (93.4EC). o Solids and semisolids which readily give off flammable vapors when moderately heated or exposed to high ambient temperatures.
1	Slightly Flammable	<ul style="list-style-type: none"> o Liquids, solids, and semisolids having a flash point above 200EF (93.4EC). o Materials which will burn in air when exposed to a temperature of 1500EF (815.6EC) for 5 minutes or less.
0	Nonflammable	<ul style="list-style-type: none"> o Any materials which will not burn in air when exposed to a temperature of 1500EF (815.6EC) for 5 minutes or less.

Note: A chemical may also be classified as a flammable on the basis of other parameters such as flame spread.

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TABLE 4
REACTIVITY RATING CRITERIA

Source: Adapted from NFPA 704M and 325M

Susceptibility of Material to Release Energy	
RATING	Potential for Energy Release
4	Materials which, in themselves, are readily capable of detonation or of explosive decomposition or explosive reaction at normal temperatures and pressures. Includes materials which are sensitive to mechanical or localized thermal shock. If a chemical with this hazard rating is in an advanced or massive fire the area should be evacuated.
3	Materials which, in themselves, are capable of detonation or of explosive decomposition or of explosive reaction but requires a strong initiating source or must be heated under confinement before initiation. Includes materials which are sensitive to thermal or mechanical shock at elevated temperatures and pressures or react explosively with water without requiring heat or confinement.
2	Materials which, in themselves, are normally unstable and readily undergo violent chemical change but do not detonate. Includes materials which can undergo violent chemical change at elevated temperatures and pressures. Also includes those materials which may react violently with water or form potentially explosive mixtures in water.
1	Materials which, in themselves, are normally stable but may become unstable at elevated temperatures and pressures. This includes: Materials that react vigorously with water, but not violently; Materials that change, or decompose on exposure to air, light, or moisture.
0	Materials which are normally stable even under fire exposure conditions and which are not reactive with water.