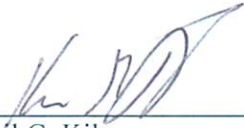

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Chemical Hazard Criteria and Review Approach Document		
Authorization and Approval	 <hr/> Keyil G. Kilp Director Office of Worker Safety and Health Assessments EA-32 Date: April 4, 2019	 <hr/> Lead, Nim Mahimaidoss Safety Engineer Office of Worker Safety and Health Assessments EA-32 Date: April 4, 2019

1.0 PURPOSE

The mission of the U.S. Department of Energy (DOE) Office of Environment, Safety and Health Assessments (EA-30) is to assess the effectiveness of safety and emergency management systems and practices used by line and contractor organizations and to provide clear, concise, rigorous, and independent evaluation reports of performance in protecting workers, the public, and the environment from the hazards associated with DOE activities.

In addition to the general independent oversight requirements and responsibilities specified in DOE Order 227.1A, *Independent Oversight Program*, this criteria and review approach document (CRAD), in part, will be used by Office of Enterprise Assessment (EA) to assess the effectiveness of contractor chemical program management and implementation, and assess contractor compliance with the applicable requirements in CFR 10 Part 851, at DOE sites complex-wide.

The CRADs are available to DOE line and contractor assessment personnel to aid them in developing effective DOE oversight, contractor self-assessment, and corrective action processes. The current revision of EA's CRADs are available at <http://www.energy.gov/ea/criteria-and-review-approach-documents>.

2.0 APPLICABILITY

The following CRAD is approved for use by the Office of Worker Safety and Health Assessments (EA-30).

3.0 FEEDBACK

Comments and suggestions for improvements on this CRAD can be directed to the Director, Office of Environment, Safety and Health Assessments.

4.0 CRITERIA AND REVIEW APPROACH

This document provides an overview of the Criteria, Activities, and Lines of Inquiry that will be used to collect information to evaluate contractor programs and implementation regarding chemical hazard regulatory requirements. Primary attention will be given to activities governed by the Occupational Safety and Health Administration's Hazard Communication Standards (29 CFR 1910.1200 and 29 CFR 1926.59) and Occupational Exposure to Chemicals in Laboratories (29 CFR 1910.1450). However, review of any activities for managing, storing, handling, and using hazardous chemicals, pesticides, and toxic materials governed by 29 CFR 1926 Subpart D, 29 CFR 1910 Subpart H, 29 CFR 1910 Subpart Z, 40 CFR Subchapter E, or 40 CFR Subchapter R are within the scope of this focus area.

Inspection Criteria: Line management ensures that the requirements for managing, storing, handling, and using hazardous chemicals established under 29 CFR 1926 Subpart D, 29 CFR 1910 Subpart H, 29 CFR 1910 Subpart Z, 40 CFR Subchapter E, 40 CFR Subchapter R, and applicable regulations and standards have been effectively implemented for federal and contractor employees, including subcontractors. Written programs are developed, implemented, and updated when conditions or requirements change. Employees have been properly trained for the chemicals they handle. Safety Data Sheets (SDS) are readily accessible. Line management ensures that administrative controls, engineering controls, work practices, personal protective equipment (PPE) and other requirements for safely managing, storing, handling, and using hazardous chemicals are followed.

OBJECTIVES

CM.1: A comprehensive chemical management program is in place that includes a hazard analysis, acquisition requirements, inventory and tracking, transportation, storage, control of chemical hazards, spill response and emergency management, disposal and training.

Does the hazard analysis: identify the conditions in which chemicals have the potential to pose a hazard to health and safety; address the severity of hazards and options for eliminating or substituting for less toxic chemicals; address the feasibility of controlling the associated hazards, and the resources involved in the safe disposal of the chemicals; lead to the identification of controls by which chemical substances can be used in a safe and non-polluting manner?

Criteria:

Hazard Analysis

Does the hazard analysis identify the conditions in which the chemicals listed in the chemical inventory pose a hazard to health and safety, hazard severity, options for substitution, and effective controls for safe handling and disposal?

- Is a hazard analysis performed for all chemicals, with consideration for how they will be handled, stored, used, and disposed of?
- Does the hazard analysis identify the conditions in which the listed chemicals pose the greatest hazard?
- Does the hazard analysis identify all of the specific hazards of the chemical i.e., inhalation, dermal, toxicity, fire, etc.?
- Does the hazard analysis include methods to mitigate the hazards?
- Does the hazard analysis address the hazards associated with disposal?
- Is the hazard analysis reviewed and updated as needed or required?

Acquisition

Is chemical acquisition a controlled process or procedure that documents and establishes the roles and responsibilities of those individuals who are responsible for requesting, approving, purchasing and receiving chemicals, and identifies the individual(s) responsible for management of the chemicals from acquisition to final disposition?

1. The site chemical acquisition procedure considers the following factors: the hazards of the chemical; elimination or substitution; justifiable quantities; use of available excess chemicals in lieu of new purchases; stability; shelf life; legacy hazards; the suitability of storage facilities; training requirements; acceptable means for final disposition; waste minimization; required safety documentation, and inventory management.
2. The site chemical management documentation describes the roles and responsibilities of the individuals who are responsible for requesting, receiving chemicals, and managing the chemicals from acquisition to final disposition.
 - Does the site have a method or procedure to evaluate the need for a chemical?
 - Are excess chemicals considered as the first supply source for chemicals?
 - Are the hazards of the chemical evaluated before the chemical is acquired?
 - Are chemical incompatibilities for storage or use considered?
 - Is elimination or substitution considered prior to chemical acquisition?
 - Is there a method for determining how much of the chemical is needed?
 - Is there a method of determining how much of a chemical is on site?
 - Is there a method for determining if the storage facilities are suitable?
 - Is final disposition considered prior to acquisition?
 - Is waste minimization and pollution prevention considered prior to acquisition?
 - Are SDSs and other required safety and health documentation maintained?
 - Does the site have a documented program to assign roles and responsibilities to individuals responsible for requesting and receiving chemicals, and for managing the chemical inventory?
 - Are assigned personnel adequately trained for their roles and responsibilities?
 - Is the person or personnel requesting the chemical(s) authorized to request the chemical(s)?
 - Is the person or personnel who received the chemical(s) authorized to receive the chemical(s)?

Inventory and Tracking

Are all chemicals brought on site tracked in a chemical inventory system? Are secondary containers to which the chemicals might be added accounted for?

Chemical inventory and tracking systems provide current information on the hazardous chemical inventories. This a continuous process performed from acquisition, through storage and use, to final disposal.

- Are all chemicals brought on site tracked? How is the tracking of chemicals ensured?
- Are secondary containers of chemicals accounted for?
- Does the chemical inventory tracking system provide current and accurate information?
- Does the chemical tracking database include locations, amounts, uses, and custodians?
- Are chemical inventory updates scheduled and performed at reasonable frequencies?
- Are chemical inventory updates effective at resolving and preventing inventory differences?

Transportation

Do transportation procedures and methods ensure the potential safety and environmental hazards associated with spills of chemicals resulting from mishandling or vehicle accidents are minimized and that prompt recovery actions are taken in the event of a loss of chemical containment?

The sites transportation criteria complies with applicable Occupational Safety & Health Administration (OSHA) and Department of Transportation (DOT) requirements for onsite and offsite shipments?

- Does the site have procedures for onsite and offsite shipment of chemicals?
- Do the procedures ensure the OSHA requirements are implemented (29 CFR 1910.120, 1910.1200).
- Do the procedures ensure that the DOT requirements for making and packaging hazardous chemicals are used?
- Do site transportation procedures include actions to be taken in emergency conditions?

Storage

Do storage procedures require that new and used chemicals are properly stored in designated storage locations? (29 CFR 1910 Subpart H)

Hazardous chemicals should be stored in appropriate storage facilities, records of quantities and types of chemicals should be kept at each location, the addition or removal of hazardous chemicals is controlled (documentation), periodic physical inventories are performed and documented, maintenance and inspection programs ensure facility integrity, awareness of chemical capability is maintained, awareness and monitoring of temperature, humidity is performed, moisture, provisions and monitoring is performed to ensure moisture is controlled, to ensure that shock sensitive chemicals are protected.

- Are chemicals stored in appropriate storage facilities (e.g., flammable storage cabinets, barriers between incompatible chemicals, specialized cabinets for explosive chemicals, gas cylinders are secured, incompatible gas cylinders are properly separated?
- Are there accurate records of the quantities and types of chemicals for each location?
- Is the addition or removal of chemicals from each location controlled and documented?
- Is there periodic physical confirmation and validation of inventory records?
- Do documented maintenance and inspection programs ensure facility integrity?

- How is chemical compatibility maintained when storing chemicals?
- Are variables such as shelf life, temperature extremes, moisture, and shock for sensitive chemicals considered and monitored as needed?

Control of Chemical Hazards

Is the control of chemical hazards carried out at all levels (i.e., site, facility, and activity)? Does the control of chemical hazards follow the same hierarchy of controls (elimination/substitution, engineering, administrative, and PPE)?

Controls for hazardous chemicals are based on the hazard identification and hazard analysis, including any additive or synergistic effects. If multiple hazards with varying severities exist, then the most conservative control should be used, i.e., if two types of hazard are present which use similar types of controls, the more protective control should be used.

- Do management, workers and subject matter experts work together to analyze, identify and mitigate chemical hazards?
- Are identified hazards consistently and accurately communicated to workers through training and work planning documentation?
- Are appropriate engineering controls (i.e., ventilation) identified, implemented, and effectively maintained?
- Are chemicals no longer needed to support planned activities removed from the facility inventory in an expeditious manner that is documented and in compliance with all applicable regulations?
- How are site chemicals determined to be waste?
- How are site chemicals determined to be recyclable?
- Is there a recycling program in place?

Training

Does the site have a comprehensive integrated environmental, health, and safety training program that includes training for the personnel that handle chemicals?

The training program must cover all applicable OSHA, Environmental Protection Agency (EPA), DOE, and other applicable requirements for personnel handling chemicals, including workers, supervisors, managers, and visitors.

- Does the training cover all the applicable requirements?
- Does the training program identify all personnel that need training and retraining?
- Is the depth of training provided appropriate to the type of work the worker will perform?
- Do work planning processes ensure that only properly trained workers handle and use chemicals?
- Does the training program implementation ensure that chemical training is conducted within established regulatory timeframes?

CM: 2 A comprehensive chemical management program is implemented that ensures the safety of workers, and the environment.

Is an effective chemical management program implemented that ensures the systematic integration of chemical safety into management and work practice at all facets of work planning and execution, in accordance with Integrated Safety Management Core Functions?

The chemical management program ensures the protection of workers, the public and the environment from unnecessary exposure or hazards.

- Are procedures in place to ensure that hazardous chemical use is identified during work planning, hazards associated with use are identified and analyzed, and appropriate controls are identified, selected, and implemented?
- Are the roles and responsibilities of employees, subject matter experts, and other support personnel, and line supervisors/managers well defined and communicated?
- Does the written hazard communication program include all required elements in sufficient detail and is the program effectively implemented?
- Are sufficient controls in place to ensure that unauthorized materials are not being procured, used, or stored?
- Are required SDSs maintained for all chemicals and other materials, and are they specific to different formulation(s) that may be in use or storage?
- Are copies of SDSs readily accessible to employees who handle or may otherwise be exposed to these chemicals/materials?
- Are consumer products, materials, and articles that are ineligible for exemption from the Hazard Communication Standard adequately addressed in the contractor and subcontractors hazard communication programs?
- Have the contractor and subcontractors adequately addressed multi-employer workplace requirements in their hazard communication programs?
- For chemicals used in laboratory operations, does the written chemical hygiene program include all required elements in sufficient detail and is the program effectively implemented?
- Are employees who may be exposed to hazardous chemicals or materials adequately trained and provided with the necessary information at the time of initial assignment and prior to introducing any new physical or chemical hazard into their work area?
- Have PPE requirements been properly identified for tasks involving hazardous chemicals or materials, and is the correct PPE being used?
- Are fume hoods, glove boxes, and other engineering controls properly calibrated, used, and maintained to minimize employee exposures?
- Are chemical containers (including secondary containers) properly labeled in accordance with regulations, policies, procedures, and program plans?
- Are compressed gases, flammables, combustibles, reactives, corrosives, and pyrophorics stored and used in a manner that minimizes the potential for employee injury and facility damage?
- Are hazardous chemicals which are exempt from the Hazard Communication Standard and Occupational Exposure to Chemicals in Laboratories Standard managed and used in accordance with applicable regulations, policies, procedures, and program plans?
- Have line organizations implemented effective efforts to reduce or eliminate the acquisition and use of toxic or hazardous chemicals?
- Do personnel comply with labels, postings, SDSs, work control documents, procedures, and permits, including working within defined scopes, instructions and hazard controls?
- Is there adequate supervision and oversight of activities involving chemical usage based on the hazards, risks, complexity, and potential for injury or release to the environment?

REVIEW APPROACH

Record Review:

- Chemical Inventory.
- Policies, procedures, and written programs pertaining to managing, storing, handling and using hazardous chemicals.
- Training programs, qualification requirements, and training records.
- Accident and injury illness records (ORPS, CAIRS, OSHA 300 Logs), internal or external assessment reports, and enforcement history, to identify incidents involving potential or actual chemical exposures or spills.

Observations:

- Work activities involving hazardous chemicals.
- Chemical storage areas and facilities.
- On a selective basis, request employees to obtain SDSs for chemicals to which they may be exposed.

Interviews:

- Responsible managers, subject matter experts, employees, and other staff responsible for procuring, managing, handling, storing, using, or disposing of hazardous chemicals.
- Personnel responsible for managing SDSs, training curriculum, and other sources of information required by applicable regulations, policies, procedures, and program plans.