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<b>Industrial Hygiene Program Criteria and Review Approach Document</b>		
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## 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, fulfills the responsibility assigned to EA in DOE Order 226.1B, *Implementation of Department of Energy Oversight Policy*, to conduct independent assessments of high consequence activities. This CRAD specifically relates to assessments of industrial hygiene programs under 10 CFR Part 851, *Worker Safety and Health Program*, Appendix A.6, *Industrial Hygiene*.

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.

## **3.0 FEEDBACK**

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

## **4.0 CRITERIA AND REVIEW APPROACH**

The review of Industrial Hygiene will evaluate the effectiveness of programs and processes for establishment of a comprehensive industrial hygiene program, identification of existing and potential workplace hazards and assessment of risk, development and implementation of hazard controls, ensure that work is performed within established hazard controls, has established and implemented a formal mechanism and process to gather feedback and implement continuous improvement by the site contractor, and the DOE field office has established and implemented a formal mechanism and process to assess the adequacy of procedures and implementation of the contractor's industrial hygiene program. The following objectives are designed as stand-alone sections to be used in any combination based on the need of the specific appraisal.

### ***OBJECTIVES***

**IH.1: A comprehensive industrial hygiene program has been established and implemented including organizational structure and administration that defines the scope of work, including objectives to meet the requirements of 10 CFR 851 Appendix A.6 *Industrial Hygiene*.**

#### **Criteria:**

1. The establishment of a documented industrial hygiene program that adequately addresses the flow down of regulatory requirements including how each element of 10 CFR 851 applicable to worker exposures to chemical, physical, biological and ergonomic hazards is implemented.
  - Has the site contractor developed a comprehensive written industrial hygiene program that addresses all the applicable industrial hygiene topical areas (e.g., noise, hazardous chemicals, etc.) at the worksite (see 10 CFR 851 Appendix A.6(a) through (f))?
  - Have policies and procedures been developed to mitigate the risk from identified and potential occupational carcinogens (see 10 CFR 851 Appendix A.6 (d))?
  - How are regulatory and contractual requirements related to industrial hygiene flowed down to subcontractor management, workers, authorized employee representatives, and occupational medical personnel and during site annual review of the worker safety and health program?
2. An adequate number of professionally and technically qualified industrial hygienists are assigned to manage and implement the industrial hygiene program. (see 10 CFR 851.20(a)(2), 10 CFR 851 Appendix A.6(e))

- Are the organizational responsibilities for industrial hygiene well defined and understood with staffing and resources sufficient to accomplish assigned tasks?
  - Has the cognizant management ensured that its industrial hygiene staff is adequately trained and knowledgeable in the anticipation, recognition, evaluation and control of occupational health and safety hazards (see 10 CFR 851.20(a)(2), 10 CFR 851 Appendix A.6(e), DOE-STD-6005-2001 Section 5.11)?
3. Effective coordination with planning and facility design personnel to anticipate and control health hazards that proposed facilities and operations would introduce. (see 10 CFR 851 Appendix A.6(b))
- Are the planning and design of facilities and work activities effectively coordinated between contractor facilities/operations and industrial hygiene professionals, including cognizant occupational medical, environmental, health physics, and work planning professionals (see 10 CFR 851 Appendix A.6(c))?
  - Have mechanisms been established to involve industrial hygienists at the earliest phases of a project (i.e., the conceptual design phase) (see DOE-STD-6005-2001 Section 5.2)?

**IH.2: A comprehensive industrial hygiene program has been established and implemented to identify existing and potential workplace hazards and assess the risk of any associated injury and illness in accordance with 10 CFR 851.21.**

**Criteria:**

1. Evaluate operations, procedures, and facilities to identify workplace hazards (see 10 CFR 851.21(a)(5)). All chemical, physical, and biological and safety health hazards in the workplace have been identified, analyzed, documented, and communicated to management and workers.
  - Have initial or baseline surveys been performed of all work areas or operations to identify and evaluate potential worker health risks (see 10 CFR 851 Appendix A.6 (a), DOE-STD-6005-2001 Section 5.1)?
  - Are periodic resurveys or reassessments and/or exposure monitoring of all work areas or operations conducted as appropriate to identify and evaluate potential worker health risks (10 CFR 851 Appendix A.6(a), DOE-STD-6005-2001 Section 5.3)?
  - Are assessments for chemical, physical, and biological hazards performed using recognized exposure assessment and testing methodologies and accredited and certified laboratories (10 CFR 851.21(a)(2))?
  - How does the industrial hygiene program establish and maintain complete and accurate records of all hazard inventory information, hazard assessments, exposure measurements and exposure controls (10 CFR 851.26 (a)(1), DOE-STD-6005-2001 Section 5.4)?
2. Potential health risks are effectively communicated to management and workers. (see 10 CFR 851.20(a)(8))
  - What mechanisms has management instituted for workers to participate in the identification and control of workplace hazards (see 10 CFR 851.20(a)(4)); and to observe monitoring or measuring of hazardous agents and to receive individual worker results of exposure monitoring (see 10 CFR 851.20(b)(4))?
  - Does management timely notify employees who are overexposed to hazardous materials of the monitoring results (e.g., within 10 working days of receipt of the results) or as otherwise required (see 10 CFR 851.20(b)(3); DOE-STD-6005-2001, Section 5.4.3)?

- Are monitoring results provided in a format consistent with applicable occupational safety and health standards, including OSHA regulations (see 10 CFR 851.23(a); 29 CFR Part 1910; DOE-STD-6005-2001 Section 5.4.2)?
3. Effective coordination of industrial hygiene activities with occupational medical professionals, environmental, health physics, and work planning professionals to ensure a comprehensive analysis of hazards. (see 10 CFR 851 Appendix A.6(c))
- How do industrial hygiene professionals ensure collaboration with other environmental, safety and health, and health physics professionals to ensure all workplace hazards have been analyzed (see 10 CFR 851 Appendix A.6(c))?
  - Has the interaction between industrial hygiene workplace hazards and other hazards such as radiological hazards been considered (see 10 CFR 851.21(a)(8))?
  - How do the industrial hygiene and occupational medicine programs coordinate to ensure that personal and workplace area monitoring results are incorporated into individual medical records (see 10 CFR 851.26(a)(2) and (a)(3))?
  - For individual workers, how are potential workplace hazards communicated to medical professionals and coordinated with industrial hygiene hazard identification and assessment methods (see 10 CFR Part 851 Appendix A.6(c))?

**IH.3: A comprehensive industrial hygiene program has been established and implemented to develop and implement hazard controls that address the full scope of facility operations.**

**Criteria:**

1. The industrial hygiene program has developed hazard controls that are appropriate for all identified workplace hazards, including the implementation of the hierarchy of controls.
  - Are the hazard controls well documented in the appropriate facility design or procedure (see 10 CFR 851.22(a)(1))?
  - Is there evidence of the consideration of the hierarchy of controls for workplace hazards (see 10 CFR 851.22(b))?
  - How is the control of health hazards communicated and implemented in accordance with industrial hygiene practices between facilities/operations, workers, and industrial hygiene professionals (see 10 CFR 851.20(a)(4) and (b)(2)(iii), 10 CFR 851 Appendix A.6(c))?
2. Contractors have developed and implemented a worker safety and health training and information program to ensure that all workers exposed or potentially exposed to industrial hygiene hazards are provided training and information on that hazard in order to perform their duties in a safe and healthful manner. (see 10 CFR 851.25(a))
  - How does the management implement the safety and health training and information program for industrial hygiene to ensure that all affected workers are provided with relevant training and information on potential workplace hazards (see 10 CFR 851.25(a))?
  - Does management provide training and information on industrial hygiene hazards to new workers before or at the time of initial assignment to a job involving exposure to an industrial hygiene hazard (see 10 CFR 851.25(b)(1))?
  - Does management provide periodic training provided as often as necessary to ensure that workers are adequately trained and informed (see 10 CFR 851.25(b)(2))?
  - Does management provide additional training when safety and health information or a change in workplace conditions indicate that a new or elevated hazard exists (see 10 CFR 851.25(b)(3))?

3. Workers have the opportunity to observe monitoring or measuring of hazardous agents, have the results of their own exposure monitoring and are notified when monitoring results indicate an overexposure to hazardous materials. (see 10 CFR §§ 851.20(b)(3) and (b)(4))
  - What is the contractor process for notifying overexposed workers of monitoring results (see 10 CFR 851.20(b)(3))?
  - What is the contractor process for including workers in exposure monitoring observations (see 10 CFR 851.20(b)(4))?
4. Contractors establish and maintain complete and accurate records of all hazard inventory information, hazard assessments, exposure measurements and exposure controls (see 10 CFR 851.26(a)(1)).
  - How does the industrial hygiene program ensure that all hazard related information is complete and accurate (see 10 CFR 851.26(a)(1))?
  - How are periodic resurveys of potential health risks coordinated for a work activity that has experienced changes in processes (see 10 CFR 851 Appendix A.6(a))?
5. When respiratory protection equipment is used, is the equipment approved by the National Institute for Occupational Safety and Health (NIOSH)? If not, has the respiratory protection equipment been tested under the DOE Respirator Acceptance Program for Supplied-air suits (see 10 CFR 851 Part Appendix A.6(f); DOE-STD-6005-2001, Section 5.8; DOE Technical Standard-1167-2003)?
6. Contractors have developed and implemented policies and procedures to mitigate the risk from identified and potential occupational carcinogens. (see 10 CFR 851 Appendix A.6(d); DOE-STD-6005-2001, Section 5.9)

**IIH.4: Work is performed within established hazard controls for all work activities and facility operations.**

**Criteria:**

1. Contractor management ensures that work activities are conducted in accordance with the direction and management of industrial hygiene personnel. (see 10 CFR §851.20(a)(2))
  - How does management provide access to and communicate hazard control information necessary for workers to perform the activities in a safe and healthful manner (see 10 CFR 851.20(a)(5) and (a)(8))?
  - How does management ensure workers implement the controls necessary to perform their activities in a safe and healthful manner (see 10 CFR 851.20(a)(4))?
  - How does management validate that work procedures are accurate and complete in order for work to be performed in a safe and healthful manner (see 10 CFR 851.26(a)(1))?
  - What mechanism is in place for workers to participate in the development of industrial hygiene program goals, objectives, performance measures, and in the identification and control of workplace hazards (see 10 CFR 851.20(a)(4))?

**IH.5.1: A formal process is established and implemented to gather feedback and implement continuous improvement of industrial hygiene program elements, implementation, and the adequacy of hazard identification, prevention, abatement and controls.**

**Criteria:**

1. Effective self-assessments of the industrial hygiene program are performed routinely to ensure adequate implementation of 10 CFR 851 Appendix A 6, *Industrial Hygiene*, requirements, including all applicable regulations and standards incorporated by reference at 10 CFR 851.23.
2. Management performs and documents an annual self-assessment to ensure the effectiveness of the implementation of industrial hygiene program and assure quality. Such self-assessments should include reviews of each of the following: (see DOE-STD-6005-2001, Section 6.1)
  - Adequacy and use of industrial hygiene resources;
  - All exposure assessment records, including medical exposure data, audiometric testing records, injury and illness logs and supporting information, and any other records relevant to the maintenance of industrial hygiene functions;
  - Compliance with applicable industrial hygiene requirements and established performance measures;
  - Success in receiving and responding to employee occupational health concerns;
  - Industrial hygiene evaluation records to assess progress in abating health hazards;
  - All required written programs that include industrial hygiene elements (e.g., the hazard communication program and respiratory protection program); and
  - Training effectiveness program.
3. Management adequately addresses any deficiencies identified by the industrial hygiene program self-assessment in a timely manner. (see 10 CFR 851.22(a) and (a)(2)(i) through (a)(2)(iii), DOE-STD-6005-2001, Section 6.1)
4. Management evaluates and resolves any issues revealed by the self-assessment by ensuring that corrective actions are implemented, effective, and have long-term sustainability. (see 10 CFR §§ 851.22(a) and (b)(1) through (b)(4))
  - How does management communicate the results of these assessments communicated to the management and workers (see 10 CFR 851.20(a)(5) and (a)(8))?
  - What are the procedures for the development of corrective actions (see 10 CFR 851.22(a) and (a)(2)(i) through (a)(2)(iii))?
  - How does management ensure the corrective actions are implemented, effective, and have long-term sustainability (see 10 CFR 851.22(b)(1) through (b)(4))?
  - Has management incorporated lessons learned into future work planning and activities for continuous improvement?
5. Management conducts routine self-assessments that evaluate their operations against requirements to maintain a workplace free of recognized hazards and to ensure activities are performed within controls established by industrial hygiene professionals. (see 10 CFR 851.20(a)(1) through (a)(10), 10 CFR 851.21(a)(1) through (a)(8) and (c))
  - How do assessments evaluate specific hazard identification, prevention, and abatement and the adequacy of workplace monitoring of chemical, physical, or biological hazards, including the

implementation of the hierarchy of controls (see 10 CFR 851.21 (a)(1) through (a)(8) and (c), 10 CFR 851.22 (a)(1) through (a)(2) and (b)(1) through (b)(4))?

**IH.5.2: The DOE field office has established and implemented a formal mechanism and process to assess the adequacy of procedures and implementation of the contractor's industrial hygiene program, including the adequacy of hazard identification, prevention, abatement and controls. (see 10 CFR 851.11(b) and DOE O 226.1B)**

**Criteria:**

1. DOE field office verifies that the Contractor Assurance System produced periodic scheduled and non-scheduled evaluations (e.g., self-assessment, independent assessment, management walkthroughs, etc.) of industrial hygiene activities which identified issues, concerns and opportunities for improvement in the work planning and control (WP&C) program.
2. DOE field office ensures that the contractor analyzes, tracks, trends internally and externally identifies industrial hygiene issues/concerns; evaluates this information against established performance objectives and expectations (i.e., measures or metrics); develops and implements corrective actions; and conducts effectiveness reviews to ensure continued improvement of the industrial hygiene program.
  - Do records or observations demonstrate that identified issues and concerns are analyzed, tracked, trended, and evaluated for collective significance?
  - Do records or observations demonstrate that this information is compared to established performance objectives in order to measure the effectiveness of the industrial hygiene program?
  - Do records or observations demonstrate that corrective actions are developed and implemented for identified issues, concerns, or negative performance trends?
  - Do records or observations demonstrate that effectiveness reviews for implemented corrective actions are conducted to ensure corrective actions taken for a given issue, concern or trend result in a reduction or elimination of similar issues?
  - Do records or observations demonstrate that corrective action effectiveness reviews include observation of work in the field to validate work execution improvement?

***REVIEW APPROACH***

Record Review:

- Contractor organizational chart for all safety and health related element
- Industrial hygiene program
- Most recent industrial hygiene program contractor self-assessment report and resulting corrective actions.
- Integrated safety management program
- Occupational medicine program
- Carcinogens program
- Personal protection program
- Respiratory protection program
- Initial and baseline surveys and exposure monitoring records for all industrial hygiene programs
- Chemical inventory program
- Work packages with industrial hygiene content
- Work package feedback and resolution of issues
- Employee training and qualification records
- Historical contractor self-assessment reports for industrial hygiene program

- Specific work procedures
- Specific analysis of workplace hazards for selected activities;
- Industrial hygiene personal and area exposure monitoring results for selected activities
- Occupational medical records
- Evidence of the application of a hierarchy of engineering and administrative controls for controlling workplace hazards
- Evidence of effective collaboration between industrial hygiene managers and personnel and work activity planners
- Evidence of contractor employees having timely access to exposure monitoring results and the opportunity to observe exposure monitoring
- Industrial hygiene equipment calibration records
- DOE line management organizational chart for all safety and health related elements
- DOE line management -assessment reports for contractor industrial hygiene program and resulting corrective actions
- Independent assessments reports for contractor industrial hygiene program performed by organizations external to EA-32

#### Interviews:

- Environment, safety and health managers
- Work planning and control managers
- Industrial hygiene managers
- Safety and health technicians
- Occupational medicine staff
- Industrial hygiene lab personnel (as applicable)
- Chemical inventory program manager
- Work planners who support the facility
- Facility operational and support personnel
- Selected workers
- DOE field office safety and health managers and support staff

#### Observations:

- Facility operational demonstrations
- Facility and building walk-throughs and reviews
- Routine and special industrial hygiene monitoring activities