

## **Industrial Safety/Industrial Hygiene Program Description**

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Advanced Mixed Waste Treatment Project

Approval:

*(Signature on file. See DCR-13343.)*

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Date



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## **1.0 PURPOSE/SCOPE**

The program elements of the Advanced Mixed Waste Treatment Project (AMWTP) Industrial Safety/Industrial Hygiene (IS/IH) Program are to support the AMWTP mission to retrieve, characterize, and ship waste from the Idaho National Laboratory (INL) in a safe and compliant manner. This IS/IH program description (PD) describes the various workplace IS/IH programs that ensure compliant, safe operations through implementation of applicable standards and requirements. This program implements the regulations of 29 Code of Federal Regulations (CFR) 1910, Occupational Safety and Health Standards; 29 CFR 1926, Safety and Health Regulations for Construction; 10 CFR 850, Chronic Beryllium Disease Prevention Program; and 10 CFR 851, Worker Safety and Health Program.

AMWTP management and personnel are committed to maintaining a safe work environment through the incorporation of requirements into management procedures (MPs) and instructions (INSTs), by conducting assessments to identified requirements, promoting employee involvement, promoting openness in resolving safety concerns, and performing routine work area monitoring. This PD addresses the key IS/IH programs and guidelines:

- LST-ISIH-02-IM, 10 CFR 851 Implementation Matrix, and LST-ISIH-03-IM, Hazardous Waste Operations and Emergency Response Implementation Matrix
- MP-ISIH-2.11, Industrial Hygiene Program, which implements the functional requirements of 10 CFR 851
- MP-ISIH-2.1, Occupational Medical Program
- MP-ISIH-2.49, Fire Protection Program.

## **2.0 IS/IH MANAGEMENT SYSTEM OVERVIEW**

The components and key steps of the IS/IH Management System fall in line with the Integrated Safety Management core functions and objectives to define work, analyze hazards, implement controls, perform work safely within the controls, and provide continuous feedback and improvement. Worker IS/IH requirements are implemented by AMWTP operations through incorporation of requirements from IS/IH programmatic documents into operating instructions (OIs), facility operating instructions (FOIs), approved methods of work (AMOWs), and emergent work control documents (permits to work [PTWs]). The IS/IH programmatic documents identify the applicable requirements of 29 CFR 1910, 29 CFR 1926, 10 CFR 850, National Fire Protection Association (NFPA), and 10 CFR 851. Where AMWTP performs or manages work activities defined as construction by 29 CFR 1910.12, Construction Work, construction standards apply.

IS/IH program requirements are implemented by AMWTP operations through integration of IS/IH MPs and instructions into routine work documents, (OIs, FOIs, AMOWs) or emergent work documents (PTWs).

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IS/IH staff provides technical assistance to line management who are responsible for conducting work safely using Integrated Safety Management System (ISMS) principle (see PD-ISM-01, Integrated Safety Management System Description Document). The IS/IH staff provides support services to line management necessary for safe operations of the AMWTP, including the following:

- Serving as technical resources to line management for IS/IH, fire protection (FP), and Occupational Medical Program (OMP), field verification that IS/IH standards are implemented and followed by operations personnel through daily monitoring of operational and maintenance tasks
- Notifying management of noncompliance occurrences, and suggesting corrective action to mitigate these occurrences
- Developing and modifying IS/IH procedures and instructions, as needed, based on changes to standards or as a result improvements/deficiencies identified by employee teams, management assessments, or surveillances
- Tracking and trending accidents, non-compliances, incidents, and behaviors associated with the IS/IH program
- Conducting formal and informal inspections, monitoring, and assessments required to maintain safe operation
- Providing technical support when responding to an emergency incident or upset conditions
- Identifying training needs.

The IS/IH Program is composed of three key areas:

- Industrial Safety/Industrial Hygiene
- Fire Protection
- Occupational Medical Program.

#### **2.1 Industrial Safety/Industrial Hygiene**

IS/IH assumes the responsibility for the following programmatic areas:

- Walking – Working Surfaces and Scaffolds
  - Scaffolding
  - Ladders
  - Stairs, Railings, and Tow Boards
- Means of Egress
  - Fire Protection
- Motor Vehicles and Mechanized Equipment
- Powered Platforms, Manlifts, and Vehicle-Mounted Work Platforms
  - Fall Protection
- Excavation

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- Occupational Health and Environmental Control
  - Ventilation
  - Noise and Hearing Conservation
  - Lasers/Non-Ionizing Radiation
- Hazardous Materials
  - Hazard Communication
  - Flammable and Combustible Liquids
  - Hazardous Waste Operations
- Personal Protective Equipment (PPE)
  - Respiratory Protection
- General Environmental Controls
  - Confined Spaces
  - Signs and Barriers
  - Workplace Inspections
- Medical and First Aid
  - First Aid Kits
- Material Handling and Storage
- Machinery and Machine Guarding
- Hand and Portable Powered Tools and Other Hand-Held Equipment
- Welding, Cutting, and Brazing
  - Hot Work
- Electrical Safety
- Toxic and Hazardous Substances
  - Exposure Assessment
  - Lead
- Chronic Beryllium Disease Prevention Program.

IS/IH supports operations and maintenance through daily reviews to identify hazards, establish controls, and monitor work to ensure it is performed in accordance with established controls by:

- Conducting surveys of work areas to identify potential worker health and safety risks
- Monitoring the control of hazards by continuously evaluating changes in work scope
- Verifying the adequacy of controls through initial routine and periodic exposure monitoring.

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IS/IH ensures field implementation of standards by:

- Documented exposure assessments for chemical, physical, and biological stressors using recognized assessment methodologies and accredited industrial hygiene laboratories
- Appropriate engineering, administrative, work practice, and personal protective control methods to limit hazardous exposures to acceptable levels (using current American Conference of Government Industrial Hygienists [ACGIH] and Occupational Safety and Health Act [OSHA] limits, whichever is more conservative)
- Worker involvement through IS/IH education, awareness training, and work planning
- A hazardous substance disease prevention and bioassay program, when necessary, for such materials as beryllium, lead, mercury, and organics
- A respiratory protection program using National Institute for Occupational Safety and Health (NIOSH)-approved equipment
- Beryllium implementation requirements in accordance with 10 CFR 850
- An OMP in accordance with 10 CFR 851
- Procedures to mitigate identified and potential carcinogens risks per ACGIH and 29 CFR 1910, Subpart Z
- A technically qualified industrial hygienist to manage the Industrial Hygiene Program.

## **2.2 Occupational Medical Program**

AMWTP has in place MP-ISIH-2.1 to minimize the risk of injury and illness and maintain a medical program that implements the requirements of 10 CFR 851. The OMP is designed to support the goal of zero accidents through the development of detailed physical demands assessments coupled with routine medical evaluations and screenings. The OMP is capable of dealing with injuries and illnesses, if they occur, and is responsible for directing initial and follow-up care as necessary.

The AMWTP OMP provides for worker protection through:

- Baseline health assessments of employees in accordance with OSHA standards and Department of Energy (DOE) orders.
- Provision of medical surveillance of employees who may be exposed to hazardous or radioactive material, or who request surveillance.
- Provision of physical exams and medical surveillances that are performed in accordance with OSHA requirements under 29 CFR 1910.120, Hazardous Waste Operations and Emergency Response, 29 CFR 1910.134, Respiratory Protection, other substance-specific standards, and List A (statutory) requirements where applicable

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- Voluntary screening and medical surveillances provided to beryllium-associated workers in accordance with 10 CFR 850. Provisions are in place for conducting exams for beryllium-associated workers in accordance with the Chronic Beryllium Disease Prevention Program (CBDPP) when identified through monitoring (MP-ISIH-2.7, Chronic Beryllium Disease Prevention Program).

The OMP provides standard practices to prevent occupational disease and injury exposure to workers, directed care for employees experiencing occupational illness or injuries, implementation of medical first aid service requirements (per 29 CFR 1910, Subpart K). The following provisions of medical and other health-related services form the framework of the OMP:

- Medical emergency, illness, or injury (occupational and non-occupational)
- Review of injuries and illnesses for trends
- Review of exposure monitoring data to applicability of surveillance requirements
- Administration of the OHM database
- Return to work (occupational and non-occupational illnesses/injuries)
- Concerns regarding an employee's ability to work (fit for duty)
- Review of physical demands assessments for job functions
- Drug screening
- New hire evaluations
- Annual health evaluations
- Termination examinations.

AMWTP maintains a group of personnel trained in cardiopulmonary resuscitation and first aid in accordance with PLN-EP&C-03, AMWTP Emergency Plan/RCRA Contingency Plan. AMWTP established a tri-party memorandum of agreement (Service Agreement Between Advanced Mixed Waste Treatment Project and Idaho National Laboratory for Emergency Support Services) with DOE Idaho Operations Office (DOE-ID) and the INL maintenance and operations (M&O) contractor that allows AMWTP operations personnel access to ambulance services and medical services at the Central Facilities Area dispensary during emergency incidents. The dispensary provides immediate medical services from staff nurses and physicians. INL Emergency Services evaluates severe injuries/illnesses for transfer to local hospitals.

Routine medical services and non-emergency services (such as, pre-employment physicals, non-emergency injury treatment, drug testing, bioassays, and specialized exams) are received at contracted clinics or hospitals which are required to provide services in accordance with AMWTP OMP requirements.

### **2.3 Fire Protection**

The AMWTP Fire Protection Program (FPP) is administered by the IS/IH organization which establishes the requirements to recognize, evaluate, prevent and control fire hazards, minimize fire losses, and ensure that Life Safety Codes are maintained at the AMWTP. NFPA standard implementation is addressed through MP-ISIH-2.49.

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The responsibility for establishing the AMWTP FPP elements and supporting documentation for implementation of requirements by line management resides in the Environmental, Safety and Health (ES&H) organization. Professional Fire Protection Engineering (FPE) services are provided by a qualified staff FPE. The FPE position also serves as the AMWTP fire marshal and is approved by DOE-ID based on a review of qualifications and knowledge of requirements.

The FPP prevents fire loss to operations by providing line management:

- Fire hazard analysis (FHAs)
- Fire safety analysis (FSAs)
- Abbreviated fire assessments (AFAs)
- Life Safety Code.

The FPP works closely with the Engineering organization which is responsible for operability and physical maintenance of AMWTP Fire Protection Systems. The Engineering organization conducts the required inspections and ensures that maintenance is performed when necessary. If impairments are required, the IS/IH FPE assists Engineering in impairment development and any associated compensatory measures.

The FPP maintains policy to operate and manage all organizational elements and facilities in a manner that will minimize the potential for the following:

- The occurrence of a fire or related event that will threaten the health and safety of employees, the public, or the environment
- A fire that causes an unacceptable onsite or offsite release of hazardous or radiological material that will threaten the health and safety of employees, the public, or the environment.
- Unacceptable interruptions of facility operations as a result of fire or related hazards
- Property losses from fire or related events
- Damage to critical process controls as a result of fire or related events.

In the event of a fire, the tri-party memorandum of agreement with the INL allows supplemental coverage with the fire department detection and notification systems currently operating at the Radioactive Waste Management Complex.

## **2.4 Cross-Cutting Requirements for IS/IH Programs**

### **2.4.1 Management Assessment**

The IS/IH organization is responsible for ongoing management reviews of the IS/IH, Fire Protection, and OMP. Reviews of various elements on an ongoing basis are conducted using MP-M&IA-17.1, Management Assessment, and MP-Q&SI-5.3, Corrective Action. Management assessments, findings, and corrective actions are reported, documented, and evaluated using the existing

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company assessment and issues management processes as described in PD-Q&SI-01, Contractor Assurance Program Description, to promote feedback and continuous improvement of the IS/IH program.

#### **2.4.2 Document Control**

The AMWTP Document Control System is designed to ensure that documents are complete, technically accurate, in compliance with regulatory/contractual requirements and standards, are usable and meet user needs, and are appropriately implemented. All IS/IH procedures, instructions, and applicable documents are written and managed within this system. This system is described in MP-DOCS-18.4, Document Control.

#### **2.4.3 Records Retention**

Records management for the IS/IH program is conducted in accordance with MP-DOCS-18.2, Records Management, and indicated in the applicable management procedure and/or instruction.

IS/IH records pertaining to employee medical history, respiratory protection (fit testing), first aid injuries, OSHA 300 logs and reports, sampling results, and information pertaining to leading indicators are entered and stored in the Occupational Health Manager (OHM) database or another electronic tracking system.

OMP records are maintained in accordance with 10 CFR 851 and electronic records of referrals, contacts, and evaluations are also maintained in OHM.

Fire Protection Program records are generated for decisions for programmatic direction such as authority having jurisdiction (AHJ) interpretations, equivalencies, and response to assessment results. Fire Protection Systems records such as impairments and inspection, testing, and maintenance records are provided to Engineering and Maintenance for submittal to Records Management per MP-DOCS-18.2.

#### **2.4.4 Subcontractors**

The operational control of subcontracted activities, products, or services is provided through procurement documents, procurement and quality procedures, and subcontractor requirements expressed in requests for proposals. Subcontractor work activities are also developed through the work control process. This process allows IS/IH to control requirements to flow to the subcontractor.

The IS/IH program requirements apply to subcontracted work activities. Work at AMWTP by subcontractors is conducted under MP-COPS-9.18, Work Management, Planning, and Control Procedure, and are conveyed to subcontractors through the subcontractor requirements manual (SRM), PD-SRM-01, Subcontractor Requirements Manual Program Description. These requirements use a graded approach for work to be performed and are tailored to the specific work scope which incorporates IS/IH requirements through the identified applicable SRM elements. Reviews of activities and routine assessments of contracted activities are conducted by IS/IH program elements. These requirements are addressed in MP-PCMT-15.1, Acquisition of Material and Services, and MP-DOCS-18.4.

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### **3.0 RESOURCES, ROLES, RESPONSIBILITY, AND AUTHORITY**

Leadership and overall responsibility for establishing and maintaining the IS/IH program is assigned to the manager of the ES&H. The ES&H Director reports directly to the president and general manager of AMWTP in addition to the AMWTP plant manager or designee. The dual reporting role allows for operational integration of programs, while providing the necessary functional independence of a safety support organization.

The ES&H Director routinely reports to the management team regarding the performance of the program by way of predefined metrics such as Total Recordable Incident Rate (TRIR), Days Away Restricted and Transferred (DART), Days Away Case Rate (DACR), First Aid Case Rates (FACR), Keeping Everyone and Yourself Safe (KEYS) (a behavior-based safety program), Observations, Leading Indicators and Safety Performance Objectives, Measures and Commitments (SPOMC). The ES&H Director is responsible for ensuring that appropriate resources have been identified and allocated to support implementation of IS/IH programmatic requirements and serves as the cost account manager under the Work Breakdown Structure (WBS) system

- The IS/IH manager reports to the ES&H Director and is responsible for determining program requirements, ensuring implementation of the program, and provision of support to the line operating and maintenance organizations. The IS/IH department is the primary organization responsible for identifying and disseminating the IS/IH program requirements to line management for implementation. The IS/IH organization is responsible for the following programmatic requirements:
  - Developing companywide IS/IH policy, guidance, procedures, and other implementing instructions
  - Tracking, evaluating, and commenting on proposed IS/IH regulations
  - Interpreting existing and new regulations
  - Determining applicability of IS/IH requirements
  - Developing and maintaining the company IS/IH program requirements documents
  - Reviewing and approving OIs, FOIs, and AMOWs for routine work
  - Reviewing and approving PTWs for emergent, non-routine work.

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#### **3.1 Competence, Training, and Awareness**

The IS/IH program (IS/IH, FP, OMP) is staffed by professionals that possess the education, experience, knowledge, skills, and abilities that are necessary to perform their job function in a safe and effective manner. This is accomplished through the Competence Commensurate with Responsibility (CCR) process. Each IS/IH staff member has an:

- Position description defining minimal acceptable qualifications for the position (education, experience, certification)
- Individual training plan (ITP).

Personnel receive site-specific training which includes required reading of procedures and instructions as part of the ITP. Required readings fill the gap regarding specific AMWTP practices and ISMS implementation that are otherwise unique to practice of their profession. Professionals by education and experience are aware of applicable federal, state, laws, regulations, and requirements.

#### **3.2 Feedback**

Feedback for IS/IH-related matters are conducted through a variety of formal and informal methods. Feedback informs employees of events, training, safety issues, management decisions, policy changes, and other company news requiring timely notification for employees to act or respond. IS/IH often works with the Communications staff and determines what messages are appropriate for what company communication medium. Feedback to all employees is reviewed and approved prior to issue. The methods of communication include:

- [AMWTP Homepage](#) at the ES&H link
- AMWTP Safety Forum
- AMWTP Lessons Learned Program
- AMWTP Safety Shares
- SPOMC
- KEYS Observation Reports
- Employee Safety and Improvement Team Meeting Minutes
- E-mail messages to employees (AMWTP Project Notes)
- Messages from company senior management (from the president)
- E-mail messages to all managers
- Posters, brochures, booklets, presentations, displays, and other visual communications
- Internal electronic monitor messages.

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On-the-job IS/IH feedback is communicated routinely during various forums. These include:

- Pre-job walkdowns, pre-job briefs, and post-job reviews
- Plan-of-the day meetings, employee safety team meetings, staff meetings, and similar routine interfaces
- IS/IH personnel in contact directly with the work force.

### **4.0 SPECIFIC IS/IH PROGRAM REQUIREMENTS**

This section describes the implementation areas addressed for the IS/IH organization in Section 2.1.

#### **4.1 Walking–Working Surfaces and Scaffolds**

29 CFR 1910, Subpart D, contains regulations on walking and working surfaces applicable to AMWTP operations. Requirements include those for protecting openings in floors and walls and for using and maintaining fixed and portable ladders, scaffolds, and stairs.

The following IS/IH procedures address the requirements for this section:

- MP-ISIH-2.20, Scaffolding, defines the roles and responsibilities and requirements for the safe use, erection, and maintenance of scaffolds.
- MP-ISIH-2.22, Ladders, defines responsibilities and requirements for the safe use, handling, and storage of ladders. This procedure implements the requirements of 29 CFR 1910, Subpart D, Walking-Working Surfaces, as applicable to AMWTP.
- MP-ISIH-2.23, Fall Protection, and SRM-ISIH-2.9, Fall Protection, set the minimum requirements use where employees are subject to a fall of 6 ft or greater during the performance of construction, maintenance repair, or renovation work-related activities. This procedure addresses the requirements and responsibilities for the selection, use, and maintenance of fall protection equipment. This document also addresses the required use of guarding protection at 4 ft per 20 CFR 1910.23, Guarding Floor and Wall Openings and Holes.
- MP-ISIH-2.27, Stairs, Railings, and Toe Boards, addresses the safety requirements associated with other walking-working surfaces not covered by other procedures. This procedure covers safety requirements associated with stairs, railings (guardrail systems), toe boards, and floor/wall openings.
- SRM-ISIH-2.28, Walking and Working Surfaces, addresses minimum requirements for establishment of safe walking and working surfaces in accordance with 29 CFR 1926.502, Fall Protection Systems Criteria and Practices, and 29 CFR 1926.1052, Stairways.
- MP-ISIH-2.32, Housekeeping, addresses requirements that contribute to a safe workplace, including combustible loading aspects of fire protection.

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## **4.2 Means of Egress**

29 CFR 1910, Subpart E, contains regulations for establishing and maintaining means of egress.

Appropriate means of egress originated in the design and construction of the AMWTP facilities. Facilities are routinely inspected to verify that the evacuation routes and exits are clearly marked and maintained unobstructed.

The following procedures address the requirements for this section:

- MP-ISIH-2.49 establishes the roles and responsibilities necessary to provide mandatory, standardized requirements for fire protection for the AMWTP.
- MP-ISIH-2.62, Fire Prevention, identifies fire prevention requirements to maintain a safe workplace.
- PLN-EP&C-03 specifies the evacuation routes, assembly locations, and other procedures and instructions that will aid in the safe evacuation of the AMWTP facilities.
- MP-ISIH-2.32 addresses housekeeping requirements that contribute to a safe workplace.

## **4.3 Motor Vehicles and Mechanized Equipment**

29 CFR 1926, Subpart O, contains general and specific regulations for motor vehicles and mechanized equipment that may be used at AMWTP. Requirements include those for motor vehicles and material-handling. These requirements are implemented by MP-ISIH-2.41, Motorized Vehicles and Heavy Equipment, and SRM-ISIH-2.21, Motor Vehicle Safety.

29 CFR 1926, Subpart W, includes regulations for the availability, functionality, and safety features of rollover and overhead protection for construction equipment that may be used at AMWTP. These requirements are implemented by SRM-ISIH-2.15, Heavy Industrial Equipment.

The Maintenance Department inspects all AMWTP motor vehicles to verify that required safety features are present and operable. Workers also inspect their vehicles at the beginning of each shift. The following IS/IH procedure addresses the requirements for this section:

- MP-ISIH-2.41 defines the responsibilities and requirements for the safe use of motorized vehicles and heavy equipment.

## **4.4 Powered Platforms, Manlifts, and Vehicle-Mounted Work Platforms**

29 CFR 1910, Subpart F, contains regulations for the safe placement and operation of powered platforms used for building maintenance, vehicle-mounted elevating and rotating work platforms, and manlifts. Use of this equipment during AMWTP operations by Operations, Maintenance, or subcontractor personnel requires fall protection and job-specific equipment training prior to use.

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The following IS/IH procedures address the requirements for this section:

- MP-ISIH-2.23 and SRM-ISIH-2.9 set the minimum requirements for fall protection use where employees are subject to a fall of 6 ft or greater during the performance of construction, maintenance repair, or renovation work related activities. These procedures address the requirements and responsibilities for the selection, use, and maintenance of fall protection equipment. This document also addresses the required use of guarding protection at 4 ft per 20 CFR 1910.23.
- MP-ISIH-2.28, Aerial Lifts, and SRM-ISIH-2.1, Aerial Lifts and Elevating Platforms, provide information pertaining to the safe use of aerial lifts.

#### **4.5 Excavations**

29 CFR 1926, Subpart P, contains general and specific regulations for safe work practices for any excavation performed at AMWTP.

All entry and egress means, sloping, shoring, barricades, and other safety measures comply with Subpart P and its appendices. The AMWTP IS/IH organization or a trained, competent worker inspects all excavations before entry to ensure the requirements of Subpart P and its appendices are followed.

The following IS/IH procedures address the requirements for this section:

- MP-ISIH-2.46, Excavation, and MP-ISIH-2.45, Subsurface Investigation and Work Execution, implement safety controls for work in and around excavations and for surface penetration to ensure worker safety and to protect facilities and property.

#### **4.6 Occupational Health and Environmental Control**

29 CFR 1910, Subpart G, contains regulations for ventilation and occupational exposure to noise, and to non-ionizing radiation. Primary ventilation controls are incorporated in the Project Design Criteria and included in the basic operating system of the AMWTP. These design features (ventilation and enclosure/confinement) incorporate OSHA and 10 CFR 851 hierarchy of controls by the application of engineering controls to mitigate both toxic material and radiological hazards. These features represent significant exposure and reduction designs utilized for routine operations.

INST-ISIH-2.17.1, Testing Specialized Ventilation Systems, and by reference, ACGIH, Industrial Ventilation: Manual of Recommended Practice (latest edition) addresses the requirements for this section.

Appropriate work control documents are used for emergent work operations and maintenance involving abrasive blasting, grinding, polishing, buffing, and spray finishing, if these operations are conducted.

AMWTP IS/IH personnel monitor work areas to determine employee exposure to noise, electromagnetic radiation, and toxic substances. If exposure levels are elevated, engineering and administrative controls are implemented. PPE is used only after other control measures are not possible, are inadequate, or in most cases at AMWTP, as a “defense in depth.”

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ACGIH threshold limit value (TLV) limits for exposure to noise and non-ionizing radiation are used in determining the need for additional engineering, administrative, or PPE controls. AMWTP follows the ACGIH TLV for noise, which is 85 dBA over an 8-hour work period. Equivalent noise TLVs are adjusted for longer work periods. If these levels are exceeded, a hearing conservation program is implemented in accordance with 29 CFR 1910.95, Occupational Noise Exposure.

Periodic noise surveys are conducted during operational activities to identify noise levels. Appropriate measures are then taken (e.g. personnel will be supplied with hearing protection) to control the levels to within the allowable noise range if engineering controls cannot be effectively implemented.

The following IS/IH procedures address the requirements for this section:

- MP-ISIH-2.4, Controlling and Monitoring Exposure to Noise, and SRM-ISIH-2.6, Hearing Conservation, address noise monitoring and exposure limits, employee notification, audiometric testing, hearing protection and noise attenuation, training, and documentation.
- MP-ISIH-2.16, Laser Safety, and SRM-ISIH-2.19, Lasers, identify the controls needed for the safe operation of non-ionizing radiation producing equipment.

### **4.7 Hazardous Materials**

29 CFR 1910, Subpart H, contains regulations for safe storage, handling, and use of hazardous materials during AMWTP operations. Requirements for hazardous materials include compressed gases (including specific regulations for acetylene, hydrogen, oxygen, and nitrous oxide), flammable and combustible liquids, liquefied petroleum gases, process safety management of highly hazardous chemicals, and hazardous waste operations and emergency response.

Compressed gas cylinders, including cryogenic gas cylinders, are inspected, stored, handled, and used in accordance with OSHA requirements. The liquefied petroleum gases tank and piping system is installed with safety features.

A chemical inventory is maintained to minimize the amount of chemicals required in conducting operations. Process safety management measures would be implemented if threshold quantities for highly hazardous chemicals are ever exceeded. Where possible, chemicals are used that do not constitute a hazardous waste when spent.

AMWTP operations are conducted in accordance with Hazardous Waste Management Act/Resource Conservation Recovery Act (HWMA/RCRA) permits and environmental regulations. Written program requirements for hazard communication, medical surveillance, material handling, and safety and health-related training related to hazardous waste operations and emergency response are included in the AMWTP operations and IS/IH procedures and instructions.

The following procedures address the requirements for this section:

- MP-CMNT-10.2, Pressurized Systems, addresses the process and guidelines for the inspection of pressurized systems and components to include: boilers, pressure vessels, hot water heaters, piping systems, overpressure protection safety devices, deaerators, and compressed air equipment. It also describes the process in place for safe transportation, use, and storage of compressed gas cylinders.

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- MP-CMNT-10.24, Compressed Gas Systems, and SRM-ISIH-2.3, Compressed Gases, provide guidance and address the requirements for the safe use and handling of portable compressed gas containers at AMWTP.
- MP-ISIH-2.49, establishes the roles and responsibilities necessary to provide mandatory and standardized requirements for fire protection for the AMWTP.
- MP-ISIH-2.63, Flammable and Combustible Liquids, addresses the proper controls for storage, handling, and use of flammable and combustible liquids to minimize threats to employees, the public, property, and the environment.
- MP-ISIH-2.5, Hazard Communication Program, and SRM-ISIH-2.13, Hazard Communication, address the transmittal of information concerning chemical hazards and other hazardous substances to employees. Information for container labeling and other forms of warning, material safety data sheets (MSDSs), and employee training are also addressed.
- LST-ISIH-03-IM, identifies the AMWTP procedures that are in place that implement the requirements of 29 CFR 1910.120.

#### **4.8 Personal Protective Equipment**

29 CFR 1910, Subpart I, contains regulations on PPE. Requirements include those for eye, face, head, foot, and hand protection, protective clothing use, hearing and respiratory protection devices, protective shields and barriers, and electrical safety equipment. Personnel use protective equipment, as needed, in the AMWTP, but the design of the facility precludes the majority of exposures during normal operation. PPE is most often used for “defense in depth” at AMWTP. Selection of PPE is documented as part of the formal hazard assessment process and is placed in the appropriate AMOW or PTW.

PPE requirements are included in AMWTP IS/IH procedures and instructions. IS/IH personnel conduct assessments and monitor AMWTP operations to determine if PPE is required and to determine the adequacy/continued effectiveness of other controls. The equipment selected conforms to the applicable regulatory requirements and American National Standards Institute (ANSI) standards.

AMWTP implements a Respiratory Protection Program that meets the requirements of 29 CFR 1910.134 and the latest version of ANSI Z88.2, Respiratory Protection. The respiratory protection program includes requirements governing the selection, issuance, use, and care of respirators, medical surveillance, and respirator user training. IS/IH administrates the respiratory program, and a designated IS/IH staff member serves as the Respiratory Protection Program administrator. AMWTP utilizes NIOSH-approved respiratory protection in conjunction with layered clothing. Special respiratory devices approved by entities other than NIOSH are not be used.

The following procedures address the requirements for this section:

- MP-CMNT-10.9, Electrical Safety Program, and SRM-CMNT-10.1, Electrical Safety, identify the requirements for an electrically safe workplace and help protect workers from electrical hazards.
- MP-ISIH-2.1 defines the AMWTP OMP, implements requirements for medical and first aid services, and states standard practices for key components of the OMP.

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- MP-ISIH-2.2, Personal Protective Equipment, and SRM-ISIH-2.22, Personal Protection Equipment, provide directions for selecting and using PPE for work assignments and directions for safety representatives to determine proper head, eye, face, body, hand, and foot protection for tasks.
- MP-ISIH-2.18, Respiratory Protection Program, and SRM-ISIH-2.17, Respiratory Protection, implement the requirements of 29 CFR 1910.134, as applicable to the AMWTP. These procedures provide instructions for implementing this program to help ensure worker health and safety.
- SRM-ISIH-2.17 implements requirements for subcontractors.

### **4.9 General Environmental Controls**

29 CFR 1910, Subpart J, contains regulations on environmental controls required during AMWTP operations. Requirements include those for sanitation, standards for safety signs and tags, and safe activities when working in confined spaces or with energized equipment.

AMWTP facilities are constructed to meet the sanitary requirements of the regulation, and housekeeping and workplace inspections are performed to maintain a safe working environment. Facility equipment and building components contain the appropriate signs and tags to ensure personnel are apprised of the hazards present.

AMWTP has IS/IH MPs and work instructions for conducting work involving confined space entries. The confined space procedure requires using an appropriate work control document before entering the confined space. The work control document review follows the integrated safety management core functions to ensure that work is performed in a safe manner.

The following procedures address the requirements for this section:

- INST-COPS-9.20.1, Lockout/Tagout, implements the processes of MP-COPS-9.18, and provides a consistent method to protect employees from injury using LO/TO. It details the planning, placement, verification, and removal of locks and tags used to protect employees from hazardous energy sources and unexpected energization or startup of equipment that could cause injury to personnel during maintenance.
- MP-ISIH-2.6, Confined Space Program, and SRM-ISIH-2.5, Confined Spaces, establishes the written confined space entry program for the AMWTP.
- MP-ISIH-2.26, Signs and Barricades, and SRM-ISIH-2.23, Safety Signs, define responsibilities and requirements for the use of OSHA-compliant accident-prevention signs and barricades for the AMWTP.

### **4.10 Medical and First Aid**

29 CFR 1910, Subpart K, contains a regulation for medical and first aid services required during the project.

The following IS/IH procedures address the requirements for this section:

- MP-ISIH-2.1 defines the AMWTP OMP, implements requirements for a medical and first aid services, and states standard practices for key components of the OMP.

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- MP-ISIH-2.15, First Aid Kits, provides directions for the standard design, availability, location, content, maintenance, inventory frequency, and restocking of first aid kits. This procedure also identifies responsibility for injury notification and reporting.
- MP-ISIH-2.10, Recording and Reporting Occupational Injuries and Illnesses, provides guidance to comply with 29 CFR 1904, Recording and Reporting Occupational Injuries and Illnesses.

#### **4.11 Compressed Gas and Compressed Air Equipment**

29 CFR 1910, Subpart M, contains a regulation for air receivers used during AMWTP operations. Air receivers are selected, installed, and tested according to the requirements of this regulation to verify safe operations.

The following procedures address the requirements for this section:

- MP-CMNT-10.2 describes the process and guidelines for the inspection of pressurized systems and components to include: boilers, pressure vessels, hot water heaters, piping systems, overpressure protection safety devices, deaerators, and compressed air equipment. It also describes the process in place for safe transportation, use, and storage of compressed gas cylinders.
- MP-CMNT-10.23, Pressurized System Inspections, provides the guidelines for the inspection of pressurized systems and components, as defined in MP-CMNT-10.2.
- MP-CMNT-10.24 and SRM-ISIH-2.3 provide guidance and address the requirements for the safe use and handling of portable compressed gas containers at AMWTP.

#### **4.12 Material Handling and Storage**

29 CFR 1910, Subpart N, contains regulations for safe use of forklifts, lift trucks, cranes, slings, etc., used during AMWTP operations. All powered industrial trucks and cranes are selected and inspected before being placed in service to verify their safe operation.

Only trained operators are allowed to use the equipment in accordance with safe operating practices. A preventive maintenance program is established to ensure the material handling equipment is inspected, serviced, and repaired or replaced as needed.

The following procedures address the requirements for this section:

- MP-CMNT-10.8, Hoisting and Rigging, and SRM-CMNT-10.2, Hoisting and Rigging, contain the requirements for worker safety for hoisting and rigging activities for AMWTP and subcontractor personnel.
- SRM-ISH-2.26, Steel Erection.
- MP-CMNT-10.8 identifies the requirements for controlling and maintaining portable rigging equipment at the AMWTP.

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- MP-ISIH-2.32 addresses housekeeping requirements that contribute to a safe workplace.
- MP-ISIH-2.38, Material Handling and Storage, and SRM-ISIH-2.20, Material, Handling, Storage, and Disposal, define the responsibilities and requirements for the safe handling and storage of materials.
- MP-ISIH-2.41 defines the responsibilities and requirements for the safe use of motorized vehicles and heavy equipment.
- MP-CMNT-10.8, Hoisting and Rigging, provides instruction for performing hoisting and rigging activities (and material handling) involving transuranic waste.

#### **4.13 Machinery and Machine Guarding**

29 CFR 1910, Subpart O, contains regulations for the installation and maintenance of machine guarding required to safely isolate point of operations, pinch points, and rotating parts on machines used during AMWTP operations.

AMWTP machinery is designed and installed with machine guarding or other engineering/administrative controls implemented to protect the workers from hazards such as pinch points, rotating shafts, crushers, and shears. Guarding may also be accomplished by location, interlock or trapped key systems. Periodically, the safety brakes, restraints, interlocks, and other safety features are verified to be operational. Certain areas (Zone 3) that are not accessible during normal operations contain equipment that does not meet all machine guarding requirements. Equipment is configured in this manner to decrease time necessary to perform maintenance tasks for ALARA purposes. Prior to entry into Zone 3 areas where guarding does not meet OSHA requirements, compensatory measures will be implemented including LO/TO and “trapped key systems.” The following IS/IH procedures address the requirements for this section:

- MP-ISIH-2.21, Machine Guarding, defines the responsibility and requirements for assuring proper machine guarding.
- MP-ISIH-2.30, Hand and Power Tools, identifies the minimum requirements for the safe handling and use of hand and power tools including required guards installed by the manufacturer on power tools.

#### **4.14 Hand and Portable Powered Tools and Other Hand-Held Equipment**

29 CFR 1910, Subpart P, contains regulations for selecting and using hand and portable powered tools during AMWTP operations. These tools include saws, sanders, pneumatic tools, grinders, lawn mowers, and jacks.

AMWTP workers are provided safe tools and equipment that contain the required guarding, safety interlocks, and other safety features. The tools are inspected by the workers before use to ensure the tools are in safe operating conditions.

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The following IS/IH procedures address the requirements for this section:

- MP-ISIH-2.21 defines the responsibility and requirements for assuring proper machine guarding.
- MP-ISIH-2.30 and SRM-ISIH-2.12, Hand and Portable Power Tools, identify the minimum requirements for the safe handling and use of hand and power tools.

#### **4.15 Welding, Cutting, and Brazing**

29 CFR 1910, Subpart Q, contains regulations for safe welding, cutting, and brazing operations that may occur during AMWTP operation. Requirements include those for oxygen-fuel gas welding and cutting, arc welding and cutting, and resistance welding. The safe work practices include welder safety, trained fire watches, fire prevention, ventilation, and safe welding procedures.

Appropriate emergent work control documents are prepared before any welding or cutting job is started. Only trained and qualified technicians perform welding and cutting operations using approved welding procedures, instructions, and PPE.

The occupational safety and industrial hygiene organization inspects and test welding and cutting operations to verify that the ventilation is meeting minimum airflow requirements and to ensure fire control measures. The AMWTP Fire Prevention Plan and associated fire safety procedures will implement the AMWTP Fire Protection Program.

The AMWTP employees are typically trained on the use of portable fire suppression systems and are educated on the proper response to a fire alarm. Drills are conducted routinely to ensure that personnel understand the proper response to fire alarms.

The following procedures address the requirements for this section:

- MP-CMNT-10.11, Welding, describes controls for all welding activities used at AMWTP.
- MP-ISIH-2.36, Welding, Cutting, and Other Hot Work, and SRM-ISIH-2.29, Welding, Cutting and Other Hot Work, identify the safety requirements for welding, cutting, and other hot work.
- INST-ISIH-2.11.9, Industrial Hygiene Exposure Assessment, provides instruction for industrial hygiene personnel conducting exposure assessments for the consistent characterization of industrial hygiene hazards and for documenting industrial hygiene evaluations.

#### **4.16 Electrical**

29 CFR 1910, Subpart S, contains regulations for the design, installation, or repair of electrical components that may be conducted during AMWTP operations. The regulations are divided into two categories:

- Design safety standards for electrical systems
- Safety-related work practices.

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Design safety standards include requirements for wiring design; wiring methods, components, and equipment for general use; specific purpose equipment and installations; hazardous locations; and special systems. The treatment facility electrical systems/components are constructed and modified in accordance to the required design standards. The AMWTP Project Design Criteria document specifies that the NFPA standard is to be followed. Redundant “trapped key interlock systems” have been incorporated in the design to protect workers accessing equipment for maintenance in accordance with applicable ANSI standards. Flash protection is provided in accordance with NFPA 70E, Electrical Safety in the Workplace, and is implemented through the work control process.

The following procedures address the requirements for this section:

- MP-CMNT-10.9 and SRM-CMNT-10.1 identify the requirements for an electrically safe workplace and help protect workers from electrical hazards.
- MP-ISIH-2.28 provides information pertaining to the safe use of aerial lifts.
- INST-COPS-9.20.1 implements the processes of MP-COPS-9.18 and provides a consistent method to protect employees from injury using LO/TO. It details the planning, placement, verification, and removal of locks and tags used to protect employees from hazardous energy sources and unexpected energization or startup of equipment that could cause injury to personnel during maintenance.

### **4.17 Toxic and Hazardous Substances**

29 CFR 1910, Subpart Z, includes regulations for the safe use of various toxic and hazardous substances that may be present during AMWTP operations. The subpart also contains regulations for employee access to medical records, hazard communication program, and retention of Department of Transportation markings, placards, and labels.

Whenever feasible, the hazardous and toxic substances listed in Subpart Z are not used. Before any products are procured, IS/IH staff evaluates MSDSs to determine if they contain any of the substances listed. If so, a suitable alternate product is considered. If an alternate product cannot be used, the applicable requirements (for the particular substance) are implemented. Also, a hazardous substance listed in Subpart Z may be present in the waste being treated (e.g., lead). If the substance is present in the waste, the specific requirements of the corresponding regulation are implemented. The requirements typically include provisions for training, monitoring, PPE, and other safe practices necessary to reduce exposures to the hazardous or toxic substances.

During new employee orientation and facility access, all operations employees are trained on the hazard communication program and are also informed of their right to their medical records and the process for accessing those records. All employees receive hazard communication training online through computer-based training.

The following IS/IH procedures address the requirements for this section:

- MP-ISIH-2.11 captures the functional elements of the industrial hygiene program for the AMWTP which have not been addressed elsewhere in the IS/IH Program, establishes responsibilities for those program elements, and presents an overview of the AMWTP commitment to industrial hygiene.

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- INST-ISIH-2.11.9 provides instruction for industrial hygiene personnel conducting exposure assessments for the consistent characterization of industrial hygiene hazards and for documenting industrial hygiene evaluations.
- LST-ISIH-02-IM identifies the procedures that contain IS/IH requirements of the AMWTP contract.
- MP-ISIH-2.1 defines the OMP, implements requirements for a medical and first aid services, and states standard practices for key components of the OMP.
- MP-ISIH-2.5 addresses the transmittal of information concerning chemical hazards and other hazardous substances to employees. Information for container labeling and other forms of warning, MSDSs, and employee training are also addressed.
- MP-ISIH-2.26 defines responsibilities and requirements for the use of OSHA- compliant accident-prevention signs and barricades for the AMWTP.
- LST-RS&C-01-IM, Radiological Control Implementation Matrix, identifies the procedures that implement radiological control requirements of 10 CFR 835.
- LST-ISIH-03-IM identifies requirements and procedures associated with implementing 29 CFR 1910.120.

#### **4.18 Chronic Beryllium Disease Prevention Program**

Beryllium is identified as a hazardous constituent within the AMWTP waste inventory. Personal breathing zone exposure monitoring conducted to date has not shown beryllium exposure in excess of the OSHA-permissible exposure limit (PEL) of  $2 \mu\text{g}/\text{m}^3$ , the ACGIH TLV, or the 10 CFR 850 action level of  $0.2 \mu\text{g}/\text{m}^3$ . Data collected to date includes waste retrieval operations, waste repackaging operations, liquid absorption operations, drum treatment tent, and waste container un-overpack operations, facility cell entries, and upset conditions involving breached systems/containers. Further, exposure monitoring for beryllium has demonstrated exposure levels well below the 10 CFR 850 CBDPP action level of  $0.2 \mu\text{g}/\text{m}^3$ , calculated as an 8-hour time weighted average. Surface swipe sampling for beryllium has also demonstrated compliance below the CBDPP free-release limit of  $0.2 \mu\text{g}/100 \text{ cm}^2$ . This has been demonstrated through the same operations addressed above, in addition to the routine beryllium swipe-sampling program of all AMWTP buildings used to verify that control programs are performing as designed.

Operations or maintenance activities which have been identified through the hazard analysis and control process as having the potential for generating beryllium dust, the potential for worker exposure to beryllium greater than the  $0.2 \mu\text{g}/\text{m}^3$  CBDPP action limit, or if surface swipe sampling detects beryllium surface contamination greater than the CBDPP  $0.2 \mu\text{g}/100 \text{ cm}^2$  free release limit, will require full implementation of 10 CFR 850 CBDPP program elements for that operation/area.

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AMWTP implements the requirements of 10 CFR 850 through IS/IH procedures. These procedures specify requirements for:

- Routine exposure assessments
- Identification and demarcation of beryllium-contaminated areas, items, and equipment
- Specific hazard analysis for routine and non-routine tasks, including specification of PPE
- Upset conditions involving known or potentially contaminated beryllium materials
- Hazard communication training (specific to beryllium hazards)
- Implementation of a medical surveillance program.

Engineered barriers (enclosure, negative-pressure zone-controlled ventilation) provide for exposure mitigation during routine facility characterization and treatment operations. Well-defined suspension levels for encountering breached/damaged containers are specified in operating instructions. Routine exposure monitoring and surface contamination survey programs have been developed for verification of controls during operations conducted in accordance with procedural and engineering controls. Potential exposures are limited to breaches of containers during retrieval operations, material movement, bag-out of materials from glove box lines, and cell entries. Monitoring for verification of controls is conducted for characterization of breached waste containers and during routine and non-routine operations and maintenance where exposure potential exists. Response plans to upset conditions are incorporated into operating procedures by IS/IH. Activities to recover from breached, upset conditions or for entry to potentially contaminated atmospheres/enclosures will require specific hazard analysis and exposure assessment, which specify conservative selection of PPE along with specific work controls.

A medical surveillance program is available to project personnel who have been identified under 10 CFR 850 as former beryllium workers, or for personnel who request medical surveillance.

The following IS/IH procedures address the requirements for this section:

- MP-ISIH-2.7 establishes the AMWTP management requirements for implementation of a CBDPP to prevent future cases of chronic beryllium disease by minimizing the number of workers exposed to beryllium and to reduce the potential for worker exposure to airborne and surface beryllium at the AMWTP.
- INST-ISIH-2.7.1, Beryllium Control Measures for the Characterization and Evaluation of Upset Conditions, establishes and implements the management requirements for determining response actions for controlling and monitoring beryllium exposure during the characterization and evaluation of upset conditions (breached glove box, continuous air monitor alarms, radiological contamination, etc.) encountered during routine AMWTP operations.

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- MP-ISIH-2.11 captures the functional elements of the Industrial Hygiene program for the AMWTP which have not been addressed elsewhere in the IS/IH Program, establishes responsibilities for those program elements, and presents an overview of the AMWTP commitment to industrial hygiene.
- INST-ISIH-2.11.9 is a guide for industrial hygiene personnel conducting exposure assessments for the consistent characterization of industrial hygiene hazards and for documenting industrial hygiene evaluations.
- MP-ISIH-2.1 defines the OMP, implements requirements for medical and first aid services, and states standard practices for key components of the OMP.
- MP-ISIH-2.2 provides directions for selecting and using PPE for work assignments and directions for safety representatives to determine proper head, eye, face, body, hand, and foot protection for tasks.
- MP-ISIH-2.5 addresses the transmittal of information concerning chemical hazards and other hazardous substances to employees. Information for container labeling and other forms of warning, MSDSs, and employee training are also addressed.
- MP-ISIH-2.18 implements the requirements of 29 CFR 1910.134 as applicable to the AMWTP. This procedure provides instructions for implementing this program to help ensure worker health and safety.
- MP-ISIH-2.26 defines responsibilities and requirements for the use of OSHA-compliant accident-prevention signs and barricades for the AMWTP.
- MP-ISIH-2.32 addresses housekeeping requirements that contribute to a safe workplace.

#### **4.19 Specific Fire Protection Program Requirements**

AMWTP implements fire protection requirements as specified in 10 CFR 851 and DOE Order 420.1B. These orders invoke requirements used for providing protection of property, workers, and the public and are incorporated into AMWTP FPP documents.

The following procedures address the FPP programmatic requirements:

- MP-ISIH-2.49 establishes the overall responsibility and authority for the AMWTP FPP. The AMWTP FPP establishes requirements in accordance with 10 CFR 851 and DOE O 420.1B.
- MP-ISIH-2.48, Fire Protection Exemptions and Equivalencies, provides requirements for obtaining an exemption (An approved deviation from a non-statutory code, standard, or DOE order. Exemptions are granted by DOE Headquarters and may be permanent, temporary for field level) or an equivalency (An approved alternative means of satisfying the technical provisions of a fire protection code or standard. Equivalencies are approved by DOE-ID) for fire protection systems or equipment that cannot meet applicable mandatory requirements and cannot be brought into compliance. Exemptions and equivalencies document the reasons that strict compliance with mandatory fire protection requirements cannot be met and the measures to ensure life safety and property damage and the environment remain protected.

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- MP-ISIH-2.47, Developing Fire Hazard Analyses, Fire Safety Assessments, and Abbreviated Fire Assessments, provides requirements for the development, approval and maintenance of FHAs, FSAs and AFAs at the AMWTP. FHAs and FSAs identify and evaluate the fire hazards associated with facilities or buildings and determine the actions necessary to mitigate the consequences of a fire. AFAs identify significant fire safety deficiencies that would prevent the achievement of DOE fire-safety policy objectives.
- INST-CMNT-10.6.2, Fire Protection System Impairments, provides requirements for controlling fire system impairments and ensures that the affected systems are returned to service in an acceptable and timely manner and that adequate compensatory measures are in place during impairment as directed by a qualified Fire Protection Engineer.

## 5.0 RECORDS

Records generated by this procedure are classified in accordance with the table below, and dispositioned in accordance with MP-DOCS-18.2, Records Management.

Record Description	Classification
PD-ISIH-01, Case File	Misc. Other Records/A16-1.2/Destroy 5 years after submittal.

## 6.0 EXHIBITS

None

## 7.0 APPENDICES

None