

REFERENCE COPY

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# SAFETY PLAN

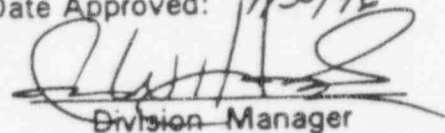
RDP-SAF-001

REVISION 0

RMI Environmental Services  
A Division of RMI Titanium Company  
Decommissioning Project  
P.O. Box 579  
Ashtabula, Ohio 44005-0579

Safety

Date Approved: 9/30/96

  
Division Manager

7010090176 961002  
PDR ADOCK 04002384  
C PDR

RMI Environmental Services

AUTHORIZATION SHEET

Document Title: SAFETY PLAN

RDP-SAF-001 Rev.0 has been reviewed and is hereby authorized for  
Reference No. implementation

C.D. Bibler  
C.D. Bibler, Manager, Quality Assurance

9/30/96  
Date

E. P. Marsh  
E. P. Marsh, Director, Environmental, Safety & Health

9/30/96  
Date

M. Shakoor  
M. Shakoor, Assistant Division Manager

9/30/96  
Date

R.L. Terlecki  
R.L. Terlecki, Director, Decontamination and Decommissioning

9/30/96  
Date

F. A. Willis  
F. A. Willis, Operations Manager

9/30/96  
Date

R.E. Williams  
R. E. Williams, Director, Administration

9/30/96  
Date

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will be implemented, revised whenever a change occurs, updated  
periodically, and subject to audit by the Quality Assurance  
Department.

T. J. Goergen  
Originator T. J. Goergen

09/30/96  
Date

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## **EXECUTIVE SUMMARY**

The RMI Titanium Company Extrusion Plant is located in northern Ashtabula County, Ohio slightly northeast of the City of Ashtabula and approximately one mile south of Lake Erie and five hundred feet south of Fields Brook. The plant is in a sparsely populated and highly industrialized area. Several chemical production and metal conversion plants are located nearby.

The RMI Titanium Company Extrusion Plant is a privately owned facility. From 1962 to 1988, the company received uranium billets and refined them into various shapes for fuel and target fabrication use by the Department of Energy and its predecessors. RMI also performed work for the Department of Defense and a number of commercial entities under a Nuclear Regulatory Commission License. Twenty-six years of handling, extruding, forging, and machining uranium at the facility have resulted in on-site and off-site contamination of buildings and environmental media consisting primarily of solvents and low-level radioactive contamination.

In 1990, all extrusion operations ceased and the project was transferred to the Environmental Management program for environmental restoration. Decommissioning and remediation activities at the site are projected to be complete in fiscal year 2002. Environmental restoration activities include remediation of local ground water, surface soils, buildings, and associated processing equipment, as well as landlord activities attributable to the Department of Energy.

The Safety Plan provides the means of planning and implementing safety procedures at the RMI Decommissioning Project (RMIDP) and describes the mechanism employed to minimize employee exposure to hazardous conditions and substances during the site decommissioning. The Safety Plan describes the organization of the Environmental, Safety, and Health Department, regulatory compliance drivers, and physical and chemical hazard mitigation. The Safety Plan also describes supporting plans and procedures for industrial hygiene monitoring, safety review, recordkeeping, training, medical surveillance, emergency response, and subcontractor safety.

The Safety Plan has been developed to define the safety policies and procedures for work at the RMIDP. The Safety Group of the Environmental Safety and Health Department of RMI Environmental Services is responsible for the implementation of the Plan which is effective for the duration of the RMIDP.



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## **1.0 PURPOSE**

The purpose of the Safety Plan is to describe policies and procedures for protecting the health and safety of employees as well as facilities and equipment during the decommissioning. The plan has been developed to facilitate coordination of health and safety issues among personnel and describes the mechanism employed to minimize employee exposure to hazardous conditions and substances during the RMIDP. The Safety Plan also describes supporting plans and procedures for industrial hygiene monitoring, safety review, recordkeeping, training, medical surveillance, emergency response, subcontractor safety which satisfies the requirements of the Hazardous Waste Operations and Emergency Response Standard (29 CFR 1910.120). The specific regulatory citation under 29 CFR 1910.120 is listed next to the section which satisfies that requirement.

## **2.0 SCOPE**

This Safety Plan applies to work performed at the RMI Decommissioning Project.

The Environmental, Safety, and Health Department is responsible for development and management of the Safety Plan. It encompasses activities associated with the RMIDP and is applicable to all RMIDP personnel, subcontractors, Department of Energy representatives, and project visitors.

## **3.0 RESPONSIBLE/FUNCTIONAL MANAGER**

The Director of Environmental, Safety, and Health is the functional manager responsible for safety at the facility. The Supervisor, Safety and Security has been delegated responsibility for implementation and day to day operations of the Safety Plan.

## **4.0 REQUIREMENTS/RESPONSIBILITY**

A copy of the organizational structure is available in the Division Manager's office. Responsibilities and chain of command as they apply to safety are described in the following paragraphs.

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#### 4.1 DIVISION MANAGER

The Division Manager is responsible for managing, coordinating, and directing decontamination and decommissioning activities. In addition, the Division Manager's responsibilities include:

- Communicating with RMI corporate officials regarding plant operations, schedules, budgets, administrative management and labor relations.
- Reporting to Senior Director, Administration and Environmental Affairs, RMI Titanium Company.
- Supervising principal subordinates who include: the Assistant Division Manager; Director, Administration; Manager, Operations; Manager, Project Controls; Manager, Quality Assurance; Director, Environmental Safety and Health; Director, Community Relations; Director New Business Development; Director, Decontamination and Decommissioning, and Manager, Engineering.

#### 4.2 ENVIRONMENTAL, SAFETY, AND HEALTH DEPARTMENT

The Environmental, Safety, and Health Department is responsible for overall project safety and health management and implementation of this program. The ES&H Department is responsible for, but not limited to:

- Development of comprehensive environmental, safety, and health programs and procedures
- Review and compliance with applicable orders, regulations, and laws
- Review and approval of safety permits
- Groundwater investigations and remediation investigations
- Surface soil investigation and restoration investigation
- Decontamination and decommissioning
- Radiological surveys
- Environmental sampling and analysis
- Interfacing with regulatory agencies
- Occupational safety and health
- Site Security





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The ES&H Department is separated into four groups: Environmental Affairs, Safety and Security (including industrial hygiene and training), Health Physics, and the Laboratory.

Within the ES&H Department, Safety is responsible for the development and implementation of the Safety Plan. It is separated into three major areas representing operational functions. The first of these functions is Safety Engineering which manages general site safety, industrial hygiene, hazardous material handling, and permit development and approval. The second function is Training which is responsible for the coordinating and conducting required site training. The third is Security, which is responsible for site access, TLD badge control, emergency communication and response, and fire safety. Positions within Safety and Security Group consist of the Supervisor of Safety and Security, the Safety Engineer and Trainer, and Security Officers.

## 4.2.1 SUPERVISOR, SAFETY AND SECURITY

The Supervisor of Safety and Security is responsible for Safety and Emergency programs administration including the Safety Plan, The Training Plan, and The Security Plan. The Supervisor will ensure regulatory compliance with applicable OSHA, DOE, and Federal, state and local regulations. The Supervisor acts as the Emergency Director, coordinates the development of safety programs, and assists in accident investigations.

## 4.2.2 SAFETY ENGINEER AND TRAINER

The Safety Engineer and Trainer develops, reviews, and coordinates, training programs for the RMIDP. This includes training program administration for site safety training. The Safety Engineer and Trainer also performs safety surveys, industrial hygiene monitoring, accident reporting, and represents RMI at the Ashtabula County Local Emergency Planning Committee.



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## 4.2.3 SECURITY OFFICERS

Security Officers are responsible for site access control including personnel and vehicle access. Security Officers patrol the site and monitor security systems and communications. They are the first responders for off-hour emergencies.

## 4.3 SAFETY PLAN

The Safety Plan is supported by an assemblage of approved procedures. Additionally, other procedures have been developed for control of work and shall be followed. This plan defines the requirements and basis for the development of the various safety procedures. Various documents available from OSHA, NIOSH, and EPA have been consulted in the development of this plan.

RMIDP documents and procedures which directly support the Safety Plan include, but are not limited to the following:

RMI Procedure/Document	Document Number
Confined Space Entry Procedure [29 CFR 1910 .120 (b) (4) (ii)(I)]	RDP-SAF-103
Emergency Control Procedures (ECP) [29 CFR 1910 .120 (b) (4) (ii)(H) and (J)]	RDP-SAF-105
ECP-Bomb Threat [29 CFR 1910 .120 (b) (4) (ii)(H)]	RDP-SAF-105-001
ECP-Civil or National Disorder [29 CFR 1910 .120 (b) (4) (ii)(H)]	RDP-SAF-105.002
ECP-Contingency Plan [29 CFR 1910 .120 (b) (4) (ii)(H) (J)]	RDP-SAF-105.003





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ECP-Criticality Incident (uncontrolled nuclear reaction)[29 CFR 1910 .120 (b) (4) (ii)(H)]	RDP-SAF-105.009
ECP-Fire, Explosion, Serious Accident [29 CFR 1910 .120 (b) (4) (ii)(H)(J) ]	RDP-SAF-105.004
ECP-Medical Emergency Incident [29 CFR 1910 .120 (b) (4) (ii)(H)]	RDP-SAF-105.010
ECP-Mutual Aid Alerting System [29 CFR 1910 .120 (b) (4) (ii)(H) and (J)]	RDP-SAF-105.011
ECP-Spill Prevention Control and Countermeasures Plan [29 CFR 1910 .120 (b) (4) (ii)(H) and (J)]	RDP-SAF-105.005
ECP-Tornado [29 CFR 1910 .120 (b) (4) (ii)(H)]	RDP-SAF-105.006
ECP-Transportation Incident [29 CFR 1910 .120 (b) (4) (ii)(H)]	RDP-SAF-105.007
ECP-Utilities Interruption [29 CFR 1910 .120 (b) (4) (ii)(H)]	RDP-SAF-105.008
Entry Control Plan [29 CFR 1910.120 (b)(4)(ii)(F) and (G)]	RMI-HP-148
Fire Control Permit Procedure [29 CFR 1910.120(b)(4)(ii)(A)]	RDP-SAF-102
Hazard Communication Procedure [29 CFR 1910.120 (b)(4)(ii)(A),(C),(D),(G)]	RDP-SAF-109



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RMI Procedure/Document	Document Number
Health Physics Manual [29 CFR 1910.120 (b)(4)(ii)(E)]	RMI-L-60
Hearing Conservation Procedure [29 CFR 1910.120 (b)(4)(ii)(A),(B),(C),(D)]	RDP-SAF-118
Issuance and Implementation of Radiological Work Permit Procedure [29 CFR 1910.120 (b)(4)(ii)(A),(C),(E),(F),(G)]	RDP-HP-155
Lesson Development Procedure [29 CFR 1910.120(b)(4)(ii)(B)]	RDP-TNG-100
Lock, Tag, and Try Procedure [29 CFR 1910.120 (b) (4) (ii)(A)]	RDP-SAF-117
Occurrence Reporting	RMI-L-117
Respiratory Protection Manual [29 CFR 1910.120 (b) (4) (ii)(A) and (C)]	RMI-HP-140
Safety Permit Procedure [29 CFR 1910.120(b)(4)(ii)(A),(B),(C),(D),(E)(F)(G) and (iii)(iv)]	RDP-SAF-100
Security Forces Procedure [29 CFR 1910.120(b)(4)(ii)(F)]	RDP-SEC-100
Security Plan [29 CFR 1910.120(b)(4)(ii)(F)]	RDP-SEC-001
Temperature Stress Management Procedure [29 CFR 1910.120(b)(4)(ii)(A)]	RDP-SAF-106



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RMI Procedure/Document	Document Number
Training Plan [29 CFR 1910.120(b)(4)(ii)(B)]	RDP-TNG-001
Training Matrix Procedure [29 CFR 1910.120 (b)(4)(ii)(B)]	RDP-TNG-101

## 4.4 HAZARD ANALYSIS [29 CFR 1910.120 (b)(4)(ii)(A)]

This Safety Plan is developed based on recognized hazards and Federal and state regulatory requirements. The following paragraphs address some of these hazards. It is not an all inclusive listing but it is intended to provide general hazard information for use by Project Supervisors when planning jobs. Specific hazards are addressed by task through utilization of safety checklists which are incorporated through various procedures. This satisfies the requirements of 29 CFR 1910.120(b)(4)(ii)(A).

### 4.4.1 RADIATION

As previously described, the site has been a uranium extrusion facility since the early 1960s. Uranium and uranium bearing materials have been stored in most areas. A small amount of thorium was processed in the 1960s and early 1970s. The principal radioactive materials present are uranium, although other radionuclides have been identified. The main radiation hazard from these materials is alpha radiation with internal exposure from inhalation, ingestion, and injection being the primary concerns. Of lesser concern is external beta and gamma radiation as a result of decay.

Contamination of surfaces or equipment with radioactive materials may be encountered in the production buildings or other facilities. Control zones with special requirements have been established to control these hazards. Soils also have the potential to have above background radioactive contamination.



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Health Physics has the primary responsibility of controlling exposure to radioactive materials and has developed a procedure for issuance and implementation of radiological work permits.

#### 4.4.2 CHEMICALS

The chemicals currently used have been identified as part of the hazard communication procedure. Other chemicals left over from the time that the facility was in operation exist on-site and are to be removed as part of the decommissioning process.

#### 4.4.3 ENERGIZED EQUIPMENT AND STORED ENERGY

Electrical hazards from overhead or buried power lines, improperly grounded equipment, live wires, or electrical capacitors pose a hazard of shock or electrocution. In addition, mechanical equipment with stored potential energy such as hydraulic equipment, springs, etc., pose a hazard unless safely released, locked out, or stored.

#### 4.4.4 UTILITIES

Electrical, natural gas, storm sewer, sanitary, and telephone lines are present and can potentially cause electrocution, fire or explosion, releases of sanitary waste, or disruption of utility services is damaged.

#### 4.4.5 CONFINED SPACES [29 CFR 1910.120(b)(4)(ii)(I)]

Confined spaces such as tanks, pits, enclosures, manholes, etc., are present on site. They pose a safety and health hazard because of the potential to contain hazardous agents and the inherent difficulty of exiting the space. Oxygen deficiency is a potential in a confined space along with the potential for a confined space to contain trapped hazardous gases or vapors.

#### 4.4.6 BIOLOGICAL HAZARDS

Poisonous plants such as poison ivy, oak, and sumac are common in this area and precautions must be taken as required for persons



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performing outdoor work. Wild animals as well as stinging insects may also pose hazards. In addition, the potential for exposures to bloodborne pathogens or other potentially infectious materials to personnel is possible.

#### 4.4.7 TEMPERATURE STRESS

Heat stress may be a potential hazard in areas such as where steam lines are located or near operating process equipment. The additional heat load imposed by working in special protective clothing and/or working outdoors during summer months must also be considered. In the winter months, cold injury (frost bite and hypothermia) are hazards at low temperatures and when the wind chill factor is low.

#### 4.4.8 HAZARDOUS NOISE

Equipment noise is present in some RMIDP locations including the Compressor and Boiler Rooms. High noise levels can also be generated by mobile equipment such as heavy equipment.

#### 4.4.9 EMERGENCIES [29 CFR 1910.120(b)(4)(ii)(H)]

Site emergencies can create an entirely new set of hazards. Site Workers must be aware of the warning alarms and proper actions to take. Actions to be taken in the event of an emergency are described in the Emergency Control Procedures.

#### 4.4.10 FIRE

The potential for fire exists anytime work is being done with an open flame such as an oxy-acetylene torch, welding operations, or grinding which generates sparks. RMIDP has developed a work and flame permit issuance program to help control the potential for fires. Fire fighting procedures are also addressed as part of the Emergency Control Procedures.





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## 4.4.11 MISCELLANEOUS HAZARDS

With the various types of tasks that take place as part of the RMIDP, various physical hazards exist. The possibility of eye injury from flying objects, dust, particulates, or splashes necessitate appropriate eye protection. The stability of structures, supports and working surfaces are addressed as part of excavation and elevated work procedures.

## 4.4.12 SPECIFIC WORK ACTIVITY HAZARDS

Each work activity has the potential for being impacted by the previously identified hazards. However, the work activity itself may create its own unique hazards. Noise, electrical, and safety hazards may be present from job specific equipment used for the work. Chemical hazards may be caused by the use of chemical products or agents, or by cutting or welding operations. Impacts on the nearby site workers must be considered as well as workers involved with the job. A hazard assessment must be completed before each job to help control the hazards associated with non-routine work.

## 4.5 TRAINING [29 CFR 1910.120 (b)(4)(ii)(B)]

The Training Plan and Training Matrix Procedure address training requirements for activities at the facility. The major objectives of the employee training programs include:

- Awareness of the potential hazards that might be encountered
- To gain knowledge and skills necessary to perform work with minimal risk to worker safety and health
- To increase awareness of the purpose and limitations of safety equipment
- To communicate procedures so that workers can safely avoid or escape from emergencies that may occur.

Training may be either a combination of both classroom or "hands-on" practice.



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Classroom training consists of instruction in safety and health topics; hands-on training consists of drills in the field that simulate site activities and conditions. Instructors are trained in the contents and requirements of the Training Plan.

Site Workers shall not engage in decontamination and decommissioning activities until they have been trained to a level commensurate with their job responsibilities and with the degree of anticipated hazards. A documented record of training shall be maintained for each site worker.

## 4.5.1 RED BADGE TRAINING REQUIREMENTS

Each person authorized to work shall be trained to the appropriate level. At a minimum, this training includes eight hours of initial environmental safety and health awareness training which includes fire safety and electrical safety training. Personnel completing this level of training receive a "Red Badge" which allows access to administrative areas and escorted access to the Restricted Area of the Extrusion Facility.

## 4.5.2 BLUE BADGE TRAINING REQUIREMENTS

More advanced training is required for personnel who may be required to work in the Restricted Area. This "Blue Badge" level of training permits unescorted access to the Restricted Area. Blue Badge training includes all of the topics included with Red Badge training as well as training in RCRA/SPCC/Contingency/Storm Water Pollution Prevention, Hazard Communication, Lockout/Tagout and Radiation Worker safety. In addition personnel who are Blue Badged and work with hazardous materials shall complete a 40 hour Hazardous Waste Operations and Emergency Response (HAZWOPER) training in accordance with 29 CFR 1910.120.

## 4.5.3 TASK SPECIFIC TRAINING

Depending on individual tasks to be completed at the RMIDP which would include non-routine tasks mostly, additional training may be required. This training may include training required by OSHA in the areas of: respiratory protection, confined space entry, energy isolation, first aid, hazard communication, laboratory chemical hygiene, bloodborne pathogens, lead exposure protection, fall protection, excavations, and power transmission



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and distribution. Training specific to equipment operation may include: crane operation, manlifts and powered platforms, industrial trucks, and welding and cutting equipment.

Subcontractors shall provide documentation that required training has been completed.

#### 4.5.4 ANNUAL TRAINING

Annual refresher training is required in procedures as required by regulation.

#### 4.5.5 SAFETY MEETING TOPICS [29 CFR 1910.120(b)(4)(iii)]

Many of the following items are covered at safety meetings and briefings on a daily, weekly, or monthly basis. Those that apply to the task being performed shall be identified prior to the start of work and may include:

- Task/Activity description
- Staff responsibilities
- Location and Duration
- Site or work area access/egress routes
- Safety and hazards
- Pathways of dispersion
- Emergency response
- Chemicals/contaminants of concern
- Special medical requirements
- Personal protective equipment requirements
- Air monitoring
- Work area or site control
- Spill containment
- Other considerations





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## 4.6 ACCIDENT INVESTIGATION

An accident log is kept with the nurse in the dispensary and with the Supervisor of Safety and Security. Injuries are reported to Safety and recorded in a log. The log describes the accident/injury, the level of severity, the nature of the injury and whether further action or disposition is required. The OSHA 200 form is completed and the incident reported to OSHA when the incident results in a fatality or the hospitalization of three or more persons.

Once initial response and evaluation has been conducted, Safety will conduct an investigation of the events surrounding the incident. Special reports may be filed with OSHA, NRC, and DOE when required by regulation.

Quality Assurance may also review the incident and may require the completion of Uncategorized Event Reports or Nonconformance reports. Quality Assurance may assist in the internal investigation to determine the nature of the incident, seriousness of the event, and the appropriate reporting mechanism. Root cause analysis and resolution of a corrective action may be used to analyze the incident and correct any deficiency in the program. The Supervisor of Safety and Security and Manager of Quality Assurance shall prepare the findings and deliver the results to the Division Manager who will determine whether the event warrants reporting to DOE.

The Occupational Safety and Health Administration (OSHA) and the DOE-Ashtabula Office shall be informed of any serious accident or event which results in personnel injury or death. OSHA and DOE may request additional information or further investigation or proceed with their own investigation.

## 4.7 PERSONAL PROTECTIVE EQUIPMENT [29 CFR 1910.120(b)(4)(ii)(C)]

Workers entering a control zone or work area must be protected against potential hazards. When feasible, engineering controls and work practices or a combination of both with personal protective equipment shall be used to reduce and maintain employee exposures to hazardous chemicals, radioactive materials, or radiation below the permissible exposure limits using ALARA (As Low As Reasonable Achievable) methodology.



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The purpose of personal protective equipment (PPE) is to shield or isolate individuals from the chemical, physical, and biological hazards that may be encountered within a hazardous waste site work area. Selection and use of adequate PPE should protect the respiratory system, skin, eyes, face, hands, feet, head, and body. PPE should be used in conjunction with other protective measures. Equipment and clothing should be selected to provide an adequate level of protection against suspected hazardous substances that cannot be controlled by engineering or work practice controls.

The use of PPE itself can create hazards such as heat stress, physical and psychological stress, impaired vision, mobility and communication difficulties. The greater the level of PPE protection, the greater the associated risks. PPE should only be used as the last measure of protection against a hazard.

#### 4.7.1 STANDARD PERSONAL PROTECTIVE EQUIPMENT

Standard protective gear is required for personnel who enter the restricted area. This PPE includes: hard hat, safety glasses, steel toed shoes, shoe covers (for shoes not left in the restricted area) and work coverall or smock.

#### 4.7.2 ADDITIONAL PERSONAL PROTECTIVE EQUIPMENT

Non-routine work and some routine work may require the use of protective clothing and respiratory protective equipment. Protective clothing shall be selected based on the type of hazard identified prior to the start work and as part of a hazard assessment. The clothing may be as simple as the addition of work gloves to prevent cuts or to assist in providing proper grip or chemical protective clothing.

Chemical protective clothing is available in a variety of materials that offer a range of protection against different chemicals. The most appropriate clothing material will depend on the substances present and the work to be accomplished. Ideally, the chosen material shall resist permeation, degradation and penetration. Permeation is the process by which a chemical dissolves in or moves through a material on a molecular level. Degradation is the loss of or change in the fabric's chemical resistance or physical properties due to exposure to



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chemicals, use or ambient conditions. Penetration is the movement of chemicals through zippers, stitched seams or imperfections in a protective clothing material.

Radiological Protection is addressed in the Health Physics Manual.

Selection of chemical protective clothing shall be performed by qualified personnel and approved by Safety. RMI is responsible for ensuring the proper selection of PPE to protect workers from injury or illness that may result for exposure to hazards. In addition to permeation, degradation, penetration, and heat transfer, the following paragraphs describe consideration for selecting the proper protective clothing.

#### 4.7.3 DURABILITY

- The material shall have sufficient strength to withstand the physical stress of the task that is to be performed.
- The material shall resist tears and punctures.
- The material shall withstand repeated use after contamination/decontamination.

#### 4.7.4 FLEXIBILITY

The chemical protective clothing shall not interfere with the worker's ability to perform his/her assigned tasks.

#### 4.7.5 TEMPERATURE

The material shall maintain its protective integrity and flexibility under hot and cold extremes.

#### 4.7.6 EASE OF DECONTAMINATION

- Decontamination procedures shall be available for personnel.
- The material shall not pose any decontamination problems.
- Disposable clothing shall be used if warranted.



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## 4.7.7 COMPATIBILITY WITH OTHER EQUIPMENT

The clothing shall not preclude the use of another necessary piece of protective equipment. (e.g. suits that preclude hard hat use in a hard hat area).

## 4.7.8 DURATION OF USE

The task shall be capable of being completed before contaminant breakthrough occurs or degradation of the chemical protective clothing becomes significant.

## 4.7.9 REASSESSMENT OF PROTECTION

The Level of Protection provided by PPE selection (including respiratory protection) shall be upgraded or downgraded based upon a change in site conditions or findings of investigations.

When a significant change occurs, the hazards should be reassessed. Some indicators of the need for reassessment are:

- Commencement of a new work phase, such as the start of drum sampling or work that begins in a different location at the site
- Change in job tasks during a work phase
- Change of season or weather
- When temperature extremes or individual medical considerations limit the effectiveness of the PPE
- Contaminants other than those previously identified are encountered
- Change in ambient levels of contaminants
- Change in work scope which affects the degree of contact with contaminants

## 4.8 RESPIRATORY PROTECTION

The use of respiratory protective equipment must comply with the requirements of the Respiratory Protection Program. This program



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presents the policies, requirements, responsibilities, and protective measures for adequate respiratory protection. The program describes training requirements, selection of types of respirators, selection of cartridges, fit testing, medical certifications, and respirator usage. Respirator Selection, Use, and Care Procedure describes the selection of proper respiratory protection, responsibilities of handling respirators, mechanisms for distributing respirators to qualified personnel, and posting of airborne hazard areas. Respirator Cleaning, Maintenance, and Storage Procedure is a procedure which details cleaning and inspection of particular brands of respirators on site.

## 4.9 MEDICAL SURVEILLANCE PROGRAM [29 CFR 1910.120 (b)(iii)(4)(D)]

Medical surveillance requirements are described in the Medical Monitoring Procedure, the Respiratory Protection Program, and the Health Physics Manual. Site specific requirements are summarized in the following paragraphs.

### 4.9.1 BASELINE MONITORING

Prior to being assigned to a hazardous or a potentially hazardous activity involving exposure to toxic materials, each employee must receive a pre-assignment or baseline physical. The contents of the physical are to be determined by the employers medical consultant. As suggested by NIOSH/OSHA/USCG/EPA's Occupational Safety and Health Guidance Manual for Hazardous Waste Activities, the minimum medical monitoring requirements for work at a site are:

- Complete medical and work histories
- Physical examination
- Pulmonary function tests (FVC and FEV1)
- Chest X-ray
- Electrocardiogram (EKG)
- Eye examination and visual acuity
- Audiometry
- Urinalysis
- Blood chemistry





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Subcontractors are required to submit evidence of enrollment in a medical surveillance program and must categorize employees as fit-for-duty and able to wear respiratory protection. This evidence must be signed by a physician.

#### 4.9.2 PERIODIC MONITORING

In addition to a baseline physical, employees take a periodic physical within the last twelve months unless the advising physician believes that a different interval is appropriate. The employer's medical consultant should prescribe an adequate medical which fulfills OSHA 29 CFR 1910.120 requirements.

#### 4.9.3 SITE SPECIFIC MONITORING

Specific tests may be required prior to individuals entering the various controlled areas. Such tests will be determined by the medical consultant.

#### 4.9.4 EXPOSURE, INJURY, AND MEDICAL SUPPORT

As a follow-up to an injury or possible exposure above established exposure limits, employees are required to seek medical attention and physical testing. It will be up to the employers medical consultant to advise the type of test required to accurately monitor for exposure effects.

#### 4.9.5 EXIT PHYSICAL

At termination of employment or reassignment to an activity or location which does not represent a risk of exposure to hazardous substances, an employee shall be required to undergo an exit physical. If his/her last physical was within the last six months, the advising medical consultant has the right to determine adequacy and necessity of an exit exam.



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## **4.9.6 MEDICAL PROGRAM COMPONENTS**

The RMIDP medical surveillance program includes physical examinations, medical tests and analyses and administrative components

### **4.9.6.1 EXAMINATION CATEGORIES**

- Pre-employment
- Comprehensive (annual)
- Return to work (from injuries on or off the job)
- Disability evaluation
- Exposure to hazardous material evaluation
- Special (required by particular standard or type of work)
- Termination

### **4.9.6.2 TEST AND ANALYSIS TYPES**

- Audiometry
- Chest X-Ray
- Electrocardiogram (EKG)
- Pulmonary function tests
- Visual acuity
- Fecal/blood testing
- Complete blood testing
- Urinalysis
- Hazard specific testing (ie blood lead levels)
- Evaluation of ability to wear respirators and other PPE

### **4.9.6.3 ADMINISTRATIVE AND EMERGENCY COMPONENTS**

- Confidential recordkeeping
- General physician consulting services
- Employee illness/injury tracking
- Emergency treatment of work related injuries



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## 4.10 EXPOSURE MONITORING [29 CFR 1910.120(b)(4)(ii)(E)]

The Health Physics Manual addresses exposure monitoring for radiation and is the primary hazard at the site. Other monitoring is addressed in the following paragraphs.

### 4.10.1 GENERAL

Air monitoring is performed at the RMIDP by the ES&H Department to identify and quantify airborne levels of hazardous substances in order to determine the appropriate actions to take in performing the tasks safely.

When work is going to be performed in an area where there is a potential exposure to hazardous substances, an evaluation of the workplace is conducted and information collected regarding potential health hazards and expected airborne concentrations. Air monitoring of active work sites as well as routine work places is periodically conducted.

Where airborne contaminants or external radiation may present a risk to health, exposure monitoring or sampling for these materials may be required to determine the concentration of these contaminants and assist in the selection of protective measures. Direct reading field instruments are available for monitoring of volatile organic compounds, hydrogen sulfide, noise, external radiation and a number of other compounds. Air sampling and analysis may be required for particulates and some individual compounds.

The concentrations of airborne contaminants and radioactive particles are generally well characterized under normal operating conditions. Areas where a potential hazard from airborne contaminants exists under normal circumstances are posted and access is controlled. Work activities which could result in higher exposures (i.e., any activity that disturbs contaminants or contaminated material or places personnel in close proximity with such materials) must obtain appropriate permits.





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## 4.10.2 RADIATION

Area air samples are collected throughout the facility areas to identify trends in airborne concentrations and to verify compliance with work practices designed to control radionuclides.

Routine surveys are performed to assess surface contamination in process areas. Control of surface contamination assists in controlling airborne hazards.

Area radiation surveys are performed routinely in various areas. The need for additional monitoring or daily dosimetry (e.g., pencil dosimeters) must be considered for cleanup activity planning and work permit issuance. Continuous gamma alarm monitors with local alarm capability are located in strategic areas.

A program for routine urinalysis exists for assessment of intake of uranium. The program is described in the Health Physics Manual and is required for workers with activities in the areas where potential exposure may occur.

## 4.10.3 CHEMICAL EXPOSURE

Air monitoring for hazardous materials/chemicals is performed in connection with industrial hygiene surveys, as a routine part of confined space permit issuance, or to monitor for special hazards. Monitoring for oxygen deficiency is also routinely performed as required. The need for additional area or personal breathing zone monitoring must be considered for cleanup activity and work permit issuance based on the specific contaminants and quantities potentially present.

## 4.10.4 COMBUSTIBLE AND TOXIC GAS MONITORING

Air monitoring for concentrations of combustible gases or toxic gases using direct reading combustible instruments is routinely performed in connection with the issuance of work permits for confined space entry and during routine sampling operations.



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## 4.10.5 OTHER MONITORING

The need for additional monitoring must be considered for cleanup activity planning and work permit issuance. Other types of monitoring may include monitoring for heat or cold stress conditions, noise monitoring, testing for pH of liquids, or collection and analysis of materials for bioassay such as urine samples.

## 4.11 WALKING AND WORKING SURFACES

Walkways and means of egress are to be maintained to facilitate continuous and unobstructed paths of travel. Exit corridor widths will be maintained at a minimum of 22 inches. Exits within the facility are clearly marked.

Work areas and working surfaces shall be kept clean, orderly, and in a sanitary condition. Floors will be maintained in a clean and dry condition.

### 4.11.1 LADDERS

Requirements for ladders are listed in the General Health and Safety Rules.

### 4.11.2 SCAFFOLDS

Requirements for scaffolds are listed in the General Health and Safety Rules.

### 4.11.3 PERSONNEL LIFTING EQUIPMENT

The use of personnel lifting equipment shall have the approval of Safety. This rule applies to but is not limited to crane suspended lift platforms, manual personnel lifts, powered platform lifts, scissor lifts, high-reach lifts, and bucket lifts.



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## 4.12 CONFINED SPACE SAFETY [29 CFR 1910.120(b)(4)(ii)(I)]

The Confined Space Entry Procedure establishes the safety requirements for entering and working in confined spaces in accordance with Federal regulation 29 CFR 1910.146. The program defines two categories of confined spaces (permit-required and non-permit spaces) and provides the control and entry requirements for each category.

## 4.13 FIRE CONTROL PERMIT PROCEDURE

The purpose of the Fire Control Procedure is to insure proper review of welding, cutting, grinding, and open flame operations for general safety, prevention of accidental combustion or explosion of flammable objects, establish guidelines for handling welding equipment and any respiratory hazards associated with contaminated metals or toxic materials involved with welding surfaces. Requirements apply to subcontractors and workers and are listed in the Fire Control Permit Procedure.

## 4.14 RADIOLOGICAL WORK PERMITS

The procedure for obtaining Radiological Work Permits and performing the related radiological work are described in the Issuance and Implementation of Radiological Work Permit procedure. The procedure provides direction for the control of radiological exposures and minimization of the spread of contamination through the issuance and implementation of Radiological Work Permits.

## 4.15 LABORATORY CHEMICAL HYGIENE PLAN

The Laboratory Chemical Hygiene Program describes procedures, equipment, personal protective equipment, and work practices that are capable of protecting employees from health hazards presented by hazardous chemicals used in laboratory facilities. The purpose of the Chemical Hygiene Program is to minimize chemical exposures for laboratory workers, assess hazards, ensure adequate ventilation, and perform exposure monitoring.



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## 4.16 HEARING CONSERVATION PROGRAM

The Hearing Conservation Program has been developed to protect workers from occupational noise hazards and exposures. It establishes procedures for annual testing of employees hearing, noise level monitoring of the work environment, training of personnel on hearing protection, issuance of hearing protection equipment, and follow-up of procedures when exposures above the action level and threshold shifts have occurred.

## 4.17 EMERGENCY RESPONSE [29 CFR 1910.120(b)(4)(ii)(H)]

Emergency Control Procedures have been developed in part to assure the safe and effective evacuation of personnel in the event of an emergency. The ECP contains the Spill Prevention Control and Countermeasures Plan and the Contingency Plan. Personnel are trained in these procedures.

### 4.17.1 EMERGENCIES

The extent of response to emergencies in work areas and zones is limited. Responses may allow control activities only or require an assessment depending on the extent of the situation. Responses by site workers to fires are limited to extinguishing incipient fires only. Responses to chemical spills are limited to control and clean-up of incidental spills only. Emergencies beyond incipient and incidental require notification of outside organizations such as the local fire service for assistance as described in the Emergency Control Procedures.

The RMIDP does not maintain a Hazardous Materials Response Team but has made arrangements with the Ashtabula Township Fire Department's HAZMAT Team to respond to a hazardous material emergency.

### 4.17.2 EMERGENCY CONTROL PROCEDURES

The Emergency Control Procedures serve as the guide for rectifying emergencies. The OSHA requirements for an emergency plan include the following elements:



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- Pre-emergency planning and coordination with outside parties
- Personnel roles, lines of authority, and communication
- Emergency recognition and prevention
- Safe distances and places of refuge
- Site security and control
- Evacuation routes and procedures
- Decontamination procedures
- Emergency medical treatment and first-aid
- Emergency alarm and response procedures
- Critique of response and follow-up
- PPE and emergency equipment

#### 4.17.3 RCRA CONTINGENCY PLAN [29 CFR 1910.120(b)(4)(ii)(H) and (J)]

Two small areas of the site are designated as RCRA Part B permitted storage facilities and therefore a contingency plan has developed and implemented a contingency plan in accordance with applicable RCRA regulations. Emergency activities in those areas of the facility which are addressed under the EPA permit are covered by the contingency plan. The Emergency Control Procedures includes the contingency plan.

#### 5.0 INTERFACE BETWEEN PLANS AND PROCEDURES

The hierarchy and structure of plans and procedures are driven by the DOE contract requirements, regulatory compliance, and operational practices. The Safety Plan is included as part of seven different operating plans which make up the NRC license and DOE contract requirements. Various other procedure documents make up the total of the Safety Plan and describe specific direction for performing various tasks in the course of the RMIDP. Section 4.3 describes the interaction of the other procedures with this Safety Plan.

#### 6.0 PLANNED COURSE OF ACTION

The Safety Plan is currently in effect, however it is in a state of evolution and periodic updates are implemented when necessitated by regulatory updates or program and procedure improvements.





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## 7.0 SUPPORTING METHODOLOGIES

### 7.1 SAFETY GROUP

The Safety Group uses a number of different techniques including training, committees, the review of Work Instruction Packages and Safety Permits and the use of the Stop Work Order to implement the goals of the Safety Plan. First, training is provided to all employees to increase hazard awareness, instruct employees on safe operation procedures and provide hazard communication training. Training may include tests, personal demonstrations, and hands-on experience. Safety Committee meetings add hazard awareness and safety issue comprehension. Through the use of Work Instruction Packages (WIP) and Safety Permit documentation and review, Safety can study work tasks before they begin and address hazards associated with the work. The Stop Work Order (RDP-QA-106) is used in situations which may be immediately dangerous to personnel or property and Safety feels that work should be stopped. In addition to Safety, site workers can issue the Stop Work Order if they suspect the job is unsafe. The Stop Work Order is released when the hazardous situation has been corrected.

### 7.2 FACILITY PERSONNEL

Personnel are responsible to perform work in accordance with the RMIDP policies and procedures. Site Workers have the opportunity to express safety concerns through safety committee meetings as well as discussions with their supervisors. Access to the Material Safety Data Sheets allow personnel to review the properties of chemicals which they are asked to work with and ensure that they are aware of proper personal protective equipment and handling procedures.

## 8.0 DEFINITIONS

**As Low As Reasonably Achievable (ALARA)** - An approach to radiation protection to control or manage exposures (both individual and collective to the work force and general public) as low as social, technical, economic, practical, and public policy considerations permit. As used as part of the RMIDP Radiological Work Permits Procedure, ALARA is not a dose limit, but a process which has the objective of dose levels as far below applicable limits as reasonably achievable.



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**Stop Work Order** - A management tool to require immediate stoppage of any activity that is not in substantial compliance with QA requirements, procedures or activity and for which corrective action is needed prior to the resumption of the work.  
**Time-Weighted Average (TWA)** - In air sampling, this refers to the average air concentration of contaminants during a particular sampling period.

## 9.0 REFERENCES

Title 29, Code of Federal Regulation, Part 1910, *Occupational Safety and Health Standards*

Title 29, Code of Federal Regulations, Part 1926, *Safety and Health Regulations for Construction*

RDP-SAF-117 - *Lock, Tag, and Try Procedure*

RDP-ESH-112 - *Work and Flame Permit Issuance*

RMI-L-213 - *Confined Space Entry Procedure*

RDP-HP-155 - *Issuance and Implementation of Radiological Work Permits Procedures*

RMI-RM-103 (Revision 3) - *Document Preparation Procedure*

RMI-L-117 - *Reporting and Uncategorized Event and Occurrence Report Processing*

RDP-TNG-001 - *Training Plan*

RMI-L-212 - *Hearing Conservation Program*