

**Barricades and Signs**

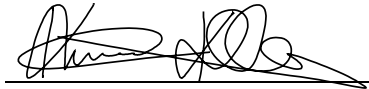
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<ul style="list-style-type: none"> <li>• This revision was preparer under Y15-95-235, <i>UPF Command Media</i>, Revision 11</li> <li>• The following changes are in response to Condition Report 25774-000-GCA-GAM-02999, Y-12 <i>APMO-F-2: Contradictory Procedural Requirements and Need to Clarify Revision 8 of UPF-CP-214, Barricades and Signs (ASRP-C&amp;ESH-2.11.2021-906017)</i>: <ul style="list-style-type: none"> <li>◦ Clarified the roles and responsibilities for Supervisors and Discipline Superintendents throughout the document, specifically in Appendix C, <i>Elevated Work Sharing Barricading</i></li> <li>◦ Clarified the process for shared barricades and use of Overhead Safety Watch (changed from Spotter)</li> </ul> </li> <li>• An evaluation determination has been performed confirming that this Procedure does not implement requirements as tracked in the Programmatic Requirements Management System (PRMS)</li> <li>• Added Section 2.5, <i>UPF Responsible Supervisor</i>, subsequent sections renumbered</li> <li>• Section 2.6, <i>UPF Subcontractor Technical Representative</i></li> <li>• Added section 3.2.6, <i>Restricted Area Startup Controlled Area</i>, that includes barricading for Startup activities</li> <li>• Other changes include: <ul style="list-style-type: none"> <li>◦ Added roles for Project Startup Manager and Test Lead</li> <li>◦ Clarified toeboard requirements</li> <li>◦ Added to table in Appendix B, <i>Common Application of Barricades and Signs</i></li> </ul> </li> </ul>	
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<i>Barricades and Signs</i>
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## **1.0 INTRODUCTION**

### **1.1 Purpose**

This Procedure describes the barricade and signage requirements for controlling (informing and/or restricting) entry into areas that contain safety hazards, abnormal conditions, or where work activities require restricted access.

### **1.2 Scope**

This Procedure applies to all personnel (including subcontractors) who perform work at the Uranium Processing Facility (UPF) Project.

## **2.0 RESPONSIBILITIES**

### **2.1 UPF Site Manager/Project Startup Manager**

The Site Manager is responsible for ensuring the implementation of this Procedure by the UPF site personnel. The Project Startup Manager has the overall responsibility for the implementation of this Procedure as it pertains to systems that have been turned over to Startup.

### **2.2 UPF Environmental, Safety and Health Manager, Bechtel National, Inc.**

The Environmental, Safety and Health (ES&H) Manager, Bechtel National, Inc. is responsible for interpreting this Procedure (intent and application) and the associated requirements.

### **2.3 UPF Environmental, Safety and Health Representative**

The ES&H Representative is responsible for:

- Reviewing compliance with this Procedure through periodic field inspections
- Assisting site personnel to determine the appropriate protective measures for recognized hazards

### **2.4 UPF Discipline Superintendent/Test Lead**

The Discipline Superintendent is responsible for:

- Understanding this Procedure and their individual responsibilities regarding implementation of this Procedure
- Pre-planning work activities to identify the appropriate barricade to use
- Communicating the identified hazards and controls to supervisors and/or work crews
- Ensuring that the identified control measures are in place and maintained until the completion of the job task

**Barricades and Signs****2.5 UPF Responsible Supervisor**

The Responsible Supervisor is responsible for:

- Understanding this Procedure and their individual responsibilities regarding implementation of this Procedure
- Pre-planning work activities to identify the appropriate barricade to use
- Communicating the identified hazards and controls to work crews and those in surrounding areas impacted by their work requiring a barricade
- Ensuring that the barricades and signs are properly erected and maintained and they are removed when the hazard has been mitigated or the work activity is complete

**2.6 UPF Subcontractor Technical Representative**

The Subcontractor Technical Representative is responsible for:

- Providing oversight of Subcontractor work activities as it applies to this Procedure
- Facilitating communication and coordination of work activities between subcontractors and direct-hire work scope as it applies to this Procedure

**2.7 UPF Personnel**

Site personnel are responsible for:

- Understanding and complying with the requirements of this Procedure
- Pausing/stopping work when they are unsure of the requirements for a work task, or they witness an unsafe condition or behavior

**3.0 REQUIREMENTS****3.1 General Requirements**

The general requirements for barricades and signs are as follows:

- Personnel initiating the work, or creating the hazard, are responsible for erecting the barricade and maintaining it throughout the scope of work; the barricade must be established prior to the start of the work task
- Barricades must be erected to fully encompass the hazard or work activity
- Signs (or tags) shall be used in conjunction with barricades to provide specific warnings and/or other essential information about the hazard(s) that exist within the barricaded area
- Personnel are not allowed to step over or duck under barricades; only designated access points will be utilized to enter a barricade
- Dismantle soft barricades at the end of the shift, or when the hazard has been abated, or when the work requiring the barricade has been completed
- Where hazards are expected to exist for more than 24 hours (e.g., excavations), a protective (hard) barricade should be erected
- Soft barricades are prohibited as edge protection for fall protection hazards

**Barricades and Signs**

- Barricades should not block emergency equipment (e.g., fire extinguishers, emergency eyewash stations) or emergency egress routes; where this is infeasible, provisions must be made by the Responsible Supervisor and with approvals as necessary by the Discipline Superintendent
- For common application of barricades and signs and their appropriate warnings, see **Appendix B, Common Application of Barricades and Signs**

**3.2 Soft (Temporary) Barricades**

The general requirements for soft (temporary) barricades are as follows:

- Use only reinforced barricade tape, plastic chain, or rope for erecting soft barricades
- Utilize portable stanchions/posts, columns, or other fixed objects to secure/support soft barricades
- Where personnel require access into a barricade, provide an access point(s) with a removable gate; place appropriate barricade tags and/or signs at those access points
- Install barricade tape approximately 42 inches high so it can be easily recognized

**NOTE:** *Do not secure barricades to sensitive permanent plant or emergency equipment (e.g., gauges, indicators, fire extinguishers).*

- Remove the barricade across "gate" at access location(s) when hazardous activity is not being performed (e.g., during lunch break, at end of shift, or when hazardous activity is suspended)
- Refer to OT-SH-801768-A129, *Guidance for Barricade Erection*

**3.2.1 Caution Barricades**

Use caution barricades to ensure that personnel are aware of physical hazards or changing conditions.

Personnel can pass through a caution barricade only after hazards are recognized and it is determined to be safe to proceed through the area. Personnel should verify conditions and contact the responsible person listed on the sign/tag if they are unsure of safe passage.

**3.2.2 Danger Barricades**

A danger barricade protects personnel from a condition or process that has the potential to cause a serious or life-threatening injury or illness. Only personnel assigned to the work task are authorized to enter the established danger barricade boundary.

If an individual who is not part of the work task requires access into the danger barricaded area, work must be paused and all potential danger hazards placed in a safe condition. A portion of the barricade must be removed before allowing non-essential personnel to enter the barricaded area.

**Barricades and Signs****3.2.3 Elevated Work/Overhead Hazards**

When a barricade is erected to protect personnel from overhead hazards (e.g., dropped objects), a general rule for barricade erection boundaries is one foot horizontal for every two feet vertical.

If this distance is not feasible because of site conditions or restrictions, alternative measures shall be implemented and documented on the Safety Task Analysis and Risk Reduction Talk (STARRT) Card in conjunction with the barricade (e.g., Overhead Safety Watch, safety netting/physical barrier). The Discipline Superintendent must approve the alternative measures on the STARRT card prior to implementation.

Authorized personnel working within the established barricade shall remain clear of line-of-fire hazards created from elevated work activities (e.g., hoisting/rigging, material handling, dropped objects).

Refer to **Appendix C, *Elevated Work Sharing Barricading***, for process details for elevated work shared barricading between two work groups.

**3.2.4 Radiation Barricades**

A radiation barricade will consist of yellow and magenta rope (or equivalent) combined with "Radiation Area" and/or "High Radiation Area" signs.

Personnel shall not cross/enter or otherwise modify radiation barricades. Only personnel who are licensed and trained are authorized to enter the barricaded area.

For radiography (non-destructive examination) work, radiation barricades shall incorporate flashing lights or other visual indicators.

**3.2.5 Restricted Area**

A Restricted Area barricade will consist of white rope, chain, or equivalent combined with "Restricted Area" signs.

Established for the general exclusion of personnel for the protection of property/work process (e.g., wet paint).

Personnel must contact the responsible person listed on the sign/tag and verify conditions before entering.

**3.2.6 Restricted Area Startup Controlled**

A Startup Controlled Area barricade will consist of green rope, chain, or equivalent combined with "Restricted Area Startup Controlled" signs.

Established by Startup Test Engineer (STE) for the general exclusion of non-essential personnel for the protection of Startup Controlled systems or components Startup operation/testing process.



**Barricades and Signs**

Personnel must contact the responsible person listed on the sign/tag and verify conditions before being allowed to enter.

**3.3 Protective (Hard) Barricades****3.3.1 Guardrail Requirements**

Guardrail systems can be constructed using wood, metal, or a combination of both.

Top rails shall be 42 inches plus-or-minus three inches (i.e., 39 to 45 inches) above the walking/working level. When conditions warrant, the height of the top edge may exceed the 45-inch height, provided the guardrail system meets all other criteria of this section.

Mid-rails, screens, mesh, intermediate vertical members, or equivalent intermediate structural members shall be installed between the top rail of the guardrail system and the walking/working surface.

- Mid-rails, when used, shall be installed at a height midway between the top rail and the walking/working surface (approximately 21 inches).
- Screens and mesh, when used, shall extend from the top rail to the walking/working level and along the entire opening between the top rail supports.
- Intermediate members (such as balusters), when used between posts, shall not be more than 19 inches apart.

Guardrail systems shall be capable of withstanding, without failure, a force of at least 200 pounds applied within two inches of the top edge, in any outward or downward direction, at any point along the top edge.

A toeboard, or equivalent mesh/debris netting, must be installed on guardrails for all elevated work surfaces where dropped objects can present a hazard to personnel working below.

- Toeboards shall be a minimum of 3½ inches in vertical height from their top edge to the level of the walking/working surface. They shall have no more than ¼-inch clearance above the walking/working surface.

***Wood Guardrail Requirements***

Wooden top rails, mid-rails, and posts must be constructed from nominal 2-inch by 4-inch lumber, at minimum.

Wooden guardrail posts cannot be spaced greater than 8 feet, unless otherwise designed/engineered.

***Metal Guardrail Requirements***

Metal top rails, mid-rails, and posts must be constructed from 1½-inch nominal size or larger material.

***Cable/Wire Rope Guardrail Requirements***

Cable top rails and mid-rails shall be at least ½-inch nominal diameter or thickness to prevent cuts and lacerations.

**Barricades and Signs**

Wire rope top rails will be flagged with high-visibility material at intervals of no more than 6 feet. Debris netting may be used in place of this flagging requirement.

**3.3.2 Excavation Barricade Requirements**

All excavations shall have a barricade around the entire perimeter with designated access points.

Excavation barricades shall be constructed from semi-permanent materials (e.g., snow fence or crowd-control barricades) and include the appropriate signs and tags.

Whenever possible, install excavation barricades at least 6 feet from open edges of excavations. If infeasible, install standard guardrail systems or equivalent hard barricade no closer than 2 feet from the edge of the excavation.

Trenching activities (with straight/sheer cut walls) that present a fall hazard greater than 6 feet shall be protected with appropriate guardrail systems.

**3.3.3 Roadway Barricades**

Protective barriers across or next to an active roadway will be substantial concrete vehicle barriers or other manufactured Jersey-style barriers (e.g., sand/water filled), and will include roadway signs (or equivalent) to alert vehicle traffic when personnel are working in or adjacent to the roadways.

Visual indicators (e.g., flashing amber lights or reflective strips) are required on barriers left after dark to alert vehicle traffic that a barrier is there.

**3.4 Signs and Tags****3.4.1 General Requirements for Signs**

Signs should be printed on material suitable to the environment (e.g., plastic or metal), or protected in a way to prevent damage and fading.

Signs shall be removed when the hazard is no longer present, and replaced when damaged or illegible.

Signs should include a description of the hazard(s) and instructions, as applicable.

See **Appendix B** for additional sign types and warning requirements/instructions.

**3.4.2 General Requirements for Tags**

Tags should include a description of the hazard(s) and instructions, as applicable.

Contact information for the Responsible Supervisor is required on the tag.

**4.0 RECORDS**

None

## 5.0 REFERENCES

### 5.1 Source References

10 CFR 851, *Worker Safety and Health Program*

29 CFR 1926 Subpart G, *Signs, Signals, and Barricades*

29 CFR 1926 Subpart M, *Fall Protection*

ML-CM-801768-A019, *UPF Construction Hazard Tree*

ML-SU-801768-A001, *UPF Startup Hazard Tree*

NS&E CP 2HC-E0S0-00214-000, *Barricades and Signs*

UPF-CP-108, *UPF Event Management and Investigation*

UPF-CP-200, *UPF General Safe Work Practices*

UPF-CP-211, *Fire Prevention and Protection*

UPF-CP-227, *UPF Safety Watches*

UPF-CP-229, *Vehicle Safety Management*

UPF-CP-312, *Hearing Conservation Program*

UPF-CP-318, *Respirator Use and Issuance*

UPF-MANUAL-CM-001, *Uranium Processing Facility Construction Electrical Safety Manual*

UPF-MANUAL-SH-A001, *UPF Elevated Work Manual*

Y17-95-64-801, *UPF Energy Isolation Management (EIM) – Lockout/Tagout (LOTO)*

Y17-95-64-806, *UPF Pressure Testing of Piping, Tubing, and Components*

Y17-95-64-822, *UPF Site Excavation and Backfill*

Y17-95-64-823, *UPF Safety Task Analysis and Risk Reduction Talk/Job Hazard Analysis Program (STARRT/JHA) Process*

Y17-95-64-837, *UPF Housekeeping*

Y17-95-64-855, *UPF Structural Steel Erection*

Y17-95-64-871, *UPF Construction Hoisting and Rigging Work Operations*

Y17-95-64-872, *UPF Crane Use and Operation*

Y17-95-64-877, *UPF Hot Work Permit*

Y72-95-003, *Silica Exposure Control Procedure for the Construction of the Uranium Processing Facility Project*

Y73-95-802, *Confined Space Entry Program*

Y73-95-803, *Hexavalent Chromium Procedure*

Y75-100, *Y-12 Site Radiological Control Program*

## **5.2 Interfacing References**

OT-SH-801768-A129, *Guidance for Barricade Erection*

## **6.0 SUPPLEMENTAL INFORMATION**

Appendix A, *Acronyms and Definitions*

Appendix B, *Common Application of Barricades and Signs*

Appendix C, *Elevated Work Sharing Barricading*

## APPENDIX A

### Acronyms and Definitions

#### Acronyms

<b>ES&amp;H</b>	Environmental, Safety and Health
<b>PRMS</b>	Programmatic Requirements Management System
<b>STARRT</b>	Safety Task Analysis and Risk Reduction Talk
<b>STE</b>	Startup Test Engineer
<b>UPF</b>	Uranium Processing Facility





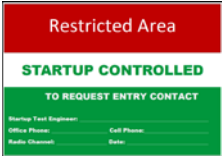


#### Definitions:

<b>Barricade</b>	A system designed to warn of a hazard and physically identify the hazard's parameters.
<b>Signs</b>	A posting bearing information, advisory, or a warning of hazards, which is temporarily or permanently affixed or placed at locations where the hazards exist.
<b>Tags</b>	Temporary postings, usually attached to a piece of equipment or part of a structure (e.g., scaffolding), to warn or inform workers of a condition or requirement. Tags are also used in conjunction with barricades to provide specific warnings and/or other essential information about the hazard(s) that exist beyond the barricade.

APPENDIX B

Common Application of Barricades and Signs

**NOTE:** Signs/tags can be used independent of a barricade; however, if a barricade or delineation of an area is required, follow the guidelines below.

WARNING HEADER	DESCRIPTION	BARRICADE/ DELINEATION	APPLICATIONS
	<b>DANGER</b> Shall be used for a condition or process that has the potential to cause a serious or life threatening injury or illness.	<b>RED OR RED/BLACK</b> 1) Webbed Barricade Tape 2) Rope 3) Plastic Chain	Examples include High Voltage, Hexavalent Chromium, Permit Required Confined Space, Abrasive Blasting, Crane Counterweight Swing Radius, Pneumatic Pressure Testing, Overhead Work, and Respiratory Protection Required.
	<b>CAUTION</b> Shall be used only to warn against physical hazards or to caution against changing conditions.	<b>YELLOW OR YELLOW/BLACK</b> 1) Webbed Barricade Tape 2) Rope 3) Plastic Chain	Examples include Noise Conditions, Non-Permit Confined Space, Low Clearance Areas, Open Excavations, and Wet/Slippery Surfaces.
	<b>NOTICE</b> Provides information or safety requirements.		Examples include Personal Protective Equipment free zones, No Dark Lenses Beyond this Point, and Laydown Areas.
	<b>RESTRICTED AREA</b> Used for the general safety of personnel, establishing exclusion areas, or the protection of property/process.	<b>WHITE</b> 1) Rope 2) Plastic Chain	Examples include Wet Paint, Do Not Enter, and Authorized Personnel Only.
	<b>RESTRICTED AREA STARTUP CONTROLLED</b> Established for the general exclusion of personnel for the protection of Startup Controlled systems or components Startup operation/testing process.	<b>GREEN</b> 1) Rope 2) Barricade Tape 3) Plastic Chain	Examples include Areas, Systems, or Components controlled by Startup
	<b>RADIOLOGICAL</b> Used ONLY where radiological hazards are or may be present.	<b>MAGENTA AND YELLOW</b> 1) Rope 2) Barricade Tape	Examples include Radiation Areas and High Radiation Areas typically associated with radiography (non-destructive examination) work.
ADDITIONAL SIGNS/SPECIFICATIONS			
Exit Signs	Red letters, no less than 6 inches high, on a white field, and the principal stroke of the letters shall be at least 3/4 of an inch in width.		
Traffic and Road Signs	Provide information to operators of motor vehicles including, but not limited to, Department of Transportation signage required on public roads.  Also including traffic control devices (e.g., signs, signals, markings, and barricades) for protection of workers that must conform to Part 6 of the Manual on Uniform Traffic Control Devices.	Speed Limit, Pedestrian Crossing, Stop, Curve, One Way, Two Way, Work Crew Ahead, Flaggers Ahead, and Do Not Enter.	
Fire Signs	Provide information on the location of firefighting equipment.	Fire Extinguisher	
Prohibition Signs	Provide information on prohibited actions.	No Smoking and No Parking	
Emergency Signs	Typically includes white lettering on a green background with the appropriate symbols. Provide information on the location of emergency equipment.	Eyewash Station, Automated External Defibrillators, and Emergency Rescue Equipment.	

## **APPENDIX C**

### **Elevated Work Sharing Barricading**

Before implementing an elevated work shared barricade with another work group, the Discipline Superintendent(s)/Subcontractor Technical Representative(s)/STE will ensure the following requirements are met:

- Affected personnel from both work groups participate on a joint STARRT card to identify the dropped object hazards and the controls that will be employed
- An Overhead Safety Watch (hereinafter referred to as "Watch") is designated and noted on the STARRT card
- The Watch will be positioned outside of the barricaded area and must be in a position to observe the coexisting activities
- The Watch will have no other duties assigned that would interfere with their ability to perform their duties
- Communication between personnel conducting the coexisting work activities will be maintained by the Watch
- Prior to moving or changing work location, personnel will communicate their intentions with the Watch to ensure the coexisting work activities are not impacted
- Multiple Watches may be required to adequately oversee the work activities; communication between multiple Watches and the elevated work groups must be maintained
- If at any point during the elevated work activities, the Watch is unable to maintain observation and/or communication with the work groups, activities shall be paused; the Watch will be repositioned and/or the coexisting work activities reevaluated

**NOTE:** *A 1-foot, horizontal separation distance for every 2 feet of vertical work location shall be maintained between work groups within the shared barricade. When the 1 to 2 ratio cannot be maintained between the two work activities, the uppermost elevated work will be directed to pause and secure the work until the appropriate distance can be re-established within the confines of the shared barricade.*