

Barricades and Signs



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*Barricades and Signs***REVISION LOG**

Revision 7	<input checked="" type="checkbox"/> Major intent	<input type="checkbox"/> Minor intent	<input type="checkbox"/> Non-intent
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- This revision incorporates the changes identified in and supersedes:
 - PRCN-UPF-CP-214-R06-01
 - PRCN-UPF-CP-214-R06-02.
- No forms have been created or edited as part of this revision.
- A periodic review was completed on the last revision of this document and is documented on DPR-UPF-CP-214-06.
- Complete re-write.
- Because of the extent of changes, revision bars are not shown.

Revision 6	<input type="checkbox"/> Major intent	<input checked="" type="checkbox"/> Minor intent	<input type="checkbox"/> Non-intent
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- This revision added clarity between barriers and barricades, changed safety acronyms to align with other safety procedures, provided additional examples for differing levels of hazards and combined sections where redundancy was present and added some additional interfacing references.

Previous revisions on record

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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 Site Manager

The Site Manager is responsible for ensuring the implementation of this procedure by the UPF site personnel.

2.2 Environmental, Safety, and Health Manager

The Environmental, Safety, and Health (ES&H) Manager is responsible for interpreting the procedure (intent and application) and the associated requirements.

2.3 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 Responsible Superintendent

The Responsible Superintendent is responsible for:

- Being thoroughly familiar with 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.

2.5 Personnel

Site personnel are responsible for:

- Understanding and complying with the requirements of this procedure.
- Pausing/stopping work when he/she is unsure of the requirements for a work task or he/she witnesses 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 barricades at end of shift or end of work requiring barricades
- 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 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 other area personnel (e.g., designate a Safety Watch or provide overhead protection).
- 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

3.2.1 General Requirements

- 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 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 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).
- Also see OT-SH-801768-A129, *Guidance for Barricade Erection*.

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3.2.2 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 they have recognized the hazard and determined that it is safe to proceed through the area. If personnel are unsure of safe passage, they should contact the responsible person listed on the sign/tag and verify conditions before entering.

3.2.3 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.

3.2.4 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: 1 foot horizontal for every 2 feet vertical.
- If this distance is not feasible due to site conditions or restrictions, alternative measures shall be implemented and documented on the Safety Task Analysis Risk Reduction Talk (STARRT) Card in conjunction with the barricade (e.g., Overhead Safety Watch). The Responsible Supervisor 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).

3.2.5 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 indicator.

3.2.6 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).

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

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 2 inches of the top edge, in any outward or downward direction, at any point along the top edge.
- A toeboard 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 3 ½ inches in vertical height from their top edge to the level of the walking/working surface. They shall have no more than 1/4 inch clearance above the walking/working surface.

Wood Guardrail Requirements

- Wooden top rails, mid-rails, and posts must be constructed from nominal 2"x4" 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.

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- 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 will have a barricade around the entire perimeter with designated access points.
- Excavation barricades should 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 of their presence.

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.
- Ensure that the description of the hazard(s) and instructions for reader are incorporated on the sign as applicable.
- See **Appendix B** for additional sign types and warning requirements/instructions.

3.4.2 General Requirements for Tags

- Ensure that the description of the hazard(s) and instructions for reader are incorporated on the tag 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*

Nuclear, Security & Environmental (NS&E) ES&H Manual 4SM-6BH-F0001, NS&E-214, *Barricades and Signs*

214, *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, *UPF Electrical Safety Manual*

Y17-95-64-801, *UPF Construction Phase System and Equipment Safety Lockout/Tagout*

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

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

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

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

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

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5.2 Interfacing References

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

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

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

6.0 SUPPLEMENTAL INFORMATION

Appendix A, *Acronyms and Definitions*

Appendix B, *Common Application of Barricades and Signs*

APPENDIX A Acronyms and Definitions

Acronyms

AED	Automated External Defibrillators
BNI	Bechtel National, Inc.
DOT	Department of Transportation
ES&H	Environmental, Safety, and Health
MUTCD	Manual on Uniform Traffic Control Devices
PPE	Personal Protective Equipment
STARTR	Safety Task Analysis Risk-Reduction Talk
UPF	Uranium Processing Facility

Definitions:

Barricade	A system designed to warn of a hazard and physically identify the hazard's parameters
Signs	A posting bearing information, advisory, or a warning of hazards, which is temporarily or permanently affixed or placed at locations where the hazards exist
Tags	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.

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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
	DANGER Shall be used for a condition or process that has the potential to cause a serious or life threatening injury or illness.	RED OR RED/BLACK 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.
	CAUTION Shall be used only to warn against physical hazards or to caution against changing conditions.	YELLOW OR YELLOW/BLACK 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.
	NOTICE Provides information or safety requirements.		Examples include Personal Protective Equipment (PPE) free zones, No Dark Lenses Beyond this Point, and Laydown Areas.
	RESTRICTED AREA Used for the general safety of personnel, establishing exclusion areas, or the protection of property/process.	WHITE 1) Rope 2) Plastic Chain	Examples include Wet Paint, Do Not Enter, and Authorized Personnel Only.
	RADIOLOGICAL Used <u>ONLY</u> where radiological hazards are or may be present.	MAGENTA AND YELLOW 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, not 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, DOT signage required on public roads. Also including traffic control devices (signs, signals, markings, and barricades) for protection of workers that must conform to Part 6 of the Manual on Uniform Traffic Control Devices (MUTCD).		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 white lettering on a green background with appropriate symbols. Provide information on the location of emergency equipment.		Eyewash Station, Automated External Defibrillators (AED), and Emergency Rescue Equipment.