THE NATION'S URANIUM PROCESSING FACILITY

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This document has been reviewed by a Y-12 DC / UCNI-RO and has been determined to be UNCLASSIFIED and contains no UCNI. This review does not constitute clearance for Public Release.

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Revision History

Revision	Effective Date	Reason for New or Change/Description of New or Change
9	TBD	This revision adds clarifying information to Section 4.10, for Construction personnel to refer to Y19-023 for further guidelines regarding Security approval prior to bringing powder actuated tools on site or prior to using them to perform work. Additional changes include: process requirements for employee conduct as well as smoking regulations; electrical safety items removed for incorporation into a separate standalone procedure, UPF-CP-226, *Electrical Equipment and Assured Grounding*; Records section updated with QA determination; and added several Developmental references.
8	04/10/2017	Incorporate the changes identified in PRCN-UPF-CP-200-A001 and PRCN-UPF-CP-200-A002 into section 4.20 and 4.8 respectively. Additional changes include: new work dress apparel requirements and foot protection requirements in section 4.1; modified position titles in section 3.0 and removed "Tool Room Attendant" roles and responsibilities; removed requirements for "Falling Object Controls" and referenced Y73-95-100, *UPF Dropped Object Prevention.* Non-intent changes include editorial, grammatical and formatting realignment; and correcting source and interfacing references.
7	03/09/2016	This revision is a complete re-write; therefore, no revision bars are shown. This revision further establishes general safe work requirements to perform work safely while using tools and equipment at the UPF Project.
6	2009	Adopted initial issue from Bechtel Core Process 200 at its current revision 6.

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1.0 Purpose

This procedure establishes the requirements for general safe work practices that help workers perform work safely at the Uranium Processions Facility (UPF) construction site. Safe work practices to be implemented at the UPF construction site include those that help protect workers from hazards associated with the use of tools and equipment (e.g., hand-held power tools, table saws, hydraulic lifting equipment). Also included are those that help prevent or eliminate worker exposure to common workplace safety hazards such as electrical hazards (e.g., frayed or damaged cords), chemical hazards (e.g., corrosive products), and ergonomic hazards (e.g., manual material handling).

2.0 Scope

This procedure establishes the general safe work practices to be implemented by the UPF construction site personnel, including subcontractor employees.

This procedure applies to all personnel working on or visiting a UPF construction site unless otherwise noted in this procedure.

3.0 Roles and Responsibilities

3.1 Construction Manager

The Construction Manager (CM) has the overall responsibility for ensuring the implementation of this procedure. In coordination with the Field Safety Manager (FSM), the CM carries out the following responsibilities:

- Ensure that all UPF construction site personnel actively participate in safe work practices.
- Provide worker support, facilities, and other resources necessary to effectively carry out safe work practices.

3.2 Environment, Safety, and Health Manager

The Environment, Safety, and Health (ES&H) Manager has the overall authority for the interpretation of the regulations associated with the procedure and the interpretation of the procedure as to intent and application.

3.3 Environment, Safety, and Health Representative

The ES&H Representative has responsibility for oversight of compliance with this procedure. The ES&H Representative carries out this responsibility through periodic field inspections. The ES&H Representative is also responsible for supplying technical advice and interpretation of the environmental, safety, and health codes included in the procedure.

3.4 Construction Supervision

Construction Supervision is responsible for being thoroughly familiar with this procedure and having a full understanding of individual roles and responsibilities regarding compliance with and implementation of this procedure. Construction Supervision is also responsible for the following:

- Plan work activities in advance to identify the appropriate tools and equipment to use.
- Ensure workers understand the requirements of the procedure.

3.5 Supervisor

The Supervisor is responsible for ensuring that the applicable safety controls and processes are incorporated into planning and execution of the work and that the workers are using the correct tools and equipment for the assigned task.

3.6 Worker

All UPF construction site workers are responsible for understanding and complying with the requirements of this procedure. They are responsible for not only knowing how to apply safe work practices to work safely, but also pausing or stopping work when they observe unsafe conditions or behaviors developing or new hazards emerging in their work area. The worker's responsibility to pause or stop work also applies when the worker is unsure of how to use a tool or equipment safely. Pause or stop work, and request your supervisor to provide further clarification or directions, which may include the safety recommendations, requirements, or guidance provided by the manufacturer of the tool or equipment.

4.0 Process Requirements

4.1 Employee Conduct

Employees on the UPF project who engage in horse play, fighting, or gambling; who possess prohibited articles will be subjected to disciplinary action up to and including termination, see Y19-023, *Physical Protection Manual*.

4.2 Work Dress/Apparel Requirements for UPF Construction Sites

All personnel are required to wear clothing appropriate for the work being performed. The minimum requirements for work clothing on UPF construction sites include the following:

1. Wear clothing that protects the body and extremities at all times. At a minimum, the following requirements must be met:
    - Wear a shirt with full length sleeves that covers the entire upper torso and the arms from the shoulders to the wrists. All personnel, subcontractors, vendors, and visitors must comply with this requirement when accessing any of the UPF construction sites.
    - Dress in full-length pants that extend to the ankles and are made of sturdy material (e.g., jeans).

    Exceptions to these requirements include those individuals working inside the on-site administrative buildings (office trailers).
2. Wear sturdy, ankle high, safety-toed, leather work boots that meet or exceed the requirements of ASTM F2413. Footwear such as tennis/athletic shoes, open-toed shoes, sandals, moccasins, high heels, boat shoes, and mules, are not acceptable footwear. All individuals, including visitors, must comply with this requirement when accessing any part of the UPF construction site.
3. Individuals working with or near machinery or equipment with moving parts shall not wear loose garments and/or accessories that can get caught in the machinery or equipment.
4. Clothing that contains or displays inappropriate material, such as jokes about gender-specific traits, or foul or obscene language or images, is expressly prohibited.

5. When using badge lanyards, use only lanyards with breakaway clasps. Lanyards without this safety feature are not allowed on the construction site.

4.3 Smoking Regulations

Smoking is permitted only in posted designated areas.

4.4 Radio and Electronic Equipment

Do not use headphones, speakers, CD players, and other such equipment while in active work areas.

Workers shall not use cell phones while engaging in work tasks or operations that may be considered critical or hazardous. The use of cell phones is also not permitted when it could cause distraction and increase the potential for mishap. For more information about the use of cell phones, see Y19-023, *Physical Protection Manual*, and UPF-CP-229, *Vehicle Safety Management*.

4.5 Signs and Tags

Appropriate signs and tags will be placed at hazardous and potentially hazardous locations throughout the UPF construction site. All accident prevention signs and tags shall conform to applicable regulatory specifications (e.g., use, color, size, placement, and wording). For requirements that govern signs and tags used with barricades, refer to UPF-CP-214, *Barricades and Signs*.

Posting of signs, tags, and other means of hazard communication requires authorization by the ES&H Manager, and the CM or designee. Signs and tags that may be seen at the UPF construction site include danger, caution, warning, and notice signs, as well as information signs that communicate pertinent information to workers (e.g., access restrictions, road closures).

4.6 Hand, Air, and Electrical Tools

Tools used on the UPF construction site shall not be manufactured, altered, modified, or in any way changed, without the explicit approval of the CM and ES&H Manager.

1. Workers shall ensure hand tools are safe by performing the following:
   a) Inspect tools before each use for damage or defects, such as
      (1) cracked handles,
      (2) damaged cutting edges,
      (3) splitting or cracked parts,
      (4) broken adjusting components, and
      (5) insulation damage (e.g., flattened, cuts, abrasions, burnt or discolored conductors, melted cord caps, cord deformation)

      If you find a damaged or defective tool, report it to the supervisor, place a "DANGER. DEFECTIVE TOOL/EQUIPMENT. DO NOT USE" tag on it, and return it to a controlled area (e.g., Tool Room) for repair.
   b) Verify that the work package identifies non-sparking tools when the work to be performed may require them.

c) Test daily (prior to use) ground fault circuit interrupter (GFCI) receptacles, including portable units.

d) Verify that tools and their components, including guards, retainers, and other safety mechanisms, are not altered, and that they are operated in accordance with manufacturers' specifications.

2. Tools, such as saws and grinders, shall have guards in place while they are in operation.
3. Tools shall not be abused, and shall be kept in good operating condition and used only for their intended purposes.
4. All electrically powered tools shall be double insulated or grounded. If there is evidence that the ground pin has been damaged or removed, immediately take the tool out of service, tag it, and return it to a controlled area for repair.
5. Temporary construction outlets used for 120-volt tools shall be protected by GFCI devices.
6. Woodworking tools shall be inspected for the following:

   a) Fixed power-driven tools have disconnect switches that can be either locked or tagged in the off position.

   b) Circular saws that are over 20 inches in diameter and/or operated over 10,000 peripheral feet per minute have clearly marked operating speeds.

   c) Installed automatic feed devices are covered and/or guarded.

7. The manufacturer's safe operating pressure for hoses, pipes, valves, filters, and other fittings used for conducting compressed air shall not be exceeded.
8. The pressure of compressed air used for cleaning purposes must be less than 30 pounds per square inch. Compressed air shall not be used for cleaning or blowing dust from any part of the body or clothing.
9. Airline hoses for hand tools and other equipment shall be secured (i.e., whip restraints) together to preclude uncontrolled whipping in the event hose couplings become separated while under pressure.
10. Air-supplying hoses exceeding ½-inch internal diameter shall be protected by an excess flow valve to prevent whipping in the event of hose separation or failure.
11. Air receivers and associated drains, traps, gages, and safety valves shall be installed to promote ease of access and safe operation.
12. Users shall ensure that portable grinders are properly configured for either a left- or right-handed person's use, as applicable.
13. Portable grinders shall be provided with a hood-type guard with side enclosures that cover the spindle and at least 50 percent of the wheel. All wheels shall be inspected regularly for signs of fracture.
14. Bench grinders shall comply with the following:

    a) Be equipped with deflector shields and side cover guards that:

       (1) Have a maximum angular exposure of the grinding wheel periphery and sides not more than 90 degrees, except that when work requires contact with the wheel below the horizontal plane of the spindle, in addition to

(2) An angular exposure not exceeding 125 degrees, and

(3) An exposure not beginning more than 65 degrees above the horizontal plane of the spindle.

b) Have tool rests with a maximum clearance of ⅛-inch between the wheel and grinding stone.

15. Hand-held grinders shall be equipped with a constant pressure switch.
16. Supervisors shall ensure that frequent light dressings on bench grinders are performed.
17. When turning on a bench grinder, the users shall stand off to one side until the wheel has come up to full speed.
18. Inspect all wheels before use for signs of fracture.
19. Prior to operating a bench grinder, personnel shall conduct a "ring test" (i.e., gently tap the wheel with an object; there should be a metallic tone or "ring."). If there is a "dead" sound, then take the grinder out of service and replace the wheel.
20. Electric bench grinders shall be equipped with an anti-restart feature to prevent restart after an electrical power outage.
21. Shop machines (e.g., drill presses, fixed saws, or bench grinders) shall be effectively fastened or secured in place to prevent movement during operation and use.
22. Tool safety retainers shall be installed on portable tools when required by the tool manufacturer (e.g., nail gun retainer).
23. Fuel powered tools shall not be used in unventilated areas. Fuel shall be dispensed only from approved safety cans. These cans shall be properly labeled and stored.
24. Cutting tools approved for general application are cutters with an integrated safety device (i.e., self/automatic retracting blade) or safety design (i.e., scissors, shears, wire strippers, or recessed/protected blades).

Prior to using cutting tools *not approved* for general use (i.e., fixed blade knives), ensure that the job hazard analysis identifies the hazards and controls associated with the use of the tool(s), and approval is received from the FSM or designee. The approval is to be documented on the Safety Task Analysis and Risk Reduction Talk (STARRT) card for the specific task.

NOTE: The safe practice of always cutting away from yourself and using cut resistant hand protection when using cutting tools is also discussed and documented on the STARRT card.

4.7 Saws

The types of saws that the UPF construction site personnel operate include band saws, portable circular saws, radial saws, swing/sliding cut-off saws, and table saws. Use the safe work practices listed below to work safely with these saws:

4.7.1 Band Saws

All portions of band saw blades will be enclosed or guarded, except for the working portion of the blade between the bottom of the guide rolls and the table.

Band saw wheels shall be fully encased.

4.7.2 Portable Circular Saws

Portable, power-driven circular saws will be equipped with guards above and below the base plate or shoe.

The lower guard will cover the saw to the depth of the teeth, except for the minimum arc required to allow proper retraction and contact with the work.

The lower guard will automatically return to the covering position when the blade is removed from the work.

4.7.3 Radial Saws

Radial saws shall be equipped with an upper guard that completely enclosed the upper half of the saw blade, including the end of the saw arbor. The upper hood is to be constructed in such a manner and of such material to protect the operator from flying debris (e.g., splinters, broken saw teeth) and deflects sawdust away from the operator.

Operator shall ensure that the sides of the lower exposed portion of the radial saw blade are guarded and that it automatically adjusts to the thickness of the material and remains in contact with the material being cut.

Ensure that radial saws used for ripping are equipped with non-kickback fingers or dogs.

Operator shall verify that the radial saw's cutting head returns to its starting position, when released.

4.7.4 Swing/Sliding Cut-Off Saws

Swing or sliding cut-off saws shall be equipped with a hood that completely encloses the upper half of the saw.

Limit stops shall be set in place to prevent swing or sliding type cut-off saws from extending beyond the front or back edge of the table.

Each swing or sliding cut-off saw shall be provided with a device that will return the saw automatically to the back of the table when released at any point of its travel.

When performing inverted sawing with the sliding cut-off saws, then ensure that a hood is in place to cover the part of the saw that protrudes above the top of the table or material being cut.

4.7.5 Table Saws

Circular table saws shall be equipped with a hood over the portion of the saw above the table and mounted so that the hood automatically adjusts itself to the thickness of the material and remains in contact with the material being cut.

Circular table saws shall have a spreader alignment with the blade spaced no more than ½-inch behind the largest blade mounted in the saw. This provision does not apply when grooving, dadoing, or rabbeting (jointing).

Ensure that circular table saws used for ripping are equipped with non-kickback fingers or dogs.

Feeder attachments shall have the feed rolls or other moving parts covered/guarded to protect the operator from hazardous points.

4.8 Electrical Safety

Ensure compliance with the following:

- Electrical devices shall be maintained in a safe condition.
- Damaged equipment and cords shall be removed from service until rendered safe.
- Listed, labeled, or certified equipment shall be installed and used in accordance with instructions, included in the listing, labeling, or certification.

4.8.1 Temporary Wiring

Temporary runs of open conductors shall be located where the conductors are not subject to physical damage (i.e., where equipment and cords are located such that a barricade or structure ensures protection from damage), and the conductors shall be fastened at intervals not exceeding 10 feet.

4.8.2 Temporary Lighting

Temporary lighting shall meet the following criteria:

a) Be equipped with guards to prevent accidental contact with the bulb unless the reflector is constructed so that the bulb is deeply recessed.
b) Be equipped with heavy-duty electrical cords with connections and insulation maintained in a safe condition.
c) If using portable lighting in wet or conductive locations, such as tanks or boilers, then ensure that the lighting will be operated at no more than 12 volts or will be protected by GFCIs.
d) Ensure task lighting, particularly halogen lamps, is clear of combustible materials when in use.
e) Ensure that lighting devices are NOT suspended by their electrical cords, unless such cords and lights have been designated for that purpose.

4.9 General Area Lighting

The following shall be applied for general area lighting:

- Establish lighting based on schedule, volume of use, and security concerns for parking lots and non-production areas.
- Protect light bulbs from breakage as designed by the manufacturer or as required by regulating agencies.
- Position light fixtures to prevent employees from coming into contact with the fixtures during work operations.
- Clearly illuminate ladder access and egress.
- Ensure that metal-case sockets are grounded.

4.9.1 General Illumination Intensities

When work is in progress, then minimum illumination intensities in construction areas shall be as follows:

Area of Operation	Intensity (foot-candles)
General construction area lighting	5
Loading platforms, refueling, and field maintenance areas	3
General Rough Work	3
Material Handling	3
Concrete Placement	5
Indoors: warehouses, corridors, hallways and exit ways	5
Tunnels, shafts, and general underground work areas (exception: minimum of 10 foot-candles is required at tunnel and shaft heading during drilling, mucking, and scaling. Bureau of mines approved cap lights are acceptable for use in the tunnel heading).	5
General construction plant and shops (e.g., batch plants, screening plants, mechanical and electrical equipment rooms, carpenter shops, rigging lofts and active store rooms, mess halls, and indoor toilets and workrooms	10
Bench work/plastering	20
First Aid Stations, infirmaries, and offices	30

4.10 Electrical Extension Cords

Ensure compliance with the following:

4.10.1 Cord Inspections

Affected workers shall perform a pre-use inspection on cords and power cords, AND shall ensure that extensions cords have male and female cord caps (male plug & female receptacle).

4.10.2 Electrical extension cords (flexible cords) shall meet the following requirements:

Shall be protected from accidental damage.

Shall NOT be used as a substitute for the fixed wiring of a structure, where attached to building surfaces, where concealed, or where the cable runs through holes in walls, ceilings, floors, or through doorways, windows, or similar openings unless specifically permitted.

Shall be connected to devices and fittings so that cord strain relief is provided that prevents pull from being directly transmitted to joints or terminal screws.

4.10.3 Cord Stewardship

All extension cords are generally to be taken down and rolled up at the completion of a task. Nightly rollup of electrical cords is recommended. Cords are to be inspected by the craft using them at the time of installation and at roll-up. Damaged cords are to be returned to a controlled area until repairs have been made.

4.10.4 Damage and Repair

An item found with defects shall be tagged "DANGER. DEFECTIVE TOOL/EQUIPMENT. DO NOT USE," and returned to a controlled area. Tagged items

that are returned shall be checked by an authorized worker to be repaired, returned to the manufacturer, or destroyed as determined by Construction Supervision. **No taping of extension cords shall be permitted as repair**.

Damaged cords are those with any one of the following characteristics:

a) Signs of burning or discoloration to cord cap.
b) Cord cap separation from cord jacket.
c) Missing, bent, or damaged prongs.
d) Cuts in the cord jacket such that upon bending back the cable at the cut, the black, white, or green insulation sheaths on the conductors (or the conductors themselves) become visible.
e) "Flattened" or deformed cords.

4.10.5 Cord Routing and Supports

The preferred methods for cord routing and supports include the following:

a) Route cords up and off the working surface,
b) Endure that cords are routed at a height that is at least seven feet above the walking surface,
c) Ensure that cords are out of walkways,
d) Ensure that cords are secured with cable ties, where applicable,
e) Route cords in non-metallic gun racks or wooden trees,
f) Avoid scaffolds, stairways, ladders, and entry ways/doorways into rooms, corridors, or buildings.
g) Avoid damp and wet locations.

4.10.6 Labeling/Tagging

Power distribution cords 208 to 480 volts are to be identified accordingly.

4.11 Jacks—Lever, Screw, Hydraulic and Ratchet

When using jacks, perform the following:

1. Verify that the manufacturer's rated capacity is marked legibly on each unit,
2. Verify the presences of a positive stop to prevent over travel on all jacks,
3. When potential exists for slippage from the metal cap of the jack, then establish a firm foundation during a lift by setting in place blocking and cribbing at the base of the jack, and a wood block between the cap and the load;
4. Crib, block, or otherwise secure a load immediately after it has been raised.
5. Lubricate jacks at regular intervals AND inspect them frequently, but not less frequently than the following:
   a) Once every 6 months for constant or intermittent use.
   b) When jacks are sent out of shop for special work or when returned.
   c) When a jack is subjected to abnormal load or shock, immediately inspect before and after use.
6. Examine repaired jacks and associated replacement parts for possible defects.

7. Tag defective jacks AND take out of service until repaired.

4.12 Powder-Actuated Tools

A powder-actuated power device is any tool or special mechanized device or gas generator system which is actuated by a smokeless propellant or which releases and directs work through a smokeless propellant charge, also referred to as "propellant-actuated device."

Construction (direct hires/subcontractors) shall request case-by-case permission from the Y-12 Physical Security Group PRIOR to bringing powder actuated power devices and/or associated propellant on site, and each time prior to commencing work. Refer to Y19-023 for additional guidelines.

When using powder-actuated tools, then the following criteria shall be met:

1. Only those workers who have received training for the particular tool being used are allowed to operate a powder-actuated tool.
2. Test powder-actuated tools each day before loading to ensure that safety devices are in proper working condition and use the manufacturer's recommended procedure to perform the required tests.
3. When powder-actuated tools are not in proper working order, or when such tools develop a defect during use, then tag them *out-of-service* immediately and remove from the worksite. Faulty tools shall not return to the work area until properly repaired.
4. **DO NOT** load powder-actuated tools until just prior to the intended firing time.
5. **DO NOT** point loaded nor empty tools at any workers and keep hands clear of the open barrel end.
6. **DO NOT** leave loaded tools unattended.
7. Avoid driving fasteners into very hard or brittle materials, including cast iron, glazed tile, surface-hardened steel, glass block, live rock, face brick, or hollow tile.
8. Avoid driving fasteners into materials that are easily penetrated, unless such materials are backed by a substance capable of preventing the pin or fastener from passing completely through and creating a flying missile hazard on the other side.
9. **DO NOT** drive fasteners into a spalled area caused by an unsatisfactory fastening.
10. **DO NOT** use powder-actuated tools in an explosive or flammable atmosphere.
11. Use powder-actuated tools with the correct shield, guard, or attachment recommended by the manufacturer.
12. Establish a danger barricade and signage in areas where powder-actuated tools are in use in accordance with UPF-CP-214, *Barricades and Signs*.
13. Store powder-actuated tools and fasteners in accordance with manufacturers' recommendations when not in use.
14. **DO NOT** dispose unspent rounds in domestic trash.
15. Dispose miss-fired rounds in accordance with manufactures instructions.
16. Ensure that the tool operator wears safety glasses and a face shield during operation.
17. Powder-actuated tools and the powder charges shall be controlled (tools in locked containers and powder charges in a locked flammable cabinet) as to prevent

unauthorized possession at any time while not in use. Operator shall not carry cartridges in their pockets.

18. Only powder-actuated charges, studs, pins, or fasteners so designed and recommended by the manufacturer for use in a specific tool shall be used. Cross use of accessories with tool is prohibited.
19. In the event of a misfire, then hold the tool in the operating position against the working surface *for not less than one full minute*. If it is uncertain that the tool is defective, then unload the tool and place it in its container, then return it to the tool room with a tag that reads "DANGER. DEFECTIVE TOOL/EQUIPMENT. DO NOT USE."
20. When making a thorough and complete study of the job, then ensure that the type of material to be worked on is included, as well as its thickness and general condition.
21. Ensure that occupied areas behind the firing location are cleared prior to task start.
22. Avoid the use of powder-actuated tools on materials or surfaces that may be completely penetrated by the fastening stud.
23. **DO NOT** drive fasteners directly into materials such as brick or concrete, closer than three (3) inches from the edge or corner, or into steel surfaces closer than ½ inch from the edge or corner, **UNLESS** a special guard or fixture is used.
24. Ensure that the operator knows what is behind the surface, or between the surfaces or walls into which the stud is being driven (e.g., electrical wires, fluid lines, gas lines, personnel, etc.).
25. **DO NOT** carry a tool from one job to another while it is loaded.
26. **DO NOT** fire the tool when there is an obstruction in the barrel.
27. **DO NOT** fire a tool into a pre-drilled hole.
28. **DO NOT** test a powder-actuated tool with the breech plug still in the barrel.
29. **DO NOT** use a fastener without a cap or guide.
30. **Avoid** using a long breech plug charge in a short-breech barrel.

4.13 Emergency Eyewash/Showers

If employees may be exposed to injurious corrosive materials, then suitable facilities for quick drenching or flushing of the eyes and body will be provided within the work area for immediate emergency use.

4.14 Temporary Heating Devices

Ensure compliance with the following:

1. Fresh air shall be supplied in sufficient quantities to maintain the health and safety of workers.
2. Use of kerosene or diesel fueled heaters inside buildings or on scaffolds is prohibited.
3. Portable gas heaters shall be equipped with an approved automatic device to shut off the flow of gas if the flame goes out.
4. Personnel shall ensure that all flammable and combustible materials have been removed from the immediate vicinity of all temporary heaters prior to using and such equipment.

4.15 Concrete and Masonry Work

Ensure compliance with the following:

1. Formwork will be designed, fabricated, erected, supported, braced, and maintained so that it is capable of supporting without failure all vertical and lateral loads that may reasonably be anticipated.
2. No construction loads shall be placed on a concrete structure or portion of a concrete structure unless the supervisor determines that the structure or portion of the structure is capable of supporting the loads.
3. All protruding reinforced steel which workers could fall onto and into shall be guarded to eliminate the hazard of impalement.

> **NOTE:** Use caps having adequate size and strength on rebar to prevent impalement.

4. No worker shall work under concrete buckets while buckets are being elevated or lowered into position. In like manner, no employee shall be permitted under precast concrete members being lifted or tilted into position except those employees required for the erection of those members.
5. To the extent practical, elevated concrete buckets shall be routed so that the fewest workers are exposed to the hazards associated with falling concrete buckets.
6. Forms and shores (except those used for slabs on grade and slip forms) shall not be removed until the Supervisor determines that the concrete has gained sufficient strength to support its weight and superimposed loads. Such determination shall be based on compliance with one of the following:
   a) The plans, specifications, procedures, guides, and lift drawings stipulate conditions for removal of forms and shores, and such conditions have been followed, or
   b) The concrete has been properly tested with an appropriate standard test method designed by ASTM to indicate the concrete compressive strength, and the test results indicate that the concrete has gained sufficient strength to support its weight and superimposed loads.
7. A limited access zone is established whenever a masonry wall is being constructed. Personnel working in limited access zone will comply with the following:
   a) Establish limited access zones prior to the start of construction of the wall.
   b) Verify limited access zones are equal to the height of the wall to be constructed plus four (4) feet and run the entire length of the wall.
   c) Establish the limited access zone on the side of the wall to be un-scaffolded.
   d) Permit only those workers actively engaged in constructing the wall into the limited access zone. No other workers are permitted to enter the zone.
   e) Maintain the limited access zone in place until the wall is adequately supported to prevent overturning and to prevent collapse.
   f) Adequately brace all masonry walls eight (8) feet high or greater to prevent overturning and collapse, unless the wall is adequately supported. Keep bracing in place until permanent supporting elements of the structure are established.
8. When performing lift-slab operations, then the following requirements shall be met:

a) Design and plan slab lifts through a registered professional engineer who has experience in lift-slab construction.

b) Implement such plans and designs through the project/facility, and include detailed instructions and sketches indicating the prescribed method of erection.

c) Use jacking equipment capable of supporting at least two and one-half times the load being lifted to ensure jacking operations and the equipment are not overloaded.

> **NOTE:** For the purpose of this provision, jacking equipment includes any load bearing component that is used to carry out the lifting operation, such as threaded rods, lifting attachments, lifting nuts, hook-up collars, T-caps, shear-heads, columns, and footings.

d) Allow no workers, except those essential to the jacking operation, in the structure when any jacking operation is taking place, unless the structure has been reinforced sufficiently to ensure its integrity during erection.

e) Use equipment designed and installed so that the lifting rods cannot slip out of position, or institute other measures, such as locking or blocking devices that to provide positive connection between the lifting rods and attachments and prevent components from disengaging during lifting operation.

4.16 Excavation Safety

Excavations requiring workers to enter shall be inspected daily, prior to the start of work, by a competent person. Excavations shall be inspected for evidence of a situation that could result in possible cave-ins, indications of failure of protective systems, hazardous atmospheres, or other hazardous conditions. (See Y17-95-64-822, *UPF Site Excavation and Backfill*.)

4.17 Liquefied Petroleum Gas

Ensure compliance with the following:

1. Each system shall have containers, valves, connectors, manifold valve assemblies, and regulators of an approved type.
2. Every container and vaporizer shall be provided with one or more approved safety relief valves or devices.
3. Containers shall be placed upright on firm foundations or otherwise firmly secured.
4. Portable heaters shall be equipped with an approved automatic device to shut off the flow of gas in the event of flame failure.
5. All cylinders shall be equipped with an excess flow valve to minimize the flow of gas in the event the fuel line becomes ruptured.
6. Storage of liquefied petroleum gas within buildings is prohibited.
7. Storage locations shall have at least one approved portable fire extinguisher rated not less than 20 lb. Class B and C.

4.18 Dropped Object Prevention

Guidelines for the prevention of dropped objects (tools and materials) while performing work at elevation can be found in Y73-95-100, *UPF Dropped Object Prevention*.

4.19 Trash Chutes

An enclosed trash chute shall be supplied when debris and materials are required to be dropped more than 20 feet to any point lying outside of the exterior walls of the building.

1. General Requirements—When debris/trash chute is constructed and/or used, the following applies:
   a) No material can be dropped to any point lying outside the exterior walls of the structure unless the area is effectively protected.
   b) Enclose all materials chutes, or sections thereof, at an angle of more than 45 degrees from the horizontal, except for openings equipped with enclosures at or about floor level for the insertion of materials. The openings are not to exceed 48 inches in height measured along the wall of the chute, and all stories below the top floor, such as openings are to be kept closed when not in use.
   c) Install a substantial gate in each chute at or near the discharge end. Assign a competent employee to control the operations of the gate, and the backing and loading of trucks.
   d) Close off the area surrounding the discharge end of the chute securely when operations are not in progress.
   e) Protect any chute opening into which workers dump debris by a substantial guardrail approximately 42 inches above the floor or other surface on which the workers stand to dump the material. Any space between the chute and the edge of the openings in the floors through which it passes is to be solidly covered over.
   f) Where the material is dumped from mechanical equipment or wheelbarrows, then provide a securely attached toe board or bumper, not less than four (4) inches thick and six (6) inches high, at each chute opening.
   g) Design and construct chutes of a strength as to eliminate failure from impact of materials or debris loaded therein, AND follow the manufacturer's instructions for installation and use.
   h) Use adequate fire protection methods (i.e., sprinklers, hose, extinguishers, or barriers), as needed, for the particular hazard present. This directive also applies during the construction of the chute.
   i) Provide protection of openings in exterior walls and protection of combustible exterior building surfaces adjacent to the chute.
   j) Remove accumulations of combustible waste material, dust, and debris from the immediate vicinity of the chute and collection container at the end of each work day to minimize exposure to fires.
   k) Construct trash chutes used in the interior of a building of noncombustible construction material.
   l) Ensure that the main artery of the chute is as straight as practical to avoid accumulations or clogging within the chute.
2. Quarterly Inspection
   a) Inspect trash chutes for visible defects on a quarterly basis and after any occurrence that could affect their safe use.

b) Place a tag that reads "DANGER. DEFECTIVE TOOL/EQUIPMENT. DO NOT USE," on trash chute equipment found damaged or unacceptable for use, in accordance with this procedure, AND notify supervision.

c) Document quarterly inspections using UCN-23240, *Chutes Inspection Sheet*, AND submit the completed form to DMC.

d) Identify chute inspections using ML-SH-801768-A001, *UPF Color Code List for Documentation of Inspections*.

4.20 Rollover Protective Structures

Rollover Protective Structures (ROPS) are manufactured roll cages that, when used in conjunction with seatbelts, minimize worker exposure to a pinch or crush if the equipment tips or rolls over. These ROPS apply to the following types of material-handling equipment, but are not limited to all rubber-tired, self-propelled scrapers, rubber-tired front-end loaders, rubber-tired dozers, wheel-type agricultural and industrial tractors, crawler tractors, crawler-type loaders, industrial and reach forklifts, and motor graders, with or without attachments.

4.21 Exits

Ensure compliance with the following:

1. Every building designed for human occupancy shall be provided with exits sufficient to permit the prompt egress of occupants in case of emergency.
2. In areas determined to be hazardous (e.g., combustible/flammable storage rooms) OR where employees may be endangered by the blocking of any single means of egress from fire or smoke, there shall be at least two means of egress remote from each other.
3. Exits and the ways of approach and travel from exits shall be kept unobstructed and accessible at all times.
4. All exits shall discharge directly to the street or other open space that gives safe access to a public way.
5. Exit doors swing open to the direction of exit travel.
6. Exits shall be marked by readily visible, suitably illuminated exit signs. Exit signs are distinctive in color and provide contrast with surroundings. The word "EXIT" will be in plain legible letters and not less than six (6) inches high.
7. Any door, passage, or stairway that is not an EXIT or a way of exit access, but which is located or arranged such that it could be mistaken for an exit, shall be identified by a sign reading "Not an Exit" or similar designation.

4.22 Manual Material Handling

Engineering and Supervision should design work methods to eliminate or minimize the need for employees to manually handle heavy loads. Mechanical aids (e.g., chain falls/hoists, forklifts, carts) will be designed into work methods and job scoping.

Supervisors will be trained in the basics of manual material handling, the hazards and basic controls, and conducting basic risk assessment for material handling work. Where manual handling is unavoidable, the supervisor will conduct an informal risk assessment as part of the STARRT process and follow up with employees before work starts.

4.22.1 Manual Material Handling Basics

When mechanical aids cannot be utilized and manual handling is anticipated, the following guidelines can help minimize the potential for musculoskeletal injuries (e.g., back strain).

a) To assist employees, it is essential to assess the load prior to attempting any manual handling task. The following questions should be considered:

(1) Can slings, or other aids, be attached to make it easier for lifting?

(2) Are handhold points strategically placed to assist the best body position for the load, preventing excessive bending, stretching?

(3) Is the load weight evenly distributed?

(4) Is the load free of debris, dust, oil, etc.?

(5) Is the work surface sound and free of obstructions (e.g., trip, fall hazards)?

(6) Are storage areas and vehicle access routes identified and clearly marked?

b) When these basic questions have been considered, then take appropriate steps to minimize the hazard of the load by performing the following:

(1) Minimizing the packaging of the load; make it smaller.
(2) In general, if the load is approximately 50 pounds, seek assistance to perform lift (team lift).
(3) Sort loads by category.
(4) Make it easier to grasp; assess handles, hold points, and grip indents.

4.22.2 Stretching

All project-assigned personnel should participate in the voluntary stretching (stretch and flex) program.

5.0 Records

Records generated by this procedure shall be submitted to the Document Management Center (DMC) for logging, issuance, distribution, and records retention to meet project records management requirements. Record types and their designations are identified in ML-PS-801768-A001, *Uranium Processing Facility Project Master Document Type List.* . Records generated during the performance of this procedure include:

- UCN-23240, *Chutes Inspection Sheet* (Type: QA Nonpermanent)

6.0 References

6.1 Interfacing References

UPF Project-specific references:

- ML-SH-801768-A001, *UPF Color Code List for Documentation of Inspections*
- UPF-CP-214, UPF *Barricades and Signs*
- UPF-CP-229, UPF *Vehicle Safety Management*
- Y17-95-64-822, *UPF Site Excavation and Backfill*
- Y73-95-100, *UPF Dropped Object Prevention.*

Other interfacing references:

- Y19-023, *Physical Protection Manual*

6.2 Developmental References

Code of Federal Regulations

- 29 CFR 1926, "Safety and Health Regulations for Construction" (2013)

ASTM International Standards

- ASTM F2413, *Standard Specification for Performance Requirements for Foot Protection* (2005).

National Fire Protection Association (NFPA) Codes and Standards

- NFPA 70E, *Standard for Electrical Safety in the Workplace* (2012)
- NFPA 101, *Life Safety Code* (2012)
- NFPA 241, *Standard for Safeguarding Construction, Alteration, and Demolition Operations* (2013)

Bechtel Environmental, Safety, and Health Core Processes (CPs):

- CP 110, *Manual Material Handling (Back Injury Prevention Program)*
- CP 200, *General Safe Working Requirements*
- CP 206, *Powder-Actuated Tools*
- CP 226, *Electrical Equipment and Assured Grounding*
- CP 230, *Night Work*

UPF Project-specific procedures

- UPF-CP-201, *General Housekeeping*
- UPF-CP-205, *Personal Protective Equipment*
- UPF-CP-211, *Fire Prevention and Protection*
- UPF-CP-225, *Compressed Gas Cylinders, Liquefied Petroleum Gas, and Liquefied Inert Gases*
- Y17-95-64-823, *UPF Safety Task Analysis and Risk Reduction Talk/Job Hazard Analysis Program (STARRT/JHA) Process*

Attachment 1 Acronyms/Definitions

ACRONYMS

CM	Construction Manager
ES&H	Environment, Safety, and Health
GFCI	ground fault circuit interrupter
OSHA	Occupational Safety and Health Administration
STARRT	Safety Task Analysis and Risk Reduction Talk

DEFINITIONS

None.