NATIONAL OCCUPATIONAL STANDARD

# MINERALS PROCESSING OPERATOR

MINING INDUSTRY
HUMAN RESOURCES COUNCIL

# INTRODUCTION

National Occupational Standards (NOS) establish clear, objective benchmarks of the skills and knowledge required for workers to perform in a particular occupation. Each NOS reflects a complete list of competencies required to perform a specific job.

The Mining Industry Human Resources Council (MiHR) developed and maintains a suite of seven NOS for the Canadian mining industry. The development and maintenance of each NOS is led by a National Occupational Standard Development Committee (NOSDC) made up of subject-matter experts from various groups across Canada, including industry, labour and education. NOS development committees undertake a regular review (every three to five years) of the NOS to ensure they remain current and relevant to industry.

For more information on the NOS or our Canadian Mining Skills Development Strategy, please visit **mihr.ca/standards-training-recognition** or email **standards@mihr.ca**.

# UNDERSTANDING THE NOS

Each National Occupational Standard reflects a complete list of competencies required to perform a specific job. All areas of competence and their tasks for the entire suite of seven NOS have been pulled together in MiHR's Master Competency List. The Master Competency List allows you to understand those competencies and tasks that are common across multiple occupations versus the specialties that set them apart.

Competency areas that are common across multiple occupations within the mining industry are referred to as common competencies. They are the foundational competencies and skills required to work in the mining industry, and include tasks such as working safely, and knowledge of workplace policies and legislation.

Each NOS builds on the common competencies by including additional competencies that are unique to each occupation. Both types of competencies are referenced in the NOS document with multiple tasks and sub-tasks to provide a deeper context and understanding of each area of competency. Each task is further defined by its general frequency. References and examples of abilities and knowledge are included to ensure adequate interpretation of each sub-task.

MiHR's Master Competency List reflects all areas of competency for MiHR's suite of NOS and each area of competency and its related tasks keep the same identification number regardless of the NOS in which they are included.

Should an area of competency or task not be included in an NOS, the related details for that area of competency or task will not be present in the NOS. In its place, there will be an indication that the task is not applicable to this NOS.

# ACKNOWLEDGEMENTS

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**Photo courtesy of Vale.**

## Area of Competency 30: Operate Processing Equipment, continued



## Area of Competency 31: Handle Reagents 67



## Area of Competency 32: Operate Tailings Systems 69

# MINERALS PROCESSING OPERATOR

## Area of Competency 1: Policies and Legislation

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# TASK 1.1
# COMPLY WITH COMPANY POLICIES AND PROCEDURES

## SUB-TASK

1. Understand, sign off and follow company policies and procedures.

## REFERENCE/EXAMPLES OF ABILITIES AND KNOWLEDGE

- Includes Standard Operating Procedures (SOP)
- Includes policies on the use of personal electronic devices, wearing jewellery, contact lenses, long hair, etc.
- Includes procedures on operation of equipment, use and handling of chemicals, care and maintenance of sumps and ventilation.
- Understand and apply human resource policies, procedures and collective bargaining agreements.
- Comply with drug and alcohol policy.
- Comply with updates and revisions to policies and procedures.

# TASK 1.2
# UNDERSTAND AND COMPLY WITH APPLICABLE WORKPLACE LEGISLATION AND REGULATIONS

## SUB-TASK

1. Understand and follow work processes mandated by legislation and regulations.

## REFERENCE/EXAMPLES OF ABILITIES AND KNOWLEDGE

- Includes Mine Health and Safety Act and Regulations, Workers' Compensation Regulations, Labour Standards, Hoisting Regulations, Environmental legislation, Explosive Regulations.
- Comply with updates and revisions to legislation and regulations.

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## Area of Competency 2: Work Safely

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# TASK 2.1
# SELECT, USE AND MAINTAIN PERSONAL PROTECTIVE EQUIPMENT (PPE)

## SUB-TASKS

1. Recognize situations that require use of PPE.
2. Select, inspect, use, maintain and store appropriate PPE for:
   - Head protection
   - Eye protection
   - Foot protection
   - Hand protection
   - Hearing protection
   - Respiratory protection
   - High-visibility clothing and apparel
   - Specific conditions (fall protection, welding, radiation, handling chemicals, energized work, roasting)
3. Wear clothing appropriate for work conditions and tasks.
4. Follow site, provincial and territorial standards.
   - Practice personal hygiene.

## REFERENCE/EXAMPLES OF ABILITIES AND KNOWLEDGE

- Select appropriate PPE.
  - Wear PPE approved by recognized authority (Canadian Standards Association (CSA), American National Standards Institute (ANSI), Underwriters Laboratories (UL)).
  - Identify limitations of PPE.
  - Workers may not be aware of approved PPE and/or the PPE may be assigned by the company.
  - Contractors can be required to select their own PPE.
  - Ensure PPE is appropriate for the assigned work task.
- Inspect PPE.
  - Inspect PPE for wear, damage and defects before using.
  - Replace worn, damaged or defective PPE.
  - Report defects to appropriate personnel.
- Use PPE.
  - Ensure PPE fits correctly and is adjusted properly.
  - Follow manufacturer's instructions and specifications for proper use and maintenance of PPE.
  - Maintain and store PPE.
- Wear clothing appropriate for work conditions and tasks.
  - Do not wear loose or torn clothing.
  - Ensure all clothing adequately covers body to protect against hazards, contaminants, work and weather elements.
  - Dispose of contaminated clothing in compliance with company policies and legislation.
  - Use appropriate eye protection in place of contact lenses.
  - Wear high-visibility PPE as required.
- Practice personal hygiene.
  - Keep work clothes separate from street clothes if required.
  - Change and clean work clothes regularly.

# TASK 2.2
# PRACTICE AND MAINTAIN GOOD HOUSEKEEPING

## SUB-TASKS

1. Maintain clean work area.
2. Use appropriate equipment for task.
3. Take corrective action as required.
4. Appropriately dispose of waste materials safely.
5. Organize and classify materials, supplies and equipment.

## REFERENCE/EXAMPLES OF ABILITIES AND KNOWLEDGE

- Maintain clean work area.
  - Ensure priority areas are clear first as identified in policies and procedures.
  - Keep work areas free from clutter.
  - Keep work areas free of ice, grease and mud.
- Use appropriate equipment for task (e.g., broom, scraper, water hose, vacuum, blow pipe or air lance, mobile equipment).
  - Clean, maintain and return tools and equipment to storage immediately after use.
  - Report, tag out and/or remove defective equipment.
- Take corrective action as required.
  - Clean all spills and/or leaks.
  - Install signs and barricades as required.
  - Ensure work area is free of obstructions.
- Dispose of waste materials.
  - Follow environmental plan.
- Organize and classify materials.
  - Use shadow boards for storing equipment.
  - Use tool cribs, bins and dedicated areas for storing similar materials.

# TASK 2.3
# IDENTIFY AND RESPOND TO WORKPLACE HAZARDS

## SUB-TASKS

1. Recognize hazardous or potentially hazardous conditions.
2. Observe safety precautions in hazardous conditions.
3. Take corrective action.
4. If hazardous condition cannot be immediately corrected: put up signs, barricade area or post guard, lock out and tag and de-energize.
5. Record and report all hazardous or potentially hazardous conditions to appropriate personnel.

## REFERENCE/EXAMPLES OF ABILITIES AND KNOWLEDGE

- Recognize hazardous or potentially hazardous conditions.
  - Use risk assessment tools as per site policies and procedures.
  - Follow water management plans.
  - Types of hazardous conditions may include: dangerous weather and environmental conditions, heat and cold stress, wildlife, poor ground conditions (loose rock, swamp, ice), overhead hazards (trees, power lines, screen, vent tubing), underground hazards (gas lines, power lines), open holes (sumps, chutes, shafts, trapdoors, hoist pits, ladder ways), protruding objects (nails, anchors), tripping or slipping hazards (hoses, rocks, muck, ice, lichen, spills), moving equipment (trucks, loaders, forklifts, aircraft), explosives (dangerous gases, e.g., oxy-acetylene, methane, propane, H2S, HCN, chlorine), inadequate ventilation (ripped or torn vent tubing, non-operating fans), lack of or inadequate safety guards on equipment with moving or rotating parts, energy sources, reagents, engulfment, potential chemical reactions, dust, confined space, flocculants.
- Take corrective action.
  - Isolate hazard or potential hazard.
  - Guard all identified hazards using barricades and signs.
  - Post guard, if required.
  - Stop work if there are unsafe conditions.
  - Complete job hazard analysis.
  - Evacuate area if necessary.
- If hazardous condition cannot be immediately corrected.
  - Put up signs, barricade area or post guard.
  - Ensure safety of self and others.
  - Lock out, tag and de-energize as per site policies and procedures.

## TASK 2.4
## MANUALLY LIFT AND CARRY MATERIALS

### SUB-TASKS

1. Assess the load.
2. Inspect pathway and destination.
3. Prepare to lift the load.
4. Make the lift.
5. Carry the load.
6. Ground the load.

### REFERENCE/EXAMPLES OF ABILITIES AND KNOWLEDGE

- Assess the load.
  - Estimate and identify size, weight, center of gravity and dimensions of load.
  - Assess load and understand Musculoskeletal Disorder (MSD).
  - Determine if assistance is required.
  - Determine if mechanical lifting equipment is needed.
- Inspect pathway and destination.
  - Identify and remove hazards, where possible.
  - Identify resting places, if needed.
  - Ensure clear path to travel.
- Prepare to lift the load.
  - Work within personal physical limits and limits identified in policies and procedures.
  - Ensure good footing and well-balanced stance.
  - Select safe and comfortable hand holds.
  - Grip with full palm of hand.
  - Use sit down position and keep back straight.
- Make the lift.
  - Ensure back is kept straight, use leg muscles to lift.
  - Use proper lifting technique to avoid muscular skeletal injuries.
  - Ground the load.
  - Keep back straight and use leg muscles to lower load.

## TASK 2.5
## RECOGNIZE CONFINED SPACE WORK AND FOLLOW POLICIES AND PROCEDURES

### SUB-TASKS

1. Obtain necessary training and authorization.
2. Prepare for confined space work.
3. Conduct pre-entry checks.
4. Conduct confined space work.

### REFERENCE/EXAMPLES OF ABILITIES AND KNOWLEDGE

- Prepare for confined space work.
  - Complete all necessary training for confined space work.
  - Ensure certification is up to date.
  - Obtain necessary work permits, i.e., confined space, hot work.
  - Post signs.
  - Remove hazards.
- Conduct pre-entry checks as per policies and procedures.
  - Lock out and tag all equipment, pipes and lines.
  - Ensure adequate ventilation and lighting.
  - Ensure warning devices are in place and properly calibrated to manufacturer's specifications.
  - Post a spotter.
  - Ensure proper first-aid precautions.
  - Ensure emergency rescue plans are in place.
- Conduct confined space work.
  - Communicate readiness to enter work area.
  - Re-evaluate air quality at regular intervals.
  - Regularly check air temperature.

## TASK 2.6
## WORK AROUND MOBILE EQUIPMENT

### SUB-TASKS

1. Work in authorized locations only.
2. Communicate with equipment operator.
3. Obey rules of conduct.
4. Avoid hazardous conditions.

### REFERENCE/EXAMPLES OF ABILITIES AND KNOWLEDGE

- Communicate with equipment operator.
  - Communicate with equipment operator/skip tender/cage tender/dispatch and verify acknowledgement.
  - Be aware of locations of communication equipment.
  - Use hand signals.
- Obey rules of conduct.
  - Maintain safe working distance and loads in tow.
  - Obey vehicle warning signals and alarms.
  - Yield the right of way.
- Avoid hazardous conditions.
  - Use designated travel ways around equipment.
  - Stay clear of suspended loads.
  - Avoid blind spots, remain visible.
  - Do not cross guards or barricades.
  - Recognize and utilize safety bays.
  - Be aware of trailing cables.
  - Obey signage and established right of way policies.

## TASK 2.7
## WORK AROUND STATIONARY EQUIPMENT

### SUB-TASKS

1. Work in authorized locations only.
2. Communicate with equipment operator.
3. Obey rules of conduct.
4. Avoid hazardous conditions.

### REFERENCE/EXAMPLES OF ABILITIES AND KNOWLEDGE

- Work in authorized locations only.
  - Including but not limited to: drill, pumps, pneumatic equipment, high pressure hoses and generators, ensuring guards are in place.
  - Work from safe location.
- Obey rules of conduct.
  - Maintain safe working distance.
  - Observe alarms and warning systems.
  - Communicate with co-workers.
- Avoid hazardous conditions.

## TASK 2.8
## WORK AROUND WATER HAZARDS

### SUB-TASKS

1. Operate equipment safely in and around water hazards.
2. Ensure safety of personnel working around water hazards.
3. Identify type of water hazard.

### REFERENCE/EXAMPLES OF ABILITIES AND KNOWLEDGE

- Operate equipment safely in and around water hazards.
  - Follow legislation and company policies and procedures as outlined.
  - Collect samples from tailings pond.
  - Utilize appropriate fall protection.
  - Use re-claim pumps.
  - Maintain berms.
- Ensure safety of personnel working around water hazards.
  - Use personal floatation devices (PFDs).
  - Monitor water levels.
  - Adhere to environmental standards.
  - Perform dam monitoring.
- Identify type of water hazard.

## TASK 2.10
## WORK IN CRAMPED AND/OR AWKWARD CONDITIONS (OR LIMITED MOBILITY)

### SUB-TASKS

1. Knowledge of site-specific hazards.
2. Ensure lock out, de-energize and tag of related equipment.
3. Assess hazard to personal safety.
4. Identify and utilize provisional working techniques.
5. Organize your work.

### REFERENCE/EXAMPLES OF ABILITIES AND KNOWLEDGE

- Knowledge of site-specific hazards.
  - Identify Job Hazard Analysis (JHA).
- Ensure lock out, de-energize and tag of related equipment.
  - Dissipate stored energy, i.e., air, oil, water, hydraulics.
  - Secure blocking of equipment.
- Assess hazard to personal safety.
  - Ground control, potential for load shifting, heat, ventilation, watch for obstructions.
  - Identify and utilize provisional working techniques.
  - Modify lifting technique.

# TASK 2.11
# PREPARE FOR HOT WORK

## SUB-TASKS

1. Recognize requirements for a hot work environment and obtain necessary permits.
2. Inform appropriate personnel for fire watch.
3. Prepare the site.

## REFERENCE/EXAMPLES OF ABILITIES AND KNOWLEDGE

- Recognize requirements for a hot work environment and obtain necessary permits.
  - Welding, cutting, grinding, soldering, using electrical equipment not suitable for a hazard location, combustible engine, "frost fighting".
- Inform appropriate personnel for fire watch.
  - Post guard and check environment after work as per site policies and procedures.
- Prepare the site.
  - Remove combustibles, wet down the area, ensure necessary firefighting equipment is present.
  - Follow site policies and procedures.
  - Ensure proper ventilation.

# TASK 2.12
# RECOGNIZE AUTHORIZED AND RESTRICTED AREAS

## SUB-TASKS

1. Recognize hazardous areas.
2. Complete necessary training for entry to authorized and restricted areas.
3. Follow entry and exit protocols.

## REFERENCE/EXAMPLES OF ABILITIES AND KNOWLEDGE

- Recognize hazardous areas.
  - Examples include: reagent room, electrical rooms, leach plant, hot work, confined spaces, explosive magazines, active lifting areas.
- Complete necessary training for entry to authorized and restricted areas.
  - Training could include applicable respiratory protection training (e.g., SCBA), WHMIS, Transportation Dangerous Goods, Arc flash training.
- Follow entry and exit protocols.
  - Follow notification process.
  - Utilize sign-in, sign-out sheets.

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## Area of Competency 3: Signs, Barricades, Traffic, Plans and Drawings

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## TASK 3.1
## RECOGNIZE AND COMPLY WITH SIGNAGE, BARRICADES, AUDIBLE ALARMS AND EQUIPMENT LIGHT INDICATORS

### SUB-TASKS

1. Recognize and comply with signage.
2. Recognize and comply with barricades.
3. Recognize equipment and system audible and visual alarm signals.
4. Recognize equipment and system indicator lights.
5. Do not alter or remove warning signs, lights, audible alarms or barricades, without proper authorization.

### REFERENCE/EXAMPLES OF ABILITIES AND KNOWLEDGE

- Recognize and comply with signage.
  - Includes informational signs and tags, cautionary and danger signs (e.g., electrical hazard), directional signs, labels (e.g., Workplace Hazardous Information System (WHMIS).
- Recognize and comply with barricades.
  - Includes cautionary tape, danger/do not enter tape, physical barriers (i.e., berms, concrete stoppers, steel cable) and protective barriers (i.e., snow fence, environmental).
- Recognize equipment and system audible and visual alarm signals.
  - Includes bells, buzzers, horns, whistles, sirens, shaft signals.
  - Includes ready lights, fault indicators, emergency indicators.
- Recognize equipment and system indicator lights.
  - Includes shaft warning lights, open hole lights, transportation of explosives, strobe light, equipment audible alarms, blast warning signs and lights, gaseous alarms, equipment start up, mixing alarms, amperes meter, pressure gauges, fault finder alarms.

## TASK 3.3
## INSTALL, REMOVE, MAINTAIN AND STORE SIGNS AND BARRICADES

### SUB-TASKS

1. Select correct sign/barricade for specific application (e.g., unsafe walkway, open hole).
2. Follow site policy and procedure for posting/installing signs and barricades.
3. Maintain and store signs and barricades in proper locations.

### REFERENCE/EXAMPLES OF ABILITIES AND KNOWLEDGE

- No additional references or examples.

## TASK 3.4
## RECOGNIZE AND COMPLY WITH TRAFFIC MANAGEMENT PLANS

### SUB-TASKS
1. Recognize traffic signs and lights.
2. Comply with traffic rules and patterns.

### REFERENCE/EXAMPLES OF ABILITIES AND KNOWLEDGE
- Recognize traffic signs and lights.
  - Includes: traffic signs, blasting signs, directional signs, restricted area signs.
- Comply with traffic rules and patterns.
  - Includes: traffic lights, restricted traffic area, right of way, right- and left-hand drive areas, emergency vehicle movement.
  - Follow site policies and procedures (e.g., call-in protocols, ramp protocols, designated parking).

## TASK 3.5
## UNDERSTAND AND USE INFORMATION PRESENTED ON PLANS AND DRAWINGS

### SUB-TASKS
1. Recognize symbols, abbreviations, colour coding.
2. Interpret drawings.
3. Recognize and comply with Emergency Response Drawings.

### REFERENCE/EXAMPLES OF ABILITIES AND KNOWLEDGE
- Recognize symbols, abbreviations, colour coding.
  - Includes direction, scale, elevation, depth.
- Interpret drawings.
  - Includes blueprints, P&ID (piping and instrumentation diagram), drill layout patterns, evacuation routes, shaft compartments, services (e.g., air, water, ventilation).

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## Area of Competency 4: Fire Safety

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# TASK 4.1
# BE PREPARED TO RESPOND TO FIRES

## SUB-TASKS

1. Classify fires by hazard.
2. Know location of fire extinguishers and fire hoses.
3. Demonstrate knowledge of components and use of fire extinguishers.
4. Inspect fire extinguishers and keep up to date.
5. Report all discharged or defective fire extinguishers to appropriate personnel.
6. Demonstrate knowledge of equipment fire suppression system.
7. Know location of emergency evacuation/in-evacuation/muster points.
8. Knowledge of location of fire suppression activation points.

## REFERENCE/EXAMPLES OF ABILITIES AND KNOWLEDGE

- Classify fires by hazard.
  - Rubber, compressor rooms, electrical, grease, oil, equipment, chemical, concentrate.
- Demonstrate knowledge of components and use of fire extinguishers.
  - Identify classes of fires: A - paper, wood, trash; B - flammable liquids, lubricants, paints; C - electrical; D - combustible metals.
  - Recognize potential for explosion (e.g., equipment fire, tire fire).
  - Identify standard types, sizes and applications of fire extinguishers.
  - Identify names and functions of principal components of fire extinguishers.
  - Identify ranges and limitations of fire extinguishers.
  - Understand safety precautions for fire extinguishers, including CO2 hazards due to misuse.
- Demonstrate knowledge of equipment fire suppression system.
  - Activate fire suppression system.
  - Ability to dismount safely after activation if needed.

# TASK 4.2
# EXTINGUISH MINOR FIRES*, IF SAFE TO DO SO

## SUB-TASKS

1. Report all fires and discharged or defective fire extinguishers to appropriate personnel.
2. Know location of emergency evacuation/in-evacuation/muster points.
3. Select and use appropriate fire extinguisher and/or suppression equipment.
4. Use proper fire extinguishing techniques.

## REFERENCE/EXAMPLES OF ABILITIES AND KNOWLEDGE

- Select and use appropriate fire extinguisher and/or suppression equipment.
  - 10- or 20-pound extinguisher.
  - Fire suppression system.
  - Know manual bypass of suppression system.
- Use proper fire extinguishing techniques.
  - P.A.S.S. (Pull, Aim, Squeeze and Sweep).
  - Follow operational instructions.

**Excluding battery fires, report to appropriate personnel.*

# TASK 4.3
# FIRE PREVENTION

## SUB-TASKS

1. Properly store combustible materials.
2. Proper maintenance of equipment.
3. Control sources of flame/ignition.
4. Safely operate open flame and hot work equipment.

## REFERENCE/EXAMPLES OF ABILITIES AND KNOWLEDGE

- Properly store combustible materials.
- Combustible wastes in covered bins or other designated containers.
- Oily rags, oil, empty grease tubes, wastepaper, coal, sulfide, wood and timber.
- Proper maintenance of equipment.
  - Ensure fire suppression is intact.
  - Clean grease buildup.
  - Clean diesel filters.
  - Do not overfill fluid levels.
- Control sources of flame/ignition.
  - Cigarettes, sparks, electrical discharges, friction, foreign material near exhaust, open flame.
- Safely operate open-flame and hot work equipment.
  - Includes: acetylene torch, tiger torch, coil torch, diesel heater and stove.
  - Refer to company hot work policies and procedures.
  - Follow manufacturer's instructions for use (e.g., use for intended purpose only, follow lighting and extinguishing procedures, follow re-fueling procedures, adhere to maintenance procedures and inspections).
  - Have appropriate class of fire extinguisher available.

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## Area of Competency 5: Emergency Situations

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# TASK 5.1
# PREPARE FOR EMERGENCY SITUATIONS AND CONDITIONS

## SUB-TASKS

1. Know the locations of emergency evacuation/in-evacuation/muster points.
2. Know the locations of fire extinguishers, hoses, equipment.
3. Know the location of first aid kits, stations and attendants.
4. Know the location of and how to use eye wash stations, emergency showers, Safety Data Sheets (SDS), respiratory protection (e.g., self-contained breathing apparatus (SCBA), self-rescuer), gas detectors.
5. Know the location of emergency tents, escape way locations, routes and markings, refuge stations.
6. Know the location of equipment emergency stop devices.
7. Know the location of spill kits.
8. Know the emergency procedures.
9. Know emergency reporting protocols.

## REFERENCE/EXAMPLES OF ABILITIES AND KNOWLEDGE

- Know the location of equipment emergency stop devices.
  - E.g., pull cord on conveyors, fuel shut offs, positive air shut offs, AED equipment.
- Know the emergency procedures.
  - E.g., alarm procedure, communication protocol and emergency response.
  - Emergency contact number, appropriate radio channel to report emergency.

# TASK 5.2
# COMPLY WITH WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEMS (WHMIS)

## SUB-TASKS

1. Identify hazard symbol classifications.
2. Access, understand and follow SDS instructions.
3. Maintain WHMIS certification.

## REFERENCE/EXAMPLES OF ABILITIES AND KNOWLEDGE

- Identify hazard symbol classifications.
  - Hazard symbols include: Class A: compressed gas; Class B: flammable and combustible material; Class C: oxidizing material; Class D: poisonous and infectious material; Class E: corrosive material; Class F: dangerously reactive materials.
- Access, understand and follow SDS instructions.
  - Knowledge of location of further instructions and key contact personnel.

# TASK 5.3
# PARTICIPATE IN SAFETY PROGRAMS

## SUB-TASKS

1. Attend and participate in safety meetings.
2. Follow company safety initiatives.
3. Management of change.

## REFERENCE/EXAMPLES OF ABILITIES AND KNOWLEDGE

- Attend and participate in safety meetings.
  - Identify types of safety meetings (site orientation, work area orientation, toolbox meeting, joint health and safety committee meeting).
- Follow company safety initiatives.
  - Safety initiatives include (zero harm, five-point safety, behavioural-based safety).
  - Implement safety practices such as Internal Responsibility System (IRS), Job Task Observations.
  - Conduct risk assessments.
- Management of change.
  - Understand and participate in development safety protocols and documents including but not limited to JHA, JHC.

# TASK 5.4
# UNDERSTAND, RESPOND TO AND REPORT EMERGENCIES

## SUB-TASKS

1. Understand and properly respond to all emergencies.
2. Report all incidents/emergencies, as per company policies.
3. Secure incident/emergency site.

## REFERENCE/EXAMPLES OF ABILITIES AND KNOWLEDGE

- Respond to all emergencies.
  - E.g., fire, medical, chemical, equipment, environmental (in-rush of water, major falls of ground, rush of muck), inadvertent stops, stray bells, dogging, high water shaft bottom, power failure.
  - Stay calm and assess the situation.
  - Interpret alarms and other indicators to determine type of emergency and need for evacuation.
  - Activate emergency protocol, release stench gas (if applicable).
  - Follow emergency response plan.
  - Evacuate if necessary.
  - Follow safest escape route.
  - If unable to reach refuge station, barricade self in safe location, ensuring supply of air.
  - Await further instructions.
  - Follow instructions of designated emergency personnel.
- Report and document all emergencies and incidents.
  - Complete all required reports and forms.
  - Report emergency or incident to appropriate personnel according to policies and procedures.
- Secure incident/emergency site.
  - Secure and freeze the scene.
  - Warn others.
  - Activate alarms.
  - Follow communication protocols.
  - Take corrective action if appropriate (e.g., emergency shutdown procedure).

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## Area of Competency 6: Energy Sources

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# TASK 6.1
# LOCK OUT, TAG, DE-ENERGIZE AND TEST EQUIPMENT

## SUB-TASKS

1. Lock out equipment for repair or maintenance as per site policies and applicable regulations.
2. Tag equipment for repair or maintenance as per site policies and applicable regulations.
3. De-energize equipment and verify zero energy state for repair or maintenance.

## REFERENCE/EXAMPLES OF ABILITIES AND KNOWLEDGE

- Lock out equipment for repair or maintenance as per site policies and applicable regulations.
  - De-energize equipment.
  - Ensure safety of self and others.
  - Ensure safety of equipment.
  - Identify types of locks including personal locks, enclosures, multi-locks, lock boxes.
- Lock out and tag for commissioning and testing as per site policies and procedures.
- Electrically powered equipment.
  - Isolate power supply by: disconnecting switch, shutting off breaker, using isolation bar/scissor locks, locking out equipment correctly, attaching required lock to isolation bar/scissor lock, ensuring appropriate key storage and handling.
- Mechanical equipment.
  - Lock out by: ensuring that no material can enter equipment being repaired/maintained, shutting down process as required, shutting off valve nearest flange to be blanked, draining, purging, depressurizing or flushing lines before repair/maintenance to ensure that stored energy is dissipated or contained, locking out valves using chain lock where applicable.
- Tag equipment for repair or maintenance as per site policies and applicable regulations.
  - Identify types of tags, the colours and their use.
  - Complete all required information on tag.
  - Record lock out.
  - Inform appropriate personnel of equipment lock out.
- De-energize equipment and verify zero energy state for repair or maintenance.
  - Ensure zero energy state (ZES) for equipment (e.g., local and remote bump test).

# TASK 6.2
# WORK AROUND ENERGY SOURCES

## SUB-TASKS

1. Understand and recognize energy sources, stored and potential.
2. Recognize when equipment is locked out and tagged and de-energized.

## REFERENCE/EXAMPLES OF ABILITIES AND KNOWLEDGE

- Recognize energy sources, stored and potential.
  - Mechanical, hydraulic, kinetic, potential, pneumatic, electrical, thermal, chemical, nuclear, overhead and underground services.

# MINERALS PROCESSING OPERATOR

## Area of Competency 7: Working at Heights

MINING INDUSTRY
HUMAN RESOURCES COUNCIL

# TASK 7.1
# IDENTIFY, INSPECT AND STORE FALL PROTECTION SYSTEMS

## SUB-TASKS

1. Identify possible alternative solutions to engineered controls.
2. Identify types of fall protection systems.
3. Select suitable fall protection system to match task.
4. Inspect, maintain and store fall protection systems.
5. Report and remove defective fall protection systems.
6. Complete fall protection training.

## REFERENCE/EXAMPLES OF ABILITIES AND KNOWLEDGE

- Identify types of fall protection systems.
  - Handrails, guard rails, travel restraint, fall arrest, anchor points.
- Inspect, maintain and store fall protection systems.
  - Identify damaged or defective fall protection systems including loose or broken handrails or guard rails.
  - Defective systems should be taken out of service.
  - Store fall protection systems properly to prevent damage.
- Report and remove defective fall protection systems.
- Complete required documentation.
  - Report deficiencies to supervisor.

# TASK 7.2
# USE PERSONAL FALL ARREST SYSTEM

## SUB-TASKS

1. Receive (certified) training for use of fall arrest system.
2. Inspect fall arrest system.
3. Ensure fall arrest system fits properly.
4. Maintain and store fall arrest system.
5. Use fall arrest system as per applicable legislation and site policies and procedures.
6. Have and understand rescue plan.

## REFERENCE/EXAMPLES OF ABILITIES AND KNOWLEDGE

- Ensure fall arrest system fits properly.
  - Select proper size, position on body, use of trauma straps and adjust correctly.
  - Follow manufacturer's specifications for use.
- Use fall arrest system as per applicable legislation and site policies and procedures.
  - Working from heights (scaffold, scissor lift), open holes.
- Have and understand rescue plan.
  - Properly retrieve fallen worker.
  - Time limitations.

# TASK 7.3
# USE PORTABLE LADDERS

## SUB-TASKS

1. Identify types, materials sizes and grades of ladders.
2. Check condition of ladder.
3. Erect ladder.
4. Ascend and descend ladder.
5. Perform tasks on ladder.
6. Inspect, clean and store ladder.

## REFERENCE/EXAMPLES OF ABILITIES AND KNOWLEDGE

- Identify types, materials, sizes and grades of ladders.
  - Extension ladders, step ladders.
  - Made of different materials: metal, fiberglass, wood.
  - Different grades of ladders: Grade III, Grade II, Grade I, Industrial.
  - Select ladder appropriate for task and conditions.
- Check condition of ladder.
  - Inspect ladder for faulty rungs or rails before, during and upon completion of job.
  - Tag out and remove ladder, if needed.
- Erect ladder.
  - Place feet of ladder on level surface.
  - Physically secure ladder.
  - Ensure proper angle of repose as per site policies and procedures.
- Ascend and descend ladder.
  - Climb facing ladder.
  - Use three-point contact.
  - Wear fall arrest system, as required.
  - Use assisted stabilization where required.
- Perform tasks on ladder.
  - Follow site specific ladder policy.
  - Work facing ladder and maintain contact with hand, whenever possible.
  - Maintain required distance from top of ladder.
  - Transport materials in suitable container using a rope.
  - Reposition ladder to prevent overreaching.
- Inspect, clean and store ladder.
  - Record and report defect/damage to supervisor.

# TASK 7.4
# WORK ON SCAFFOLDS AND RAISED PLATFORMS

## SUB-TASKS

1. Ascend and descend scaffold or raised platform.
2. Verify and identify tag.
3. Perform work on scaffold or raised platform.

## REFERENCE/EXAMPLES OF ABILITIES AND KNOWLEDGE

- Ascend and descend scaffold or raised platform.
  - Ensure scaffold has been signed off by certified assembler and is current.
  - Ensure necessary guards are in place.
  - Use three-point contact.
  - Wear fall arrest system, as required.
- Perform work on scaffold.
  - Record and report defect/damage to supervisor.
  - Shut down raised platform if defective.
  - Fasten fall arrest system to appropriate anchorage point at or above shoulder.
- Raised platforms include scissor lifts and aerial boom lifts.
  - Limited to working from raised platform and does not include operation of the equipment.

# MINERALS PROCESSING OPERATOR

## Area of Competency 8: Communicate

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HUMAN RESOURCES COUNCIL

# TASK 8.1
# LISTEN ACTIVELY

## SUB-TASKS

1. Pay attention to person giving the message.
2. Ask person to repeat information if not understood completely.
3. Confirm information by repeating or rephrasing.

## REFERENCE/EXAMPLES OF ABILITIES AND KNOWLEDGE

- Pay attention to person giving the message.
  - Reduce surrounding noises by stopping equipment and tools or moving away from noise.
  - Allow speaker to finish message before responding.

# TASK 8.2
# SPEAK CLEARLY AND CONCISELY

## SUB-TASKS

1. Give clear and concise directions.
2. Use common language and terminology of work site.
3. Confirm understanding.

## REFERENCE/EXAMPLES OF ABILITIES AND KNOWLEDGE

- Give clear and concise directions.
  - Organize your thoughts before speaking.
  - Use appropriate volume and tone of voice.
  - Use appropriate body language.
  - Use sketches as required to assist in understanding.
- Confirm understanding.
  - Ask open-ended questions to make sure directions were understood.

# TASK 8.3
# USE COMMUNICATION DEVICES

## SUB-TASKS

1. Familiarize self with equipment.
2. Know how to use equipment.
3. Conduct pre-operational check.
4. Use proper communication etiquette.

## REFERENCE/EXAMPLES OF ABILITIES AND KNOWLEDGE

- Familiarize self with equipment.
  - Includes: two-way radios, telephones, bells, pager phones, public address systems, CB radios, dispatch system (e.g., Modular, WENCO).
  - Use only authorized communication systems.
- Conduct pre-operational check.
  - For two-way radios and pager phones (prepare radio, ensure battery is fully charged, test radio).
  - Use proper communication etiquette.
- Use appropriate radio channels, language and codes.
  - Avoid unnecessary chatter.
  - Maintain radio silence as appropriate.
  - Reduce background noise, such as satellite radio.
  - Follow control room protocol.

# TASK 8.4
# CONVEY MESSAGE USING SIGNALS

## SUB-TASKS

1. Ensure visual contact.
2. Use and understand appropriate signals for the task.

## REFERENCE/EXAMPLES OF ABILITIES AND KNOWLEDGE

- Ensure visual contact.
  - Take signals from one person only.
  - Confirm signals.
- Use appropriate signals for the job.
  - Includes visual and audible (e.g., hand signals, light signals, horns, bells and whistles).
  - Includes signals for: lifting devices (cranes, cage, skip), tramming, conveyance, aircraft and helicopters.

# TASK 8.5
# USE WORKPLACE TECHNOLOGIES

## SUB-TASKS

1. Use digital-based training modules.
2. Read and understand machine parameters.
3. Receive and follow dispatch instructions.
4. Use digital input services.

## REFERENCE/EXAMPLES OF ABILITIES AND KNOWLEDGE

- Use digital-based training modules.
  - Interactive digital program, simulators.
  - Enter and track training data.
- Read and understand machine parameters.
  - Electronic warning cluster, warning lights and audible alarms, computer screens.
  - Includes heavy equipment status monitoring screens, in-plant diagrams, on-line references (SDS, SOPs).
- Receive and follow dispatch instructions.
  - Dispatch screen (e.g., Modular, WENCO, Mine Star).
- Use digital input services.
  - Electronic forms, databases, Internet, e-mail.
  - Control and maintenance of Standard Operating Targets and Standard Operating Procedures.

# TASK 8.6
# COMPLETE WORKPLACE DOCUMENTATION

## SUB-TASKS

1. Use appropriate form.
2. Write legibly.
3. Be specific.
4. Use correct terminology.
5. Submit or file immediately, as required.

## REFERENCE/EXAMPLES OF ABILITIES AND KNOWLEDGE

- Use appropriate form.
  - Includes inspection checklists, logbooks, cross shift notes, shift reports, production reports, near miss reports, incident reports, safety system cards, time cards, training status reports.
- Be specific and timely.
  - Include accurate information, appropriate details and complete report in full and submit in a timely manner.

# TASK 8.7
# COACH OR MENTOR OTHER COWORKERS/PEERS

## SUB-TASKS

1. Demonstrate proper technique.
2. Check for understanding.
3. Observe coworkers/peers.
4. Provide assistance and appropriate feedback.
5. Continue to observe/follow up.
6. Report to supervisors, if applicable.

## REFERENCE/EXAMPLES OF ABILITIES AND KNOWLEDGE

- No additional references or examples.

# MINERALS PROCESSING OPERATOR

## Area of Competency 9: Be Professional

MINING INDUSTRY
HUMAN RESOURCES COUNCIL

# TASK 9.1
# WORK IN A TEAM ENVIRONMENT

## SUB-TASKS

1. Respect team members.
2. Be professional.

## REFERENCE/EXAMPLES OF ABILITIES AND KNOWLEDGE

- Respect team members.
  - Accommodate each other's communication needs (language differences).
  - Cooperate with each other (need to be able to trust one another and rely upon each other).
  - Be tolerant of others.
  - Be willing to learn from others; be willing to mentor others.
- Be professional.
  - Understand requirements for the job.
  - Show up to work on time.
  - Demonstrate a strong work ethic.
  - Understand chain of command.
  - Follow, model and promote safety and legislative requirements.

# TASK 9.2
# WORK IN A CULTURALLY DIVERSE ENVIRONMENT

## SUB-TASKS

1. Respect practices of co-workers and local populations.
2. Respect social and cultural differences.

## REFERENCE/EXAMPLES OF ABILITIES AND KNOWLEDGE

- Respect practices of co-workers and local populations.
  - Be open-minded.
- Respect social differences.
  - Show interest in others (ask about work experience, family).
  - Be a role model for others.

# TASK 9.3
# MAINTAIN GOOD COMMUNITY RELATIONS

## SUB-TASKS

1. Consider yourself an ambassador for the industry and the company.
2. Support local businesses and events.

## REFERENCE/EXAMPLES OF ABILITIES AND KNOWLEDGE

- Consider yourself an ambassador for the industry and the company.
  - Recognize that personal behavior both in person and online affects public perception of employer.
- Support local businesses.
  - Buy supplies locally.

# TASK 9.4
# DEMONSTRATE HIGH STANDARDS OF CONDUCT

## SUB-TASKS

1. Model safety leadership.
2. Be both consistent and fair.
3. Maintain integrity.
4. Protect company proprietary.

## REFERENCE/EXAMPLES OF ABILITIES AND KNOWLEDGE

- Model safety and environmental leadership.
  - Lead by example, “walk the talk”.
  - Lead toolbox/safety huddle and safety meetings.
  - Ensure safety of crew (fit for work, proper PPE).
- Maintain integrity.
  - Ensure strong moral principles both online and in person.
- Protect company proprietary.
  - Knowledge and understanding of company proprietary process.

# MINERALS PROCESSING OPERATOR

## Area of Competency 10: Equipment Knowledge

MINING INDUSTRY
HUMAN RESOURCES COUNCIL

# TASK 10.1
# DEMONSTRATE EQUIPMENT KNOWLEDGE

## SUB-TASKS

1. Trained, qualified and authorized for proper use and operation of equipment.
2. Conduct pre-operational checks.
3. Properly mount and dismount equipment.
4. Start equipment.
5. Conduct operational checks.
6. Drive equipment to worksite, as required.
7. Shut down equipment (normal and emergency situations).
8. Conduct post-operational check.
9. Knowledge of refueling procedure.
10. Toggle controls to release stored energy.
11. Use appropriate ventilation supplies for operating.

## REFERENCE/EXAMPLES OF ABILITIES AND KNOWLEDGE

- Trained and authorized for proper use and operation of equipment.
  - Follow manufacturer's recommendations and specifications.
  - Follow safe operating procedures.
  - Know capabilities and limitations of equipment.
- Conduct pre-operational checks.
  - Inspect equipment for defects, hazards and potential hazards.
  - Identify and assess severity of equipment defects.
  - Take corrective action to restore normal equipment operation.
  - Record defect(s) and corrective action taken in logbook.
  - Damage to equipment.
  - Steering.
  - Test brakes, as per manufacturer's specifications.
  - Tires and undercarriage pre op check.
  - Know and understand fire suppression systems.
  - Bolts, keepers and holders.
  - Oil spills and/or excessive grease.
  - Pinion and ball gears.
  - Rope windows.
- Inspect layout of hoist.
  - Conveyance inspections.
  - Test all forms of communication – radio, bell phones, pager phones.
  - Mechanical, electrical and HMI (Human-Machine Interface).
- Properly mount and dismount equipment.
- Ensure equipment is shut down before exiting.
  - Use three-point contact.
  - Use grab handles and handrails.
- Start equipment.
  - Neutralize controls (transmission, control levers).
  - Activate power supply (master switch).
  - Use warning signal before start-up.
  - Activate ignition.
- Conduct operational checks.
  - Read and countersign logbook.
  - Fill out pre-operational check sheet.
  - Check gauges, consoles and alert indicators.
  - Ensure air and oil are at required levels.
  - Listen for unusual noises (engine, power train).
  - Check brakes and steering are functional.
  - Check warning systems and lights are operating.
  - Hoist testing (trial run, brake tests, conveyance checks, cage and skip checks).
  - Test hoist limits of travel – over wind, under wind, track limit.
- Drive equipment to worksite, as required.
  - Wear seat belts.
  - Use appropriate warning lights and signals.
  - Test service and emergency brakes.
  - Follow designated travel routes.
  - Observe speed limit, traffic signs, traffic patterns and rights-of-way.
  - Adjust speed according to road and weather conditions.
  - Listen for unusual noises (engine, power train).
- Operate equipment.
  - Wear seatbelts.
  - Use appropriate warning lights and signals.
  - Test service and emergency brakes.
  - Follow designate travel routes.
  - Observe speed limit, traffic signs, traffic patterns and rights-of-way.
  - Operate machine controls smoothly.
  - Adjust speed according to road and weather conditions.
  - Listen for unusual noises (engine, power train).
  - To maximize efficiency and ensure safety of other personnel and equipment.
  - Assess material and site conditions to determine appropriate operating techniques and speeds.
  - Monitor ammeter.
- Shut down equipment (normal situations)
  - Park in designated areas.
  - Set parking/emergency brake.
  - Ground all equipment implements.
  - Shut off ignition and/or fuel supply.
  - Toggle controls to release stored energy.
  - Shut off master switch.
  - Set wheel chocks.
  - Lock out and tag as required.
- Shut down equipment (emergency situations).
  - Recognize and respond to alarms.
  - Shut down as prescribed for type of hazard.
  - Set off fire suppression system, as required.
  - Report incident to appropriate personnel.
- Conduct post-operational check.
  - Fill out logbook.

# TASK 10.2
# WORKING WITH MOBILE EQUIPMENT

## SUB-TASKS

1. Use appropriate personal protective equipment.
2. Be cautious around moving parts of equipment.
3. Identify potential pedestrian, traffic interaction, subsurface and overhead utilities.
4. Avoid hazardous conditions.
5. Demonstrate knowledge of working in vicinity of explosives.
6. Demonstrate knowledge of working in close quarters and around equipment.

## REFERENCE/EXAMPLES OF ABILITIES AND KNOWLEDGE

- Be cautious around moving parts of equipment.
  - Avoid pinch points.
  - Ensure appropriate guards are in place.
  - Stay clear of moving pulleys and belts.
- Avoid hazardous conditions.
  - Identify blind spots.
  - Use designated travel ways.
  - Check for power, telephone and cable lines, guy wires and fences, low clearance areas and stationary equipment.
  - Call before you dig.
  - Avoid debris resulting from work or movement of equipment.

# TASK 10.3
# WORK WITH STATIONARY EQUIPMENT

## SUB-TASKS

1. Use appropriate personal protective equipment.
2. Avoid hazardous conditions.
3. Demonstrate knowledge of working in close quarters and around equipment.

## REFERENCE/EXAMPLES OF ABILITIES AND KNOWLEDGE

- Be cautious around moving parts of equipment.
  - Avoid pinch points.
  - Ensure appropriate guards are in place.
  - Stay clear of moving pulleys and belts.
- Avoid hazardous conditions.
  - Identify blind spots.
  - Use designated travel ways.
  - Avoid debris resulting from work or equipment.

# MINERALS PROCESSING OPERATOR

## Area of Competency 11: Protect the Environment

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# TASK 11.1
# COMPLY WITH ENVIRONMENTAL POLICIES, PROCEDURES AND PERMITS

## SUB-TASKS

1. Minimize environmental impact of operations.
2. Follow appropriate handling and clean-up procedures for various substances.
3. Comply with environmental policies.

## REFERENCE/EXAMPLES OF ABILITIES AND KNOWLEDGE

- Minimize environmental impact of operations.
  - Minimize waste produced (use recommended quantities of additives, do not let equipment run/idle unnecessarily, recycle fluid returns).
  - Use biodegradable and non-toxic additives and store and handle with caution to prevent loss.
  - Use appropriate waste disposal measures.
  - Be aware of restrictions for emissions and noise.
  - Avoid practices that may cause erosion, soft ground rutting.
  - Follow existing roads when possible.
  - When constructing new access routes avoid sensitive areas (swamps, rivers, streams, lakes), avoid cutting, pushing or dumping debris into water courses, use proper bridging techniques, avoid recreational and historical/cultural/archaeological sites, plantations, fish, wildlife and their habitats and whenever possible, minimize tree cutting.
  - When setting up work site avoid unnecessary stripping or grubbing of vegetation, neatly stockpile disturbed overburden for reclamation purposes, maintain required distance from water bodies and courses, ensure campsite construction conforms to regulations and safety practices (structure spacing, noise abatement, fire control).
- Follow appropriate handling and clean-up procedures for various substances.
  - Identify environmental issues.
  - Assess severity of environmental issue.
  - Take corrective action.
  - Report environmental issue and corrective action to appropriate personnel.
  - Record environmental issue and corrective action in logbook.

# TASK 11.2
# APPLY SPILL CONTAINMENT MEASURES

## SUB-TASKS

1. Identify when containment is required.
2. Know and select appropriate type of containment.
3. Install containment, as per company policies.

## REFERENCE/EXAMPLES OF ABILITIES AND KNOWLEDGE

- Identify when containment is required.
  - Containment is required for the storage and handling of fuel, cuttings, hazardous materials, liquid and solid wastes.
- Select appropriate type of containment.
  - Types of containment include straw, berms, pits, portable plastic containers, ditches, silt fencing, secondary containers of required dimensions.
  - Match type of containment to the area and material being contained.
- Install containment.
  - Install containment best suited to material being contained (fuel drum inside another secondary container, fuel tank inside a berm, double-walled fuel tanks).

# TASK 11.3
# MANAGE WASTE

## SUB-TASKS

1. Select and use appropriate PPE.
2. Identify type of waste.
3. Manage solid waste.
4. Manage liquid waste.
5. Manage recycling waste.
6. Manage biohazard waste.

## REFERENCE/EXAMPLES OF ABILITIES AND KNOWLEDGE

- Select and use appropriate PPE.
- Identify type of waste.
  - Identify generated waste including solid, liquid and recycling.
  - Identify the need to set up waste management measures.
  - Select appropriate type of waste management measures.
  - Follow waste management policies and procedures.
  - Adhere to applicable environmental legislation and regulations.
- Manage solid waste, as per company policies and regulations.
  - Use sumps to remove excess water from solids (ensure sumps are of adequate size and capacity; direct water to designated areas with good drainage where natural percolation can occur without reappearance).
- Manage liquid waste, company policies and regulations.
  - Includes sludge, cuttings, waste oil.
  - Select compatible disposal equipment.
  - Document and follow instructions for disposal of all effluent.
  - Collect used petroleum products (transfer used oil into clean pails/containers marked “waste oil” and dispose of as required).
  - Use special precautions when working adjacent to lakes, rivers or creeks (do not direct excess fluid into any watercourse unless treated and approved by regulatory authorities).
- Manage recycling waste, company policies and regulations.
  - Cardboard, scrap metal, empty fuel drums, empty propane tanks and unused lumber must be salvaged and recycled.
- Manage biohazard waste, company policies and regulations.
  - Comply with WHMIS, if applicable.

# TASK 11.4
# MANAGE FUELS AND OTHER HAZARDOUS MATERIALS

## SUB-TASKS

1. Identify types of fuels and other hazardous materials.
2. Transfer fuels and other hazardous materials.
3. Use spill prevention measures.
4. Store fuels and other hazardous materials.
5. Transport fuel/propane and other hazardous materials.

## REFERENCE/EXAMPLES OF ABILITIES AND KNOWLEDGE

- Identify types of fuels and other hazardous materials.
  - Types of fuels include gasoline, propane, diesel.
  - Types of hazardous materials include mill reagents (e.g., cyanide, collectors, frothers), oil, hydraulic fluid, antifreeze, battery acid, grease, solvents, fuel additives.
- Transfer fuels and other hazardous materials.
  - Use closed systems.
  - Drain transfer hoses.
  - Ensure emergency equipment is available and accessible (fire extinguisher, spill kits).
  - Do not leave fuel, equipment or fuel pump nozzles unattended while refueling.
- Use spill prevention measures.
  - Includes oil absorbent matting, drip trays.
  - Replace caps and nozzles on fuel cans immediately after use.
  - Fill fuel tank to safe level; do not overfill.
  - Identify and repair leaks immediately.
- Store fuels and other hazardous materials.
  - Ensure all equipment used for storage of fuels and other hazardous materials are in good condition and/or properly installed.
  - Store cylinders and other fuel containers in an upright position in approved storage area.
  - Ensure proper labelling of containers and signage.
- Transport fuel/propane and other hazardous materials.
  - Obtain certification for to transport dangerous goods (TDG) and WHMIS.
  - Ensure proper permits are in place.
  - Check bills of lading against supplies.
  - Use appropriate types and sizes of containers to transport hazardous materials.

# TASK 11.5
# RESPOND TO SPILLS

## SUB-TASKS

1. Assess danger.
2. Manage spill.
3. Complete follow-up spill reporting procedures.

## REFERENCE/EXAMPLES OF ABILITIES AND KNOWLEDGE

- Assess danger.
  - Halt operations.
  - Identify substance.
  - Determine risk to self and others.
  - Take precautions if substance is highly volatile.
- Manage spill.
  - Take action to stop a continuous spill (turn off pump, reposition overturned containers).
  - Determine spill spread (into ground, run off into watercourse).
  - Initiate spill containment (initiate company contingency plan for specific situation, isolate and remove spill material and contaminated material under and around spilled material if possible).
  - Monitor safe, uncontained spill until relieved by appropriate personnel.
  - Complete follow-up spill reporting procedures.
- Notify supervisor.
  - Notify proper authorities (Spill Line).
  - Complete required documentation (Spill Report form).

# MINERALS PROCESSING OPERATOR

## Area of Competency 12: Operate Support Equipment

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## THE FOLLOWING PRINCIPLES APPLY TO ALL TASKS UNDER THIS AREA OF COMPETENCY

- ✓ Adhere to Area of Competency 10 – Equipment Knowledge
- ✓ Adhere to Task 3.4 - Recognize and comply with traffic management plans
- ✓ Adhere to Task 8.4 - Convey message using signals
- ✓ Adhere to operating manuals and manufacturers' specifications/recommendations

# TASK 12.1
# OPERATE LIGHT OR SERVICE VEHICLE

### ✓ SUB-TASKS

1. Demonstrate equipment knowledge.
2. Ensure proper housekeeping of vehicle.
3. Load, transport and unload materials, supplies and/or personnel.

### ✓ REFERENCE/EXAMPLES OF ABILITIES AND KNOWLEDGE

- Ensure proper housekeeping of vehicle.
  - Keep vehicle free from clutter.
  - Ensure vehicle is equipped with appropriate equipment including but not limited to; first aid kit, survival kit, spill kit, fire extinguisher, wheel chalk.
- Load, transport and unload materials, supplies and/or personnel.
  - Ensure protection of self and others.
  - Ensure non-movement of vehicle while loading.
  - Observe load limitations.
  - Secure seats, safety bars and chains.
  - Follow procedures when: towing trailers/carriers to transport materials (capacity, transporting materials on board, positioning and fastening).
  - Secure loads.

# TASK 12.12
# OPERATE SUPPORT LOADER

### ✓ SUB-TASKS

1. Demonstrate equipment knowledge.
2. Select and utilize appropriate implement for selected task.
3. Change implements as needed.

### ✓ REFERENCE/EXAMPLES OF ABILITIES AND KNOWLEDGE

- Select and utilize appropriate implement for selected task.
  - Rock bucket, clean up bucket, forks, grapple, rock breaker.
- Change implements as needed.
  - Follow appropriate procedures.

# TASK 12.15
# OPERATE SKID STEER

## SUB-TASKS

1. Demonstrate equipment knowledge.
2. Knowledge of limitations.
3. Load and unload materials/supplies safely.

## REFERENCE/EXAMPLES OF ABILITIES AND KNOWLEDGE

- Demonstrate equipment knowledge.
  - Raising and lowering, tilting and tipping bucket.
  - Loading and balancing within limitations of bucket and machine.
  - Safely carrying load on grades.
  - Use spotter with proper equipment.
  - Ground equipment on shut down.
- Knowledge of limitations.
  - Do not exceed limitations.
  - Use appropriate equipment attachments.

# TASK 12.16
# OPERATE FORKLIFT

## SUB-TASKS

1. Demonstrate equipment knowledge.
2. Knowledge of limitations.
3. Transport materials and equipment.
4. Identify load landing area.
5. Unload materials and equipment.

## REFERENCE/EXAMPLES OF ABILITIES AND KNOWLEDGE

- Demonstrate equipment knowledge.
  - Lower forks to ground when parked.
  - Understand center of gravity.
- Knowledge of limitations.
  - Do not exceed limitations.
- Transport materials and equipment.
  - Know weight of load and do not exceed limitations of forklift.
  - Position forks so lift is within its limits with pallets and/or attachments.
  - Secure and balance load.
  - Ensure adequate clearance for vehicle and load.
  - Ensure safe handling of hazardous materials.
  - Drive vehicle with forks/load in correct position.
  - Drive forward or in reverse to ensure maximum visibility or stability.
- Unload materials and equipment.
  - Position vehicle and place load in required locations.

# TASK 12.17
# OPERATE ELEVATED WORK PLATFORM

## SUB-TASKS

1. Demonstrate equipment knowledge.
2. Set up elevated work platform.
3. Work from platform.

## REFERENCE/EXAMPLES OF ABILITIES AND KNOWLEDGE

- Demonstrate equipment knowledge.
  - Ensure proper use of PPE.
  - Fall arrest certification, up to date.
  - Knowledge and understanding of rescue plan.
  - Includes scissor lift, boom lift (straight or articulated).
  - Cycle elevated work platform using lower controls to check holding valve operation.
  - Assess safety and condition of personnel bucket/platform.
  - Secure lifting device.
  - Lower boom to rest position.
  - Raise stabilizer legs.
  - Install boom and bucket covers in preparation for travel.
- Set up elevated work platform.
  - Choose firm base in a suitable position for maximum job efficiency.
  - Load and secure tools, materials and supplies in bucket.
  - Ensure clearance for movement of self, bucket/platform and ropes when raising/lowering equipment, materials and supplies with ropes.
  - Observe limits of electrical approach.
- Work from platform.
  - Operate upper aerial controls to access work position.
  - Adjust safety harness.
  - Work within personal physical limits and equipment limits.

# TASK 12.19
# OPERATE ROCK BREAKER

## SUB-TASKS

1. Demonstrate equipment knowledge.
2. Prepare for rock breaker operations.

## REFERENCE/EXAMPLES OF ABILITIES AND KNOWLEDGE

- Demonstrate equipment knowledge.
  - Position tool on target.
  - Keep rock breaker in near vertical position during operations.
  - Maintain weight on pick during operation.
  - Operate machine controls smoothly (with joystick, if applicable).
  - Change tips according to manufacturer's instructions.
- Prepare for rock breaker operations.
  - Mobile and permanent rock breakers.
  - Ensure machine, breaker and type of tip are compatible with material and end product.
  - Fit protection devices to excavator.
  - Build cove with material, when possible.
  - Position excavator for optimum work pattern.
  - Identify when to change pin size.
  - Use approved dust suppression methods.
  - Follow pre-operational and safe operational procedures.

# TASK 12.20
# OPERATE ALL-TERRAIN VEHICLES

## SUB-TASKS

1. Demonstrate equipment knowledge.
2. Move equipment, materials and personnel.
3. Transport all-terrain vehicle.

## REFERENCE/EXAMPLES OF ABILITIES AND KNOWLEDGE

- Demonstrate equipment knowledge.
  - Identify hazardous or potentially hazardous conditions (during spring and fall conditions, avoid and not create avoid heavily rutted trails/road, on hills, watch for tip-over risks, on blind hills and curves, water flows, extreme weather conditions, unsuitable ground/ice conditions, ground conditions of access to and from location).
  - Ensure use of proper PPE and seatbelts.
  - Do not overdrive headlight.
- Move equipment and materials.
  - Ensure vehicle permit, proof of insurance and valid driver's license are all with the vehicle, when applicable.
  - Inform responsible person of travel plan (departure and estimated return time and route).
- Transport all-terrain vehicle.
  - Follow procedures when loading and unloading onto trailer or pick-up truck.
  - Follow procedures when towing trailers/carriers to transport materials (capacity, transporting materials on board, positioning and fastening).

# TASK 12.23
# OPERATE DEWATERING/THICKENING SYSTEMS

## SUB-TASKS

1. Demonstrate equipment knowledge.
2. Monitor reagent systems.
3. Knowledge of water management plan.

## REFERENCE/EXAMPLES OF ABILITIES AND KNOWLEDGE

- Demonstrate equipment knowledge.
  - Includes stock tanks, decanters, pumping systems, sampling systems, rakes, drive system, feed wells.
  - Check shell, rakes (height, torque, integrity), motor and gear box, U/F pumps and density, flow rates, water supply, motion detectors, monitoring devices, piping.
  - Knowledge and understanding of lock out tag out procedures.
  - Follow communication procedures regarding interlocking systems.
- Monitor reagent systems.
  - Ensure system contains proper amount, type and strength of reagents.
  - Measure quantities of reagents.
- Knowledge of water management plan.
  - Follow government environmental and legislated policies and procedures.

# TASK 12.24
# OPERATE PUMPS

## SUB-TASKS

1. Demonstrate equipment knowledge.
2. Install pump.
3. Monitor pump operation.
4. Switch pumps.

## REFERENCE/EXAMPLES OF ABILITIES AND KNOWLEDGE

- Demonstrate equipment knowledge.
  - Includes piston pumps, plunger pumps (grout pump), centrifugal pumps (trash or volume pump), screw pump (Moyno pump), diaphragm pump.
  - May be powered by internal combustion, diesel, hydraulic, air or electric motors.
- Install pump.
  - Identify components required (pumps, water heaters, suction/discharge hoses, pressure relief valve, signer valves, check valves).
  - Place equipment at predetermined location(s).
  - Lock out, tag out (LOTO).
  - Secure pump and discharge lines.
  - Screen intake.
  - Verify discharge.
- Monitor pump operation.
  - Control volume, temperature, pressure, minimal vibration, direction of flow from discharge lines.
  - Ensure no excessive leaking of gland water.
  - Perform routine checks.
  - Troubleshoot pumping system.
  - Clear blockages.
  - Identify flow/head requirements and materials (i.e., slurry, reagent).
  - De-energize lines.
- Switch pumps.
  - Switch to stand-by pump.
  - Open and close valves slowly and accurately.
  - Do not over tighten.

# MINERALS PROCESSING OPERATOR

## Area of Competency 14: Use Hand and Power Tools

MINING INDUSTRY
HUMAN RESOURCES COUNCIL

# TASK 14.1
# DEMONSTRATE HAND AND POWER TOOL KNOWLEDGE

## SUB-TASKS

1. Select appropriate PPE.
2. Trained in proper use and application of hand and power tools.
3. Inspect tool for defects/damages.
4. Maintain tools.
5. Store tools.

## REFERENCE/EXAMPLES OF ABILITIES AND KNOWLEDGE

- Train in proper use and application of hand and power tools.
  - Includes wrenches (socket, adjustable, pipe, box-end, etc.), impact tools, electric tools, chainsaws, handsaws, hammers, screwdrivers, hose repair equipment, shovel.
  - Identify capabilities and limitations of tool.
  - Select appropriate type, size, shape and capacity of hand tools for type of task to be completed, type of material to be used, necessary force to be applied, most efficient usage.
  - Tether tools when working at heights.
  - Assemble and adjust hand tools according to manufacturer's recommendations.
  - Follow procedures for start-up, operation, shutdown, disconnect and use/replacement of attachments.
  - Position tool properly.
  - Use safety features.
- Inspect tool for defects.
  - Identify any defective, broken or damaged tools and attachments.
  - Assess severity of defect/damage.
  - Do not use defective tools.
  - Do not remove or modify safety devices.
  - Remove and/or lock out and tag any defective tools and attachments.
  - Report defect/damage to appropriate personnel.
- Maintain tools.
  - Clean and inspect tool before returning to storage.
  - Ensure tool is unplugged when replacing worn or dull drill bits, saw blades.
  - Ensure battery maintenance.
- Store tools.
  - Store in appropriate designated place.

# TASK 14.2
# USE POWER, CORDLESS, PNEUMATIC, POWDER-ACTUATED AND HYDRAULIC POWERED TOOLS

## SUB-TASKS

1. Demonstrate tool knowledge.
2. Select appropriate tool.
3. Select appropriate PPE.
4. Use tool.

## REFERENCE/EXAMPLES OF ABILITIES AND KNOWLEDGE

- Demonstrate tool knowledge.
  - Ensure trained in proper use and application of tool.
  - Use proper extension cords, pneumatic hoses and secure them in safe location.
  - Safety practices when using hydraulic.
  - Inspect extension cords before using.
  - Inspect batteries and battery chargers.
  - Use ground fault protector including draining air and waterlines before disconnecting.
  - Ensure proper PPE.
  - Place hoses and lubricators properly to avoid tripping and other hazards.
  - Connect tools to air lines following procedures.
  - Follow proper pneumatic or hydraulic tool shut-down procedures.
  - Ensure batteries are replaced on the chargers.
- Select appropriate tool.
  - Includes air grinder, air lights, generators, chainsaws, hydraulic tools (jacks, air tugger, winch).
  - Clean tools according to manufacturer's instructions.

# TASK 14.6
# OPERATE MOBILE GENERATORS

## SUB-TASKS

1. Demonstrate equipment knowledge.
2. Operate generator under no load conditions.
3. Operate generator under load conditions.

## REFERENCE/EXAMPLES OF ABILITIES AND KNOWLEDGE

- Demonstrate hand and power tool knowledge.
  - Use appropriate generator (e.g., diesel, gas, air, battery).
  - Set up equipment, ensuring it is secure and on a flat, level base.
  - Conduct pre-op inspection, if applicable.
  - Follow proper mine ventilation procedures.
  - Ground generator.

# MINERALS PROCESSING OPERATOR

## Area of Competency 21: Conduct Lifting Operations

MINING INDUSTRY
HUMAN RESOURCES COUNCIL

## THE FOLLOWING PRINCIPLES APPLY TO ALL TASKS UNDER THIS AREA OF COMPETENCY

✓ Adhere to company policies and procedures.

# TASK 21.1 PLAN LIFT

### ✓ SUB-TASKS

1. Describe rigging, slinging and lifting equipment.
2. Demonstrate equipment knowledge.
3. Obtain authorization to conduct lift.
4. Select and use proper rigging/lifting equipment.
5. Trained in appropriate lift mechanisms and rigging programs.

### ✓ REFERENCE/EXAMPLES OF ABILITIES AND KNOWLEDGE

- Describe rigging and lifting equipment.
  - Includes non-mechanized and mechanized lifting equipment.
  - May include hooks (with safety latches), slings or chains (specific to lifting), anchor (attached to an existing or temporary beam), hoisting plugs, weight indication devices.
  - Power-operated devices may have over-wind protection.
  - Chain blocks include chains and gears (enclosed in a metal case).
  - Come-a-long includes a ratchet lever.
- Obtain authorization to conduct lift.
  - Establish daily logbook for overhead cranes.
- Select and use proper rigging/lifting equipment.
  - Follow engineered lifting plan.
  - Determine weight and center of gravity.
  - Ensure proper use of PPE.
  - Ensure clear path for load travel.
  - Store slinging equipment in designated/approved area.
  - Inspect equipment for defects.
- Trained in appropriate lift mechanisms and rigging programs.
  - Knowledge and understanding of rescue plan.

# TASK 21.2 SET UP LIFT

### ✓ SUB-TASKS

1. Select lifting equipment.
2. Set up lifting equipment.
3. Prepare workplace for lift.

### ✓ REFERENCE/EXAMPLES OF ABILITIES AND KNOWLEDGE

- Select lifting equipment.
  - Use only certified rated rigging equipment.
  - Match capacity of lifting equipment to load.
  - Determine and inspect attachments to be used such as hooks, chains or slings (wire, rope, nylon).
- Set up lifting equipment.
- Secure area using guards (banners, barricades).
- Ensure devices are securely anchored.
- Activate all necessary warning devices.
- Prepare workplace for lift.
  - Activate all necessary warning devices.

# TASK 21.3
# RIG AND SECURE LOAD

## SUB-TASKS

1. Rig load.
2. Secure load.
3. Inspect load.

## REFERENCE/EXAMPLES OF ABILITIES AND KNOWLEDGE

- Rig load.
  - Ensure proper rigging training and qualifications.
  - Ensure proper footing.
  - Knowledge of Musculoskeletal Disorders injuries.
  - Attach selected rigging equipment.
  - Centre and balance load.
  - Use attachments to maintain balance.
  - Ensure load is free of all equipment (hoses, cables and other tools).
- Secure load.
  - Place shims, fillers and spacers to secure load.

# TASK 21.4
# TEST AND MAKE THE LIFT

## SUB-TASKS

1. Test lift.
2. Maintain line of sight to loader and spotter.
3. Move, place and secure load.

## REFERENCE/EXAMPLES OF ABILITIES AND KNOWLEDGE

- Test lift.
  - Conduct test lift as per site policies and procedures.
- Move, place and secure load.
  - Control load: lift load slowly, move load in one direction only, keep load as close to ground as possible, keep load clear from operating equipment.
  - Ensure area is clear before lowering load.
  - Release load.
  - Use spotter and proper hand signals according to site policies and procedure.
  - Do not handle load, have spotter steading the tagline.
  - Do not walk under load.

# TASK 21.5
# DISMANTLE AND STORE LIFTING EQUIPMENT

## SUB-TASKS

1. Remove lifting equipment.
2. Return workplace to normal condition.
3. Inspect, tag out, remove and replace damaged/defective lifting equipment.

## REFERENCE/EXAMPLES OF ABILITIES AND KNOWLEDGE

- Remove lifting equipment.
  - Remove hooks, slings and accessories.
  - Inspect equipment for defects and if unusable tag out and remove from service.
- Return workplace to normal condition.
  - Store slings according to manufacturer's specifications.
  - Ensure proper housekeeping.

# MINERALS PROCESSING OPERATOR

## Area of Competency 30: Operate Processing Equipment

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HUMAN RESOURCES COUNCIL

## THE FOLLOWING PRINCIPLES APPLY TO ALL TASKS UNDER THIS AREA OF COMPETENCY

- ✓ Adhere to Area of Competency 6 – Energy Sources.
- ✓ Adhere to Area of Competency 10 – Equipment Knowledge.
- ✓ Ensure proper guards are in place.

# TASK 30.5
# OPERATE CRUSHER

### ✓ SUB-TASKS

1. Demonstrate equipment knowledge.
2. Operate grizzly.
3. Clear blockages.

### ✓ REFERENCE/EXAMPLES OF ABILITIES AND KNOWLEDGE

- Demonstrate equipment knowledge.
  - Follow start-up procedures, (do pre-operational check, ensure all auxiliary equipment is operational, set gap (as applicable)).
  - Observe special precautions and procedures when bridging occurs (stored energy).
  - Conduct operation checks (clear screens, remove tramp steel).
- Operate crusher.
  - Conduct operational checks (e.g., temperature, water flow, oil temperature).
  - Operate according to standard operating procedures.
  - Ongoing housekeeping.
  - Identify and address spillage.
- Clear blockages.
  - Anticipate unexpected movement of crusher and/or feed (resulting from stored/potential energy).

# TASK 30.6
# MAINTAIN ORE INVENTORIES

### ✓ SUB-TASK

1. Monitor bins and stockpile levels.

### ✓ REFERENCE/EXAMPLES OF ABILITIES AND KNOWLEDGE

- Monitor bins and stockpile levels.
  - Report levels to appropriate personnel (e.g., notify crusher, call for more feed).
  - Manage ore blend to maximize throughput.
  - Be aware of live piles.

# TASK 30.7
# OPERATE DUST COLLECTORS

## SUB-TASKS

1. Demonstrate equipment knowledge.
2. Follow standard operating procedures for control of dust.
3. Monitor equipment.

## REFERENCE/EXAMPLES OF ABILITIES AND KNOWLEDGE

- Demonstrate equipment knowledge.
  - Comply with company and environment policies and procedures
  - Maintain dust suppression systems.
- Follow standard operating procedures for control of dust.
  - Monitor dust levels through use of dust sensor information, visual check (cameras in specific locations), personal physical reactions.
  - Ensure proper use of specialized PPE.
  - Scrubbers, bag houses.
- Monitor equipment.
  - Ensure chute inspection hatches are closed during operations.
  - Ensure dust cyclone and exhaust fan are operating properly.

# TASK 30.8
# OPERATE FEEDERS

## SUB-TASKS

1. Demonstrate equipment knowledge.
2. Remove jams.

## REFERENCE/EXAMPLES OF ABILITIES AND KNOWLEDGE

- Demonstrate equipment knowledge.
  - Includes pan feeder, screw feeder, belt feeder, pneumatic feeder, tube feeder, vibratory feeder, tripper, roll feeder, rotary valve feeder, drag feeder, hydro stroke feeder.
  - Understand layout of feeder.
  - Ensure all components are in place and functional.
  - Ensure all related systems are activated in proper sequence.
  - Cross over/under feeder at designated areas only.
- Remove jams.
  - Remove jams according to site standard operating procedures.
  - Be aware of unsuspected movement from stored (potential) energy.

# TASK 30.9
# OPERATE SCREEN

## SUB-TASKS

1. Demonstrate equipment knowledge.
2. Clear blinding.
3. Replace screen media.

## REFERENCE/EXAMPLES OF ABILITIES AND KNOWLEDGE

- Demonstrate equipment knowledge.
  - Including but not limited to, vibrating screens, linear screens, wet screens, stationary screens etc.
- Conduct pre-operational checks.
  - Anticipate unexpected movement of screen, components or feed (resulting from stored/potential energy).
  - Ensure related systems are shut down or deactivated in proper sequence.
- Set up screen.
  - Ensure footing is secure (firm and even base).
  - Ensure adequate clearance for equipment and components.
  - Clear bindings.

# TASK 30.10
# OPERATE CONVEYOR

## SUB-TASKS

1. Demonstrate equipment knowledge.
2. Convey material.
3. Remove blockages.
4. Move conveyor and components.

## REFERENCE/EXAMPLES OF ABILITIES AND KNOWLEDGE

- Demonstrate equipment knowledge.
  - Includes but not limited to: belt conveyors, drag conveyors, pneumatic conveyors, screw conveyors, bucket elevators, high angle, radial stacker conveyors.
  - Conduct pre-operational checks.
  - Anticipate unexpected movement of conveyor components or feed (resulting from stored/potential energy).
  - Check rollers and idlers for proper operations.
  - Cross under conveyor at designated areas only.
  - Stay clear of moving pulleys.
  - Record defect and corrective action taken in logbook.
- Set up conveyor.
  - Ensure footing is secure (firm and even base)
  - Ensure adequate clearance for equipment operation
  - Ensure correct alignment and adjustment of conveyor belt.
  - Ensure guards are in proper place of moving parts.
  - Ensure tail pulley switch is in place if applicable.
  - Ensure emergency stop pull cords are in place.
- Convey material.
  - Ensure related systems are activated in proper sequence.
  - Monitor flow.
  - Ensure correct placement of material on belt to prevent spillage.
- Remove blockages.
  - Ensure conveyor is stopped, locked out, de-energized, tested for zero energy and tagged before removing blockages.
  - Remove manually or mechanically.
- Move conveyor and components.
  - Load conveyor on an incline.

# TASK 30.11 OPERATE MILLS

## SUB-TASKS

1. Demonstrate equipment knowledge.
2. Control densities.
3. Manage power draw.
4. Maintain mill media charge.

## REFERENCE/EXAMPLES OF ABILITIES AND KNOWLEDGE

- Demonstrate equipment knowledge.
  - Includes ball mill, pebble mill, autogenous mill/scrubber, semi-autogenous mill, rod mill, tower mill, ISA mill, SMD.
  - Identify name, function and location of mill's principal components (drive motor, motor cooling fan, drive shaft and bearings, clutch, pinion gear, feed chute, shell, liners, lifters and bolts, ring/bull gear, trunnion and trunnion bearings, trommel screen, lubrication system(s), grinding media, controls (main disconnect), interlocks, stop/start switches (remote/local), selector switch (remote/local), cooling system(s), sound boxes).
  - Use HMI control systems.
  - Working knowledge of ancillary equipment.
  - Knowledge of process flows and options.

# TASK 30.12 OPERATE SIZE CLASSIFIERS

## SUB-TASKS

1. Demonstrate equipment knowledge.
2. Control feed flow.
3. Control density.
4. Check grinds.

## REFERENCE/EXAMPLES OF ABILITIES AND KNOWLEDGE

- Demonstrate equipment knowledge.
  - Includes cyclone classifier, screw classifier, trommel screens.
- Control feed flow.
  - Remove and clean excess spillage and blockages.
  - Don't overload.
  - Control density.
  - By sampling, reading dials, vary speed of pump, add more or less water, add or remove cyclones.

# TASK 30.13 OPERATE SEPARATORS

## SUB-TASKS

1. Demonstrate equipment knowledge.
2. Check and monitor process parameters.

## REFERENCE/EXAMPLES OF ABILITIES AND KNOWLEDGE

- Demonstrate equipment knowledge.
  - Including but not limited to: dense media concentrators, gravity concentrators, intense leach reactors, cyclones.
- Check and monitor process parameters.
  - Maintain flows.

# TASK 30.14
# OPERATE FLOTATION EQUIPMENT

## SUB-TASKS

1. Demonstrate equipment knowledge.
2. Check and monitor process parameters.

## REFERENCE/EXAMPLES OF ABILITIES AND KNOWLEDGE

- Demonstrate equipment knowledge.
  - Includes flotation air, bank of cells, conditioner, collector, floatation column, cells (roughers, scavenger, cleaners), pumping system, in-line assay system.
  - Understand froth.
- Check and monitor process parameters.
  - Control quantity of reagents, percent solid, addition of air, level of froth/pulp, launder water, pump speed, pH level.
  - Ensure cells are at proper levels.
  - Unplug cells as required.

# TASK 30.15
# OPERATE FILTRATION SYSTEMS

## SUB-TASKS

1. Demonstrate equipment knowledge.
2. Control system.

## REFERENCE/EXAMPLES OF ABILITIES AND KNOWLEDGE

- Demonstrate equipment knowledge.
  - Includes stock tanks, pumping systems, sampling systems, drive systems, lubrication systems, hydraulic systems, pneumatic systems, vacuum systems, filter cloth, filter media, reagents.
- Control system.
  - Control moisture, filtrate, wash water, pump speed, pressure, density.
  - Monitor filter condition (thickness of filter cake).
  - Monitor boot levels and agitation.
  - Ensure vacuum system is operational.

# TASK 30.16
# OPERATE TANK/HEAP LEACHING EQUIPMENT

## SUB-TASKS

1. Demonstrate equipment knowledge.
2. Check and monitor process parameters.
3. Check condition of tanks.

## REFERENCE/EXAMPLES OF ABILITIES AND KNOWLEDGE

- Demonstrate equipment knowledge.
  - Atmospheric leach, pressurized leach.
  - Understand required temperature and pressure settings.
  - Understand reagent efficiency.
- Check and monitor process parameters.
  - Add reagents as required (cyanide, calcium, chlorine, hydrochloric acid, sulfuric acid).
  - Monitor particle size.

# TASK 30.17
# OPERATE PRESSURE OXIDATION EQUIPMENT

## SUB-TASKS

1. Demonstrate knowledge about how to operate the pressure oxidation vessel.
2. Conduct pre-operational and operational inspection of pressure vessel.
3. Introduce oxidizing agent and mineral.
4. Prepare leaching solution as needed.
5. Transfer batch to next stage of processing.
6. Transfer/ship product.

## REFERENCE/EXAMPLES OF ABILITIES AND KNOWLEDGE

- Conduct pre-operational and operational inspection of pressure vessel.
  - Inspect hatches, piping joints, valves, etc.
  - Check gauges and control systems.
  - Maintain the reaction in a controlled state.
  - Tag out and request maintenance when needed.
- Introduce oxidizing agent and mineral.
  - Check and maintain pH and strength of oxidizing agent.
  - Introduce required amount to pressure vessel.
  - Introduce oxidizer modifiers if required (e.g., chlorine, acids, etc.).
  - Bring to required Delta Temperature if required.
  - Monitor boiler operations.
  - Vent and neutralize excess gases (operate and maintain pH neutralizing scrubbers).
  - Introduce required amount of mineral to be processed.
  - Pressurize and heat batch to required temperature.
- Transfer batch to next stage of processing.
  - Operate cooling vessels.
  - Operate pumping systems.
  - Operate filtration/oxidizer recovery and recycling systems.
  - Operate drying systems.

# TASK 30.18
# HANDLE FINAL PRODUCT

## SUB-TASKS

1. Bring product to shipping state.
2. Store product in appropriate facility.

## REFERENCE/EXAMPLES OF ABILITIES AND KNOWLEDGE

- Bring product to shipping state.
  - Includes drying, packaging, loading out, sorting, sampling, implementing quality control methods.
- Store product in appropriate facility.
  - Includes hoppers, silos, vaults, sheds/bins, bags.

# TASK 30.19
# MOVE AND ASSEMBLE PIPES

## SUB-TASKS

1. Shut down system.
2. Uncouple pipe.
3. Reconnect system.

## REFERENCE/EXAMPLES OF ABILITIES AND KNOWLEDGE

- Shut down system.
  - Isolate system.
  - Drain and/or flush system.
  - Close all valves and cap lines.
- Uncouple pipe.
  - Replace with new pipe.
- Reconnect system.
  - Re-energize system.
  - Check for leaks.

# TASK 30.20
# INSPECT AND MAINTAIN HOSES

## SUB-TASKS

1. Describe hoses.
2. Use hoses.
3. Repair hoses.

## REFERENCE/EXAMPLES OF ABILITIES AND KNOWLEDGE

- Describe hoses.
  - Water hose: commonly used to supply drill with water or wash the headings or rock face, usually made of rubber, come in various sizes, usually 1 inch diameter.
  - Air hose: used for low/high air pressure applications, e.g., pneumatic tools, usually made of rubberized material.
- Use hoses.
  - Inspect hoses to ensure they are not damaged.
  - Turn on air or water slowly to detect any unnoticed damage.
  - Do not let hose become a tripping hazard.
  - Protect hoses from falling muck.
  - Air hoses: ensure clear of muck, debris or water before connecting to a piece of equipment, use whip check when attaching air hoses to diamond drills.
  - Water hoses: be aware of sudden surges of pressure in water hoses caused by air locks.
  - Use correct fitting for hoses (joiners, ends).
  - Use clamps to secure hose to fitting (select correct size, use correct number of clamps for size of hose, punch to ensure connection, be careful not to cut hose).
- Repair hoses.
  - Discard damaged hoses.

# TASK 30.21
# OPERATE REFINERY EQUIPMENT

## SUB-TASKS

1. Demonstrate equipment knowledge.
2. Run the table, day tanks and associated pumps.
3. Operate electrowinning.
4. Operate filter press.
5. Operate oven.
6. Operate furnace.

## REFERENCE/EXAMPLES OF ABILITIES AND KNOWLEDGE

- Demonstrate equipment knowledge.
  - Operate within metallurgical guidelines.
  - Equipment inspection.
  - Select appropriate PPE.
  - Identify process flow.
  - Identify equipment.
  - Operate shaking tables, pumps, valves, pneumatic controls, agitators, etc.
  - Operate rectifiers, ventilation systems, pressure washers.
  - Operate filters, replacing plates or filter media, pumps, compressed air.
  - Work with hot drying ovens.
  - Handle dry flux (reagents for melting), work with extreme hot equipment, operate the melting furnace, operate ventilation systems, handling molten metal/slag in dore moulds, drill samples from dore bars, log proper information in the logbook.

## TASK 30.22
## CONDUCT CYANIDE DESTRUCTION

### SUB-TASKS

1. Demonstrate equipment knowledge.
2. Monitor reagents.
3. Monitor equipment.
4. Sampling.

### REFERENCE/EXAMPLES OF ABILITIES AND KNOWLEDGE

- Demonstrate equipment knowledge.
  - Ability to identify tanks and equipment.
  - Ability to identify reagents and their purpose.
  - Control reagent addition.
- Knowledge of chemical compatibility.
  - Cyanide and low pH solutions.
  - Cyanide gas (HCN) formation.
  - Using of gas monitoring instruments.
- Sampling.
  - Understand lab test results and adjust the circuit, as needed.
  - Perform specific lab testing.

## TASK 30.23
## OPERATE ELUTIONS CIRCUIT

### SUB-TASKS

1. Demonstrate equipment knowledge.
2. Transfer carbon.
3. Control flow, temperature, pressure and reagents.
4. Monitor and maintain carbon inventory.

### REFERENCE/EXAMPLES OF ABILITIES AND KNOWLEDGE

- Demonstrate equipment knowledge.
  - Able to measure carbon and density.
  - Sample carbon and process solutions.
  - Configure tank.
- Transfer carbon.
  - Identify method of carbon transfer.

## TASK 30.24
## OPERATE SOLVENT EXTRACTION AND ELECTROWINNING CIRCUIT

### SUB-TASKS

1. Demonstrate equipment knowledge.
2. Demonstrate knowledge of control system.
3. Control flow, reagents and power draw.
4. Pull cathodes and wash them.
5. Wash cells.

### REFERENCE/EXAMPLES OF ABILITIES AND KNOWLEDGE

- Demonstrate equipment knowledge.
  - Inspect all equipment and auxiliaries.
  - Operate to set parameters.
  - Operate overhead crane.
  - Operate pressure washer.
- Control flow, reagents and power draw.
  - Knowledge of handling organic chemicals used and their purpose.
  - Knowledge of operating high-G centrifuge.
- Pull cathodes and wash them.
  - Cutting samples from the cathode plates.
  - Collect proper samples.

# TASK 30.25
# OPERATE E-FLUENT WATER TREATMENT PLANT

## SUB-TASKS

1. Demonstrate equipment knowledge.
2. Demonstrate knowledge of control system.
3. Demonstrate water treatment requirements.
4. Demonstrate safe use of specific reagents.

## REFERENCE/EXAMPLES OF ABILITIES AND KNOWLEDGE

- Demonstrate equipment knowledge.
  - Identify equipment, reagent tanks, reagent addition points, water tanks, multi-stage tanks, clarifiers, thickeners, disc filter, cartridge filters, Nano Filtration Membranes (if installed), Reverse Osmosis Membrane (if installed).
  - Identify proper PPE for specific reagents used.
  - Knowledge of proper sampling method.
  - Monitor water quality.
  - Monitor and adjust reagents accordingly.

# MINERALS PROCESSING OPERATOR

## Area of Competency 31: Handle Reagents

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HUMAN RESOURCES COUNCIL

# TASK 31.1
# USE CHEMICALS SAFELY

## SUB-TASKS

1. Identify chemicals used in specific mineral processes.
2. Handle reagents.
3. Mix reagents.

## REFERENCE/EXAMPLES OF ABILITIES AND KNOWLEDGE

- Identify chemicals used in site specific mineral processes.
  - Knowledge on SDS and ensure easily accessible.
- Handle reagents.
  - Maintain training for handling relevant chemicals.
  - Use specialized PPE, as required.
- Mix reagents.
  - Avoid sparks and open flames (use non-sparking tools) where necessary.
- Conduct appropriate mix concentration tests (SG, pH, colour).
  - Including but not limited to SG, pH, colour, etc.
  - Ensure no incompatibility of chemicals.
  - Ensure proper ventilation.

# TASK 31.2
# MONITOR REAGENT ADDITIONS

## SUB-TASKS

1. Set and measure addition rates.
2. Perform visual check of addition points.
3. Record additional rates and tank levels as required.

## REFERENCE/EXAMPLES OF ABILITIES AND KNOWLEDGE

- Set and manually measure addition rates.
  - Use appropriate measuring device.
  - Check flow.
  - Check for leaks.
- Report discrepancies to appropriate personnel.
- Understand controls system and perimeters.

# TASK 31.3
# MONITOR INVENTORY

## SUB-TASKS

1. Inspect levels of inventory.
2. Report amounts used.
3. Check balance of inventory.
4. Monitor holding and mix tank levels.

## REFERENCE/EXAMPLES OF ABILITIES AND KNOWLEDGE

- Inspect levels of inventory.
  - Conduct visual inspection.
  - Report any deficiencies in reagents.
- Check balance of inventory.
  - Count stock within the plant and replenish as needed.
- Monitor holding and mix tank levels.
  - Ensure batch is mixed to replenish holding tank.

# MINERALS PROCESSING OPERATOR

## Area of Competency 32: Operate Tailings Systems

MINING INDUSTRY
HUMAN RESOURCES COUNCIL

## TASK 32.1
## RECLAIM WATER

### SUB-TASKS
1. Pump water.
2. Send water to reclamation area (settling ponds/tanks).

### REFERENCE/EXAMPLES OF ABILITIES AND KNOWLEDGE
- Pump water.
  - Treat water for chemicals.
- Send water to reclamation area (settling ponds/tanks).
  - Sample water and monitor levels of ponds.
  - Inspect weirs and dam systems.

## TASK 32.2
## OPERATE TAILINGS MANAGEMENT FACILITIES

### SUB-TASKS
1. Treat and manage tailings.
2. Deposit tailings.

### REFERENCE/EXAMPLES OF ABILITIES AND KNOWLEDGE
- Treat tailings.
  - Follow standard operating procedures.
  - Enhanced knowledge of environmental responsibility, refer to area of competency 13.
  - Check the pH level.
  - Monitor integrity of system.
  - Inspect dam pumping and piping.
- Deposit tailings.
  - Send tailings to appropriate area (e.g., place sand upstream and downstream of the dam core).

## TASK 32.3
## PASTE BACKFILL/DRY STACK

### SUB-TASKS
1. Thicken tailings.
2. Dewater tailings.
3. Operate a paste pump.

### REFERENCE/EXAMPLES OF ABILITIES AND KNOWLEDGE
- Thicken tailings.
  - Understand and operate a tailings thickener.
  - Measure densities.
  - Understanding of rake torque and bed pressure.
- Dewater tailings (blend with cement optional).
  - Operate a filter press or disc filter.
  - Operate a hopper or twin-screw system.
- Operating a paste pump.
  - Understanding line pressure.
  - Knowledge of bulk heads underground.
  - Measuring slumps.
  - Cleaning and pigging paste line.