Hazard Analysis Form for Detector Development and Operations Draft

Back to Hazard Analysis Main Page Help

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Hazard Analysis Form

This form can be used by Fermilab Employees, Fermilab Supervisors, Fermilab Task Managers and Construction Coordinators, Services Coordinators and Fermilab Subcontractors. This is a dynamic document which may require modification as the project moves from start to finish and should be readily available at the site where the work is being performed.

Note: Not all sections of the first page are applicable to every job or task, complete what is necessary for your specific job or task.

Job Title: Work in the Minos underground cavern

92

Job Location: Minos Underground cavern

104

Contract/Work Order #:

Owner: James Kilmer
Form ID: 2304

Work Permit Association:

TO BE COMPLETED FOR WORK INVOLVING SUBCONTRACTORS

Subcontractor (if applicable)

Company:
Project Manager:
Phone: Page:
ESH Rep.:
Phone: Page:

Fermilab

Project Eng./C.M. FNAL ID:
Phone: Cell:
TM/CC/SC FNAL ID:
Phone: Page: Cell:
ESH Rep. FNAL ID:
Phone: Page: Cell:

AT LEAST TWO SIGNATURES ARE REQUIRED

Prepared: James Kilmer (01641N) kilmer@fnal.gov Date: Mar 19 2020

☐ Accept: () Date:

☐ Accepted As Noted: () Date:

Description of Work: This HA covers ALL work in the Minos underground cavern during the COVID-19 emergency including all electronic or mechanical work for the

Industrial Hazards

- ☐ Flammable Gas Areas
- ☐ Working within Magnetic Field areas
- ☐ Heat Stress /Cold Stress
- ☐ Structural Demolition
- ☐ Excavation
- ☐ Scaffold Erection
- ☐ Scaffold Use
- ☐ Ladder Use
- ☐ Steel Erection

Electrical Hazards

- ☐ Manipulative Energized Work
- ☐ Diagnostic Energized Work (inc. LOTO verification)
- ☐ Working within 25 feet of 345kV overhead utilities
- ☐ Working within 10 feet of overhead utilities

Environmental Hazards

- ☐ Potential impact to Storm Water
- ☐ Potential Release to Environment
- ☐ Air emissions (including equipment/generators)
- ☐ Waste generation (Hazardous, Radioactive, etc.)
- ☐ Discharge to sanitary sewer
- ☐ Use of refrigerants

Radiation Safety

- ☐ Posted Radiological Area (Radiation Area, HRA, Contamination, Airborne)
- ☐ Radioactive Material, Ionizing Radiation, Radiation Sources, RGDs, RAW systems, Exhaust Systems, Beamline Components - including targets & absorbers
- ☐ Area working in >= 100 mrem/hr
- ☐ Worker receiving >= 50 mrem for the job

General Hazards

- ☐ Traffic Control
- ☐ Working above others
- ☑ Biological Hazards

- [ ] Fall Protection - Fall Exposures >4 feet (>6 feet for construction)
- [ ] Heavy Equipment Operation (crane, boom lift, excavator)
- [ ] Critical Crane Lift
- [ ] Rotating Equipment
- [ ] High Pressure air/fluids
- [ ] Welding/Cutting/Brazing /Grinding
- [ ] Lead (Lead paint, moving bricks, cutting sheets, soldering)
- [ ] Chemical Use (cleaners, solvents, adhesives, etc.) (if checked attach or link SDS to the HA) Upload Files Add Hyperlinks
- [ ] Non ionizing radiation (lasers, RF, UV, magnets)
- [ ] Confined Space
- [ ] Ergonomics (overexertion, repetition, heavy lifting, awkward lifting, static posture)
- [ ] Silica (machining - concrete, asphalt, grout, mortar)
- [ ] Loud Noise (continuous, instantaneous)
- [ ] Asbestos (presumed or suspect building materials, e.g. tile, pipe insulation, roofing materials, etc.)
- [ ] Nanomaterial (1-100nm)
- [ ] Beryllium
- [ ] Potential Oxygen Deficiency - ODH 1 or ODH 2 Area
- [ ] Oil use and storage

Personal Protective Equipment: (Check all that are required for the job.)

- [ ] Safety glasses (marked Z87+, Z87-2+ for prescription)
- [ ] Hearing Projection
- [ ] 3.0 Brazing goggles
- [x] Face shield
- [x] Leather gloves
- [ ] Chemical resistant gloves (specify type): 256
- [x] Other required PPE (specify): nitrile gloves for delicate work N95 or equivalent face mask 194
- [ ] Chemical splash goggles
- [ ] Hard Hats
- [x] Impact Goggles
- [ ] Rubber apron
- [ ] Hot/Cold thermal protective gloves
- [ ] Respirators
- [x] Safety Footwear (specify): No open toed footwear, and steel toed safety shoes while any 167
- [ ] Fall protection equipment (specify): 256

Environmental Impacts (Required - check one):

- ( ) Yes, I have thought about potential the envionmental impacts (see Guidelines for Completing the HA below) of this job and will document such impacts and mitigation steps within this document.
- (•) Yes, I have thought about the environmental impacts of this job and no such credible impacts exist and therefore do not need to be written in this document.

Equipment required for the job: (List the tools needed to perform the job.)

Proper footwear and gloves

Work plan history information; (List any lessons learned incidents from this job, tips from previous jobs)

Improvement/Feedback: At the conclusion of the job, the Task Manager, Supervisor and / or Project Leader shall work with those involved to consider improvements for future work plans. If lessons have been learned to improve this or similar tasks, please update the Standard Operating Procedure or HA for future reference. If lesson learned has lab-wide implications please enter it into the Lessons Learned Database.

Check one:

○ Yes we have considered lessons learned and accepted feedback on this job and will communicate such information so that in future work plans may be improved.

◉ Yes we have considered lessons learned feedback and determined that future work plans do not need to be improved.

Utilizing the format below, identify hazards and environmental aspects, and their corresponding safety precautions/procedures to mitigate hazards. Use as many sheets as necessary.

HAZARD ANALYSIS

	Description	Safety Hazards / Potential Environmental Impacts	Precautions / Safety Procedures
1	Entering or leaving the cavern	Spread of the COVID-19 virus	Gloves should be worn to protect hands from contacting surfaces. Only one person at a time may ride the elevator. The first person down must wait in the elevator vestibule at the bottom until the second person arrives to maintain the two person rule. Face masks MUST be worn at all times while in the surface building or in the
2	Working in the cavern	Spread of COVID-19 virus	Maintain a safe working distance of 6 feet from any other individual AT ALL TIMES while underground. Where leather gloves are inappropriate for the work wear nitrile gloves. For work needing heavy work gloves, rubber faced work gloves may be worn or leather gloves over Nitrile gloves are also OK.
3	Working within 6 feet of another individual	Spread of COVID-19 virus	Wear a mask AND face shield or goggles and impervious gloves while working within 6 feet of any other individual to limit contact with any droplets that may have the virus. Face shields can be washed with soap and water after each use, and dried well.

4 ^			

+Add New Step

GUIDELINES FOR COMPLETING THE HAZARD ANALYSIS

Phase of Work	Safety Hazards / Potential Environment Impacts	Precautions / Procedures
Examining a specific job by breaking it down into a series of steps or tasks, will enable you to discover potential hazards employees may encounter. Each job or operation will consist of a set of steps or tasks. For example, the job might be to move a box from a conveyor in the receiving area to a shelf in the storage area. To determine where a step begins or ends, look for a change of activity, change in direction or movement. Picking up the box from the conveyor and placing it on a hand truck is one step. The next step might be to push the loaded hand truck to the storage area (a change in activity). Moving the boxes from the truck and placing them on the shelf is another step. The final step might be returning the hand truck to the receiving area. Be sure to list *all* steps needed to perform the job. Some steps may not be performed each time; an example could be checking the casters on the hand truck. However, if that step is generally part of the job it should be listed. Close observation and knowledge of the job is important. Examine each step carefully to find and identify hazards - the actions, conditions, and possibilities that could lead to an accident. Compiling an accurate and complete list of potential hazards will allow you to develop the recommended safe job procedures needed to prevent accidents.	A safety hazard is potential danger to a person or equipment. An environmental impact is a change to the environment. The purpose of the Job Safety Analysis is to identify ALL hazards - including those produced by the environment, those connected with the job procedure, and those with the potential to result in an environmental impact. To identify hazards, ask yourself these questions about each step: Is there a danger of the employee striking against, being struck by, or otherwise making injurious contact with an object? Can the employee be caught in, by, or between objects? Is there potential for slipping, tripping, or falling? Could the employee suffer strains from pushing, pulling, lifting, bending, or twisting? Is the work environment hazardous to safety and/or health (toxic gas, vapor, mist, fumes, dust, heat, or radiation)? Are there electrocution hazards? Will action require soil/erosion control? Will chemicals or petroleum products be used in an area where they could be released into the environment? Will action have the potential to affect storm water (drains, ponds, or streams in the vicinity)? Will action have the potential to affect the sanitary water system? Will action involve refrigerants? Will any regulated or recyclable waste be generated?	Using the first two columns as a guide, decide what actions or procedures are necessary to eliminate or minimize the hazards that could lead to an accident, injury or occupational illness. Consider the hierarchy of controls: 1. Elimination (physically remove the hazard) 2. Substitution (replace with something less hazardous) 3. Engineering controls (isolate the hazard) 4. Administrative controls (change the work) 5. PPE List the recommended safe operating procedures. Begin with an action word. Say exactly what needs to be done to correct the hazard, such as, " lift using your leg muscles." Avoid general statements such as, "be careful", "use caution", and "be alert". List the required or recommended personal protective equipment necessary to perform each step of the job. Give a recommended action or procedure for each hazard. Serious hazards should be corrected immediately. The JSA should then be changed to reflect the new conditions. Finally, review your input on all three columns for accuracy and completeness. Determine if the recommended actions or procedures have been put in place. Re-evaluate the job safety analysis as necessary.

Pre-job Brief/Walkdown Conducted By:

I have reviewed this hazard analysis and I understand the hazards and required precautionary action. I will follow the requirements of this hazard analysis or notify my supervisor or Fermilab contact if I am unable to do so.

Signed	Name	Date

+Add a person for signatures

Update/Save

Draft?

Update this hazard analysis information with the current information displayed here. If stored as a draft, messages will not be sent to those subscribed to get system update messages and its draft status will be visible on the list of HAs.

Save as new HA — Copy this hazard analysis to a new entry. The new entry will appear in the list under the department of the person doing the copy. After the copy, the entry can be viewed and updated.

Print — This will re-display this form in a format better for printing and bring up the print dialog. If changes have been made, save them first using the Save or Update button. More information on printing is available.
