

ANTELOPE VALLEY STATION SAFETY PROCEDURE

Procedure No. 30	Revision No. 1	Page 1 of 14
Affected Department(s): ALL	Originating Department: SAFETY	
	Final Approval: /s/ Chad Edwards	Date: October 24, 2014
Subject: HOT WORK		

I. PURPOSE AND SCOPE

- A. The purpose of this procedure is to establish control over work that requires the use of open flame, is spark-producing, or may provide an ignition source. Additionally, this procedure is meant to:
1. To ensure that flammable or combustible materials are absent, isolated, protected or removed from work sites requiring the use of tools or equipment that may provide an ignition source.
 2. To establish minimum standards for hot work.
 3. To minimize hot work in coal handling areas by pre-fabbing in shop areas and using mechanical fasteners and other alternative methods whenever practical.
- B. This procedure applies to Basin Electric employees and contractors performing hot work in high risk areas at Antelope Valley Station.
- C. This program does not apply to areas that are specifically designed and equipped for such operations such as designated welding areas and permanent area maintenance shops provided they are isolated, or at a sufficiently safe distance from flammables or combustibles.
- D. This procedure does not cover hot work operations in confined spaces. These requirements are covered in the Confined Space Entry procedure #146.

II. DEFINITIONS

- A. Hot Work Permit Designated Area is defined as an area where other than a minor fire might develop or where any of the following conditions exist. (See appendix A for a list of areas)
1. An area that has a high amount of flammable or combustible material adjacent to the hot work activity
 2. Flammable or combustible material is more than 35 feet away but is easily ignited by sparks.
 3. Wall or floor openings within a 35-foot radius expose combustible material in adjacent areas including concealed spaces in walls or floors.



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4. Combustible materials are adjacent to the opposite side of metal partitions, walls, ceilings, or roofs and are likely to be ignited by conduction or radiation.
 5. Areas where flammable gas (LEL) testing is required.
 6. Areas with an accumulation of combustible dusts that could develop an explosive atmosphere.
- B. Auxiliary heating device – approved supplemental heating equipment such as fire barrels, kerosene, propane or electrical heaters.
- C. Hot Work – any work involving electric or gas welding, cutting, brazing, burning or similar flame or spark producing operations and open flames. This includes but is not limited to acetylene torches, arc welding equipment, portable grinders, propane torches, and powder actuated guns.
- D. Hot Work Permit – a system used to authorize hot work, listing as a minimum the fire precautions listed in this procedure, nature and location of work to be performed, date and time work will commence, and space for signatures.
- E. Fire Watch – a BEPC or contractor employee who observes hot work activities for the purpose of preventing, detecting, and suppressing fires. The fire watch must be trained to use manual firefighting equipment and have the ability to summon emergency assistance if needed.
- F. Shift Supervisor – A BEPC employee designated to authorize hot work activities by the operating authority, Operations Manager.
- G. Safe Designated Area – an area where significant flammable or combustibles are not present and hot work can proceed without the need for an authorized hot work permit. Welding shops and other permanent area maintenance shops fall into this category.

III. RESPONSIBILITIES

- A. Fire Watch
1. Shall ensure that safe conditions are maintained during hot work operations.
 2. The fire watch shall have the authority to stop the hot work operations if unsafe conditions develop.



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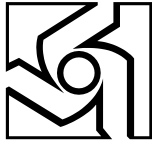
3. The fire watch shall have fire extinguishing equipment readily available and shall be knowledgeable in its use. The fire watch shall attempt to extinguish fires only when the fires are within the capacity of the equipment available. If the fire watch determines that the fire is not within the capacity of the equipment, the fire watch shall notify the main control room immediately.
 4. Notifies the main control room if a fire is detected and uses appropriate firefighting equipment to suppress any detected fires within their capability.
 5. Remains in the hot work area during the entire period of hot work activities and for thirty minutes thereafter.
 6. The fire watch shall be permitted to perform additional tasks, but those tasks shall not distract him from fire watch responsibilities.
- B. Contractors
1. Contractors shall provide trained personnel knowledgeable of this procedure to serve as fire watch for their hot work activities.
 2. Contractors shall not initiate any hot work activities until a permit is received from their assigned planner with authorization to proceed (as evidenced by signatures of the BEPC operating authority, shift supervisor or designee).
- C. Maintenance Supervisors/Leads/Planners
1. The Supervisor/Lead of the individual performing the work and Planners supervising contractors shall assure that those persons are knowledgeable on the hot work permit system, the proper use of tools and equipment, and the proper use of personal protective equipment.
 2. The supervisor/lead/planner shall periodically inspect hot work activities to ensure compliance with the procedure.
 3. The contractor planner shall perform atmospheric monitoring for contractors as required and note appropriate levels on the HOT WORK PERMIT.



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- D. AVS Employees performing hot work are responsible for following and using the methods in this procedure.
1. Informing the shift supervisor or designee of planned work activities within designated areas requiring a hot work permit.
 2. Affixes the hot work permit to a visible place in the immediate work area.
 3. Conducts the hot work operations within the parameters and time limit set by the permit.
 4. Stops hot work operations if any new hazards are introduced to the area
 5. Employees are responsible for ensuring that their tools and equipment are in satisfactory condition and good repair, and the proper use of all personal protective equipment.
 6. Employees are responsible for protecting nearby personnel and passersby against heat, sparks, etc when working in occupied areas.
 7. Signs the Hot Work Permit and ensures the Hot Work Permit is returned to the shift supervisor or designee after the 30 minute inspection.
- E. Shift Supervisor or designee – A BEPC employee who is designated to authorize hot work activities by the operating authority, Operations Manager is responsible for the following
1. Has overall responsibility for ensuring that the hot work permit procedure is followed in designated areas.
 2. Reviews the list of hot work precautions and any additional precautions with individuals requesting a hot work permit.
 3. Signs and issues the hot work permit when assured that all necessary hot work precautions have been taken.
- F. The Safety Coordinator shall be responsible for conducting periodic reviews of work activities to ensure Hot Work Permits are being completed prior to the start of work as well as:
1. The Hot Work Permits is posted in the work area and plainly visible during work.



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2. A qualified fire watch is designated and in the immediate area until hot work is completed.
3. That all elements identified on the permit are completed as required.

IV. PROCEDURE/GENERAL REQUIREMENTS

- A. Hot work should not be performed in high risk areas if the work can be avoided or performed in a safer manner. When possible, materials to be welded, cut, or heated shall be moved to a safe location, such as a shop, or remote protected area.
- B. Prohibited conditions
 1. A hot work permit will not be issued if ANY of the following conditions exist.
 - a) Area fire protection/detection system is impaired.
 - b) Appropriate firefighting equipment is not readily available.
 - c) Flammable or combustible materials are within 35 feet and cannot be moved or protected.
 - d) Floor or other openings cannot be covered.
 - e) Cutting or welding on pipes or other metals could conduct enough heat to ignite nearby combustible materials.
 - f) Any condition that could result in undue hazards by performing the work.
- C. If hot work must be performed, a Hot Work Permit must be obtained before the hot work begins.
- D. Hot Work Permits will be issued from the Main Control Room for the majority of locations requiring a Hot Work Permit. The Scrubber Control Room will issue Hot Work Permits for areas under their jurisdiction.
- E. The operating authority, the shift supervisor or his designee will be responsible for issuing hot work permits.



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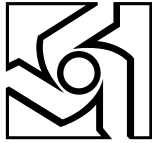
1. When a hot work permit is required, the shift supervisor or his designee and the principal employee, who is assigned by the maintenance supervisor or lead will:
 - a) Review the work to be done, including tools, equipment and materials to be used and the safe work practices to be followed.
 - b) Identify areas to be cleaned, isolated, protected and/or determine all flammable and combustible materials to be removed from the area.
 - c) Identify areas such as floors, walls or roofs of combustible materials that must be wetted down or covered with wet sand or fire resistant blankets.
 - d) Determine if combustible materials are present and whether materials must be relocated at least 35 feet from the hot work site.
 - e) Determine if relocation is impractical and whether combustibles shall be protected with fire resistant covers or shielded with metal guards.
 - f) Determine if atmospheric monitoring of the area is required
 - 1) In the case of arc welding or any gas cutting, grinding, or other spark production activity, an area extending 35 feet in radius from the job and all levels below the work must be reviewed for the possibility of flammable or combustible liquids, gases, or dusts.
 - 2) Areas where atmospheric monitoring may be required include:
 - (a) Storage tanks or piping containing flammable or combustible liquid.
 - (b) Boiler within 35 ft. of natural gas line and within 50 ft. if above gas line.
 - (c) Chemical storage areas such as bulk acid or ammonia tanks, chemical containers, and drums.
 - (d) Battery charging/storage areas or rooms
 - (e) Sewer drains, tank vents, manholes, sumps, or drainage.



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- g) Continuous atmospheric monitoring of the job site may be necessary in locations where hazardous vapors may accumulate. This requirement must be indicated on the Hot Work Permit when implemented. If significant changes in flammable gas monitoring are seen then the maintenance employee must notify the shift supervisor or designee immediately.
 - h) Initial gas tests must be performed prior to the first arc, spark or ignition source being created in locations indicated on the permit.
 - i) Discussion of the planned work should ensure that sparks and molten slag from welding and/or grinding are confined to the work area and prevented from falling to floors below or entering wall or roof openings or other such areas. Barricading and signs may be required on floors or levels below the hot work site.
2. Following review of work scope, the shift supervisor or his designee shall:
- a) Identify and document on the Hot Work Permit the location where the hot work will be performed, what equipment will be used, and who will perform the hot work.
 - b) Document any special precautions and fire equipment requirements the maintenance/service crew must follow.
 - c) Document a crewmember whose sole assignment is fire watch and that additional fire extinguishers are provided by the crew.
 - d) Determine the need for any additional precautions which may include fire blankets for spark/heat containment and water hoses for fire suppression.
 - e) Sign and date and time the permit.
 - f) Remove the cover sheet on the completed Hot Work Permit and hang on the Alert Board to identify hot work in progress.
3. Hot work permits will cover the length of time that the original maintenance or service crew is on the job and will not exceed 24 hours.
- a) When jobs extend beyond two shifts or a 24 hour period, the relieving operating authority, shift supervisor, or designee will:



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- (1) Review the requirements on the Hot Work Permit written previously.
- (2) Inspect the area, equipment, or process.
- (3) Issue a New Hot Work Permit if all requirements are met.

F. Working Under a Hot Work Permit

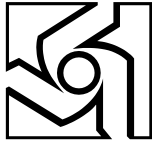
1. The Hot Work Permit form shall be conspicuously posted at the job site.
2. The maintenance/service crew working under a Hot Work Permit shall follow all precautions itemized on that permit. All required protective equipment shall be in place prior to starting the task.
3. Firefighting equipment and extinguishers located in the general area of the hot work shall not be utilized as fire watch equipment. The service crew must bring in additional fire extinguishers, designated for fire watch use, to the work site.
4. The assigned fire watch shall watch for fires in all exposed areas, attempt to extinguish any fires within the capacity of the equipment available **AFTER** notifying operations.
5. When all hot work has been completed and the area has been restored to its original classification.
 - a) The Fire Watch shall remain at the work site for a minimum of 30 minutes following completion of all hot work jobs.
 - b) During this time the Fire Watch shall inspect for smoldering materials or hot spots and wash down potential fire areas.
 - c) Following the 30 minutes, the Fire Watch will sign off on the hot work permit indicating the watch period has been completed and return the permit to the shift supervisor or designee.
 - d) The Shift Supervisor or designee will remove the cover sheet Hot Work Permit from the Alert Board located in the Control Room and staple to the completed Hot Work Permit.
 - e) The Shift Supervisor or designee will conduct a walk down of the hot work location indicated on the permit no later than 12 hours following completion of hot work and note this inspection on the bottom of the Hot Work Permit.



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6. The grounding clamp for an electric welding machine is an ignition source and should be clamped as close as feasibly possible to the material being welded.
7. Engine driven electrical arc welding equipment shall have a separate auxiliary ground wire which is connected from the equipment frame to a proper ground. This requirement only applies when the welder is being used for auxiliary 110V power.
8. Once work is started under a Hot Work Permit, the crew, if required to leave the area for any reason, must ensure that a Fire Watch remains for the appropriate time.
 - a) A fire watch shall be provided during breaks and lunch and for at least 30 minutes after the work is completed.
 - b) For BEPC work activities, personnel from operating departments may act as the fire watch during lunch or break and after the work is complete if their job duties allow them to keep check on the area after being notified by the employee who performs the hot work. The Shift supervisor must give prior permission by indicating this on the Hot Work Permit in the Special Requirements section of the permit.
9. A Hot Work Permit does not authorize smoking at the permitted site.
10. A Hot Work Permit may be canceled at any time where conditions have changed, making continuation of the work hazardous. All permits are automatically voided when a fire or emergency condition has been identified. In that event, the permit holder should cease operation and secure this equipment in a safe manner without delay.
11. If hot work is being conducted inside a confined space in plant areas where a hot work would be required then the confined space procedure shall take precedence. If hot work moves outside the confined space then a Hot Work Permit shall be required. The Hot Work Permit does not exempt personnel from following the proper confined space entry procedure.
12. At work areas, hazards other than hot work may be present such as noise, chemicals, and radiation. Any additional PPE donned for protection against these other hazards should also be appropriate for hot work activities, not easily ignited.



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G. Exceptions for requirements of Fire Watch

1. Use of an impact gun when working on or around flammable/combustible products will require a Hot Work Permit to be issued. The requirement for the 30 minute Fire Watch shall not be required for this type of activity.

H. Training

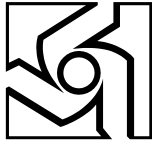
2. Affected employees shall be trained on this procedure on assignment and every two years thereafter.
3. Training shall meet the requirements of NFPA Standard 51B, ANSI/ASC Z49.1 and OSHA requirements found in 1910.252(a) and 1910 – Subpart L

B. Hot Work Permit Program Audit and Record Retention

1. Completed Hot work permits shall be sent to the Safety Coordinator for review and retained for one year.
2. The Safety Coordinator shall be responsible for conducting periodic reviews of work activities to ensure Hot Work Permits are being completed prior to the start of work as well as:
 - a) The hot work permit is posted in the work area and plainly visible during work.
 - b) A qualified fire watch is designated and in the immediate area until hot work is completed.
 - c) That all elements identified on the permit are completed as required.

V. SOURCE DOCUMENTS

- A. 29 CFR 1910 Subpart L – Fire Protection
- B. 29 CFR 1910.252 – General Welding Requirements
- C. 29 CFR 1910.253 – Oxygen Fuel Gas Welding and Cutting
- D. 29 CFR 1910.254 – Arc Welding and Cutting
- E. NFPA Standard 51B, Fire Prevention in Use of Cutting and Welding Processes
- F. ANSI/ASC Z49.1, Safety in Welding, Cutting, and Allied Processes



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G. FM Global Hot Work Management Data Sheet 10-3

I. ATTACHMENTS


- A. Appendix A – Hot Work Permit Designated Areas
- B. Appendix B – Hot Work Permit (Form AVS 1316)

Appendix A

Hot Work Permit Designated Areas:

1. Acid Storage Tank Berm and Surrounding Area, Unit 1 & Unit 2 & PWT
2. Acid Lines, Unit 1 & Unit 2
3. Boiler Unit 1 natural gas line (Major Outages will be purged and reclassified)
4. Natural Gas Yard
5. Ignition Oil Pumps & Piping
6. Hydrogen Seal Oil System and Surrounding Area
7. Coal System to include:
 - a. Live Coal Storage
 - b. All conveyer galleries
 - c. Tripper areas
 - d. Feeder areas
 - e. Transfer Buildings
 - f. Coal Bunkers
8. Vehicle Fuel Storage Area
9. Ignition Oil Storage Area
10. Oil and Paint Storage Areas
11. Lube & Oil Storage Area
12. Warehouse
13. Office/Administration Building
14. Base of Unit 2 Stack – FRP liner
15. All roofs
16. Transformers
17. Cable spreading & cable tray areas
18. Battery charging areas / battery rooms

Appendix B

 <div style="display: inline-block; vertical-align: middle; margin-left: 10px;"> <p style="margin: 0;">Antelope Valley Station</p> <p style="margin: 0; font-size: 1.2em; font-weight: bold;">HOT WORK PERMIT</p> <p style="margin: 0; font-size: 0.8em;">SEEK AN ALTERNATIVE/SAFER METHOD IF POSSIBLE</p> <p style="margin: 0; font-size: 0.8em;">THIS PERMIT IS GOOD FOR ONE 24 HOUR PERIOD</p> <p style="margin: 0; font-size: 0.8em; font-weight: bold;">HOT WORK PERFORMED WITHIN A CONFINED SPACE WILL FOLLOW THE CONFINED SPACE PROCEDURE AND FORM</p> </div>		
	Permit Number	
	Permit Expires	
	Date:	Time:
	Permit Issued by:	
	Date:	
Hot Work Location (Be Specific):		
HOT WORK PERFORMED BY: <input type="checkbox"/> BEPC Employee <input type="checkbox"/> Contractor		
Equipment To Be Used: (electric drills, welder, cutting torch, etc.)		
Special Precautions/Instructions:		
I verify the above location has been examined, precautions taken to prevent a fire, and permission is authorized for this work to proceed.		
Shift Supervisor or Designee:		Date: _____ Time: _____
Principal Employee: <small>(Maintenance employee performing hot work)</small>		Time: _____
FIRE WATCH RESPONSIBILITIES		
<ol style="list-style-type: none"> 1. A Fire Watch fire extinguisher must be brought to the work site by the service crew. 2. The Fire Watch shall have fire extinguishing equipment readily available and watch for fires in all exposed areas, try to extinguish them only when within the capacity of the equipment available, and notify area shift supervisor. The Fire Watch shall remain at the work site for a minimum of 1/2 hour following the completion of the hot work. The Fire Watch should use this time to inspect the area for smoldering material or "hot spots" and wash down potential fire areas. 3. The Fire Watch/Service Crew shall contain sparks created by welding, cutting or grinding to the immediate area of the work. Fire retardant shields or fire blankets must be placed to minimize the possibility of slag or sparks traveling outside the immediate work area. 4. The shift supervisor must be notified if LEL readings exceed 10%. 5. Flammable and combustible material and wall openings within 35 feet of the hot work removed or protected with appropriate shields. 6. NOTIFY THE MAIN CONTROL ROOM OF ALL FIRES. 7. Restore area to original classification. (Remove all power tools, electrical cords, GFCI units, etc.) 		
Employee Assigned Fire Watch:		
Date:	Time:	1/2 Hour Check Completed:
Date:	Time:	Operations Final Check Completed:



HOT WORK PERMIT REQUIREMENTS

This Hot Work Permit is required for any operation involving open flame or producing heat and/or sparks. This work includes but is not limited to: welding, brazing, flame cutting, grinding, soldering, thawing pipe, torch-applied roofing, chemical welding, use of powder actuated guns.

Please verify the following:

- Available sprinkler, fire protection systems, hose stations and extinguishers are in service and operable.
- Maintenance employee ensures that hot work equipment is in good working condition in accordance with mfg specifications.
- Special permission obtained from Engineering to conduct work on metal vessels or piping lined with rubber or plastic.

Requirements for materials within 35ft of hot work activities:

- Flammable liquid, dust, lint, and oily deposits removed
- Flammable atmosphere in area eliminated (See monitoring requirements below)
- Floors swept clean and trash removed
- Combustible floors wet down or covered with fire-resistant/noncombustible materials or equivalent
- Personnel protected from electrical shock when floors are wet
- Other combustible storage material removed or covered with approved materials (pads, blankets, or curtains), metal shields, or noncombustible materials.
- All wall and floor openings covered
- Ducts and conveyors that might carry sparks to distant combustible material covered, or shut down

Requirements for hot work on walls, ceilings, or roofs

- Construction is noncombustible and without combustible coverings or insulation.
- Combustible material on other side of walls, ceiling, or roofs is moved away

Requirements for hot work fire watch and additional monitoring

- Fire Watch is provided during and for a minimum of 30 minutes after hot work, including any break/lunch activity
- Fire Watch is provided with suitable extinguishers and where practical, a charged small hose line
- Principal employee ensures that fire watch is trained in use of equipment and in emergency notification
- Additional Fire Watch is necessary above or below work due to falling sparks/slag:

Special requirements:

Requirements for atmospheric monitoring:

- Monitor nearby flammable tank – vents or hydrocarbon tank or drum storage
- Chemicals stored nearby – Sulfuric acid tanks or lines nearby
- Nearby trenches and drains – may contain residual flammable liquids

Atmospheric Testing Recording if required:

Monitoring Conducted by: _____

Gas Testing Results	Time	Time	Time	Time	Time	Time
02% – 19.5 – 23.5%						
LEL%						
Other						
Other						