



Safety Alert: Welding and Other Hot Work Procedures in Shipyard Employment



Reducing the potential of fire hazards from hot work (grinding, welding, burning, riveting, or other fire- or spark-producing operations) is very important in shipyard employment. The Occupational Safety and Health Administration (OSHA) has safety standards that establish minimum performance requirements for welding and hot work in shipyard employment. (See 29 CFR 1915, Subparts B, D and P.)

Shipyard employers and employees must be fully aware of the variety of workplace hazards and dangers posed by the generation of sparks, molten metal, toxic atmospheres, heat energy and light radiation from hot work. Fires and explosions associated with improperly controlled hot work are well documented. Therefore, hot work is only allowed in areas proven to be free of fire hazards, or where fire hazards have been recognized and are controlled by physical isolation, fire watches, or other positive means. Employers must maintain hazard-free conditions in the space while hot work is being performed. **Controlling all fire hazards found in shipyard employment is an essential step towards protecting workers from injury and possible fatality as well as minimizing the potential for property damage, business interruption, legal liability, and costly operating expenses.**

Fast Fact:
Approximately 25 percent of fatalities in shipyards result from fires and explosions caused by hot work.
Bureau of Labor Statistics (BLS) – 2007

Shipyard Employers and Employees Must Ensure the Following:

Proper evaluation and preparation of the work area....

- Review the Marine Chemist Certificate and/or Shipyard Competent Person Inspection Record. If Hot Work Permits are utilized, review them as well.
- Ensure adequate access/egress, illumination and ventilation, keeping access/egress paths clear of ventilation equipment.
- Perform hot work in areas free of fire hazards, or where fire hazards have been controlled by physical isolation, fire watches, or other positive means. All flammables and combustibles, such as flammable liquids, rags and trash, within 35 feet must be removed or protected.
- Ensure that adjacent spaces have been inspected, tested and meet requirements for hot work. Ensure that the opposite side of walls, partitions or bulkhead depths where hot work is to take place are evaluated.

Proper work set-up....

- Ensure that welding and burning equipment is properly grounded, inspected and installed and that gas torches, gauges and hoses are tested for leaks. Torches should have flash back arrestors.
- Do not take oxygen and fuel gas cylinders into confined spaces.
- Consider potential exposures to particulate and gaseous emissions from base metals and surface coatings.
- Ensure that suitable fire extinguishers are at the work area and that fire watches are present in all areas where needed.
- Ensure that the hot work areas, including any vertical penetrations, are free of flammable and combustible materials.
- Ensure that ventilation is adequate to maintain a safe atmosphere during hot work.
- Post signs that prohibit employees from transporting flammable or combustible materials to or through the area whenever necessary. For example, signs such as “No flammable solvents allowed in this area.” or other signage may be used to inform other personnel of the potential hazards.

During the job....

- Ensure that additional hazards are not introduced into the work area. Employees performing hot work and fire watches must continue to monitor their work areas as the hot work operation progresses.
- Maintain proper housekeeping. Keep the area free from unprotected flammables and combustibles.
- Ensure that employees performing hot work, or other affected personnel, wear fire-resistant clothing and other appropriate personal protective equipment (PPE).

- Minimize worker exposure to metal fumes by utilizing proper ventilation controls and appropriate respiratory protective equipment.
- Make frequent checks of employees who are working alone in confined or other isolated spaces. Where possible, avoid assigning only one employee.

After the job, or during extended breaks....

- Remove torches and hoses from confined spaces. Never leave them unattended during breaks.
- Remove electrodes from electrode holder when not in use.
- Shut down or disconnect gas lines (oxygen and other flammable gases) at the source at the end of each shift. Remove the discharge end of each hose from confined or enclosed spaces that are no longer occupied.
- Monitor the area after the conclusion of hot work to ensure that no uncontrolled fire results from residual heat or molten metal. Monitoring for 30 minutes is required for most hot work operations, although longer or shorter periods may be necessary depending on the nature of the work.

Sample Solutions to Reduce Potential Fire Hazards Resulting From Hot Work Include:

- Conduct a hazard analysis to evaluate the specific work tasks, hazards and necessary control measures for all hot work. Wherever practical, use engineering and/or administrative controls.
- Use appropriate PPE for the welder, burner, and other exposed employees for all hot work not adequately controlled by engineering or administrative controls.
- Train workers to identify and report potential unsafe working conditions related to any hot work.
- Train workers on the hot work permit program.
- Post warning signs, as appropriate.
- Keep access to the space clear, and, if possible, provide more than one access/egress route.
- Employees performing hot work in a confined space should have a trained attendant in constant sight and the ability to communicate any emergency outside the confined space.
- Inspect welding and cutting equipment before use (e.g., for arc or gas welding/cutting).
- Depressurize oxygen and fuel gas cylinder lines when not in use.
- Do not take oxygen and fuel gas cylinders into confined spaces.



Ventilation



Testing



PPE



Fire Watch

Discussion Leader Talking Points

What this Safety Alert Covers:

This Safety Alert identifies hot work-related hazards in shipyard employment and provides possible solutions for workers and employers to reduce injuries and fatalities in the maritime industry.

Discussion Leader Duties:

Distribute Safety Alert to shipyard employees in a safe and secure work zone and highlight and demonstrate key safety points, such as the need for inspection and certification of hot work areas.

Discussion Notes:

- Emphasize the importance of working safe and staying alert while conducting welding and hot work procedures in shipyard employment. (e.g., PPE use)
- Note that, according to BLS in 2007, up to 25 percent of fatalities in shipyards result from fires and explosions caused by hot work.

Through the OSHA Alliance Program, this Safety Alert was developed as a product of the Alliances OSHA has signed with the [American Industrial Hygiene Association](#), the [American Society of Safety Engineers](#), the [American Shipbuilding Association](#), the [Shipbuilders Council of America](#), and [National Shipbuilding Research Program](#). It is for informational purposes only and does not necessarily reflect the official views of OSHA or the U.S. Department of Labor.