

SAFETY ALERT



Safety Alert No. 453

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Fires During Decommissioning Cause Injuries

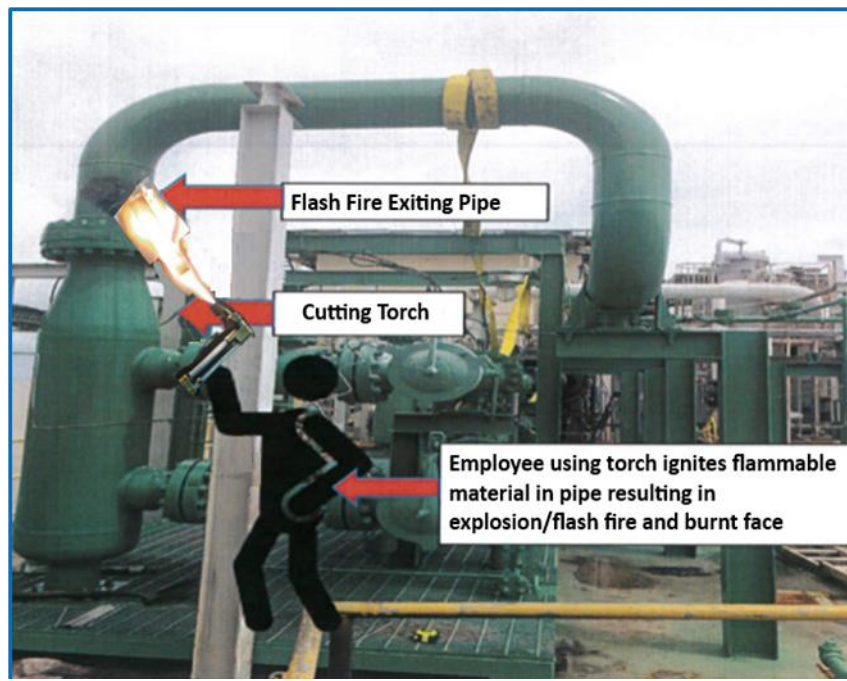


Figure 1. Contractor employee conducting hot work

Recently, a contractor was injured by a severe flash fire while performing “hot work”¹ on a pipeline skid during decommissioning activities. While cutting a section of 12-inch pipe using a five-foot cutting torch, a flash fire struck the contractor on the right side of his face. Fire watch personnel quickly extinguished the fire, and the contractor was immediately transported to shore to treat his burns.

Six months before this incident, the pipe was flushed, filled with seawater, and inspected by opening several needle valves. Clear salt water was discharged before the hot work activity commenced. However, releasing the salt water did not eliminate the trapped hydrocarbons from the pipe. The first cut was made on the lower end of the pipe without incident, suggesting that

¹ **Hot work** includes all work operations which make use of or create sources of ignition. Examples of sources of ignition include welding, hot tapping of pipes and tanks, use of open flame(s), use of cutting torches and grinding, electric heat guns, sandblasting, electrical hand tools, megger testing, soldering, flash cameras, nail guns and other non-explosion proof electrical equipment.

the line did not contain flammable vapors or liquids. When the contractor made the second cut on the upper end of the pipe, the gas ignited, causing the flash fire (see figure 1, above).

Contributing Factors included the following:

- Insufficient identification of hazards: The Job Safety Analysis (JSA)² covered the pipe-cutting operation and several other decommissioning activities. It addressed common hazards for this job but only briefly mentioned testing for flammable gas.
- Inadequate work planning: A detailed work procedure specific to cutting and removing piping was not developed, and the entire decommissioning project did not have a work plan.
- Deficient work-permitting system: There was no isolation verification (e.g., mechanical barrier) nor pre-job validation that the pipe contained no flammable gas; the pipe was presumed safe and ready for demolition.
- Insufficient policies and procedures: The hot work permit and JSA were unclear about gas detection requirements for the Lower Explosive Limit (LEL)³.

Therefore, BSEE recommends operators and contractors do the following:

- Always assume that all piping and vessels that previously contained flammable liquids or vapors may still contain these flammable gasses until it has been positively verified that there is no longer hazardous. Piping or vessels isolated from potential hydrocarbon sources using only a single barrier (e.g., a closed ball valve) should also be assumed to contain flammable hydrocarbons.
- Understand that gravity draining a vessel or pipe and opening them to the atmosphere may not be sufficient to remove all flammable liquids and vapors.
- Plan and conduct multi-disciplinary pre-job risk assessment.
- Develop job-specific procedures for:
 - Determining no hydrocarbons are present inside vessels or piping before cutting or breaking containment.⁴
 - Removing hydrocarbons if they are present.

² **Job Safety Analysis (JSA)** is a systematic procedure that breaks each job/task into key training sequences, identifies safety elements of each job/task step and coaches the employee on how to avoid potential safety hazards.

³ **Lower Explosive Limit (LEL)** is defined as the lowest concentration (by percentage) of a flammable gas or vapor in air that can produce a flash of fire in presence of an ignition source (arc, flame, heat, etc.). At concentrations lower than the LEL, the mixture is too “lean” to burn.

⁴ **Breaking Containment** is the act of breaking the integrity of process piping or equipment that may contain toxic or hazardous products. It is a planned loss of containment where there is potential for trapped pressure, or exposure to a toxic commodity or unknown material.

- Ensuring hydrocarbons will not enter piping or vessels during the job (e.g., closing and locking valves, installing pipe plugs, etc.).
- Develop and follow hot work policy/procedures⁵ for tasks involving special hazards (e.g., welding, flame cutting, removing barriers separating hydrocarbons from work areas (breaking containment), working at heights, working in confined spaces, etc.).
- Ensure all contractors use proper work permits and comply with requirements.
- Ensure all operations and contract personnel attend and participate in a pre-job JSA meeting to evaluate the specific job tasks, hazards, and necessary control measures for all hot work and ensure that the supervisors of all phases of the work know and understand the complete job scope.
- Ensure all operations and contract personnel involved in hot work attend and participate in a pre-job meeting/toolbox talk.⁶
 - All workers should review the JSA and should ensure that all hazards are acknowledged, and that policies/procedures, guidelines, contingencies, and communications are understood.
 - Verify that the gas detector's audible alarms (e.g., high %LEL reading) will be heard in the work area and the individuals know how to respond to the alarm.
- Consider splitting larger jobs with multiple tasks into organized respective units via JSAs and work permits.
- Ensure operator, contractor, and service company employees recognize and understand that inadequate communication is one of the most common causes of major accidents, especially when performing hot work.
- Always ensure that all individuals involved in the task wear proper Personal Protective Equipment (PPE).

– BSEE –

A **Safety Alert** is a tool used by BSEE to inform the offshore oil and gas industry of the circumstances surrounding a potential safety issue. It also contains recommendations that could assist avoiding potential incidents on the Outer Continental Shelf.

Category: Fire, Decommissioning

⁵ **Hot work policies/procedures** should establish the minimum safe working guidelines for the operation on cutting, welding, brazing, grinding, and soldering or any other similar operation.

⁶ **Toolbox talks** allow you and your workers to explore the risks of specific health and safety issues on your site and think about ways to deal with them. Toolbox talks should focus on safety topics and be held regularly for greatest impact. Toolbox Talks should focus on techniques that keep workers safe and reinforce that we should never sacrifice safety for increased productivity.