

**OCCUPATIONAL SAFETY  
AND HEALTH STANDARDS BOARD**

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**NOTICE OF PROPOSED MODIFICATIONS TO  
CALIFORNIA CODE OF REGULATIONS**

TITLE 8: Chapter 4 Subchapter 15, Article 5, Section 6777 of the Petroleum Safety Orders

**Hot Work Permits**

Pursuant to Government Code Section 11346.8(c), the Occupational Safety and Health Standards Board (Standards Board) gives notice of the opportunity to submit written comments on the above-named standard in which further modifications are being considered as a result of public comments and/or Board staff evaluation.

On April 15, 2004, the Standards Board held a Public Hearing to consider revisions to Title 8, California Code of Regulations, Section 6777 of the Petroleum Safety Orders. The Standards Board received oral and written comments on the proposed revisions. The standard has been further modified as a result of the comments and Board consideration.

A copy of the full text of the standard as originally proposed and a copy of the modified text clearly indicating the further modifications are attached for your information. In addition, a summary of all oral and written comments regarding the original proposal and staff responses are included.

Any written comments on these modifications must be received by 5:00 p.m. on July 6, 2004, at the Occupational Safety and Health Standards Board, 2520 Venture Oaks Way, Suite 350, Sacramento, California 95833. This standard will be scheduled for adoption at a future business meeting of the Standards Board.

The Standards Board's rulemaking files on the proposed action are open to public inspection Monday through Friday, from 8:00 a.m. to 4:30 p.m., at the Standards Board's office at 2520 Venture Oaks Way, Suite 350, Sacramento, California 95833.

Inquiries concerning the proposed changes may be directed to the Executive Officer, Keith Umemoto at (916) 274-5721.

OCCUPATIONAL SAFETY AND HEALTH  
STANDARDS BOARD

Date: June 14, 2004

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Keith Umemoto, Executive Officer

**REGULATIONS AS ORIGINALLY PROPOSED**

STANDARDS PRESENTATION  
TO  
CALIFORNIA OCCUPATIONAL SAFETY AND HEALTH STANDARDS BOARD

PROPOSED STATE STANDARD,  
TITLE 8, CHAPTER 4

Amend Section 6777 to read:

§ 6777. Hot Work Procedures and Permits.

~~(a) A written and numbered hot work permit issued and signed by the employer or his authorized agent shall be required before a source of ignition is used, except:~~ Scope and application. This section contains the required practices and procedures necessary to protect employees from fire and explosion hazards associated with hot work. This section applies to all hot work operations, except as provided in subsections (a)(1) and (a)(2).

(1) The following operations are exempt from the requirements of this section:

~~(1)(A) In connection with~~ The operation of fixed fired equipment.

~~(2)(B) Hot work required for operating purposes in laboratories and pilot plants required for operating purposes but.~~ This exemption does not apply to sources of ignition used in the maintenance of equipment.

~~(3)(C) Hot work W~~within designated, marked, or posted smoking areas within plants; or,

(D) Hot work in locations outside of plants where it would be safe to smoke.

~~(4) In locations where compliance with the order would result in the employer or his authorized agent issuing a hot work permit to himself, or, where the use of a source of ignition, in connection with work upon an oil or gas transmission pipe line remote from plants, does not affect the normal movement of the contents of the line, provided, however, that in either case the safety provisions of subsections (d), (e), (g) and (h) of this Section shall be complied with.~~

~~(5)(E) Hot work W~~within areas meeting all of the following conditions and when posted by the employer in a manner to define the boundaries:

~~(A)1. The area shall be so located from~~ With respect to operating process equipment, which is being operated to ensure the following the area is:

~~1.a. The area shall be f~~Free of flammable liquids, vapors and gases except as may be required for necessary activities when safely used, handled and stored; and

~~2.b. The area shall be e~~Effectively protected against the possibility of flammable oils, liquids, vapors or gases being liberated within the area from pipe lines, sewers, drains or ditches.

2. The area is posted in a manner to define the boundaries.

~~(B)3. The area has A a~~ warning system to alert employees to eliminate ignition sources in the event of an emergency.

(2) The following operations need only comply with the hot work safety procedures in subsections (b), (c), and (d):

(A) Operations where compliance with the order will result in the employer or authorized agent issuing a hot work permit to him/herself.

(B) Operations where the use of a source of ignition in connection with work on an oil or gas transmission pipeline remote from plants does not affect the normal movement of the contents of the pipeline.

~~(b) The employer shall provide the employee or post a copy of the permit prior to initiation of a source of ignition, except as specified in subsection (a) of this Section. The copy of the permit~~

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~~shall be kept on the job where the source of ignition is being used until the work is completed, the permit expires, or is revoked.~~ Hot work procedures. Before hot work is begun, the employer shall determine that a source of ignition can be safely used. In locations where flammable vapors may be present, precautions shall be taken to prevent ignition by eliminating or controlling sources of ignition. A source of ignition shall not be introduced into an area until all of the following required actions have been completed:

(1) Tests for the presence of flammable gases and vapors shall be made when the concentration of flammable gases or vapors may reasonably be expected to exceed 20 percent of the lower explosive limit (LEL). The tests shall confirm that the concentration of flammable gases and vapors does not exceed 20 percent of the LEL.

(2) Oil accumulations or other combustible materials shall be removed or protected from ignition when present in exposed areas.

(3) The gauge valves shall be closed and the gauges drained, or the gauge glasses shall be guarded when gauge glasses contain flammable liquids, vapors or gases and are exposed to the spatter of molten metal.

(c) A source of ignition shall not be used where the concentration of flammable gases or vapors exceeds 20 percent of the LEL.

(d) Suitable fire extinguishing equipment shall be readily available in the area where hot work is performed.

(e) Hot work permits.

Except for those operations identified in subsection (a)(2), a written and numbered hot work permit shall be completed, signed and issued by the employer or his authorized agent before a source of ignition is used. As part of this hot work permit issuance procedure, the employer shall verify that all of the required actions identified in subsection (b) have been completed before a hot work permit is issued.

(f) Before an employee introduces a source of ignition, the employer shall provide a copy of the hot work permit to the employee or shall post a copy of the permit in the area of the planned hot work. The copy of the permit shall be kept on the job where the source of ignition is being used until the work is completed, or the permit expires or is revoked.

~~(e)~~(g) The hot work permit shall contain the following information:

- (1) The effective time and date.
- (2) The place of use.
- (3) The hours during which the source of ignition may be used, not to exceed 24 hours.
- (4) The specific location or piece of equipment where the source of ignition will be used.
- (5) The nature of the use of the source of ignition.
- (6) Any special precautions or limitations to be observed before, during or after the use of the source of ignition, including the need for fire watch.

~~(d)~~(h) The permit employer shall be terminated revoke the permit under the following conditions:

- (1) When circumstances would make the continued use of the source of ignition hazardous.

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- (2) Any time the conditions of its issuance change.
- (3) Inactivity of permitted hot work in excess of two hours unless test(s) determine the lower explosive limit LEL is less than 20%.
- ~~(e) Before a hot work permit is issued the employer shall determine that the source of ignition may be safely used. No hot work permit shall be issued unless the flammable gas or vapor content is less than 20 per cent of the lower explosive limit.~~
- ~~(f) When a hot work permit is issued, the following requirements, if applicable, shall be met:~~
- ~~(1) Oil accumulations or other combustible materials in exposed areas shall be removed or protected from ignition.~~
- ~~(2) Gage glasses containing flammable liquids, vapors or gases and exposed to the spatter of molten metal shall have their valves closed and be drained, or the gage glasses shall be guarded.~~
- ~~(g)(i) The employer issuing the hot work permit shall keep A a copy of each the permit issued shall be kept on file at the plant of issue for at least six months after the date of issue.~~
- ~~(h) Suitable fire extinguishing equipment shall be available to the employees who are using a source of ignition.~~
- ~~(i) In locations where flammable vapors may be present, precautions shall be taken to prevent ignition by eliminating or controlling sources of ignition.~~

NOTE: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code.

**PROPOSED MODIFICATIONS**

**(Modifications are indicated by bold, double-underlined for new language and bold, strikeout for deleted language.)**

**(Only modified pages are included.)**

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PROPOSED STATE STANDARD,  
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Amend Section 6777 to read:

§ 6777. Hot Work Procedures and Permits.

~~(a) A written and numbered hot work permit issued and signed by the employer or his authorized agent shall be required before a source of ignition is used, except: Scope and application. This section contains the required practices and procedures necessary to protect employees from fire and explosion hazards associated with hot work. This section applies to all hot work operations, except as provided in subsections (a)(1) and (a)(2).~~

~~(1) The following operations are exempt from the requirements of this section:~~

~~(1)(A) In connection with The operation of fixed fired equipment.~~

~~(2)(B) Hot work required for operating purposes in laboratories and pilot plants required for operating purposes but. This exemption does not apply to sources of ignition used in the maintenance of equipment.~~

~~(3)(C) Hot work Wwithin designated, marked, or posted smoking areas within plants; or.~~

~~(D) Hot work in locations outside of plants where it would be safe to smoke.~~

~~(4) In locations where compliance with the order would result in the employer or his authorized agent issuing a hot work permit to himself, or, where the use of a source of ignition, in connection with work upon an oil or gas transmission pipe line remote from plants, does not affect the normal movement of the contents of the line, provided, however, that in either case the safety provisions of subsections (d), (e), (g) and (h) of this Section shall be complied with.~~

~~(5)(E) Hot work Wwithin areas meeting all of the following conditions and when posted by the employer in a manner to define the boundaries:~~

~~(A) 1. The area shall be so located from With respect to operating process equipment, which is being operated to ensure the following the area is:~~

~~1.a. The area shall be fFree of flammable liquids, vapors and gases except as may be required for necessary activities when safely used, handled and stored.; and~~

~~2.b. The area shall be effectively protected against the possibility of flammable oils, liquids, vapors or gases being liberated within the area from pipe lines, sewers, drains or ditches.~~

~~2. The area is posted in a manner to define the boundaries.~~

~~(B) 3. The area has A a warning system to alert employees to eliminate ignition sources in the event of an emergency.~~

~~(2) The following operations need only comply with the hot work safety procedures in subsections (b), (c), and (d):~~

~~(A) Operations where compliance with the order will result in the employer or authorized agent issuing a hot work permit to him/herself.~~

~~(B) Operations where the use of a source of ignition in connection with work on an oil or gas transmission pipeline remote from plants does not affect the normal movement of the contents of the pipeline.~~

~~(C) Hot work within areas meeting all of the following conditions:~~

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**1. The area is located with respect to operating process equipment such that the area is:**  
**a. Free of flammable liquids, vapors and gases except as may be required for necessary activities when safely used, handled and stored; and**

**b. Effectively protected against the possibility of flammable oils, liquids, vapors or gases being liberated within the area from pipe lines, sewers, drains or ditches.**

**2. The area is posted in a manner to define the boundaries.**

**3. The area has a warning system to alert employees to eliminate ignition sources in the event of an emergency.**

~~(b) The employer shall provide the employee or post a copy of the permit prior to initiation of a source of ignition, except as specified in subsection (a) of this Section. The copy of the permit shall be kept on the job where the source of ignition is being used until the work is completed, the permit expires, or is revoked.~~ Hot work procedures. Before hot work is begun, the employer shall determine that a source of ignition can be safely used. In locations where flammable vapors may be present, precautions shall be taken to prevent ignition by eliminating or controlling sources of ignition. A source of ignition shall not be introduced into an area until all of the following required actions have been completed:

(1) Tests for the presence of flammable gases and vapors shall be made when the concentration of flammable gases or vapors may reasonably be expected to exceed 20 percent of the lower explosive limit (LEL). The tests shall confirm that the concentration of flammable gases and vapors does not exceed 20 percent of the LEL.

(2) Oil accumulations or other combustible materials shall be removed or protected from ignition when present in exposed areas.

(3) The gauge valves shall be closed and the gauges drained, or the gauge glasses shall be guarded when gauge glasses contain flammable liquids, vapors or gases and are exposed to the spatter of molten metal.

(c) A source of ignition shall not be used where the concentration of flammable gases or vapors exceeds 20 percent of the LEL.

(d) Suitable fire extinguishing equipment shall be readily available in the area where hot work is performed.

(e) Hot work permits.

Except for those operations identified in subsection (a)(2), a written and numbered hot work permit shall be completed, signed and issued by the employer or his authorized agent before a source of ignition is used. As part of this hot work permit issuance procedure, the employer shall verify that all of the required actions identified in subsection (b) have been completed before a hot work permit is issued.

(f) Before an employee introduces a source of ignition, the employer shall provide a copy of the hot work permit to the employee or shall post a copy of the permit in the area of the planned hot work. The copy of the permit shall be kept on the job where the source of ignition is being used until the work is completed, or the permit expires or is revoked.

~~(e)~~(g) The hot work permit shall contain the following information:

## **SUMMARY AND RESPONSE TO COMMENTS**

## SUMMARY AND RESPONSE TO WRITTEN AND ORAL COMMENTS

### I. Written Comments:

Elizabeth A. Treanor, Director, Phylmar Regulatory Roundtable, by letter dated April 15, 2004.

#### Comment 1.

Ms. Treanor stated that the Phylmar Regulatory Roundtable (PRR) supports the intent of limiting the exemption from the requirement for a Hot Work Permit to only fixed fired equipment that is in operation. Ms. Treanor noted that the Board clearly sees that there is a potential for the release of flammable liquids or vapors from fixed fired equipment that is shut down for maintenance but may still contain product or fuel gas in the piping associated with the fired equipment. Ms. Treanor stated that the PRR, however, recommends that the language of this section be revised as follows for clarity:

(a)(1)(A) Fixed fired equipment while in operation.

#### Response:

Ms. Treanor is correct in recognizing that it is the Board's intent to limit the operations that qualify for exemption under subsection (a)(1)(A) such that fixed fired equipment is only exempt while it is in operation. The Board's proposal would revise the current language as follows (bold added for emphasis):

§6777(a)

\* \* \* \* \*

(1) The following operations are exempt from the requirements of this section:

~~(A) In connection with~~ The operation of fixed fired equipment.

The Board believes that the proposed language is sufficient to make it clear to the reader that the exemption applies only to the operation of the equipment and not to maintenance activities.

#### Comment 2.

Ms. Treanor noted that Section 6777(a)(1)(E) exempts areas meeting the following conditions from the need to comply with these requirements:

- (a) Free of flammable liquids, vapors and gases except as may be required for necessary activities when safely used, handled and stored; and
- (b) Effectively protected against the possibility of flammable oils, liquids, vapors or gases being liberated within the area from pipe lines, sewers, drains or ditches.

Ms. Treanor stated that the PRR is concerned that under (a), in the absence of testing, individuals could determine that the potential sources of flammable liquids and vapors are isolated, so the area is "free" of flammable liquids and vapors, and a hot work permit is not required.

Ms. Treanor noted that this could have severe consequences.

Also, Ms. Treanor stated that the PRR questions how one could determine that the area is “effectively protected” against the possible liberation of flammable liquids and vapors if one does not conduct testing. Ms. Treanor stated that typical industry hot work procedures require that testing be conducted to verify that the area is, in fact, free of the flammable vapors and liquids.

Ms. Treanor stated that the permit process assures that an area is free from flammable liquids and vapors. She stated that the PRR recommends that all of the required practices and procedures in this section apply to these situations, and that if there is an exemption, it apply only to the documentation of the hot work permit.

Response:

Ms. Treanor refers to only two of the four conditions that must be met in order for the area to be exempt from the standard per subsection (a)(1)(E), which requires that all of the conditions of the subsection must be met. The other two conditions are:

- (a)(1)(E) 2. The area is posted in a manner to define the boundaries.
- (a)(1)(E) 3. The area has a warning system to alert employees to eliminate ignition sources in the event of an emergency.

The chief concern expressed by Ms. Treanor is that employers are not required to monitor for flammable vapors to determine that: 1) the area is free from flammable vapors, and 2) the area is effectively protected from flammable vapors entering the area. These are only two of the four conditions that must be met in order to be eligible for an exemption from the standard under subsection (a)(1)(E). Ms. Treanor recommends that the exemption be deleted, or at a minimum, the exemption should only relieve the employer from the requirements related to hot work permits so that the employer must still comply with the requirements related to hot work procedures. The latter would be accomplished by relocating the exemption under subsection (a)(2), which states, “The following operations need only comply with the hot work safety procedures in subsections (b), (c), and (d).” The employer would then be required to monitor for flammable vapors under subsection (b) when the concentration may reasonably be expected to exceed 20 percent of the lower explosive limit (LEL).

The Board agrees that it is typical industry practice to monitor areas where flammable vapors may be present before hot work is begun. The proposal would revise the current standard to be more consistent with industry practice. The current standard merely requires the employer to determine that a source of ignition may be safely used. Revised subsection (b) specifically requires monitoring under certain conditions. On the other hand, there may be areas in a facility, subject to the provisions of Section 6777, where there are no flammable vapors present and there is no potential for flammable vapors being released in the area because all sources of the vapors are effectively contained and/or are so remote that a system can be used to warn of their release. Mandating flammable vapor monitoring and a permit for hot work in these areas would be an unnecessary burden on the employer. The Board believes that the employer needs some flexibility in determining where to conduct flammable vapor monitoring.

The above notwithstanding, the concerns expressed by Ms. Treanor have merit. Proposed subsection (a)(1)(E) does not require the employer to monitor an area to determine if it is free of

flammable vapors and eligible for exemption from the standard. The exemption might hinder or prevent compliance or enforcement of subsection (b), which requires monitoring when flammable vapors may exceed 20 percent of the LEL.

The Board agrees with Ms. Treanor's recommendations to the extent that the exemption covered under subsection (a)(1)(E) should be relocated and renumbered as subsection (a)(2)(C). As a result of this revision, areas that meet the conditions of the exemption would be required to comply with the hot work procedures in subsections (b), (c), and (d), but would not be subject to the hot work permit requirements in subsections (e) through (i).

### Comment 3.

Ms. Treanor stated that in Section 6777(b)(3), the term "lower explosive limit" is deleted and replaced with the acronym "LEL." Ms. Treanor stated that the PRR recommends that for technical accuracy and consistency with the National Fire Protection Association (NFPA), the Board delete all references to the lower explosive limit and/or LEL. Ms. Treanor noted that "The Flammable & Combustible Liquids Code," NFPA 325, lists LFLs/UFLs (lower and upper flammable limits) for many compounds; in its definition of "Fire Hazard Properties," it states the following:

"The range of flammable vapor or gas-air mixture between the upper and lower flammable limits is known as the "flammable range," also referred to as the "explosive range"... No attempt is made to differentiate between the terms "flammable" and "explosive" as applied to the lower and upper limits."

Ms. Treanor stated that since the NFPA uses the term "upper/lower flammable limit", and California recently adopted the NFPA set of fire and building codes, the PRR recommends that Cal/OSHA do so as well.

### Response:

The term(s) "flammable (explosive) limits" are defined in General Industry Safety Orders (GISO) Section 5415. The GISO is consistent with the NFPA in that the GISO also makes no attempt to differentiate between the terms "flammable" and "explosive" as applied to the lower and upper limits. In Title 8 of the California Code of Regulations, which contains occupational safety and health standards, the term "flammable limit" is used fourteen times, while the term "explosive limit" is used thirty eight times.

Since Board staff is currently working on a project to reorganize the Cal/OSHA standards in Title 8, which includes improving consistency between the standards, staff will consider Ms. Treanor's recommendation as part of that endeavor. However, the Board believes it is unnecessary to modify this rulemaking proposal to substitute "flammable range" for "explosive range," because it is generally accepted that the two terms are interchangeable.

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The Board thanks Ms. Treanor for her comments and participation in the Board's rulemaking process.

## II Oral Comments

Oral comments received at the April 15, 2004 Public Hearing in San Diego, California.

Elizabeth A. Treanor, Director, Phylmar Regulatory Roundtable.

### Comment:

Ms. Treanor's oral comments were the same as those expressed in her letter dated April 15, 2004, which are summarized above.

### Response:

See the above responses to Ms. Treanor's written comments.