

**OCCUPATIONAL SAFETY  
AND HEALTH STANDARDS BOARD**

2520 Venture Oaks, Suite 350  
Sacramento, CA 95833  
(916) 274-5721  
FAX (916) 274-5743  
[www.dir.ca.gov/oshsb](http://www.dir.ca.gov/oshsb)



SECOND NOTICE OF PROPOSED FURTHER MODIFICATIONS TO  
CALIFORNIA CODE OF REGULATIONS

TITLE 8: Division 1, Chapter 4, Subchapter 4,  
Article 4, Section 1533(a), (b) (c) and Article 6, Section 1541(g)(3) of the Construction Safety  
Orders and Subchapter 20, Article 1, Section 8403(a)(4) of the Tunnel Safety Orders.

**Ventilation Inside Shafts, Culverts and Pipelines**

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 modifications are being considered as a result of public comments and/or Board staff consideration.

On August 18, 2011, the Standards Board held a Public Hearing to consider revisions of Title 8, Division 1, Construction Safety Orders, Sections 1533 and 1541 and Tunnel Safety Orders, Section 8403. The Standards Board received written and oral comments on the proposed revisions. The standard was modified as a result of these comments, and on September 16, 2011, a 15-Day Notice of Proposed Modifications was issued.

As a result of written comments submitted in response to that 15-Day Notice further modifications have been made. A copy of the full text of the standard, with the modifications clearly indicated, is attached for your information.

Any written comments on these modifications must be received by 5:00 p.m. on November 14, 2011, at the Standards Board's Office, 2520 Venture Oaks Way, Suite 350, Sacramento, California 95833 or submitted by fax to (916) 274-5743 or e-mailed to [oshsb@dir.ca.gov](mailto:oshsb@dir.ca.gov). This proposal will be scheduled for adoption at a future Business Meeting of the Standards Board.

The Standards Board's rulemaking file on the proposed action is open to public inspection Monday through Friday, from 8:00 a.m. to 4:30 p.m. at the Standards Board's Office. Inquiries concerning the proposed changes may be directed to Marley Hart, Executive Officer at (916) 274-5721.

OCCUPATIONAL SAFETY AND HEALTH  
STANDARDS BOARD

Date: October 27, 2011

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Marley Hart, Executive Officer

# Further Modifications to the Original Proposal

## **PROPOSED MODIFICATIONS**

**(Regulatory language to be deleted is shown in bold double strike-out  
and, new language is shown in bold double underline.)**

**STANDARDS PRESENTATION  
TO  
CALIFORNIA OCCUPATIONAL SAFETY AND HEALTH STANDARDS BOARD**

PROPOSED STATE STANDARD,  
TITLE 8, DIVISION 1, CHAPTER 4

Amend Section 1533 to read:

§1533. Internal Combustion Engines.

(a) Internal combustion engine-driven equipment shall be operated inside buildings or enclosed structures, **or, if they are 20 feet or less in depth, inside shafts, culverts, pipelines or other excavations,** only when such operation does not result in exposure to dangerous gases or fumes in concentrations above the maximum acceptable limits listed in **Section 5155 of** the General Industry Safety Orders. Some acceptable methods of control are:

- (1) Piping exhaust gases to the outside atmosphere.
- (2) Providing a system of building ventilation that dilutes and removes exhaust products to outside atmosphere.
- (3) Installing effective, catalyst-type exhaust treatment units on the engines.

(b) When shafts, culverts, pipelines or other excavations are 20 feet or less in depth and when internal combustion engine-driven equipment is operated therein, a mechanical ~~exhaust~~ ventilation system shall be provided to prevent exposure to the internal combustion engine's emissions. **The ventilation system, which may consist of a mechanical exhaust system, a forced air ventilation (blower) system, or a combination of the two, shall: may be used in conjunction with, or in lieu of, mechanical exhaust ventilation. The ventilation system (be it a mechanical exhaust system or a forced air ventilation system or a combination of the two) shall:**

- (1) Supply fresh air at a minimum of 60 lineal feet per minute through the area where the engine is operated;
- (2) Supply at least 100 cubic feet of fresh air per minute per engine brake horsepower of the internal combustion engine used;
- (3) Supply a minimum of 200 cubic feet of fresh air per minute for each person that enters the space, and
- (4) Be inspected by a competent person at the beginning of each shift, or more frequently, to ensure an effective supply of fresh air.

**(c) If any work location subject to subsection (b) is subject to confined space safety orders contained in these orders, the General Industry Safety Orders or other Title 8 safety orders, and if the provisions of subsection (b) are less protective than a confined space safety order, the confined space safety order shall take precedence.**

NOTE: For shafts greater than 20 feet in depth and excavations subject to the Tunnel Safety Orders, refer to Title 8, Division 1, Chapter 4, Subchapter 20, the Tunnel Safety Orders.

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

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PROPOSED STATE STANDARD,  
TITLE 8, DIVISION 1, CHAPTER 4

Amend Section 1541 to read:

§1541. General Requirements.

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(g) Hazardous atmospheres.

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(3) Whenever internal combustion engine-driven equipment is operated inside a shaft subject to Section 1542 of these Orders, a ventilation system shall be provided and operated in accordance with Sections 1530 and 1533(b) of these Orders.

NOTE: For shafts greater than 20 feet in depth and excavations unrelated to the Construction Safety Orders, refer to Title 8, Division 1, Chapter 4, Subchapter 20, the Tunnel Safety Orders.

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

**STANDARDS PRESENTATION  
TO  
CALIFORNIA OCCUPATIONAL SAFETY AND HEALTH STANDARDS BOARD**

PROPOSED STATE STANDARD,  
TITLE 8, DIVISION 1, CHAPTER 4

Amend Section 8403(a)(4) to read:

§8403. Scope and Application.

(a) In accordance with the provisions of Labor Code, Division 5, Part 9 et al., these orders establish minimum safety standards in places of employment at tunnels, shafts, raises, inclines, underground chambers, and premises appurtenant thereto during excavation, construction, alteration, repairing, renovating or demolishing and the following:

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(4) All shaft excavations intended to exceed 20 feet in depth where employees may enter the shaft and/or approach the shaft area. A shaft will be considered a shaft from its inception. For shafts 20 feet or less in depth and excavations unrelated to the Tunnel Safety Orders, refer to, CCR, Title 8, Section 1533 and Article 6, commencing with Section 1539 of the Construction Safety Orders.

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NOTE: Authority cited: Sections 142.3 and 7997, Labor Code. Reference: Sections 142.3 and 7997, Labor Code.

## **SUMMARY AND RESPONSE TO COMMENTS**

## SUMMARY AND RESPONSE TO WRITTEN COMMENTS

### I. Written Comments

Mr. Hank McDermott, Board Member by e-mail transmission dated September 28, 2011.

Comment:

Mr. McDermott indicated that for clarity, the word “exhaust” should be deleted from the first sentence of Section 1533(b) and that the latter portion of the prefatory part of Section 1533(b) should be stated in a simpler, less confusing fashion. The intent of the rule is to require a ventilation system that may be either an exhaust or forced air system, and the present wording confuses this point.

Response:

The Board concurs with Mr. McDermott’s comment and has made the changes he suggested.

Mr. Van Howell, Area Director, Region IX, OSHA, U.S. Department of Labor, by letter dated September 28, 2011.

Comment:

Mr. Howell commented that Federal OSHA has reviewed the modified proposal and found it to be commensurate with federal standards.

Response:

The Board acknowledges Federal OSHA’s opinion regarding the proposal.

Mr. Michael Landy, Senior Safety Specialist, Department of Water Resources, by e-mail transmission dated October 4, 2011.

Comment:

Mr. Landy discussed maintenance activities on box culverts (natural drainage channels) using powered shovels. The buildup of fumes in the culverts is a concern as employees are continuously transiting the structures. Large fans are utilized to blow the fumes out of the work area, and gas detectors are provided to employees to warn of fume accumulation. Some build-up of fumes will happen at times, and build-ups are effected by such conditions as breezy days. Mr. Landy is concerned that the proposed language regarding air flow is difficult to quantify in user-friendly terms. Mr. Landy asks the following questions: “What does ‘100 cubic feet of fresh air per minute per engine brake horsepower’ look like? Would a typical 3 foot diameter industrial fan move that much air?”

Response:

Mr. Landy’s comments are outside the scope of this 15 day modification. The Board notes the proposal enhances safety by instituting ventilation requirements for worksites not covered by the

tunnel safety orders or confined space regulations. The Board believes that the proposal's requirements are clear and are stated in terms that employers can understand and work with. The proposal requires that the ventilation system must be able to supply at least 100 cubic feet per minute (CFM) of fresh air per engine brake horsepower of the internal combustion engine being used. In response to Mr. Landy's questions, a 4½ foot square box holds by volume nearly 100 cubic feet of air for each brake horsepower (745.7 watts=1 horsepower measured at the crankshaft) of the internal combustion engine operated within the enclosure. An industrial fan 3 feet in diameter moves between 9,000 and 11,000 CFM and is more than adequate to displace 100 CFM of air.

The Board thanks Mr. Landy for his comments and participation in the Board's rulemaking process.