BILLING CODE 4163-19-P

DEPARTMENT OF HEALTH AND HUMAN SERVICES

Centers for Disease Control and Prevention (CDC)

[CDC-2012-0012; NIOSH-254]

Request for Information on Edel-Kindwall Caisson Tables for Preventing Decompression Illness in Construction Workers

AGENCY: National Institute for Occupational Safety and Health (NIOSH) of the Centers for Disease Control and Prevention (CDC), Department of Health and Human Services (HHS).

ACTION: Notice of public comment period.

SUMMARY: The National Institute for Occupational Safety and Health (NIOSH) of the Centers for Disease Control and Prevention (CDC) invites comments and information on decompression tables used for protecting tunneling (caisson) workers from developing decompression illnesses.

PUBLIC COMMENT PERIOD: Comments must be received by March 29, 2013.

ADDRESSES: Written comments, identified by CDC-2012-0012 and docket number NIOSH-254, may be submitted by any of the following methods:

- Federal erulemaking portal: http://www.regulations.gov. Follow the instructions for submitting comments.
- Mail: NIOSH Docket Office, Robert A. Taft Laboratories, MS-C34, 4676 Columbia Parkway, Cincinnati, OH 45226.
- E-mail: nioshdocket@cdc.gov.

All information received in response to this notice will be available for public examination and copying at the NIOSH Docket Office, 4676 Columbia Parkway, Cincinnati, Ohio 45226. The document and instructions for submitting comments can be found at: http://www.regulations.gov. NIOSH includes all comments received without change in the docket, including any personal information provided. All electronic comments should be formatted as Microsoft Word. Please make reference to CDC 2012-0012 and docket number NIOSH-254.

FOR FURTHER INFORMATION CONTACT: Frank J. Hearl, PE, Chief of Staff, National Institute for Occupational Safety and Health, Centers for Disease Control and Prevention, Patriots Plaza, Suite 9200, 395 E St. SW., Washington, DC

20201. Telephone: (202) 245-0625 (this is not a toll-free number).

SUPPLEMENTARY INFORMATION: High pressure tunneling operations are used for some underground infrastructure projects. Compressed air is used to prevent seepage of water or to stabilize unstable soil conditions. Caisson work (a water-tight structure that allows underwater construction to be performed) can also involve elevated pressure worksites. This hyperbaric environment created by ambient pressure and compressed air effects exposes caisson and tunnel workers to the risks of decompression sickness (DCS) such as the "bends". DCS is related to intravascular or extravascular bubbles formed during reduction of environmental pressure (decompression). The release of nitrogen bubbles into blood or tissues can result in obstruction of blood flow or pressure effects. Clinical manifestations of DCS include (but are not limited to) joint pain ("bends"), lytic lesions of bones (dysbaric osteonecrosis), cutaneous disorders (cutis marmorata), spinal cord and brain disorders (stroke, paralysis, paresthesias, bladder dysfunction, etc.), and cardiopulmonary disorders (shortness of breath "chokes"), arterial gas embolism.

In order to prevent DCS, workers in higher hyperbaric environments must be safely brought back to the non-work environmental ambient pressure (decompressed) in decompression areas.

Decompression tables generally utilize stepwise (staged) progressions of gradually decreasing pressure at varying time intervals based on work exposure pressures and length of work shift.

In 1971, the Washington State Decompression Tables that were used in multiple states became the federal code enforced by the Occupational Health and Safety Administration (OSHA) and remain, unchanged, as the decompression tables in force today. The maximum worksite pressures allowed by OSHA (1926 Subpart S, Appendix A) and addressed by the OSHA decompression tables is 50 pounds per square inch (psi) (~3.45 bar gauge) [1]. They are considered inadequate for "efficiently eliminating nitrogen from the body" at pressures in excess of 36.5 psi [2].

The Edel-Kindwall Caisson Tables were developed for NIOSH in 1981. They are based on advances in hyperbaric research and are considered to be more protective of worker health

than the OSHA tables. As a result, these tables have been used for variances to the OSH standard. NIOSH is making these tables more easily accessible to construction users by posting them to a new webpage at the NIOSH Website at http://www.cdc.gov/NIOSH/topics/Decompression/.

However, the Edel-Kindwall tables are inadequate for dealing with pressures greater than 50 psi. Many modern projects using Tunnel Boring Machines involve pressures greater than 50 psi. There is a need for up-to-date decompression tables.

NIOSH is thus requesting information on the following: (1) Information on types of projects where the Edel-Kindwall Tables have been used, (2) Published and unpublished reports and findings relating to the use of the Edel-Kindwall Tables, including information on possible health effects or lack of observed health health effects in tunnel/caisson workers who were decompressed with data from the Edel-Kindwall Tables,(3) Information on related control measures (e.g., engineering controls, work practices, personal protective equipment) in use in workplaces where decompression is required, and (4) Information on alternative tables and approaches being used to protect

tunneling workers from higher pressures greater than 50 psi.

References

1. Hamilton RW, Bill Kay E. (2008) *Boring deep tunnels. Third conference on U.S. – Japan panel on aerospace-diving physiology & technology and hyperbaric medicine*.

2. Downs GJ, Kindwall EP. (1986) Aseptic necrosis in caisson workers: A new set of decompression tables. *Aviat Space & Environ Med* 57:569-574.

December 4, 2012
John Howard, Date

Director, National Institute for Occupational Safety and Health, Centers for Disease Control and Prevention

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