30 CFR section	Respondents	Burden hours	Burden hour cost
75.310	980	7,523	$195,598
75.312	980	99,739	$2,593,214
75.312(c)(d)	980	3,920	$101,920
75.312(g)	980	620	$16,120
75.312(g)(2)(ii)	23	46	$1,196
75.342	980	10,515	$273,390
75.351(h)	60	5,984	$155,584
75.360	980	1,470,667	$38,641,870
75.361	980	7,500	$195,000
75.362	980	642,744	25,709,760
75.363	980	10,224	319,514
75.364	980	410,884	10,767,544
75.370	554	38,226	$1,509,264
75.382	300	15,000	$390,000
Total	10,737	2,723,592	80,869,974

Frequency: On occasion; quarterly.

Average Time per Response: Varies from 5 minutes for countersigning preshift examinations to 16 hours for updating mine ventilation plans.

Total Burden Cost (capital/startup): $0.

Total Burden Cost (operating/maintaining): $194,256.

Comments submitted in response to this notice will be summarized and/or included in the request for Office of Management and Budget approval of the information collection request; they will also become a matter of public record.

Dated: October 27, 1997.

George M. Fesak,

Director, Program Evaluation and Information Resource.

[FR Doc. 97–28918 Filed 10–30–97; 8:45 am]

BILLING CODE 4510–43–M

DEPARTMENT OF LABOR

Occupational Safety and Health Administration

[V–97–1]

Notice of Application for Permanent Variance From Dixie Divers

AGENCY: Occupational Safety and Health Administration, Department of Labor.

ACTION: Notice of application for permanent variance from Dixie Divers.

SUMMARY: This notice announces the application of Dixie Divers, Inc., for a permanent variance from the Occupational Safety and Health Administration (OSHA) requirements for the availability and use of decompression chambers for mixed-gas diving operations (i.e., 29 CFR 1910.423(b)(2), 29 CFR 1910.423 (c)(3)(iii), and 29 CFR 1910.426(b)(1)).

DATES: The last date for interested parties to submit comments on the variance application is December 30, 1997. The last date for affected parties, including employers and employees, to request a hearing regarding the variance application is December 30, 1997.

ADDRESSES: The original and four copies of written comments and requests for a hearing must be submitted to: U.S. Department of Labor, Occupational Safety and Health Administration, Office of Variance Determination, Room N–3653, Attention: Ms. Juanita Jones, 200 Constitution Avenue, N.W., Washington, D.C. 20210.

For comments, one original (hardcopy) and one diskette (5¼-or 3½-inch) in Wordperfect 5.0, 5.1. or 6.1, or ASCII may be sent to this address; however, any information not contained on the diskettes (e.g., studies, articles) must be submitted in quadruplicate with the original written comments. Written comments of 10 pages or less may be transmitted by facsimile (fax) to OSHA's office of Variance Determination at (202) 219–7068, provided the original and four copies of the fax material are sent to OSHA's Office of Variance Determination within the 60day period allowed for comments.

FOR FURTHER INFORMATION CONTACT:

Ms. Juanita Jones, Office of Variance Determination (see **ADDRESSES** above), Telephone: (202) 219–7193, Fax: (202) 219–7068, E–mail: juanita.jones@osha-no.osha.gov

or the following Regional and Area Offices:

U.S. Department of Labor—OSHA, 1375 Peachtree Street, N.E., Suite 587, Atlanta, Georgia 30367, Telephone: (404) 562–2300, Fax: (404) 562–2295, E–mail: burgoyne-joanne@dol.gov and

U.S. Department of Labor—OSHA, 5807 Breckenridge Parkway, Suite A, Tampa, Florida 33610, Telephone: (813) 626–1177, Fax: (813) 626–7015, E-mail: larry.falck@tampa.osha.gov.

For an electronic copy of this Federal Register notice, contact the Labor News Bulletin Board at (202) 219–4748, or access OSHA's web page on the Internet at http://www.OSHA.gov.

Notice of Application

Dixie Divers, Inc. (hereafter, ''Dixie,'' ''applicant,'' or ''employer''), 14601 Orange Avenue, Ft. Pierce, Florida 34945, has applied, pursuant to Section 6(d) of the Occupational Safety and Health Act of 1970 (29 U.S.C. 655) and 29 CFR 1905.11, for a permanent variance from the requirements specified in 29 CFR 1910.423(b)(2), 29 CFR 1910.423(c)(3)(iii), and 29 CFR 1910.426(b)(1) concerning the availability and use of decompression chambers during mixed-gas diving operations.

SUPPLEMENTARY INFORMATION:

I. Background

The addresses of the places of employment affected by this application for a permanent variance are diving training facilities operated by Dixie Divers, including:

Dixie Divers of Boca Raton, 8241 Glades Road, Boca Raton, Florida 33434

Dixie Divers of Boynton Beach, 340 North Congress, Boynton Beach, Florida 33426

Dixie Divers of Coral Springs, 2060 University Drive, Coral Springs, Florida 33071

Dixie Divers of Deerfield, 1645 Southeast 3rd Court, Deerfield Beach, Florida 33441

Dixie Divers of Fort Pierce, 1717 South U.S. Route 1, Fort Pierce, Florida 34950

Dixie Divers of Key Largo, 103400 Overseas Highway, Key Largo, Florida 33037

Dixie Divers of Lakeland, 4120 South Florida Avenue, Lakeland, Florida 33813

Dixie Divers of Palm Bay, 4651 Babcock Street, Northeast, Palm Bay, Florida 32905
Dixie Divers of Panama City, 109B West 23rd Street, Panama City, Florida 32405
Dixie Divers of Stuart, 1839 Southeast Federal Highway, Stuart, Florida 34994
Dixie Divers of Vero Beach, 1833 U.S. Route 1, Vero Beach, Florida 32960
Dixie Divers of West Palm Beach, 1401 South Military Trail, West Palm Beach, Florida 33415.

The applicant has certified that employees who would be affected by the permanent variance have been notified of the application for a permanent variance by posting a copy of the application at locations where employee notices are normally posted, and that the employees have been informed of their right to petition the Assistant Secretary of Labor for the Occupational Safety and Health Administration for a hearing on the application.

Regarding the merits of the application, the applicant states that it is providing a place of employment at least as safe and healthful as that required by 29 CFR 1910.423(b)(2), 1910.423(c)(3)(iii), and 29 CFR 1910.426(b)(1).

Paragraph (b)(2) of 29 CFR 1910.423 requires that:

> For any dive outside the no-decompression limits, deeper than 100 fsw [feet of sea water], or using mixed gas as a breathing mixture, the employer shall instruct the diver to remain awake and in the vicinity of the decompression chamber which is at the dive location for at least one hour after the dive (including decompression or treatment as appropriate).

Paragraph (c)(3)(iii) of 29 CFR 1910.423 specifies that:

> [The decompression chamber shall be] located within 5 minutes of the dive location.

Paragraph (b)(1) of 29 CFR 1910.426 requires that:

> A decompression chamber is ready for use at the dive location.

The purpose of these standards is to provide for the rapid treatment of decompression sickness (DCS) that may result from breathing mixed gases at diving depths and durations that require decompression.

The applicant operates 12 diving schools; five of the schools are operated directly by the applicant and seven of the schools are franchise operations. The applicant employs 34 recreational diving instructors, who are highly skilled and experienced divers, to train novice divers in recreational diving knowledge and skills. The same 34 employees also serve as diving guides and lead groups of sports divers to local diving sites for recreational purposes. (The recreational diving instructors and diving guides are also referred to hereafter as ''employees'' or, more generally, as ''divers.'')

As recreational diving instructors, employees train recreational diving students in conventional diving procedures and the safe operation of diving equipment. The diving students may use an open-circuit, semi-closed-circuit, or closed-circuit self-contained underwater breathing apparatus (SCUBA) with compressed-air or a high-oxygen breathing-gas mixture during these training dives. The applicant's training program involves both classroom instruction and practice dives in which the employees accompany diving students to ocean depths of zero to 130 feet of sea water (fsw) for durations that do not exceed established no-decompression limits. During these training dives, the diving instructors provide underwater instruction in, and allow the diving students to practice using, diving procedures and equipment. A diving instructor may make as many as three to four training dives a day while training diving students either individually or in small groups.

As diving guides, employees lead small groups of trained sports divers to local undersea diving locations for recreaitonal purposes. The diving locations are pre-selected by the diving guide. The diving guide provides the sports divers with information regarding the diving site, including hazardous conditions and safe practices. The recreational diving groups consist of sports divers who use open-circuit, semi-closed-circuit, or closed-circuit SCUBA with compressed-air or a high-oxygen breathing-gas mixture while diving. In conducting these diving excursions, the diving guide will dive for periods that do not exceed established no-decompression limits at diving depths ranging from zero to 130 fsw. A diving guide may make as many as five of these recreational diving excursions a day.

The applicant proposes to have its employees use open-circuit, closed-circuit, or semi-closed-circuit SCUBA supplied with high-oxygen breathing-gas mixtures that contain a higher fraction of oxygen than air. For the purpose of this application, the term ''high-oxygen breathing-gas mixture'' refers to any breathing-gas mixture containing an oxygen fraction of more that 22 percent (22%) by volume; the maximum oxygen fraction is 40 percent (40%) by volume for open-circuit SCUBA, and never exceeds an oxygen partial pressure delivered to the diver of 1.40 ATA (atmospheres absolute) for any SCUBA.

The high-oxygen breathing-gas mixture is obtained by mixing pure nitrogen with pure oxygen, removing oxygen from air for mixing with pure nitrogen, adding pure oxygen to air, or by denitrogenating air. Employees who use high-oxygen breathing-gas mixtures will be able to make more or longer repetitive-training and/or excursion divers than they would using compressed-air open-circuit SCUBA (their current mode of operation) because the higher oxygen and lower nitrogen levels of these breathing-gas mixtures will extend the no-decompression limits of these dives compared to repetitive-training and/or excursion dives made using breathing gases composed only of air. The use of closed-circuit and semi-closed-circuit SCUBA will also enable employees to make repetitive-training and/or excursion dives without continually refilling the cylinders that contain the breathing-gas mixture, as is the case currently when open-circuit SCUBA is used.

According to the applicant, the employees covered by this variance application will receive a level of protection that is equal to, or greater than, the level of protection they receive when they use compressed air supplied to open-circuit SCUBAs under no-decompression diving limits as permitted by the exemption to the Commercial Diving Operations standard at 29 CFR 1910.401(a)(2)(i).

Since OSHA first published the Commercial Diving Operations standard in 1977, diving equipment (including dive-decompression computers), decompression tables, training, and safety programs have steadily improved. Consequently, the overall safety performance of recreational diving has improved substantially. According to the data discussed in Reference A, the fatality rate for recreational diving as a whole (including non-work, recreational diving) has fallen from 8.62 fatalities per 100,000 divers in 1976 to 2.09–2.68 fatalities per 100,000 divers in 1991.

In the preamble to the Commercial Diving Operations standard (42 FR 37650), OSHA noted that high-oxygen breathing-gas mixtures were being developed by the National Oceanic and Atmospheric Administration (NOAA), but had not yet (in 1977) been made available to the recreational diving community. This technology increases the fraction of oxygen contained in the breathing-gas mixture, thereby exposing divers using this breathing-gas mixture to a decreased fraction of nitrogen.

During the 1980s, NOAA published diving procedures, including decompression protocols, for dives using high-oxygen breathing-gas mixtures. (See Reference B.)

While the percentage of oxygen in breathable air is 19.5–22.0 (see Gas Association Commodity Specification G–7.1–1966), the percentage of oxygen in high-oxygen breathing-gas mixtures for open-circuit SCUBA typically ranges from 28 to 40. By increasing the fraction of oxygen in the breathing-gas mixture, the driver's bodily tissues accumulate less nitrogen during a dive. As a result, the mathematical probability of developing decompression sickness (DCS) is reduced compared to divers who use compressed air under the same diving conditions (i.e., depth, bottom time, and descent and ascent rates). (See Reference C.)

Regardless of the diving equipment used (e.g., open-circuit SCUBA, surface-supplied air), paragraph 29 CFR 1910.423(b)(2), 29 CFR 1910.423(c)(3)(iii), and 29 CFR 1910.426(b)(1) of OSHA's Commercial Diving Operations standard require a decompression chamber at the diving site if a diver is supplied with high-oxygen breathing-gas mixtures; these requirements apply even if the dive does not involve decompression stops (i.e., is a no-decompression dive). Dixie believes, however, that the reduced mathematical probability of DCS that results from the use of high-oxygen breathing-gas mixtures under the conditions specified in this variance application will provide a level of safety to its employees that is equivalent to the level of safety they experience when they use open-circuit, compressed-air SCUBA within the no-decompression limits. Dixie asserts, therefore, that maintaining a decompression chamber at the dive location should not be required if it complies with the alternative conditions specified in this variance application.

II. Proposed Alternative

Instead of complying with the standard, the applicant contends that the specific safety procedures and technical provisions set forth in the variance application make the need for immediate access to a decompression chamber no greater than would be in the case when its divers use open-circuit, compressed-air SCUBA within the no-decompression diving limits as specified in the exemption to the Commercial Diving Operations standard under the provisions of 29 CFR 1910.401(a)(2)(i). These procedures and provisions are described in each of the following conditions:

A. High-oxygen breathing-gas mixtures shall be supplied using open-circuit, closed-circuit, or semi-closed-circuit SCUBA. If the divers use a closed-circuit or semi-closed-circuit SCUBA, this diving equipment must use:

1. Commercially-available disposable scrubber cartridges prepacked with sorbents that remove carbon dioxide and maintain the carbon-dioxide level in the breathable gas (i.e., the gas being inhaled directly by the diver from the regulator) below a partial pressure of 0.1 ATA. An alternate scrubber method may be used provided the employer demonstrates that this method is equal in effectiveness to commercially-available disposable scrubber cartridges in removing carbon dioxide and maintaining the carbon-dioxide level in the breathable gas below a partial pressure of 0.1 ATA.

2. Redundant, continuously-functioning carbon-dioxide sensor, moisture traps, an over-pressure valve, and redundant, continuously-functioning moisture sensors, or an equivalent method that provides immediate and accurate detection of depleted scrubber sorbent or scrubber sorbent that has been compromised by moisture contamination.

3. Flexible breathing bags (i.e., ''counter lungs'').

4. An open-circuit (''bail-out'') system in which the second stage of the SCUBA regulator is connected to a separate supply of emergency breathing gas, or for semi-closed-circuit and closed-circuit SCUBA, a diluent supply of emergency breathing gas, in the event the SCUBA malfunctions (e.g., fails to provide a breathable oxygen level or to maintain carbon dioxide below 0.1 ATA). The bail-out system shall be at least as reliable as other commercially-available open-circuit SCUBA, and contain a supply of breathable air or a high-oxygen breathing-gas mixture sufficient to last 3 to 4 minutes at 130 fsw.

5. An information module that provides:

a. For closed-circuit SCUBA, digital and/or graphical displays for: gas pressures (including oxygen partial pressures) and/or deviations from the preset values for this information; time (i.e., surface time, dive time remaining, required ceiling stop times, and total ascent time); depth (i.e., current depth, maximum depth achieved, and required ceiling stop depth); gas temperature within the breathing loop; and ascent and decent rates.

b. For semi-closed circuit SCUBA, analog and/or digital displays for: gas pressures; time (i.e., surface time, dive time remaining, required ceiling stop times, and total ascent time); and ascent and decent rates.

c. For both closed-circuit and semi-closed-circuit SCUBA, flashing displays and symbols in the data-display module, audible alarms, or visual displays in the mask sufficient to warn the diver of: solenoid failure (when solenoids are used); low battery voltage (for electronic instruments); excessive ascent and descent rates; depth levels that are shallower than the required ceiling stop depth; and, for closed-circuit SCUBA only, oxygen partial pressures that are below or exceed the planned oxygen levels (e.g., exceed an oxygen partial pressure delivered to the diver of 1.40 ATA).

B. Closed-circuit SCUBA also must use:

1. Oxygen and diluent gas (i.e., air or nitrogen) supply-pressure sensors, depth sensors, continuously-functioning and redundant temperature-compensated oxygen sensors, and continuously-functioning gas-loop and ambient water-temperature sensors.

2. A gas-controller package with electrically-operated solenoid oxygen-supply valves and a pressure-activated regulator with a second-stage diluent-gas addition valve.

3. A manually-operated, gas-supply bypass valve to add oxygen or diluent gas to the breathing loop.

4. Separate oxygen and diluent-gas cylinders to supply the breathing-gas mixture.

C. Regardless of the SCUBA used (i.e., open-circuit, closed-circuit, or semi-closed-circuit), the fraction of oxygen in the high-oxygen breathing-gas mixture shall be greater than the fraction of oxygen in compressed air, with a maximum fraction of breathable oxygen of 40 percent (40%) by volume for open-circuit SCUBA, but never to exceed a maximum oxygen partial pressure delivered to the diver of 1.40 ATA for any SCUBA.

D. Regardless of the SCUBA used, the diver shall dive no deeper than 130 fsw. or to a maximum oxygen partial pressure delivered to the diver of 1.40 ATA, whichever is most restrictive.

E. The employer shall ensure that the divers' exposures to partial pressures of oxygen between 0.60 and 1.40 ATA (delivered to the diver) do not exceed the 24-hour single-exposure time limits specified by the 1991 NOAA Diving Manual or other oxygen-exposure limits, such as the Diving Science and Technology (DSAT) Oxygen Exposure Table, that provide a level of oxygen-toxicity protection at least equivalent to the level of protection afforded by the 1991 NOAA Diving Manual. (See

Reference D.) In using these tables, time limits shall be determined as the function of the maximum partial pressure of oxygen to which the diver was exposed during the dive, as well as the total time of the dive (i.e., from the time the diver leaves the surface until that diver returns to the surface), not the total bottom time of the dive.

F. Nitrogen shall be the only inert gas used to obtain the breathing-gas mixture.

G. The conditions listed below apply to mixing and analyzing the high-oxygen breathing-gas mixtures:

1. If the breathable gas is a high-oxygen mixture compounded by the employer, the follow procedures apply:

a. Either the continuous-flow or partial-pressure mixing techniques specified in the 1991 NOAA Diving Manual or a semi-permeable membrane shall be used to compound the appropriate breathing gas prior to delivery to the SCUBA cylinders.

b. For open-circuit and semi-closed-circuit SCUBA , the oxygen fraction of the breathing-gas mixture must be analyzed by the employer using a oxygen analyzer (e.g., consisting of a fuel-cell process the oxidizes a chemical to produce an electrical output proportional to the oxygen content) that is accurate to within one percent (1%) by volume.

c. For closed-circuit SCUBA, the oxygen fraction used in the breathing loop must be analyzed by the employer to an accuracy within one percent (1%) by using redundant temperature-compensated electromechanical sensors (e.g., consisting of electrodes that absorb oxygen that is used to form ions that react with counter electrodes and produce electrical outputs proportional to the oxygen fraction).

d. The accuracy of the equipment used by the employer to analyze the oxygen fraction shall be maintained in accordance with the manufacturer's instructions.

2. If the breathable gas is procured (purchased) high-oxygen breathing-gas mixture, the employer must ensure that:

a. The commercial supplier of the gas mixture analyses and documents the oxygen fraction of the mixture, and uses an oxygen-analytic method at least as accurate and reliable as the methods specified in Condition G.1 above;

b. The commercial supplier provides certification of the oxygen analysis; and

c. The oxygen used in the high-oxygen breathing-gas shall be Grade A (aviator's oxygen) or Grade B (Industrial/medical oxygen), and shall meet the specifications, including the purity requirements, found in the 1991 NOAA Diving Manual. These specifications shall be analyzed using a method at least as accurate and reliable as the method described under Condition G.1 above, and the employer must obtain from the commercial supplier of the breathing-gas mixture a certification document to this effect.

H. If the employer uses a compressor to produce the high-oxygen breathing-gas mixture, the compressor shall be oil-less or the compressed-air shall be filtered to produce oxygen-compatible air.

I. SCUBA exposed to high-pressure (i.e., exceeding 300 psi) high-oxygen breathing-gas mixtures and/or pure oxygen must be rated for oxygen service (i.e., use components that are oxygen compatible and oxygen clean).

J. For both single and repetitive diving conducted while using a high-oxygen breathing-gas mixture, the diver shall remain within the no-decompression limits specified for such diving. The no-decompression limits shall be determined from decompression tables and formulas developed for single and repetitive air diving and published in the 1991 NOAA Diving Manual. The employer may use other decompression tables, formulas, and/or principles for their purpose provided the employer demonstrates that these tables, formulas, and/or principles are equivalent to, or better than, the NOAA tables and formulas.

K. The employee may wear and use an underwater dive-decompression computer designed to regulate decompression procedures provided that:

1. The dive-decompression computer uses decompression procedures that are based on the no-decompression tables or formulas specified in Condition J above;

2. The output from the dive-decompression computer can be demonstrated by the employer to provide its divers with protection that is equivalent to the tables or formulas specified in Condition J above;

3. A log is maintained at the dive site that records, for each dive, ''Left Surface Time,'' ''Reached Surface Time,'' ''Maximum Depth,'' ''Manufacturer and Model Number of the Dive-Decompression Computer,'' and ''Serial Number of Dive-Decompression Computer''; and

4. Decompression tables are available at the dive site for use in case the dive-decompression computer fails, is damaged, or is lost.

L. Regardless of the SCUBA used, the employer shall confirm prior to each day's diving operations in which a high-oxygen breathing-gas mixture is supplied by the diver's SCUBA that the following resources are available to treat a diving-related medical emergency (e.g., DCS, air embolism) that may occur to a diver who uses such a breathing-gas mixture:

1. A hospital, qualified health-care professionals, and the nearest Coast Guard Coordination Center (or the State or Municipal equivalent), with a list of telephone or call numbers for these health-care professionals and facilities being maintained at the dive site; and

2. If a decompression chamber is not at the dive site, access and transportation to a decompression chamber must be available, with the transportation being capable of delivering the diver having a diving-related medical emergency to the decompression chamber within two hours of the injury.

M. Portable oxygen equipment with a transparent mask shall be available at the dive site to treat the diver who has a diving-related medical emergency; the oxygen shall be available for administration to the diver during the entire period the diver is being transported to a decompression chamber.

N. At least two personnel, one of whom shall be a diver employed by the applicant and both of whom are qualified in first-aid and in the administration of treatment oxygen, shall be available at the dive site to provide emergency treatment for diving-related medical emergencies.

O. The employer shall ensure that the employees covered by this variance application are divers who are certified by a training agency recognized by the recreational diving industry and who perform the functions of recreational diving instructors or diving guides. The divers must be qualified by such an agency to use the SCUBA and high-oxygen breathing-gas mixtures relevant to their recreational diving operations.

P. The employer shall ensure that the divers covered by this variance application conform with the recreational diving practices specified in the instructor training manual currently used by the certified training agency with which the diver is affiliated, to the extent that these practices are consistent with the conditions specified above in this variance application.

III. Rationale for the Proposed Alternative

The applicant provided a rationale for each of the conditions specified above in the proposed alternative; this section presents this rationale.

Conditions A and B

These conditions allow the use of closed-circuit and semi-closed-circuit SCUBA, in addition to traditional open-circuit SCUBA. While the safety of open-circuit SCUBA for use by recreational diving instructors is acknowledged by OSHA under the exemption provision to its Commercial Diving Operations standard at 29 CFR 1910.401(a)(2)(i), this provision made no reference to closed-circuit or semi-closed-circuit SCUBA because such equipment was not available or in common use by recreational diving instructors when OSHA's Commercial Diving Operations standard was promulgated in 1977. Closed-circuit and semi-closed-circuit SCUBA is now available for use by recreational divers, although data related to the reliability and safety of such equipment are difficult to obtain because its use by recreational divers is still uncommon. Conditions A and B specify a number of technical features (including manually-operated ''bail-out'' systems) that will ensure that such SCUBA supplies and maintains the appropriate breathing-gas mixture to the divers, thereby providing them with a degree of safety that is at least as protective as they would obtain using compressed-air, open-circuit SCUBA under no-decompression diving limits.

Conditions A and B require closed-circuit and semi-closed-circuit SCUBA to operate so as to: automatically inject oxygen into the breathing loop to maintain an oxygen partial pressure in the breathable gas (i.e., delivered to the diver) of 0.95 to 1.40 ATA; automatically add diluent gas through the regulator to compensate for decreases in gas volume during descent; and permit these functions to be performed manually by the diver using gas-supply bypass valves provided on the equipment. These conditions will maintain oxygen levels in the breathable gas within the range of partial pressures specified by Condition E above, and will ensure that sufficient breathing-gas pressure is available to deliver breathable gas to the diver without adversely affecting the diver's breathing effort.

These conditions also will prevent the diver from breathing unsafe levels of carbon dioxide by requiring the use of proven sorbent systems, continuously-functioning control systems, and information displays that inform the diver of the SCUBA's status. Should carbon dioxide in closed-circuit SCUBA exceed planned levels, a visual display and auditory warning will be activated so that the diver is alerted to take corrective action. Semi-closed-circuit SCUBA equipment shall provide the diver with an equivalent method for ensuring that the scrubber absorbent does not deplete, thereby avoiding excessive carbon-dioxide build-up. Providing a means to manually override these functions (i.e., the ''bail-out'' mode) ensures that a diver can maintain an adequate supply of air or high-oxygen breathing-gas mixture to return to the surface should problems develop with the closed-circuit or semi-closed-circuit SCUBA. The ''bail-out'' capability, therefore, will provide an effective means for divers using closed-circuit or semi-closed-circuit SCUBA to ascend to the surface in a manner that duplicates the safety advantages of open-circuit SCUBA, and to do so with an adequate margin of safety (i.e., well within the specified ascent rates).

Conditions C to E

While high partial pressures of oxygen can be poisonous or toxic when breathed by divers, current information indicates that oxygen toxicity is not a hazard if high-oxygen breathing-gas mixtures are used within the limits specified under Conditions C and D above (i.e., at or less than a diving depth of 130 fsw equivalent, with a maximum oxygen partial pressure delivered to the diver of 1.40 ATA). (See, also, References B and C.) Conditions C and D, therefore, limit the maximum fraction of breathable oxygen to 40 percent (40%) by volume when using open-circuit SCUBA, regardless of the diving depth or oxygen partial pressure, and restricts the use of high-oxygen breathing-gas mixtures to diving depths of 130 fsw or a maximum oxygen partial pressure delivered to the diver of 1.40 ATA, whichever is most restrictive.

When employees are breathing oxygen partial pressures between 0.6 and 1.4 ATA in the high-oxygen breathing-gas mixture, Condition E specifies that the employer shall comply with the 24-hour oxygen-exposure limits of the 1991 NOAA Diving Manual or other oxygen-exposure limits that are equivalent to the 1991 NOAA Diving Manual oxygen-exposure limits in terms of protecting divers from oxygen toxicity when they are exposed to partial pressures of oxygen between 0.6 and 1.4 ATA in the high-oxygen breathing-gas mixture. For the purposes of this variance application, the Diving Science and Technology (DSAT) Oxygen Exposure Table provides such protection. When the employer chooses to use oxygen-exposure limits other than the NOAA or DSAT limits, the employer must be able to demonstrate that these oxygen-exposure limits are equivalent to, or better than, the 1991 NOAA Diving Manual with regard to protecting divers from oxygen toxicity when they are exposed to partial pressures of oxygen between 0.6 and 1.4 ATA in the high-oxygen breathing-gas mixture. The provisions of Condition (E), therefore, will ensure that the probability of oxygen-induced central nervous system or pulmonary toxicity is not materially greater than would occur when using open-circuit, compressed-air SCUBA under the no-decompression limits.

A maximum oxygen partial pressure delivered to the diver of 1.40 ATA delivered to the diver is specified under Condition D because this limit is well within the normal oxygen partial-pressure exposure limits adopted by NOAA. Under the NOAA limits, the maximum total exposure duration to oxygen at a partial pressure (delivered to the diver) of 1.40 ATA must not exceed 180 minutes during any 24-hour period. (See Reference B.) Condition E also refers to the oxygen-exposure limits in the DSAT Oxygen Exposure Table. The DSAT Oxygen Exposure Table is more conservative (i.e., more protective of divers) than the 24-hour oxygen limits promulgated by NOAA; for example, at an oxygen partial pressure delivered to the diver of 1.40 ATA, the DSAT Oxygen Exposure Table allows a total exposure of 150 minutes during any 24-hour period, versus 180 minutes permitted under the NOAA limits. (See Reference D.)

Condition E also specifies that the time limits in the DSAT Oxygen Exposure Table be defined in terms of the total time of the dive (i.e., from the time the diver leaves the surface until the diver returns to the surface), which is more protective of divers than if the period is limited to the bottom time of the dive (i.e., from the time the diver leaves the surface until the diver leaves the bottom). The employees covered by this variance application will, therefore, be required to limit the time they spend at the maximum and intermediary depths so they can remain within these time limits; this procedure will reduce their exposure to hyperbaric and hyperoxic conditions, and, consequently, provide them with an added measure of protection from DCS and oxygen toxicity.

The U.S. Navy has reported no cases of central nervous system toxicity, and only two cases of pulmonary toxicity, among Navy divers exposed to oxygen partial pressures of 1.40 ATA. (See Reference E.) The two cases of pulmonary toxicity, however, resulted after the divers had been exposed to the hyperoxic conditions for a total of 55

hours over a 3-day period, far in excess of the maximum time limit that would be used by recreational divers, or permitted under the DSAT Oxygen Exposure Table.

Only a single case of central nervous system toxicity, and no cases of pulmonary toxicity, have been documented among civilian divers exposed to an oxygen partial pressure of 1.40 ATA. (See Reference F.) The single documented case of central nervous system toxicity involved a civilian technical sport diver who took an overdose of pseudoephedrine hydrochloride, a decongestant, prior to exposure to an oxygen partial pressure of 1.40 ATA; the resulting central nervous system seizures may well have been caused by the drug overdose, not oxygen toxicity alone.

The U.S. Navy is considering a maximum oxygen partial pressure limit of 1.30 ATA, apparently in response to the two pulmonary-toxicity cases described in the preceding paragraph. The 1.30–ATA limit is for use on dives in which the diver remains at the maximum depth for extended periods of time; these dives typically require decompression. Application of this limit to Dixie's employees who use high-oxygen breathing-gas mixtures is inappropriate because Dixie's employees will be limited to no-decompression diving. To ensure that the applicant's employees obtain the added protection that results from short-duration dives, Condition J of this variance application permits only no-decompression dives.

Condition F

The mathematical probability of DCS is elevated with increases in diving depth and duration, and if the diver uses breathing-gas mixtures consisting of oxygen at reduced partial pressures and high partial pressures of a diluent gas (especially helium). Consequently, Condition D limits diving to 130 fsw or to a maximum oxygen partial pressure delivered to the diver of 1.40 ATA (whichever condition is most restrictive), while Condition F restricts the inert gas used to obtain the breathing-gas mixture.

Condition G

This condition was adopted to ensure that the oxygen used in the high-oxygen breathing-gas mixture is safe and effective, and appropriate for use under no-decompression diving conditions. To remain safe and effective, the no-decompression limits used in the NOAA no-decompression diving tables (see Condition J below) require that breathing gases be properly mixed to an accuracy of no less than one percent (1%) by volume. Consequently, the high-oxygen breathing-gas mixtures must be compounded using the techniques specified in Condition G.1. In addition, the fraction of oxygen in the high-oxygen breathing-gas mixtures used with open-circuit SCUBA, and the fraction of oxygen in the breathing-gas loop of closed-circuit and semi-closed-circuit SCUBAs, shall be analyzed to an accuracy of one percent (1%) by volume. Analysis of the oxygen fraction shall be accomplished using, at a minimum, one of the oxygen-analysis methods specified by this condition. Also, the manufacturer's instructions shall be used to maintain the reliability of the oxygen-analysis method. If the breathing-gas mixtures are compounded by a commercial supplier, the employer must obtain from the commercial supplier a certification document attesting to the fraction of oxygen, the method used to analyze the oxygen fraction, and the procedures followed to maintain the reliability of the analytic method.

Pure oxygen that is supplied commercially to the employer must be Grade A (aviator's oxygen) or Grade B (industrial/medical oxygen). The employer must obtain from the commercial supplier a certification document attesting that the oxygen is at least 99.5% pure as specified by paragraph 15.3.3. of the 1991 NOAA Diving Manual. The employer must also receive from the commercial supplier certification that, at a minimum, one of the oxygen-analysis methods specified in Condition G.1 was used to analyze the oxygen fraction, and that the manufacturer's instructions were followed to maintain the reliability of the analytic method. Again, these requirements will ensure that only oxygen sufficient to maintain a diver's health and safety will be used by the applicant's employees.

Conditions H and I

These conditions require that oil-less compressors or compressed air filtered to produce oxygen-compatible air be used to obtain the high-oxygen breathing-gas mixtures, and that SCUBA equipment exposed to high-pressure (i.e., exceeding 300 psi) high-oxygen breathing-gas mixtures and/or pure oxygen be rated for oxygen service. These conditions will reduce the chance of fires and explosions by preventing petroleum by-products from serving as an ignition source during mixing procedures involving elevated levels of oxygen.

Conditions J

The variance application requires that the applicant's employees remain within the no-decompression limits specified by decompression tables for single and repetitive air diving developed and published in the 1991 NOAA Diving Manual; the employer may use other decompression tables, formulas, and/or principles for this purpose provided the employer demonstrates that these tables, formulas, and/or principles are equivalent to, or better than, the NOAA decompression tables and formulas. This condition was adopted to achieve an equivalent or lower mathematical probability of DCS when compared to recreational diving instructors covered by paragraph 29 CFR 1910.401(a)(2)(i) of the OSHA's Commercial Diving Operations standard. Consequently, this condition eliminates the need for a decompression chamber at the dive site, provided that the other conditions specified in the variance application are followed.

Condition K

When OSHA adopted the Commercial Diving Operations standard in 1977, divers typically relied on printed diving tables to plan their dives, and no-decompression limits were developed under the assumption that a diver would remain at one planned depth for the duration of the dive (i.e., ''square-wave'' diving). No-decompression limits for a subsequent dive made within 12 hours of a previous dive were determined using special extensions of the decompression tables; these extensions required that tedious and time-consuming calculations be made by hand. Consequently, any errors resulting from these calculations placed the diver at an increased probability of developing DCS.

Underwater dive-decompression computers, which were not widely available in 1977, are now commonly used by recreational divers to perform no-decompression calculations automatically; these calculations are based on diver's previous multi-level diving profiles, inclusive of diving depth and duration. The time remaining for subsequent no-decompression dives (i.e., the adjusted no-decompression limit) is accessible to the diver throughout the dive via the liquid crystal display (LCD) screen on a module that, typically, has been incorporated into an instrument console mounted on the end of the submersible pressure-gauge hose, or worn separately on the diver's wrist. This feature eliminates the need to calculate no-decompression limits manually, and to

remember the depths and durations allowed for subsequent repetitive no-decompression dives. Dive-decompression computers, therefore, provide divers with continuous and instant access to adjusted no-decompression diving limits. This information can be used to plan subsequent repetitive dives by determining the no-decompression time remaining. Dive-decompression computers may also calculate and display, either digitally or graphically, the diver's: vertical ascent rate, which assists them in maintaining safe and controlled ascents to the surface; and breathing-gas consumption rates and oxygen loadings, either for single dives or over 24-hour periods, which aids divers in planning their subsequent diving activities.

After a diver reaches the surface, a dive-decompression computer automatically transfers the data collected during the dive into an electronic log that can be accessed and viewed on the LCD screen, and then entered in the diver's log book. Many dive-decompression computers also store the profile data of a dive (e.g., depths, times) for subsequent downloading to personal computers; once downloaded into a personnel computer, the data can be displayed in a tabular or graphic format, and manipulated for statistical purposes. This feature also enables analysis of precise dive-profile data in the event of a diving accident.

In summary, dive-decompression computers assist divers in decreasing their exposure to excessive ascent rates, oxygen toxicity, and DCS that could result from errors in calculating repetitive no-decompression diving schedules manually. Also, dive-profile information can be stored for subsequent viewing and downloading, thereby preventing errors that may result if the divers fail to record the information, or do so erroneously. Condition K, therefore, permits the applicant's employees to use dive-decompression computers to avoid the calculation and recording errors that could be made in determining adjusted no-decompression diving limits.

To ensure that the decompression schedules calculated by the dive-decompression computers are valid (i.e., conform to NOAA no-decompression air tables or formulas, or other equivalent tables, formulas, and/or principles as the basis of the decompression calculations. In addition, Condition K.2 specifies that these calculations must reliably represent the tables, formulas, and/or principles (i.e., the results determined by the dive-decompression computer for decompression stops, ascent and descent rates, and surface-interval determinations must be the same results that would be obtained using the model, formula and/or principles on which the dive-decompression computer calculations are based).

Conditions K.3 and K.4 have been included to provide backup procedures should the results calculated by the dive-decompression computer be lost or become unavailable for some reason. The information obtained under Condition K.3 can serve to reconstruct the diving schedule used previously by a diver, as well as assess the reliability of dive-decompression computers for dives that involve a diving-related medical emergency. Condition K.4 will provide the diver with immediately-accessible decompression information when such information is not available from the dive-decompression computer.

The provisions of Condition K will ensure that: the decompression procedures calculated by dive-decompression computers are accurate and appropriate to the diving conditions specified in the variance application; the reliability of the dive-decompression computer has been determined; and decompression information is readily accessible if the dive-decompression computer fails, is lost, or is damaged. These provisions, together with the detailed operating instructions provided by the manufacturers of dive-decompression computers, will ensure that dive-decompression computers are used appropriately. Consequently, the dive-decompression computers will improve diver safety by reducing errors made in determining decompression schedules.

Conditions L to N

As noted in the earlier discussion of Conditions C to E, the mathematical probability of DCS resulting from the use of open-circuit, closed-circuit, or semi-closed-circuit SCUBA supplied with high-oxygen breathing-gas mixtures is expected to be lower than the DCS incidence associated with the use of open-circuit, compressed-air SCUBA. Nevertheless, the divers covered by this variance application will receive added protection from DCS by implementing the measures described under Conditions L to N. The procedures specified in Conditions L to N will ensure that decompression chambers and other medical facilities have been identified and are available should a diving-related medical emergency occur at the dive site. Requiring the employer, under these conditions, to plan and prepare for diving-related medical emergencies will provide the divers covered by this variance application with an additional margin of safety compared to divers who experience DCS and other diving-related medical emergencies while using open-circuit, compressed-air SCUBA.

Conditions O and P

Condition O requires the applicant to hire and use only divers who, when they dive under the conditions specified in the variance application, have been certified by a diving training agency that is recognized by the recreational diving industry as possessing the qualifications necessary to effect the conditions specified in the variance application; the divers must also be capable of conducting dives consistent with these conditions. In addition, the employees must perform the functions of recreational diving instructors or diving guides when they dive under the conditions specified in the variance application. Condition O provides general uniformity to the diver qualification and training process, as well as quality control over the certifying agencies.

The applicant states that the requirements of Conditions O and P will ensure that the employees covered by this variance application are trained to perform diving procedures, use diving techniques, and operate diving equipment in a manner that is acknowledged by the recreational diving industry as being safe and effective, and that are consistent with the conditions specified in the variance application.

IV. References

Copies of the following references can be obtained from Ms. Juanita Jones at OSHA's Office of Variance Determination (see **FOR FURTHER INFORMATION CONTACT** above).

A. Richardson, D. (1995). An Assessment of Risk for Recreational Dive Instructors at Work. *Undersea Journal*, 2nd quarter, p. 14.

B. National Oceanic and Atmospheric Administration (1991). *NOAA Diving Manual: Diving for Science and Technology*, Chapter 15. U.S. Government Printing Office, Washington, D.C.

C. Hamilton, R.W. (1996). Justification for Allowing Recreational Divers To Use Oxygen-Enriched Air. Prepared for International PADI (Professional Association of Diving Instructors or ''PADI''), Inc., Santa Ana, California.

D. Diving Science and Technology (1995). Analysis of Proposed Oxygen Exposure Limits for DSAT Oxygen Exposure Table Against Existing

Database of Manned Oxygen Test Dives. *Enriched Air Resource Guide.* PADI, Santa Ana, California.

E. Hornsby, A. (1996). Response to OSHA Draft Variance Application. Cited on p. 2 of a facsimile dated October 11, 1996 to Mr. Bill Ford of Patton Boggs, L.L.P., from PADI, Santa Ana, California.

F. See Reference E, p. 3.

V. Additional Information

Copies of this variance application are available from OSHA's Office of Variance Determination or the Regional and Area Offices listed above under **FOR FURTHER INFORMATION CONTACT,** or through the Labor News Bulletin Board at (202) 219–4748 or OSHA's web page on the Internet at http://www.OSHA.gov.

All interested parties, including the employers and employees, who believe they may be affected by the approval or denial of the variance application are invited to submit written data, views, and arguments relating to this application no later than December 30, 1997.

Under 29 CFR 1905.15, interested parties, including the employers and employees, who believe they may be affected by the grant or denial of this variance may request a hearing on the variance application no later than December 30, 1997. The original and four copies of written comments and requests for a hearing must be addressed to OSHA's Office of Variance Determination; for further information on submitting comments and requests for a hearing, see **ADDRESSES** above.

VI. Issues

In submitting comments on the variance application, OSHA invites the public to submit information (e.g., reports, case histories, statistical analyses, data) and specific comments and rationale on the following issues:

A. Differences between recreational diving instructors and diving guides in the underwater tasks and type of diving they perform, and the relationship of such differences to an increased probability of experiencing diving-related medical problems;

B. In general, the health and safety effectiveness of closed-circuit and semi-closed-circuit SCUBA if used under the conditions specified in the variance application;

C. In general, the health and safety protection afforded by high-oxygen breathing-gas mixtures, if used under the conditions specified in the variance application;

D. The health and safety protection provided to divers using the carbon-dioxide scrubber, sensor, and other control measures described in Conditions A.1 and A.2 of the variance application;

E. The adequacy of the ''bail-out'' provisions specified in Condition A.4 of the variance application;

F. The engineering and maintenance reliability of closed-circuit and semi-closed-circuit SCUBA, including the features specified in Conditions A and B of the variance application;

G. The adequacy of the methods used to obtain and analyze high-oxygen breathing-gas mixtures, especially the semi-permeable-membrane method, described in Condition G of the variance application;

H. The extent to which the conditions specified in the variance application will protect employees who are engaged in repetitive diving, including the use of (1) available decompression tables, formulas, and principles to prevent DCS, and (2) oxygen-exposure limits from the 1991 NOAA Diving Manual, DSAT Table, or other equivalent limits to protect divers from oxygen toxicity; and

I. The provision specified in Condition O of the variance application regarding the use of ''a training agency recognized by the recreational-diving industry'' to certify the applicant's employees.

VII. Authority and Signature

This document was prepared under the direction of Gregory R. Watchman, Acting Assistant Secretary of Labor, U.S. Department of Labor, 200 Constitution Avenue, N.W., Washington, D.C. 20210, pursuant to Section 6(d) of the Occupational Safety and Health Act of 1970 (29 U.S.C. 655); Secretary of Labor's orders 12–71 (36 FR 8754), 8–76 (41 FR 25059), 9–83 (48 FR 35736), 1–90 (55 FR 9033), or 6–96 (62 FR 111), as applicable; and 29 CFR Part 1905.

Signed at Washington, D.C., this 24th day of October 1997.

Gregory R. Watchman,

Acting Assistant Secretary of Labor.

[FR Doc. 97–28930 Filed 10–30–97; 8:45 am]

BILLING CODE 4510–26–M

DEPARTMENT OF LABOR

Occupational Safety and Health Administration

[Docket No. ICR–97–1]

Reports of Injuries to Employees Operating Mechanical Power Presses (§ 1910.217(g); Announcement to OMB Approval of Information Collection Requirements

AGENCY: Occupational Safety and Health Administration, Labor.

ACTION: Notice, Announcement of the OMB Approval of Information Collection Requirements.

SUMMARY: The Occupational Safety and Health Administration is announcing that the collections of information on the reporting of injuries to employees operating mechanical power presses, § 1910.217(g), has been approved by the Office of Management and Budget (OMB) under the Paperwork Reduction Act of 1995. This document announces the OMB approval number and expiration date.

DATES: Effective October 31, 1997.

FOR FURTHER INFORMATION CONTACT: Barbara Bielaski, Directorate of Policy, Occupational Safety and Health Administration, U.S. Department of Labor, Room N–3627, 200 Constitution Avenue, N.W., Washington, DC 20210, telephone (202) 219–8076, ext. 142.

SUPPLEMENTARY INFORMATION: In the **Federal Register** of March 7, 1997 (62 FR 10592), the Agency announced its intent to request renewal of its current OMB approval for 29 CFR 1910.217(g), Reports of Injuries to Employees Operating Mechanical Power Presses. In accordance with the Paperwork Reduction Act of 1995 (44 U.S.C. 3501–3520), OMB has renewed its approval for the information collection and assigned OMB control number 1218–0070. The approval expires on May 31, 2000. Under 5 CFR 1320.5(b), and Agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless the collection displays a valid control number.

Signed at Washington, D.C., this 23rd day of October 1997.

John F. Martonik,

Acting Director, Directorate of Safety Standards Program.

[FR Doc. 97–28775 Filed 10–30–97; 8:45 am]

BILLING CODE 4510–26–M