



DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS
WASHINGTON, D.C. 20314-1000

REPLY TO
ATTENTION OF:

CESO-ZA

9 Sep 2004

MEMORANDUM FOR CENWP-SO

SUBJECT: Waiver Request, Dive Team Manning Levels for Oxygen-Enriched Air (Nitrox) Use, REF: EM 385-1-1 dtd 2003, Appendix O, Table O-5

1. Background: Associated Underwater Services, is performing work for NWP under contract W912EF-04-C-0020, Work on Removable Spillway Weir. This contract was advertised and awarded under the 2003 edition of EM 385-1-1. Appendix O of this manual lists the minimum manning requirements for dive operations based on depth and whether air or "Mixed Gas" is used for a breathing medium. Nitrox is considered by OSHA to be a mixed gas, which includes all breathing mixtures other than air, and the USACE manual follows the same tactic. Table O-5 lists the minimum manning levels for all surface-supplied mixed gas diving as 6 personnel. Table O-3 requires a minimum of 4 personnel for air dives 0-100 feet. Both OSHA and USACE require a recompression chamber for all mixed gas diving. The request is that, for dives as deep as 80 feet, the contractor be allowed to use a 4-member team when diving within the limits of Nitrox no-decompression dive tables, as the degree of safety is relatively the same as air diving.

2. Based on advice from USACE and dive industry personnel and general facts concerning the safety of Nitrox diving, this waiver is granted with the following limitations. These shall be conspicuously stated in the contractor's dive plan/ Activity Hazard Analysis and stringently applied during project operations:

- a. The maximum dive depth allowed using Oxygen-Enriched Air (Nitrox) shall be 80 feet.
- b. Dive times shall be within the limits of nationally accepted no-decompression tables for Nitrox and all other dive restrictions of USACE and OSHA regulations.
- c. As stated in the request, all dive team members shall be trained and qualified in chamber operation.
- d. At all times during dive operations, at least one team member capable of performing "inside chamber" tender duties shall be available and shall have no residual nitrogen load.
- e. In the even the chamber is used, it shall be considered an emergency incident; all diving operations shall cease and the GDA and DDC shall be notified.
- f. The chamber shall be made operational prior to and remain ready during all Nitrox dives.
- g. Divers shall be continuously monitored for oxygen toxicity in addition to other diving injuries/illnesses.

3. The subject variance request is granted for the above-named project activity only. Please contact Karl Anderson at (202) 761-7112 if you have any questions concerning this waiver.

Robert E Stout
ROBERT E. STOUT
Chief, Safety and Occupational
Health Office, HQUSACE