

National Aeronautics and  
Space Administration

**NASA Headquarters**  
Washington, DC 20546-0001



December 15, 2020

Reply to Attn of: **Office of the Chief Health and Medical Officer**  
M-QA-2020-082

Mr. Patrick J. Kapust  
Acting Director, Directorate of Enforcement Programs  
Occupational Safety and Health Administration  
U.S. Department of Labor  
200 Constitution Avenue, NW, Rm 3119  
Washington, DC 20210

Dear Mr. Kapust,

The Occupational Safety and Health Administration (OSHA) regulations (29 CFR 1960.17) allow for agency heads to adopt alternate standards as necessary and appropriate for application to working conditions of agency employees.

The National Aeronautics and Space Administration (NASA) currently operates training and simulation facilities for space operations that routinely involve underwater diving operations. The Neutral Buoyancy Laboratory (NBL) facility is an indoor diving pool located at the Johnson Space Center (JSC) in Houston, Texas. NASA complies with requirements listed in 26 CFR 1910.423, Post-Dive Operations, at this facility and is proposing an alternate standard in the area of post-dive health monitoring. Specifically, we are seeking to reword section 1910.423(b)(2) to allow for an alternate duration of post-dive health monitoring that is tailored to NASA's specific dive operations and medical surveillance capabilities.

The proposed alternate standard provides equivalent or superior protection to the OSHA standard, as intended to be applied at the NBL. The facility's operational constraints (i.e. fixed diving depth) has mitigated the risk of decompression sickness. As a result, the post-dive health monitoring is limited in scope to the control and treatment of arterial gas embolism. At the NBL, a ten-minute observation provides the equivalent protection as the one-hour observation that is necessary in an open water environment. Implementation of an alternate standard will provide greater protection for divers by allowing them to routinely dive on Nitrox rather than air. This will reduce recurrent decompression stress experienced by the divers, along with the resulting long-term health problems that occur from repetitive decompression stress, such as the risk of dysbaric osteonecrosis (bone death). Further details outlining the equivalent level of protection are included in the attached document.

This proposed alternate standard has been developed in cooperation with employees, NASA physicians and safety and health professionals. Multiple town hall events were held to obtain feedback and process improvement. The audience included affected facility staff, operations personnel (contractor and civil servant) and the astronaut corps itself. The American Federation of Government Employee (AFGE) Local #2284 Union and the JSC Safety and Mission Assurance Directorate Control Board (safety and health committee) have both concurred with the proposed alternate standard. A summary of comments that were received through that process is also included with the attached document.

In accordance with preliminary discussions held between OSHA and NASA, and consistent with OSHA Instructions related to 29 CFR 1960.17(b), OSHA will notify NASA within 15 days if they find anything in the NASA Alternate Standard inconsistent with OSHA or any standards. Consequently, it is NASA's intention to officially adopt this standard 30 days after the date of this letter if no comments have been received from OSHA by that time. If after this period, OSHA identifies any issues or concerns, NASA will collaborate with OSHA to resolve them. Upon completion of the OSHA review we look forward to obtaining a letter of concurrence.

If you have questions about this document, please contact Mr. Gerald Piasecki in the Office of Safety and Mission Assurance by phone at (202) 360-7924 or via e-mail at [gerald.f.piasecki@nasa.gov](mailto:gerald.f.piasecki@nasa.gov).

Sincerely,



James D. Polk, DO, MS, MMM, CPE, FACOEP, FAsMA  
Chief Health and Medical Officer, NASA HQ

Enclosure:  
Alternate Diving Standard Supporting Documentation

cc:  
OSHA - Mikki Holmes  
OCHMO - Dr. Vincent J. Michaud  
OCHMO - Dr. Angel L. Plaza  
OSMA - Terrence W. Wilcutt  
OSMA - Grant M. Watson  
OSMA - Gerald F. Piasecki