Australian/New Zealand Standard™

Occupational diving operations

Part 2: Scientific diving

Standards Australia

STANDARDS NEW ZEALAND

This Joint Australian/New Zealand Standard was prepared by Joint Technical Committee SF-017, Occupational Diving. It was approved on behalf of the Council of Standards Australia on 15 March 2002 and on behalf of the Council of Standards New Zealand on 21 March 2002. It was published on 4 April 2002.

The following interests are represented on Committee SF-017:

Australian Council of Trade Unions
Australian Dive Council
Australian Industry Group
Australian Marine Sciences Association
Australian Medical Association
Australian Seafood Industry Council
CSIRO Division of Marine Research
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PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee SF-017, Occupational Diving.

This Standard is Part of a series of Standards for the conduct of occupational diving operations. Diving operations which fall into the scope of this sector-specific Standard may be conducted using either this Standard or AS/NZS 2299.1, *Occupational diving operations* Part 1: *Standard operational practice*.

This Standard is based on a draft prepared by the Australian Marine Sciences Association. An earlier version of the draft was released for comment by Standards Australia Committee MS-053, Scientific Diving, in 1991.

The provision of guidance on delay times between diving and altitude exposure was considered at length during preparation of this Standard. Internationally, there are many different recommendations regarding appropriate limits for altitude exposure following diving and extensive public comment was received which made it clear that previous delay to altitude exposure tables have been interpreted as rules which were excessively restrictive for certain situations. Local and international diving medicine experts were consulted and the Committee agreed to encourage diving operators to obtain specialist advice to assist in working out delay protocols to suit their particular situation prior to the diving operation's commencement. It was also agreed to continue to include one set of guidelines that may be used when an individualized protocol had not been arranged but these guidelines have been moved to an informative appendix to reinforce their status as one consensus recommendation only, rather than the definitive publication on this subject. The values in the guidelines provided in this Standard are generally consistent with other published guidelines. The importance of normal health before travel to altitude has been emphasized in view of the frequency with which altitude associated decompression illness seems to be preceded by at least some pre-travel warning symptoms.

The Committee also sought local and overseas expert opinion concerning on-site compression chamber availability requirements. Public comment requested that the Committee consider the difficulty in applying the risk-based table in the Draft for Comment, which was a minor update of that published in the 1999 edition of AS/NZS 2299.1. Particular difficulties were raised with applying this table to repetitive dives and there were requests for the use of the no-decompression limits in the Canadian Defence and Civil Institute of Environmental Medicine (DCIEM) decompression tables as a versatile, consistent and readily implementable alternative means of determining compression chamber needs. The risk-based table was originally introduced to make requirements for compression chamber support more evidence based. The Committee acknowledged that whilst the previous table was based upon decompression illness risk equivalence, the decompression illness (DCI) risk levels chosen to require chamber availability and the travel times selected were derived from expert opinion rather than hard data. Further, while the data set used as the original table's source is the largest, most analysed set available, the dives that provided the data may not necessarily reflect the types of dives conducted during onshore commercial diving and scientific diving, where multi-level dive profiles are often used. The Committee, therefore, agreed to the request to use DCIEM table limits, which were noted to have received extensive field usage in a range of types of diving.

While investigations indicated DCIEM tables could be used for some dive depths, DCIEM suggested to the Committee that more conservative limits should be set for dive depths up to 12 m. The resultant process published in this Standard for determining the level of compression chamber support required for a diving operation is considered suitable for application to the types of diving covered by both this Standard and by AS/NZS 2299.1. It

is intended to revise the corresponding compression chamber availability requirements in AS/NZS 2299.1:1999 in a similar manner. It should be noted that reliance solely upon dive depth and time for determining compression chamber needs was not supported. Requirements for on-site chamber support of dives involving certain types of work or factors that significantly increased risk of arterial gas embolism or high gas load/rapid progression decompression illness have been included.

Also in early deliberations, the Committee planned to use the competencies for scientific divers set out in Appendix A of this Standard as new text for some Parts of the AS 2815 series on training and certification of occupational divers when it was revised. However, it became apparent that the alignment of competencies and training course contents for the scientific sector of the diving industry and for those who used the AS 2815 series was not achievable in the short term. Regulatory interests registered particular concern over the limited range of training exercises required prior to qualification as a scientific diver. The Australian Diver Accreditation Scheme and The National Association of Occupational Diver Training Establishments (Australia) considered the training was reduced too much from that in the AS 2815 series and a mechanism for quality assurance of certification providers should be included. The Committee intends to continue working towards a time when competency and training details align with new qualifications in a revised AS 2815 series that provides competencies for each form of occupational diving.

The illustrations for the hand signals shown in Appendix C are reproduced with the permission of PADI Asia Pacific Pty Ltd.

The terms ‘normative’ and ‘informative’ have been used in this Standard to define the application of the appendix to which they apply. A ‘normative’ appendix is an integral part of a Standard, whereas an ‘informative’ appendix is only for information and guidance.

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SECTION 1 SCOPE AND GENERAL

1.1 SCOPE

This Standard specifies requirements for occupational underwater diving operations performed at a place of work for the purpose of professional scientific research, natural resource management or scientific research as an educational activity. This Standard applies to diving in water to depths not exceeding 39 m in the case of no-decompression diving and 30 m otherwise, where breathing gas is supplied through either self-contained underwater breathing apparatus (SCUBA) or surface-supplied breathing apparatus (SSBA).

NOTE: Without limiting the scope of this Standard, there may be diving tasks or situations which require a scientific diver to operate under other diving standards.

This Standard includes requirements and recommendations for personnel, procedures and the equipment and breathing medium supply utilized, together with appendices containing the following:

(a) Personal records of divers.

(b) Examples of employer's records of dives.

(c) Contents of a diving operations manual.

(d) Hand signals.

(e) Lifeline signals.

(f) Qualification levels for scientific divers.

1.2 OBJECTIVE

The objective of this Standard is to provide the scientific diving industry with a set of minimum requirements to provide uniformity of practice in relation to the health and safety of those people engaged in occupational underwater operations for the purpose of scientific diving.

1.3 APPLICATION

This Standard applies to persons directly involved in scientific diving operations, organizations employing those persons and industries supplying equipment for use in connection with scientific diving operations. This Standard has been developed for diving activities using air or oxygen-nitrogen mixtures where the oxygen concentration is in the range of 20% to 22%. Although this Standard may be used for guidance for diving activities using oxygen-nitrogen mixtures with higher or lower concentrations, additional training and procedures will be necessary. Similarly, this Standard may be used for guidance for diving activities in liquids other than water and for breathing apparatus such as rebreather units with the appropriate additional training and procedures.