THE UNIVERSITY OF ARIZONA

University of Arizona Scientific Diving Program Manual

For Compliance with 29 CFR 1910, Subpart T, Appendix B

Contents

Preface 3
Acknowledgements 3
Revision History 3
1.0 General Intent 4
1.1 Purpose 4
1.20 Operational Control 5
1.30 Consequences of Violation of Regulations by Divers 7
1.40 Consequences of Violation of Regulations by UArizona 7
1.50 Recordkeeping Requirements 7
2.0 General Diving Procedures 9
2.10 Introduction 9
2.20 Dive Planning 9
2.30 Diving Procedures 11
2.40 Post-Dive Procedures 12
2.50 Flying after Diving or Ascending to Altitude 12
3.0 Diving Equipment 13
3.10 General Policy 13
3.20 Air & Breathing Gas Quality Standards 13
4.0 Program Entry Requirements 14
4.10 Administrative File 14
4.20 Medical Examination or Fitness to Dive Record 14
4.30 Classroom/Theory Evaluation 14
4.40 Practical Evaluation 14
4.50 Waiver of Requirements 15
5.0 Designated Diver Authorizations 16
5.10 Authorization Types 16
5.20 Continuation of Diving Authorization 17

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5.30 Revocation of Authorization 18
6.0 Training and Proficiency 19
6.10 Initial Active Diver Verification 19
6.20 Training for Specific Environments 19
6.30 Training for Specific Dive Modes 21
6.40 Training for Specialized Breathing Media 23
6.50 Development of Training Programs 24
6.60 Proficiency 24
7.0 References 25
8.0 Appendices 26
Appendix A: Dive Planning and Risk Assessments 26
Appendix B: Program Management Checklists 31
Appendix C: Incident Reporting 36
Appendix D: Operations Halt Procedure 37
Appendix E: Snorkeling Policy 39

Preface

The Diving Control Board (DCB) of the University of Arizona (UArizona) maintains this Diving Safety Manual (DSM) as a requirement of the Scientific Exemption to OSHA 29 CFR Subpart T to guide its involvement in and management of occupational diving activities. We refer to the Marine Technology Society (MTS) publication "*Code of Practice for Diving Program Management"* for a detailed description of our motivation in adopting the MTS guidelines as the basis for UArizona's DSM. UArizona's DSM is a tailored implementation of the MTS Code of Practice which enables integrating the most contemporary best practices from and across multiple agencies, organizations, and regulatory authorities (Navy, NOAA, AAUS, USACE, ADCI, etc.) for diving safety. This approach is adaptable to the broad range of activity and technologies that UArizona divers engage with and, at the same time, makes significant progress in addressing limitations and shortcomings present within existing individual regulatory approaches.

Acknowledgements

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Revision History

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02/02/2022	000	DCB Members	Initial Draft Prepared.
10/31/2022	001	DCB Members	Minor revisions and addition of snorkeling appendices.
3/1/2024	002	DCB Members	General revisions, formatting changes, and clarifications of procedure.

1.0 General Intent

1.1 Purpose

The University of Arizona (UArizona) recognizes that *the development and application of diving equipment, technology or related techniques is a scientific field unto itself* ("diving science"). As such, the purpose of this manual is to reinforce the notion that all diving activities associated with the development and application of diving technology and techniques are effectively self-regulated when conforming to scientific exemptions recognized within occupational settings. Of paramount importance and focus is that diving activities are conducted in a manner that maximizes safety for the divers, mitigates risks for the host organization, and allows a working reciprocity between diving communities engaged in diving science activities.

This manual serves as a framework for the UArizona DCB and its divers to address safety, diving project management, risk mitigation, liability, regulatory issues, training, and proficiency when technology and scientific techniques are central to a given diving project.

As diving science progresses, so shall the effort to maintain this manual. The UArizona assumes a responsibility to review and update this manual to meet or exceed state of the art, safe practices of its diving community.

Scientific Diving Exemption

In 1982, OSHA exempted scientific diving from commercial diving regulations (29CFR1910, Subpart T) under conditions outlined below. The final guidelines for the exemption became effective in 1985 (Federal Register, Vol. 50, No.6, p.1046).

Scientific Diving is defined as:

"Diving performed solely as a necessary part of a scientific, research, or educational activity by employees whose sole purpose for diving is to perform scientific research tasks." (29 CFR 1910.402)

Exemption Requirements

OSHA has granted this exemption for scientific diving from commercial diving regulations under Appendix B to 29 CFR 1910 Subpart T, which reads as follows:

This appendix contains guidelines that will be used in conjunction with 1910.401(a)(2)(iv) to determine those scientific diving programs which are exempt from the requirements for commercial diving. The guidelines are as follows:

The Diving Control Board consists of a majority of active scientific divers and has autonomous and absolute authority over the scientific diving program's operations.

The purpose of the project using scientific diving is the advancement of science; therefore, information and data resulting from the project are non-proprietary.

The tasks of a scientific diver are those of an observer and data gatherer. Construction and trouble-shooting tasks traditionally associated with commercial diving are not included within scientific diving.

Scientific divers, based on the nature of their activities, must use scientific expertise in studying the underwater environment and, therefore, are scientists or scientists in training.

Further, the two elements that a scientific diving program must contain are:

1910.401(a)(2)(iv)(A)

Diving safety manual which includes at a minimum: Procedures covering all diving operations specific to the program; procedures for emergency care, including recompression and evacuation; and criteria for diver training and certification.

1910.401(a)(2)(iv)(B)

Diving control (safety) board, with the majority of its members being active divers, which shall at a minimum have the authority to: Approve and monitor diving projects; review and revise the diving safety manual; assure compliance with the manual; certify the depths to which a diver has been trained; take disciplinary action for unsafe practices; and, assure adherence to the buddy system (a diver is accompanied by and is in continuous contact with another diver in the water) for SCUBA diving.

Utility & Applicability

This manual is applicable to all UArizona diving operations related to the development and application of diving equipment or technology, or the application of scientific techniques for occupational purposes.

Review of Guidelines

As part of the approval of the DCB annual report, any recommendations for modification to this manual will be voted upon by the DCB.

1.20 Operational Control

Host Entity

All diving projects that UArizona divers engage in will have a designated Host Entity. This may be UArizona or a collaborative entity.

The Host Entity is defined as the individual, company, institution, or other organizer of the diving science project or program who(m) is connected to the work because of ownership of any equipment used, locations selected, or relationship with the individual(s) concerned.

For the purposes of this manual, a Host Entity of any diving science project or program shall be designated as having operational control over the diving operation. The Host Entity is ultimately responsible for the lawful conduct of the project or program and for meeting any regulatory standards required for its operation that exceed the scope of this Manual. This responsibility includes all actions and cases involving the operations of the Host Entity's employees, volunteers, affiliates, or subsidiary programs where such persons are acting within the scope of their employment or other-directed assignments. This responsibility also includes the operations of other persons who are engaged collaboratively, cooperatively, or contractually in a diving science project with or for the Host Entity. This broadly encompassing operational control

ensures regulatory compliance by employees and ensures that those working with employees have been reasonably vetted to the extent that they may impact the assigned activity of an employee.

Diving Control Board

UArizona has established a DCB for program governance which shall always consist of a majority of active divers. The DCB was organized according to its Charter signed by Betsy Cantwell, Senior Vice President for Research and Innovation, on May 18, 2022.

The DCB has absolute and autonomous authority over the UArizona scientific diving program, which encompasses both scientific diving and scientific snorkeling (Appendix E). When a diving project or program requires safety expertise outside of the DCB's expertise, the DCB and/or DSO will seek consultation with subject matter expert(s). If a project requires outside expertise regarding technical aspects, the project lead will be responsible for acquiring this consultation (including all related costs associated with outside consultation), as the DCB's focus will remain on reinforcing fundamental safe practices.

When two or more organizations are engaged in a collaborative research program, one organization will assume the primary responsibilities of the Host Entity (as above). When UArizona is the host, all participating divers are subject to review and approval according to this manual. When UArizona is not the host, the UArizona DCB retains its authority over UArizona affiliated divers to guide their participation and will work cooperatively with the host's DCB to address concerns over reciprocal privileges.

Diving Safety Officer

The DCB will appoint a Diving Safety Officer (DSO) which serves as a member of the DCB and is responsible for the safe conduct and implementation of the diving safety program.

The DSO shall possess formal leadership training, diving credentials, or demonstrable experience in leading, organizing, and managing diving operations within their community. The DSO must *also* have broad knowledge and experience that encompasses the nature of the diving science taking place under their purview. When projects require practical expertise beyond the DSO's knowledge, the DCB will ensure that the DSO has appropriate subject matter consultation or advising.

The DSO may permit portions of this program, such as dive safety oversight for remote field teams over a specified finite duration, to be carried out by a qualified delegate, such as the Lead Diver. However, the DSO may not delegate full accountability for the overall safe conduct and operations of the local diving program (diving occurring on UArizona's Main Campus). The DCB shall direct the DSO in the performance of required duties, but day to day operational responsibility for the conduct of the local diving program will be retained by the DSO.

Instructional Personnel

All personnel involved in delivering diving instruction to UArizona divers under the direction of the DCB shall be qualified for the type of instruction being given. Instructional personnel must be approved by the DCB.

Lead Diver

For each dive, one individual shall be designated as the Lead Diver who shall be present at the dive location during the entire diving operation. This Lead Diver is responsible for coordination with other known activities in the vicinity that are likely to impact the safety of diving operations, executing dives according to the pre-determined plan, briefing divers on the pre-determined plan prior to diving, and managing the dive operation for maximum safety and efficiency (including equipment operability, reporting incidents, and suspending operations if needed).

1.30 Consequences of Violation of Regulations by Divers

Failure to comply with this Diving Safety Manual and/or direction of the DSO may be cause for the revocation or restriction of the individual diver's authorization to dive. This determination will be made by the DCB.

1.40 Consequences of Violation of Regulations by UArizona

UArizona recognizes that failure to comply with this manual may be cause for the revocation or restriction of UArizona's recognition by other organizations, and possibly jeopardize recognition as meeting the OSHA Scientific Diving Exemption.

1.50 Recordkeeping Requirements

All personnel engaged in each project or program shall have a file on record with the DCB. The file shall include diver qualifications, dive record/log sheets, fitness to dive records, reports of disciplinary actions, and other pertinent information deemed necessary.

Health & Safety Plans (HASPs), Dive plans, Activity Hazard Analyses (AHAs), equipment service records, and any other related documents supporting the work shall also be kept on record with the DCB.

The DSO is responsible for actively maintaining these program files.

Diver File

Each diver is required to maintain a current (maintained in accordance with specific document/certification requirements) administrative file with the DSO. This includes training records, dive logs, medical or fitness to dive records, and other documents to support their experience and verify competency. This information will expedite dive authorizations and reciprocal privileges.

The DSO will furnish the forms necessary to establish this file (Section 4.10) and notify divers when items need to be refreshed.

Personal Diving Log

UArizona divers must log every dive made under the control of UA, and are additionally encouraged to log all other dives completed outside of UA. Dives completed outside of

UArizona are not included in any statistics gathering by UArizona and are only used as a relative measure to gauge activity that speaks to proficiency. Divers shall update their dive logs following each dive project.

The DSO will collate all divers' logs annually to summarize in an annual report to the Dive Safety Committee and will form the basis of any statistics submissions to required regulatory agencies.

A dive log template is attached to this manual.

Equipment Service Records

Maintenance of all diving equipment owned or operated by UA, and/or used by project divers shall be recorded. The DSO shall verify that equipment used by participating individual divers has been maintained according to industry best practices and manufacturer recommendations.

Appropriate records may include a receipt of equipment service or other record from the service center and may be further supported by a standing letter from a local dive shop that is regularly used for rentals. Compressors or other UArizona dive related infrastructure shall be maintained according to manufacturer's recommendations and accompanied by a tag or service record such that end-users can verify its service status.

Required Incident Reporting

All diving incidents must be reported. Incidents refer to injuries and property damage of any severity level, as well as any event that includes a deviation from regulation or approved plans. Reporting requirements differ depending on the type and severity of incident, detailed in Appendix C. Annual Report

The DSO, in cooperation with RLSS, will prepare an annual report to present to the DCB summarizing the UA's activity for the year. This report should include but is not limited to diving statistics, training conducted, field programs administered, summaries of incidents, and programmatic recommendations to the DCB.

There is no set format for this report, however, report preparers are encouraged to build upon prior reports to ensure consistency in the material presented.

2.0 General Diving Procedures

2.10 Introduction

No person shall engage in diving science operations under the control of UArizona unless they are operating to the provisions of this diving safety manual.

2.20 Dive Planning

The dive planning process shall include an analysis of the required tasks and their associated hazards to determine the appropriate equipment (technology) required, and further determine the required qualifications and personnel to perform the tasks. This information shall be collated in the form of a Health & Safety Plan (HASP). For routine and recurring activity over time, for instance recurring activity at Biosphere 2 (B2), a master HASP may be established to form the basis of the routine activity. The DSO should be involved as early as possible to allow assistance and expertise in the creation of the HASP.

Task Determination

The task to be conducted during the dive and the nature of the work environment must be clearly defined since the nature of the task within a given environment substantially influences the selection of the most appropriate mode of diving to be employed. Diving modes should be determined to meet best practices for the given task, and this determination shall be made while considering best practices across all diving communities that operate within the given environment or utilize the given diving mode. Diving mode selection must be delineated in the HASP as it impacts all aspects of the dive and project planning.

Equipment Selection

Equipment shall be selected to appropriately employ the defined mode of diving required for the task. Equipment selection should reflect consideration of best practices across communities that operate within the given environment or utilize the given diving mode.

Personnel Determination

When conventional open-circuit SCUBA is utilized, the ‘buddy’ system will be enforced as it is designed to provide mutual assistance, especially in the case of an emergency. A dive buddy refers to an individual within immediate proximity for rendering mutual assistance.

Under unique circumstances, diving with a buddy may present undue risk to the success of an operation; further, many modes of diving by their very nature do not include in-water partners such as hookah or surface supplied diving.

Personnel levels (number of divers required) will be determined as most appropriate for the mode employed, and as consistent with community best practices and/or regulations. Deviations from established best practices shall be supported with adequate evidence or references and approval by the DCB prior to implementation. Specific procedural changes due to deviations from best practice are a necessary element of any project plan and pre-dive brief by the Lead Diver or Dive Supervisor to the diving team.

Activity Hazard Analyses (AHA)

When a given technology or technique, human interaction with a technology platform, or operation within a specific environment subjects the diver or dive team to risks outside of those conventionally recognized during routine operations, a risk assessment will be conducted in the form of an Activity Hazard Analysis (AHA). The AHA will present actions to be taken to lower the assessed risk, and these actions shall be incorporated into the HASP. A guide to developing AHA's is presented in Appendix A.

Emergency Procedures

The DSO in cooperation with the Lead Diver will develop emergency procedures which follow the standards of care of the community and must include best practices and procedures for emergency care, recompression, and evacuation for each dive location. This may require coordination with a local point of contact or local EMS service. Emergency procedures specific to the project or program shall be addressed in the HASP.

The individual leading the dive project and/or daily dive activity, typically the DSO or a Lead Diver, will review the HASP and specific emergency procedures with the dive team prior to commending the underwater work.

Written Health and Safety Plans (HASPs)

All diving projects require preparation of a written Health & Safety Plan (HASP) before field activities start to ensure that the activity is consistent with this manual, other applicable regulations, and that associated risks of the required task have been well evaluated. This HASP is typically prepared by the Lead Diver in concert with the DSO and serves as the master document for managing the diving operation.

A HASP template form is provided in Appendix A. This should be completed and submitted to the DSO for preliminary screening, and then to the DCB for final review and approval. Should a dive plan be rejected by the DCB, specific comments will be provided to inform possible re-submission. The Lead Diver may seek guidance from the DSO to appeal the decision in writing to the DCB. The mutual goal of the Lead Diver, DSO, and DCB should be to work together to address deficiencies in the plan and facilitate safe operations and success in achieving research aims.

Field Dive Plans

Before conducting any diving operations, the Lead Diver will prepare and brief the dive team on the daily/imminent dive plan. This plan will review the HASP, and will then focus on the immediate activity, as follows:

Transit to any locations (by small vessel for example)

Estimated depth(s) and bottom time(s) anticipated.

Specific tasks to be completed.

Decompression status and repetitive dive plans, if required.

Diver recall signal and emergency procedures.

Field dive plans may be verbal, or come in the form of a sign in/out sheet or board depending on the nature of the dive activity. The specific format of the field dive plan will be described within the HASP, and if using a written procedure or worksheet, attached to the HASP for ease of use by the field team.

2.30 Diving Procedures

All diving shall take place in accordance with the approved HASP and be consistent with the daily dive plans. If divers decide to change the approved plan in regard to scope of work, personnel, or dive modes, they must halt work and seek DCB approval. Minor day to day procedural responses to condition changes (that do not impact scope of work, personnel or dive modes, e.g., depth, tools utilized, no-decompression limits) may be permitted when local authority is delegated to the Lead Diver. For example, such a minor change to a dive plan may include diving from shore instead of a boat (or vice versa) due to a change in weather or site conditions. All changes to the procedure shall continue to prioritize safety while efficiently completing the required tasks.

Pre-dive checks

Pre-dive safety checks of the environment, operational footprint, and equipment are the primary responsibility of each diver and should be reviewed in concert with the Lead Diver.

Refusal to Dive

It is the diver’s responsibility and duty to refuse to dive if, in their judgment, conditions are unfavorable, or if they would be violating the precepts of their training or this manual. No dive team member shall be required to dive against their will. No dive team member shall be required or permitted to dive for the duration of any known condition that is likely to adversely affect the safety and health of the diver or other dive members.

Termination of the Dive

It is the responsibility of the diver to terminate the dive without fear of penalty whenever they feel it is unsafe to continue the dive. The Lead Diver may abort the dive and recall divers at any time and such decision shall not be disputed by the diver.

Emergencies and Deviations from Regulations and this Manual

Any diver may deviate from these guidelines or dive plans to the extent necessary to prevent or minimize a situation that is likely to cause death, serious physical harm, or major environmental damage. If such a situation occurs, the Lead Diver must notify the DSO immediately and complete reporting requirements as described in Appendix C.

2.40 Post-Dive Procedures

After the completion of a dive, each diver shall report any physical problems, symptoms of decompression sickness, or equipment malfunctions to the Lead Diver. The Lead Diver shall report these issues or concerns to the DSO according to adopted procedure.

The Lead Diver shall conduct a debrief of the dive for the divers.

Equipment shall be broken down and post-dive maintenance performed accordingly, and all required record-keeping and data transcription completed.

2.50 Flying after Diving or Ascending to Altitude

Changes in altitude 24 hours before or after diving must be addressed in the HASP.

UArizona recognizes that diving at Biosphere 2 is at altitude and therefore altitude diving procedures will be identified within each HASP for B2 operations.

3.0 Diving Equipment

3.10 General Policy

Equipment shall be selected according to most appropriate mode and configuration to accomplish the task at hand. This decision may be impacted by training, practical experience, and community best practices, however under no circumstance will an inappropriate mode of diving or equipment selection be accepted by the DCB.

Equipment to be employed will be referenced in the HASP and as such is subject to review and approval by the DCB. All equipment shall be regularly examined by the end user, dive team and Lead Diver, and maintained according to manufacturers or DCB's recommendations and procedures. Equipment that is subjected to extreme usage under adverse conditions may require more frequent testing and maintenance.

When new technology or related techniques are employed, decisions to implement will be guided by both activity and equipment hazards analyses to navigate program implementation.

3.20 Air & Breathing Gas Quality Standards

Breathing air shall meet the CGA Grade E specification (or equivalent) as set forth by the Compressed Gas Association (CGA Pamphlet G-7.1). Breathing air produced by UArizona owned or operated compressors will be tested every 6 months to ensure the Grade E specification is met. This certificate will be posted at the compressor station, with a copy maintained by the DCB/DSO files.

Other gases used for diving shall be verified according to community best practice.

4.0 Program Entry Requirements

This section describes the process for a diver to engage in an occupational diving science activity at UA.

4.10 Administrative File

The applicant diver must establish an administrative file with the DSO which constitutes application to engage in the diving program. Many items are verification of qualifications that may lapse over time; as such this file must be maintained, with the onus for maintenance resting with the diver.

In addition to keeping up requisite forms, current copies of the following must be maintained as a portion of a record of training and proficiency:

Appropriate dive certification(s), records of training, and experience verifications

- Diver Medical Examination or appropriate Fitness to Dive Record
- First aid & CPR certification
- O2 administration certification
- DAN insurance or equivalent dive accident medical coverage
- Proof of dive equipment servicing to manufacturer recommendations

4.20 Medical Examination or Fitness to Dive Record

All divers are required to have a current medical authorization for diving which declares the individual to be fit to engage in the proposed diving activities.

UArizona recognizes the work and recommendations of the Undersea & Hyperbaric Medical Society (UHMS) and defer to their diving medical statement form for routine activities. The UHMS form is attached to this manual. Divers must complete and submit this form annually.

4.30 Classroom/Theory Evaluation

Before authorization to dive, the applicant must demonstrate to the DSO possession of sufficient knowledge of diving theory relevant to the project or operation. The format of this theory demonstration may be determined by the DCB – DCB should consider accepting norms from past training when ongoing proficiency has been maintained.

4.40 Practical Evaluation

Before final authorization to dive, the applicant must demonstrate to the DSO that they possess sufficient skill and proficiency in the field to participate in the project or program. The nature of the practical evaluations should be guided by the DCB, and while considering the nature of the local diving operation. The format of this practical evaluation may be determined by the DCB. A checklist/guide is provided in Appendix B.

4.50 Waiver of Requirements

The DSO may grant a waiver for specific requirements of training, examinations, and minimum activity to maintain an authorization to dive after careful review of these requirements and a consensus agreement by the DCB while considering the experience history and proficiency of the applicant. Such waivers will be considered on a case-by-case basis.

5.0 Designated Diver Authorizations

No person shall engage in the organized diving project unless that person is authorized by the DSO. Only a person diving under the control of the DCB is eligible for a diving authorization for the DCB. Authorization to dive may be granted with distinctions and restrictions.

5.10 Authorization Types

Authorization types do not necessarily represent a general pathway of inexperience towards experience, rather, they are specific to the given scope of a particular dive project. For example, a novice diver may be designated as a Diver in Training for relatively routine shallow water tasks. They may then progress towards proficiency, eventually becoming authorized as an Active Diver, then Lead Diver for work within this scope. If this Lead Diver seeks to participate in a highly technical project that is outside of their current training or proficiency, their Lead Diver status does not automatically transfer. Rather, they may be designated as a Diver in Training for the new technical program. In short, the following authorization types are specific to a particular project or program and will be designated by the DSO on a per-project basis.

Diver In Training

This designation signifies that a diver applicant is in the process of completing program entry requirements defined in Section 4.0 and authorizes the diver to participate in a project under the direction of a Lead Diver, and within practical limitations defined by the DSO. A diver-in-training is effectively undergoing on the job training through mentorship with senior personnel.

Active Diver

This designation represents authorization to engage in diving according to an approved dive plan while working in concert with another active diver(s) or Lead Diver. This qualification requires meeting all program entry requirements, and demonstration of any additional training and proficiency required to meet mission objectives. Demonstration may include both documentation of training and a check-out dive, performed by the DSO or a DSO-designee.

Lead Diver or Dive Supervisor

This designation authorizes the individual to lead and/or supervise dive events and operations on behalf of the DSO. Documented leadership experience in the given environment, or while conducting the designated task is required; and formal dive leadership training is recommended. The Lead Diver must demonstrate sound judgment and the ability to responsibly manage a dive operation to the DSO.

Inactive Diver

This designation will be assigned to a diver that has previously been assigned diver in training, active, or lead diver status in the instance that they have not maintained requirements or proficiency, per Sections 4 and 6.60, respectively. Previous status may be regained by

submitting new certifications or working to meet proficiency requirements. Depending on the length of inactivity, the diver may be required to perform a checkout dive with the DSO or DSO designee.

Temporary Diver Permit

This permit constitutes a waiver of the partial requirements and is limited to only specific, necessary circumstances (e.g., photographer or videographer). The DSO may issue this permit and is required to inform the DCB once they are convinced that the person in question has demonstrated proficiency in diving and can contribute measurably to a planned dive. The permit is valid only for a limited time that must be specified in writing by the DSO. This permit is not to be construed as a mechanism to circumvent any requirements for dive authorization. Temporary permits shall be restricted to the planned diving operation and shall comply with all other policies, regulations, and standards of this standard, including medical requirements.

Reciprocity and Verification of Qualifications

If a UArizona diver is planning to dive with another institution (Host Entity), they must alert the UArizona DCB. The DSO may then provide a written 'Verification of Qualifications' to the Host Entity on behalf of the UArizona diver. The Verification of Qualifications form (attached to this manual) provides a concise summary of the UArizona diver's background to expedite review and acceptance for the external project. The Verification of Qualifications does not guarantee approval to dive for the receiving Host Entity – rather, it is a mechanism to exchange pertinent information and guide DSO decision making towards acceptance.

If a visiting diver with a home institution is planning to dive on a UA-sponsored project, they must provide documentation that (1) their home institution has approved them as an active diver with credentials meeting the scope of work within the UArizona DCB approved dive plan, and (2) documentation that their home institution is aware of their diving with UA. This documentation may come in the form of a Verification of Qualification letter or 'Letter of Reciprocity', provided in response to a dive plan exchange from DSO to DSO. The UArizona DSO is responsible for reviewing and accepting the visiting diver's credentials as sufficient for conducting the work described in the Dive Plan for the UArizona-sponsored project. If a diver does not have a home institution, then they may follow UArizona procedures for internal diver approval.

These procedures ensure reciprocity between institutions and facilitate cooperation among and between diving science projects or programs.

5.20 Continuation of Diving Authorization

During any 12-month period, each authorized diver must maintain their administrative file, including keeping up to date all qualifications that may expire. A minimum level of activity to

maintain diving proficiency of 12 dives per year is required. Failure to meet these requirements may be cause for revocation or restriction of authorization.

5.30 Revocation of Authorization

If the DCB, DSO, or another UArizona compliance unit identifies a non-compliance issue (according to this Dive Manual and/or 29 CFR 1910 Subpart T) by an individual diver or diving group, revocation of authorization will occur as outlined in Appendix D. The DCB will inform the diver or diving group within 10 days of the identification of the non-compliance issue via a “Tier One Memorandum.” The memorandum will indicate a timeframe for implementing corrective action. The noncompliant diver and/or diving group must respond within 15 days with plans to take corrective action. Once non-compliance has been adequately corrected, the DCB will verify and issue a “Resolution Memorandum.” If no response is received, the DCB may issue a “Tier Two Memorandum,” in which the operations of the diver/diving group will be halted.

If a diver’s authorization expires solely due to diving inactivity or training expiration, this official revocation of authorization process does not apply. Rather, the DSO will notify the diver that their authorization status has been changed to Inactive and provide the appropriate steps that the diver must take to regain their previous authorization.

6.0 Training and Proficiency

When reviewing diver qualifications and requests to dive, past training and ongoing proficiency from the diver's history should be considered and given merit towards the diver's UArizona credentials.

Dive training in all communities and at all skill levels benefits immeasurably through mentorship; as such, upon program entry divers who are novice or new at any given skill level or for a given mode can participate in projects for educational purposes under supervision to the extent they will measurably contribute to the project objectives without placing undue risk on the project's divers. This on-the-job training is critical to promote ongoing training and proficiency within an occupational diving regimen.

6.10 Initial Active Diver Verification

One-hundred hours is widely recognized as a minimum experience benchmark for scientific diving qualification, aligns well with introductions to other occupational diving training regimens, and as such is presented in this manual as an example trajectory towards becoming authorized as an 'active diver'. These 100 hours include the effort to meet program entry requirements – administrative, theoretical aspects, and practical dive training, as well as on the job training. A minimum of 40 hours of on-the-job training and 12 proficiency dives under the mentorship of a Lead Diver/DSO affords the opportunity for an entry level diver to demonstrate competency with the given diving mode towards being authorized as an active diver for comparable projects in the future.

Thereafter, an active diver assisting entry level divers through a 100-hour cycle and demonstrating leadership capabilities may then be designated as a Lead Diver for comparable dive tasks.

This progressive and recurring verification of training and experience can initially be undertaken as a dedicated course of study (such as a semester academic course program), or may be verified through the culmination of multiple independent training programs or experience at the discretion of the DCB.

Note however that this 100-hour regimen does not only apply to novice divers seeking to enter an occupational diving program. This structure also serves as a model pathway for formal training and mentorship through advanced skill sets and for specific technology and techniques.

6.20 Training for Specific Environments

A diver working under UArizona auspices may only work within the depths and environments for which they have adequate training and proficiency. Authorization for a given depth or environment should be granted only upon approval of a dive plan that accounts for management of recognized risks. Formal training for specific environments will be carried out by DCB-approved Instructional Personnel and to recognized community best practices or standards that

best meet the requirements of the diving operation. After completion of training, the diver must demonstrate to the DCB a degree of proficiency and sound judgment to perform work within the scope of the newly acquired skills and capabilities.

The following specific environments are broadly considered and warrant distinct considerations for authorizations to dive. A dive environment may fit one or more of these descriptions.

Confined water diving
Confined water diving is considered any dive within a pool, test tank, or similar controlled environment in which multiple modes of diving are relevant depending on the nature of the task. Confined water diving is commonly considered as a starting point for all diver training, often preceding Openwater diving, though occupational tasks and task rehearsals/mock-ups are also conducted in confined water.

Openwater diving
Openwater diving is considered any dive within the ocean or various freshwater bodies in which multiple modes of diving are relevant depending on the depth and nature of the task. Openwater diving is commonly considered as a starting point for all diver training, when following confined water training.

Deep Diving
Deep diving is considered any dive depth from which the diver cannot perform an emergency swimming ascent comfortably and with confidence which indicates redundant life support measures must be in place.

Cave and Cavern Diving
Cave and cavern diving is considered any dive where a diver enters a natural underground formation that is submerged or partially submerged and which prohibits a direct and immediate ascent to the point of entry. Caverns differ from caves in that sunlight is readily visible which help direct divers to the point of entry/exit.

Blue or Black Water Diving
Blue water diving is defined as diving in mid-water where the bottom is not within sight. Similarly, black water is this same environment, though at night.

Ice and Polar Diving
Ice diving is defined as diving through or beneath ice which may prohibit a direct and immediate ascent to the point of entry, and where special consideration must be given to diver thermal management.

Aquarium Diving
Aquarium, mesocosm, or exhibit diving presents unique circumstances including but not limited to close quarters, shallow water, close proximity to aquatic life, structural entanglements, in takes and other flow conditions which require specialized training and procedures.

Offshore Industrial Diving
Offshore Industrial diving is defined as diving in, around, or near offshore infrastructure such as but not limited to pipelines, cable installations, oil or gas infrastructure, or other industrial structures.

Inshore Industrial Diving
Inshore Industrial diving is defined as diving in, around, or near inshore infrastructure such as but not limited to ports, harbors, marinas, or other industrial facilities with submerged infrastructure such as hydro facilities, aqueducts, wastewater facilities, or similar.

Overhead Environments & Confined Spaces
Overhead and confined space environments present unique operational hazards that may vary considerably from cave and cavern diving, but often require similar redundancies for controlled intervention.

Contaminated Water Diving
Contaminated water presents unique operational hazards that occur from the exposure to bacteria, viruses, nuclear or radioactive waste, construction slurries, sewerage, fuel, oil, or other fluid mediums that require significant efforts to shield the diver from the hazardous environmental exposure.

Potable Water Diving
Potable water presents unique operational circumstances that require mitigating contamination of the environment and as such the diver and all equipment must undergo a cleaning or decontamination procedure prior to entry. The diving at times requires entry into a confined space such as tunnel, shaft, pipe, or storage tank.

6.30 Training for Specific Dive Modes
A diver working under UArizona auspices may only use specific dive modes for which they have adequate training and proficiency. Authorization for a given diving mode should be granted only upon approval of a dive plan that accounts for management of recognized risks. Formal training for specific dive modes will be carried out by DCB-approved Instructional Personnel and to recognized community best practices or standards that best meet the requirements of the diving operation. After completion of training, the diver must demonstrate to the DCB a degree of

proficiency and sound judgment to perform work within the scope of the newly acquired skills and capabilities.

The following specific dive modes warrant individual consideration.

Open Circuit SCUBA
Open Circuit Self-Contained Breathing Apparatus (SCUBA) is widely accepted as the most common mode of diving and is often the point of entry for occupational diving training in both commercial and science sectors. It is commonly used throughout many diving communities.

Rebreather Diving
Rebreather diving involves specialized equipment that recycles the diver's breathing media to provide a variety of physical and physiological benefits. Rebreather diving includes oxygen only rebreather systems, semi-closed-circuit rebreathers, and fully closed-circuit rebreathers. Rebreathers may be self-contained or included as a component of a tethered system.

Surface Supplied Diving
Surface Supplied diving involves where the breathing gas is supplied from the surface by means of a pressurized umbilical hose. The umbilical generally consists of a gas supply hose, strength member, pneumofathometer hose, and communication line. The umbilical supplies a helmet or full-face mask. The diver is typically dependent on a surface-based dive team, i.e., topside, which varies in size and composition based on community best practices.

Hookah Diving
While similar to Surface Supplied diving in that the breathing gas is supplied from the surface by means of a pressurized hose, the supply hose often does not require a strength member, pneumofathometer hose, or communication line. Hookah equipment may be as simple as a long hose attached to a standard SCUBA cylinder supplying a standard SCUBA second stage. The diver is responsible for self-monitoring depth, time, diving profile, and assumes responsibility for tether management.

Staged Decompression Diving
Decompression diving shall be defined as any diving during which the diver cannot perform a direct return to the surface without performing a mandatory decompression stop to allow the release of inert gas from the diver's body.

Saturation Diving
Saturation diving involves the diver saturating their tissues with inert gas at a given depth and thereafter often residing at that depth or pressure until the mission is carried out. Typically, lengthy decompression in a controlled environment follows.

Atmospheric Diving

Atmospheric Diving involves utilizing a personal submersible, hard suit, or other one-atmosphere enclosure to protect the human from the effects of ambient pressure greater than one atmosphere. The diver [pilot] is individually responsible for their well-being during the dive. By contrast, a passenger submarine would be considered a manned undersea vehicle (MUV), and as such not considered categorically to be atmospheric diving.

Diving with ROVs or other subsea robotics

Personnel diving in concert with or augmented by ROVs, or other subsea robotics including autonomous vehicles, presents unique operating hazards, which may vary depending on the mode of diving utilized. This includes diving in proximity to a robotic system in place for observation only, and/or diving while interacting with the robotic system.

Other Diving Technology

Certain other types of diving technology that impact the safety or well-being of the diver may require training and/or specialized operational procedures. Broadly accepted community best practices will be reviewed and adopted for the given project.

6.40 Training for Specialized Breathing Media

A diver working under UArizona auspices may only use breathing media for which they have adequate training and proficiency. Authorization for a given breathing media should be granted only upon approval of a dive plan that accounts for management of recognized risks. Formal training for specialized breathing media will be carried out by DCB-approved Instructional Personnel and to recognized community best practices or standards that best meet the requirements of the diving operation. After completion of training, the diver must demonstrate to the DCB a degree of proficiency and sound judgment to perform work within the scope of the newly acquired skills and capabilities.

The following breathing media are considered ‘specialized’ and warrant consideration beyond very routine air diving operations by way of their handling, dive operational considerations, and their physiological impacts on the diver.

Nitrox Diving

Nitrox is defined for these guidelines as breathing mixtures composed predominately of nitrogen and oxygen, where the oxygen fraction is elevated and is most commonly produced by the addition of oxygen or the removal of nitrogen from air.

Mixed Gas Diving

Mixed gas diving is defined as dives done while breathing gas mixes containing proportions greater than 1% by volume of an inert gas other than nitrogen. Heliox and trimix are two examples of those breathing media considered mixed-gases.

Pure Oxygen

Pure oxygen, typically accepted as 98% or greater by volume, is used in multiple ways including but not limited to accelerating decompression, first aid administration, and within closed-circuit breathing devices.

6.50 Development of Training Programs

When a required course of training is needed to prepare divers for a novel environment, specialized breathing media, or new diving technology or diving mode and there are no such well-established courses of training within a respective expert community that can be readily adopted, or such an existing course requires adaptation to best fit the application, a training program may be developed by UArizona which may in part involve on-the-job training when appropriate. When the training involves the use of new diving technology, the inventor or manufacturer of the technology or product should be consulted to develop an appropriate training regimen. If the manufacturer does not or cannot provide direction on training practices, UArizona may develop a training regimen, should engage subject matter expert consultation, and should seek counsel on any associated liabilities. Developed courses should be backed up by technical reference to applicable existing standards or community best practices.

This manual proposes that developed courses are organized to the outline in the attached document, “Training Development Template.”

6.60 Proficiency

All occupational divers must attain and maintain proficiency in the environments, with the breathing media, and for the modes of diving they will employ during their work. At a minimum, 12 dives per year are required to maintain an active file. This number of dives is adopted from the current scientific community consensus and represents the effort to go through the process of a dive once per month to maintain a very minimal level of activity. It is recognized that specialized diving circumstances cannot always be foreseen and therefore work-up proficiency regimens may be employed to reconstitute proficiency according to a HASP to minimize operational risks to the divers and diving project.

The DCB in no way recognizes that 12 dives/year asserts a degree of proficiency in most occupational environments, and only serves to demonstrate a commitment to minimal activity. Divers must demonstrate competency prior to being assigned underwater tasks.

The UArizona DCB recognizes that diving proficiency regimens and routine diving activity may lapse from time to time due to any number of circumstances including personal or family health and well-being, pregnancy, financial hardship, or any similar reason. These lapses are in no way cause for revocation of diving privileges and the DCB is committed to proactively facilitating a return to diving with appropriate administrative file upkeep, medical clearances, and establishing a proficiency regimen to return to diving safely.

7.0 References

This manual was derived from content presented in the following sources:

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8.0 Appendices

Appendix A: Dive Planning and Risk Assessments

All diving carries inherent risks. These are mitigated through technology, its techniques for use, training and proficiency in these techniques, and understanding when it is most appropriate to apply one technology mode versus another for the given diving task and/or within the specialized environment.

Risk mitigation guidance is directed through a Health & Safety Plan (HASP) that must be prepared for each diving activity. A master plan may be prepared for activities which are routine and recurring, though this should be reviewed as part of the pre-dive briefing to note any required changes.

Over time, many risks become considered routine and are mitigated through standard conventions within given diving communities. When risks are identified for a given task that are not well understood by the DCB or are cause for acute attention (differential pressure (delta P) for example), they must be analyzed as part of the dive plan. An Activity Hazard Analysis (AHA) is an appropriate mechanism to make safety decisions and further guide actionable directions. AHAs should be collated and maintained for ongoing analysis and guiding future dive safety policies and procedures.

This appendix contains a HASP template, an AHA template, and an example of primary emergency response instructions for all locations.

Scientific Diving Health and Safety Plan (HASP)

1. **Description of the proposed work.**

2. **Location(s) of proposed dives.**

3. **Qualifications for each diver including documentation of applicable training and proficiency for the given dive(s) (attach or reference to Project Diver Checklist).**

4. **Approximate number of proposed dives with specified tasks.**

5. **Description of technology and/or techniques employed to perform specified tasks.**

6. **Specific hazardous conditions anticipated, including unique hazards associated with the adoption of a specific technology, related technique, or within a unique operating environment (Use AHA template when needed).**

7. **Any post-dive immediate equipment maintenance, or securing of material, and/or record keeping requirements.**

8. **Emergency plan with the following information:**

    a. **Method of diver recall.**

    b. **Nearest operational recompression chamber.**

    c. **Nearest accessible hospital.**

    d. **Available means of transport.**

    e. **Name, telephone number, and relationship of person to be contacted for each diver in the event of an emergency.**

THE UNIVERSITY OF ARIZONA

Scientific Diving Activity Hazard Assessment (AHA)

Activity **(Environment, equipment, technology, operations, etc.)**	**Hazards Identified**	**Actionable Decision to Mitigate Hazards**

Primary Emergency Response (all locations)

Sequence of steps to follow in an emergency:

1. **Stop. Think. Breathe. Act.**
2. **Assess the situation.**

Ensure there are no hazards to yourself as the rescuer before approaching the victim.

3. **At surface**
   a. **Approach** looking for signs of panic
   b. **Evaluate:** stop out of reach and tell victim to inflate BCD and put snorkel in their mouth
   c. **Assist and transport** if the diver is responsive, **reassure** the diver.
   d. If the diver is panicked, make contact from behind or underwater and establish buoyancy for you and the victim before towing.
4. **If underwater**
   a. Establish responsiveness: wave hand in front of mask and do a gentle shake of the arm.
   b. **Leave regulator in mouth** and hold in place from behind.
   c. Use the victim's BC to control ascent, ditch victim's weight only if necessary to get them to the surface.
   d. At surface— inflate victims BC, inflate your BC, if victim is wearing a weight belt ditch it.
   e. Tow to beach path using the do-si-do supporting victims head and **maintaining the airway.**
   f. Ditch your gear and prepare victim for extraction by unclipping all of their gear.
   g. Extract using packstrap method or modified crawl.
5. **Secondary assessment:**
   a. Lie victim down.
   b. **Radio Energy Center:** "Energy center, we have a diving accident emergency, call 911 and bring an AED and first aid kit"
   c. **Primary Assessment:** look, listen, feel, check pulse, check breathing.
   d. **Administer O_2 always.** Even if emergency response is delayed, give 15 L/min until supply runs out.
   e. **Start with 2 rescue breaths, then 30 chest compressions, and repeat until EMS arrives or someone else relieves you.**
   f. **Check for bleeding.** Assess skin color, temperature, and moisture on the face and abdomen.
   g. **Manage shock.**
6. **Missing diver:**
   a. Call **EMS.**
   b. Assign **spotters** to look for bubbles.

c. Determine if the diver may have **left.**
d. Assign qualified divers to search.

Appendix B: Program Management Checklists

The DSO and DCB may use these checklists to guide establishment of administrative files, direct program development, and subsequently, ensure compliance with applicable regulatory bodies.

1. **Checklist for Host Entity Evaluation -** The Host Entity is the organization taking the lead for project management and is generally responsible for executing the project. The DCB may use this checklist to self-evaluate when UArizona is serving as the Host Entity. In instances when UArizona divers are diving under a Host Entity that is not UArizona, the DCB may use this checklist to verify that the Host has the appropriate organizational elements in place.

2. **Checklist for Project Divers -** Divers applying for approval to dive on a project must maintain a diver file to support their application. At a minimum, the file must include the items in this checklist. The DSO may choose to keep this checklist in the diver's file.

3. **Checklist for Verification of Watermanship and Dive Safety -** The DCB must verify that applicant divers are proficient in watermanship and diving safety. Verification may be determined through assessment of past experience and current activity and/or through a formal checkout dive process with the DSO or designee. The activities and skills in this checklist are a guideline. The DCB and DSO may use their discretion to determine additional requirements for specific diving modes, environments, and tasks. The DSO may choose to keep this checklist in the diver's file.

4. **Checklist for Verification of Snorkel Skills -** Non-divers must complete this swim checkout under the guidance of a UArizona Campus Recreation lifeguard or another individual if approved by the DSO. The DSO may choose to create a file for non-diver snorkelers and keep this checklist in the snorkeler's file.

Checklist for Host Entity Evaluation

- ❑ Establish the diving objective for the advancement of diving science and/or related data gathering.
- ❑ Develop and put in place a Diving Safety Manual consistent with this guideline and meeting applicable regulatory requirements.
- ❑ Assemble a Diving Control/Safety Board comprised of experts in the technologies and techniques to be utilized.
- ❑ Appoint a Diving Program Manager, Diving Safety Officer, or similar responsible for overall risk management and site safety.
- ❑ Designate Lead Divers or Diving Supervisors to oversee the field operations.
- ❑ Establish a mechanism for vetting divers' qualifications for projects consistent with these guidelines.
- ❑ Prepare a HASP for each project and conduct diving activity according to plan.
- ❑ Establish administrative, record-keeping, and general operating practices consistent with these guidelines.
- ❑ Recognize that all dives are conducted at will; convey to each individual diver the authority to determine when to abort the dive.

Checklist for Project Divers

Entry-level divers / all divers

- ❑ Applicant/diver CV/summary
- ❑ Current medical clearance for diving
- ❑ Demonstration or verification of watermanship safety
- ❑ Verification of training in an appropriate diving mode
- ❑ Copies of dive logs to demonstrate proficiency
- ❑ Maintenance records for any personal diving equipment to be used on the project

Active Divers (in addition to above)

- ❑ Verification of training in basic emergency response – first aid, CPR, O2 administration
- ❑ Verification of training in dive accident management/dive rescue
- ❑ Documentation of at least 40 hours of on-the-job training or related experience
- ❑ Verification of additional training and proficiency applicable to the project or program

Lead Divers / Dive Supervisors (in addition to above)

- ❑ Verification of appropriate leadership training or comparable experience
- ❑ Verification of at least 100 hours of occupational diving project experience applicable to the project or program (ex. assistance to or mentorship through a complete 100-hour regimen)

Checklist for Verification of Watermanship and Dive Safety

Academic

___ Knowledge of applicable diving standards and regulations
___ Pre-dive planning, briefing, site orientation, and buddy check
___ Use of dive tables and/or dive computer
___ Equipment familiarity
___ Underwater signs and signals
___ Proper buddy contact
___ Monitor cylinder pressure, depth, bottom time

Swim skills

___ Surface dive to 10 ft. without scuba gear
___ Demonstrate watermanship and snorkel skills
___ Surface swim without swim aids (400 yd.)
___ Tread water without swim aids (10 min.), or without use of hands (2 min.)
___ Transport another swimmer without swim aids (25yd)

Basic Diving

___ Entry and exit (pool, boat, shore)
___ Mask removal and clearing
___ Regulator removal and clearing
___ Surface swim with scuba; alternate between snorkel and regulator (400 yd.)
___ Neutral buoyancy (hover motionless in mid-water)
___ Proper descent and ascent with B.C.
___ Remove and replace weight belt while submerged
___ Remove and replace scuba cylinder while submerged
___ Alternate air source breathing with and without mask (donor/receiver)
___ Buddy breathing with and without mask (donor/receiver)
___ Simulated emergency swimming ascent
___ Compass and underwater navigation
___ Simulated decompression and safety stop

Rescue

___ Self-rescue techniques
___ Tows of conscious and unconscious victim
___ Simulated in-water rescue breathing
___ Rescue of submerged non-breathing diver (including equipment removal, simulated rescue breathing, towing, and recovery to boat or shore)
___ Use of emergency oxygen on breathing and non-breathing victim
___ Accident management and evacuation procedures

Checklist for Verification of Snorkel Skills

_____ _____
NAME DATE

___ Surface dive to 10 ft. without scuba gear
___ Demonstrate watermanship and snorkel skills
___ Surface swim without swim aids (400 yd.)
___ Tread water without swim aids (10 min.), or without use of hands (2 min.)
___ Transport another swimmer without swim aids (25yd)

_____ Signature (UArizona Lifeguard/Other)

Appendix C: Incident Reporting

Type of Event	Process
Deviation - Event that does not result in any injury or loss but required deviation from regulations and/or approved dive plan.	Immediately: • Lead Diver notifies the DSO immediately. Within 24 hours: • Lead Diver submits the RLSS incident reporting online form, which is shared with the DCB. Within 10 days: • The DSO and RLSS will develop an event report.
Minor Incident – Incident that results in a minor (first aid injury) and/or minor property damage.	Immediately: • Lead diver notifies the DSO immediately. Within 24 hours: • Lead Diver submits the RLSS incident reporting online form, which is shared with the DCB. • Lead Diver submits the RMS Injury & Claim Reporting form through UAccess Within 10 days: • The DSO and RLSS will develop an incident report.
Moderate-Severe Incident – Incident that results in serious property damage, moderate-serious injury, recompression treatment, or death.	Immediately (as soon as situation is stabilized): • Lead Diver notifies the DSO, who then notifies RLSS & RMS Within 24 hours: • Lead Diver submits the RLSS incident reporting online form, which is shared with the DCB. • Lead Diver submits the RMS Injury & Claim Reporting form through UAccess. Within 35 days: • The DSO and RLSS will develop an incident report.

Appendix D: Operations Halt Procedure

Tier One

When the DCB or a UArizona compliance unit has identified a non-compliance issue (according to the Dive Manual and/or 29 CFR 1910 Subpart T) by an individual diver or diving group, a Tier One Memorandum may be issued.

The Diving Safety Officer will provide the DCB voting members with a report indicating the instance(s) of non-compliance. Issues that require consideration for a Tier One Memorandum by the DCB include, but are not limited to the following:

- Unauthorized dives
- Non-compliance with DCB-approved Health and Safety Plan (HASP)
- Violations of the Dive Safety Manual

Once a report has been issued to the DCB, the Committee has 10 business days to issue a Tier One Memorandum or defer the memorandum issuance. If the Committee wishes to delay, it must establish a rationale for deferring issuance and set a time and manner for re-evaluation.

A UArizona compliance unit will issue a Tier One Memorandum to the diver(s), PI of the Diving Group, their Department Head, and Associate Dean for Research (ADR), informing them of the non-compliance issue(s) and the potential for suspension of operations. The memorandum will indicate the item(s) of non-compliance and indicate a new timeframe for implementing corrective action.

A written response from the non-compliant party to the Tier One Memorandum is required. The response should contain details regarding either the corrective action(s) taken or the plans to take corrective action. Failure to respond within 15 business days may escalate the memorandum level to Tier Two. Lack of corrective action within the prescribed problem-resolution period following a Tier One Memorandum (and included in the memorandum) may result in a Tier Two Memorandum issuance. If the DCB wishes to defer a Tier Two Memorandum issuance, it must establish a rationale for deferring issuance and set a time for re-evaluation.

Should the item(s) of non-compliance be corrected adequately, the DCB will issue a Resolution Memorandum indicating that corrective action has been taken and verified by RLSS on behalf of the LCSC. Since the DCB must verify corrective action, dive groups must provide a minimum of 10 days for a response from the DCB.

Tier Two

Upon recommendation of the DCB, following a non or insufficient response to a Tier One memorandum, the operations of the diver(s) or PI's diving operation will be halted until reinstated in writing by the DCB and SVPR. This shall be documented by the DCB in a memo signed by the DSO, DCB members, and the Senior Vice President for Research or their designee. Sponsored projects may or may not be informed depending on the severity of the non-compliance, risk to life and safety, and at the discretion of the DCB and SVPR. The DSO will provide authority and instruction on enacting suspensions, which will be enforced by the SVPR. During the suspension period, the diver(s), PI, and Department Chair will be instructed to appear to the DCB to explain why the operation should be reinstated and concurrently present a formal written corrective action plan.

Appendix E: Snorkeling Policy

Safety oversight of scientific snorkeling is maintained by the DCB and may occur with approval of the DSO. Individuals authorized as UArizona Scientific Divers may participate in scientific snorkeling projects. Non-divers must complete the UHMS Diver Medical Statement and a swim check out. The swim check out must follow the guidelines detailed in Appendix B (Checklist for Verification of Snorkel Skills) and may be conducted by a UArizona Campus Rec lifeguard or another individual if approved by the DSO.

UA's Scientific Snorkel policy requires that:

1. A Snorkel Health and Safety plan (template below) for each project must be submitted to the DSO for approval.
2. A topside spotter trained in water rescue techniques must accompany snorkelers while in the water.
3. A radio and/or phone and emergency O_2 must be available onsite.
4. Breath holding (freediving) to conduct underwater tasks is prohibited; tasks requiring the person to remain underwater will be conducted by quailed UArizona divers.

Scientific Snorkeling Health and Safety Plan (HASP)

1. **Description of the proposed work (including location).**

2. **Applicable swim and snorkel experience.**

3. **Specific hazards anticipated.**

4. **Safety measures in place.**