



# Scientific Diving: Code of Conduct

Centre for Marine and Coastal Archaeology

School of Conservation Sciences

David Parham

(Version 3 – March 2006)





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## **BACKGROUND**

The Health & Safety Executive (HSE) consider that diving at work is a high-hazard activity that can be carried out safely if properly planned and the risks managed appropriately. It is considered that in a working environment SCUBA diving generally involves higher risks than surface supplied diving, however professionally run diving at work SCUBA operations have a low accident rate. Research has shown that 1 in 5000 SCUBA dives results in a fatality, but that 97.2 % of accidents are caused by a number of factors that are avoidable by well-trained, intelligent and alert divers. Elimination of these factors would reduce the fatality rate from 1 in 5000 dives to 1 in 238,000 (HSE, 1998).

Diving at work in the United Kingdom is governed by the *Diving at Work Regulations 1997* (The Regulations) that form part of the *Health and Safety at Work etc. Act 1974*. The Regulations impose few specific requirements, however they do impose a responsibility on the diving contractor to ensure that diving operations are carried out safely.

The modern diving industry is a highly and undertakes operations in a number of distinct sectors. The HSE worked with each of the 6 major sectors to produce Approved Codes of Practice (ACoPS) that provide practical guides as to how to comply with the Regulations. In almost all foreseeable circumstances Bournemouth University School of Conservation Science (the School) diving projects will be conducted in accordance with the HSE's *Approved Code of Practice for Scientific and Archaeological Diving Projects* except for training when they may be conducted in accordance with the HSE's *Approved Code of Practice for Recreational Diving Projects*. In unusual circumstances, where operations fall outside the scope of this ACoP the most appropriate ACoP will be used.

This document sets out how the School's SCUBA Diving Operations will be conducted within the Regulations and in such a way to avoid those factors that are known to cause accidents. However it should be accepted that it is impossible to eliminate all risk. Adhering to the guidelines set out in this document should ensure that diving operations are conducted safely and within the regulations, however the requirements of other legislation may also have to be fulfilled.

Diving is a high-hazard specialist activity. Therefore all members of staff who intend to undertake diving operations as part of their Bournemouth University duties, or students who intend to undertake diving operations relating to their course of study, must seek advice from the nominated 'Diving Adviser' (see School H&S Policy Implementation Procedures). Bournemouth University's School of Conservation Sciences has nominated David Parham to act as the Competent Person within the School, and Adviser to the University in respect to Diving Operations.

### **Acknowledgments**

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Nigel Brynt (Bournemouth University), Rohan Holt (Countryside Council for Wales), Richard Martins (HM Specialist Inspector (Diving) Health & Safety Executive), Olivia Merritt (Bournemouth University), Brian McGlinchy (HM Specialist Inspector (Diving) Health & Safety Executive) and Martin Sawyer (UK National Facility for Scientific Diving).

## Definitions

**Approved Code of Practice** - gives advice on meeting the requirements of the Diving at Work Regulations 1997. In particular, the Code gives advice in general terms on how to comply with those Regulations.

**'At work'** - means as an employee or as a self-employed person. The phrase covers divers who dive as part of their duties as an employee and divers who are in business on their own account during the time that they devote themselves to work as a self-employed person. Diving does not have to be the main activity of the employee or the self-employed person. The Diving Regulations apply to any diving project when at least one person is at work.

**'Casualty'** - means any casualty or other incident which involves loss or danger to the life of any person engaged in a diving project.

**'Craft'** - means a ship, hovercraft, or floating structure, including any fishing vessel or work boat, which is used for or in connection with a diving project.

**'Competence'** - is not defined in legislation but it is considered to mean having a combination of training, knowledge and experience such that the person can do the job required in a safe and efficient manner.

**'Core team'** - means a diving team whose make-up complies with the Regulations.

**'DCI'** - Decompression Sickness, commonly known as the *bends*

**'Dives'** - For the purposes of the Regulations a person dives if -

- (a) he/she enters water or any other liquid; or a chamber in which he/she is subject to pressure greater than 100 millibars above atmospheric pressure; and
- (b) in order to survive in such an environment he/she breathes in air or another gas at a pressure greater than atmospheric pressure.

**'Diver'** - under the Regulations a diver is defined as a person at work whom dives. In this document the definition is expanded to mean any individual who dives on a School diving project or a student at the University who dives as part of their university course.

**'Diving Advisor'** - In order to comply with Regulation 7 of the Management of Health and Safety at Work Regulations 1999, Bournemouth University has appointed 'Competent Persons' to assist in undertaking its statutory duties under Health & Safety law. In order to discharge the relevant duties, the School has nominated a 'Diving Adviser' to ensure that accurate and timely advice is available on safety matters relating to diving, to monitor and maintain diving standards, identify needs for and help organize training, keep a centralised record of diving qualifications and activities and update the Diving Rules as required. This position is currently held by David Parham.

**'Diving services'** - means services which are provided, for profit or gain, by the master or owner of a craft, to a person taking part in a diving project as a diver, (including the supply of submersible equipment for personal use by a diver or the supply of compressed gas (excluding therapeutic oxygen) for all forms of breathing apparatus, but excluding the provision of tuition or of transportation services); and for the purposes of this definition "tuition" includes information on local conditions and "transportation services" means the provision of a craft for the purposes of conveying its occupants to or from a diving operation or providing a platform for a diving operation.

**‘Diving contractor’** - The diving contractor has the main responsibility under the Regulations for ensuring that a safe diving project is carried out, although other people, such as clients also have responsibilities under the Diving Regulations. The diving contractor is usually the employer of the divers involved in the diving project. In accordance with regulation 7(1) of the Regulations Bournemouth University is registered to act as a Diving Contractor. The position of ‘Diving Contractor’ is held by the Office of the Vice Chancellor; however responsibilities for managing safety at School level are delegated to each Head of School.

**‘Diving operation’** - means a diving operation identified in the diving project plan. The diving project plan shall identify each diving operation which makes up the diving project. The nature and size of any diving operation shall be such that it can be safely supervised by one person. A diving operation can be made up of either a number of dives or even a single dive. It is the portion of a diving project identified in the diving project plan which can be safely supervised by one supervisor. It will normally be evident what this portion of work is, but factors such as the task, site conditions and the diving techniques to be used, all contribute to making the decision. For example, a 28-day diving project might be made up of 40 diving operations.

**‘Diving supervisor’** - means a person appointed in writing by the diving contractor to supervise under regulation 6(2)(b). Each diving operation will be under the control of a supervisor who may give reasonable instructions to any person taking part in a diving operation.

**‘Diving project’** - means any activity, made up of one or more diving operations, in which at least one person takes part or will take part as a diver. The Project extends from the time when that person, or the first such person, commences to prepare to dive until that person, or the last such person, has left the water, chamber or other environment in which the dive, or any part of the dive, took place and has completed any requisite decompression procedures, including, where it may be reasonably anticipated that this will be needed, any therapeutic recompression. 'Diving project' is the term used for the overall diving job, whether it lasts two hours, or two months, it is made up of one or more diving operations.

**‘Hazard’** - A hazard is something with the potential to cause harm. This may include water, environmental factors, plant, methods of diving and other aspects of work organisation.

**‘Master’** – means the person in charge of the parent craft from which the diving project is conducted.

**‘Medical examiner of divers’** – Under Regulation 15(6) this means a medical practitioner who falls within a class of medical practitioners who are approved in writing by the Executive for the purposes of the regulations. Any such approval may be given generally or restricted to any class of diver or dive.

**‘Permit-to-work system’** - A formal written system used to control certain types of work which are identified as involving significant risk.

**‘Person’** - The term used to identify the diving contractor under this Regulation means person with legal identity such as an individual or a company and includes a body of people corporate or incorporate.

**‘Risk’** - A risk is the possibility that someone or something will be harmed by identified hazard. The element of the risk includes the numbers of people who might be affected by the risk.

**‘Risk assessment’** - A risk assessment is a careful examination of what may cause harm and an evaluation of precautions that can be taken to prevent harm.

**‘SCUBA’** – Self Contained Underwater Breathing Apparatus

**Sheltered water** - A swimming pool or open water site with a flat bottom of sand, shingle or rock, free from any wave action and current whose depth of water will not provide a hazard for students at their level of ability and experience. Ideally it will range from standing depth to 2-3 meters within a distance of 10-15m. Underwater visibility must not be less than 3 meters

**‘Supervise’** - means the exercise of direct personal control and "supervising" shall be construed accordingly;

**‘the 1995 Order’** - means the Health and Safety at Work etc. Act 1974 (Application outside Great Britain) Order 1995(a).

**‘the Regulations’** – The Diving at Work Regulations 1997 cover all diving projects within Great Britain, its territorial waters and applies to activities outside Great Britain which are referred to in sections 1 to 59 and 80 to 82 of the Health and safety at Work etc Act 1974 by virtue of the 1995 order as they apply with Great Britain.

**‘the School’** - means Bournemouth University School of Conservation Science

### **Geographical Limit**

The *Diving at Work Regulations 1997* apply to diving within UK territorial waters. Diving operations from or on offshore installations or pipelines on the UK continental shelf and diving from United Kingdom registered ships other ships working within UK territorial waters is regulated by the *Merchant Shipping (Diving Safety) Regulations 2002*. This document is designed to be compliant with both regulations.

# STANDARD OPERATING RULES FOR SCUBA DIVING

## Limitations of SCUBA

SCUBA is a safe method of conducting diving operations if conducted in a well-organized structure. However it does have its limitations (see below) and should only be used in open water under benign conditions. In other circumstances, diving using surface-supplied breathing apparatus is the preferred method of carrying out diving operations.

SCUBA will not be used for:

- (a) Offshore diving operations in support of oil/gas projects
- (b) Offshore, inshore and inland diving operations in support of construction, maintenance and salvage projects
- (c) In the proximity of intakes or discharges
- (d) Where there is a risk of entrapment (i.e near underwater nets, structures, deep excavations or enclosed spaces)
- (e) In the vicinity of remotely operated vehicles (ROV's)
- (f) Where the diver is required to use electrical equipment (other than battery powered) or other high energy tools or equipment

In other cases where SCUBA may be considered appropriate the risk assessment should take into account all hazards and environmental factors which may affect the safety of the diver, such as entrapment, tidal conditions, visibility and other operational constraints. The results of this should be reflected in the dive plan.

If the risk assessment concludes that SCUBA is not appropriate for the work planned then the work will be modified to make it suitable for the use of SCUBA. If this is not possible then another, more appropriate method will be used.

## Diving Contractor

As the diving contractor the Office of the Vice Chancellor has the main responsibility under the Regulations for ensuring that a safe diving project is carried out, although other people, such as clients also have responsibilities under the Diving Regulations. The responsibilities for managing safety at School level are delegated to each Head of School and the School has appointed a 'Competent Person' to undertake the role of 'Diving Adviser' who will ensure that accurate and timely advice is available on safety matters relating to diving, to monitor and maintain diving standards, identify needs for and help organize training, keep a centralised record of diving qualifications and activities and update the Diving Rules as required.

It is the diving contractor is responsibility to ensure that the diving contractor should determine, after studying the risk assessment, how many diving operations the diving project is to be broken down into and must appoint, in writing, a supervisor to supervise each operation. The diving contractor has overall responsibility for ensuring that all parts of a diving project are managed in such a way and that adequate resources are made available to ensure that diving operations are conducted in a safe manner. If there is more than one diving operation being conducted at the same time, as part of the diving project, the diving contractor has a responsibility to ensure that there is proper co-ordination.

## **Project Plan and Risk Assessment.**

Before the commencement of any diving project a diving project plan and risk assessment will be prepared and updated as necessary during the continuance of the project. The plan will identify the individual(s) who will act as diving supervisors from the commencement of the project and will describe the task(s) to be undertaken and make an assessment of the risks to the health and safety of any person taking part in the diving project. The diving project plan will include the School's *Generic Rules for SCUBA Diving* and all information and instructions which, so far as is reasonably practicable, are necessary to protect the health and safety of those taking part in the diving project.

The plan will detail how the identified risks are to be controlled and generate a site-specific risk assessment which will be completed prior to the start of any individual diving operation. As a minimum this will consider:

- (a) Sea conditions, underwater visibility, pollution, depth, and temperature
- (b) Access to and from the shore/boat/platform, this must include the emergency recovery of an incapacitated diver within 3 minutes of them reaching the surface.
- (c) Breathing gas mixture and equipment needed (Emergency gas volumes will be calculated at 50 litres per minute)
- (d) Experience and number of personnel (including people who are not at work but who are part of the dive team)
- (e) Emergency procedures, including the means of recovery of an incapacitated diver, the location and proximity to emergency facilities, such as compression chambers and medical expertise
- (f) The method chosen for the dive, i.e. surface supply or SCUBA, stating the safety reasons for the choice
- (g) A casualty evacuation plan and an identified means of summoning further emergency assistance that does not involve essential personnel leaving the dive site.

This risk assessment will be reviewed at regular intervals during the diving project, even if the risk is low, to ensure that the risk assessment is still adequate and does not need to be revised. The results of the review will only need to be recorded if there has been a significant change.

This risk assessment will cover, in part, the requirement to make an assessment under the *Management of Health and Safety at Work Regulations 1992*. There will be no need to repeat those aspects of the assessment, so long as they remain valid, in any other assessment that is carried out. However, all significant risks not covered by the diving project assessment (including risks to members of the public arising from the diving project/diving activities) must be covered by the risk assessment carried out under the *Management of Health and Safety at Work Regulations 1992* or in any assessment required to be carried out under the specific regulations.

All documents should show the date upon which they were prepared and must be kept for a minimum of two years after the completion of the project.

## **Monitoring & Audit System**

The School has in place a diving safety audit system that requires that all School diving project plans and risk assessments have to be approved in writing as fit for purpose by the School Diving

Advisor before they can be implemented. In addition all paperwork generated during the project has to be inspected upon completion, or at intervals during the life of the diving project. On some occasions the School Diving Advisor will make site spot checks to satisfy him/herself that the project is proceeding as planned.

## **Suitable Qualifications**

All members of the core diving team shall be suitably qualified to conduct the planned diving operation. As a minimum the divers should be qualified to those standards set out in the HSE *List of approved qualifications for the Approved Code of Practice for Scientific and Archaeological Diving*.

## **Medical Fitness to Dive**

All divers 'at work' must have a valid medical certificate to dive issued by an HSE medical examiner of divers. The certificate of medical fitness to dive is a statement of the diver's fitness to perform work underwater, and is valid for as long as the doctor certifies, up to a maximum of 12 months.

Those not defined as 'at work' will need initially (from 1<sup>st</sup> October 2006) a medical as above and then annually hold a valid United Kingdom Sports Diving Committee (UKSDMC) Medical Declaration Form (details at <http://www.uksdmc.co.uk/>). They will not be expected to carry out tasks that are more arduous than those commonly undertaken in sports diving. People who dive in a diving project and who consider themselves unfit for any reason, must report this to the supervisor before the start of a dive.

## **Personnel not Employed by the Diving Contractor**

Personnel who are not employed by the diving contractor but who are considered for inclusion in the dive team must be competent for the work that they are going to do. They should be familiar with the diving contractor's procedures, rules and the diving plant that is to be used.

## **Duty to Ensure Compliance with the Regulations**

Every person who to any extent is responsible for, has control over or is engaged in any diving project to which the Regulations apply or whose acts or omissions could adversely affect the health and safety of persons engaged in any such project, shall take such measures as it is reasonable for a person in their position to take to ensure that these Regulations are complied with.

## **Diving Plant**

As a minimum the SCUBA diver will be equipped with.

- (a) Suitable thermal protection, (for example, a dry suit)
- (b) A primary source of breathing gas suitable for the planned diving operation
- (c) An independent secondary source of breathing gas (for example, a pony cylinder). This must be capable of supplying sufficient breathing gas during a controlled 'assisted' ascent. The size of this reserve should be adequate for the depth, work rate and any hazards likely to be encountered and should not be compromised if the primary supply fails. All emergency breathing gas calculations will be calculated at 50 litres per minute
- (d) A means of proving positive buoyancy, that is operable in the event that the diver's main gas supply becomes unavailable, which will float him or her on the surface while

awaiting recovery (for example a buoyancy compensator/lifejacket supplied by the diver's independent secondary source of breathing gas or a separate emergency cylinder)

- (e) A sharp knife, or other suitable cutting tool
- (f) A submersible decompression slate
- (g) A means of recording depth, time and cylinder pressure. Dive computers will not be used in their role of calculating decompression time but may be used as depth gauge/dive timers
- (i) A lifeline (see below)

## Lifelines

A lifeline from the diver to the surface must be provided. This may be tended by or attached to a high visibility surface float. When a diver is connected to the surface by a lifeline to a high visibility surface float the appropriate surface support team should be in a position to render assistance in an emergency. If two divers are within constant sight of each other or connected by a buddy-line only one marker float/tended lifeline need be used. The diver not carrying the marker float/tended lifeline will have a delayed surface marker buoy for use as a marker float and lifeline should they become separated from their buddy. Where lifelines are tendered they will be marked as a minimum every 5 meters with the '0' being at the diver's end.

## Communications

There must be a suitable two-way means of communication between the divers and the supervisor. This can be by rope signals via the lifeline if ALL members of the team are competent in the rope signaling to the single lifeline general code (detailed below). If a surface float is being used the supervisor must ensure that they can assess each buoy readily.

<b>Signal</b>	<b>Tender - Diver</b>	<b>Diver - Tender</b>
1 Pull	To call attention Are you well?	To call attention I am well
2 Pulls	Prearranged working signal	Prearranged working signal
3 Pulls	Go down until we stop you	I am going down
4 Pulls	Come up	I am coming up
Succession of Pulls (more than 4)		Emergency

Equipment enabling voice communication will be used where any part of the diving operation is deemed hazardous or where the diver's task requires rapid and accurate communication with the supervisor.

## Diver Recall

Where voice communications are not used, or have ceased to function, the standard diver recall signal will be 4 pulls on the divers lifeline or in the case of lifelines attached to a high visibility surface float a suitably carabiner clip with a tag marked 'surface now' that can be slid down the line.

## **Gas Cylinders, Marking and Testing**

Accidents have occurred because of wrong gas or gases being used in a diving project. All gas storage units will comply with the international, European or national standards of colour coding and marking of gas storage cylinders, quads and banks.

Breathing gas cylinders should be manufactured to BS5045 (Part i: steel; Part iii: Aluminium; Part iv: less than 0.5 litre water capacity), be marked with their working pressures, be legibly marked "breathing air". Cylinders must be tested according to BS5430 by an approved test house. Cylinders require a hydraulic test and visual inspection every four years and a visual only inspection every two years.

## **Diving Plant Examination, Testing and Certification**

Sufficient plant, suitable for the use to which it will be put, will be provided for the diving project and made available, whenever needed, to ensure the safe conduct of the project. All plant used will be 'in test' i.e. in accordance with relevant statutory provisions, and international, European or national standards. As a minimum each item of equipment used within a diving project shall be allocated, and marked with, a unique School serial number and a hard copy record kept detailing its make, model, serial number, purchase details, service history (service dates and work undertaken) any faults and actions taken to rectify these. All equipment shall be serviced by a competent person (both trained and experienced in servicing the specific equipment in use) every six months from the date of first use. All plant will be inspected immediately before use by a competent person to ensure that it is not damaged or suffering from deterioration.

Where divers supply their own personal diving equipment documentary proof of the serviceability of this equipment to the same standards as above will be required.

## **Diving Craft**

If the primary diving platform is a craft this must be 'coded' under the Maritime and Coastguard Agency *MCA Code of Practice for the Safety of Small Workboats and Pilot Boats*. The master of the vessel should be suitable experienced in working with SCUBA divers and it must be suitable equipped, maintained, seaworthy and have adequate navigation, communication and emergency equipment. It should be suitable for the operation of divers, have safe place on board from which the diving project may be undertaken and have adequate facilities for the safe removal of an incapacitated diver from the water and onto the operational deck of the vessel.

## **Lights and Shapes Marking the Diving Craft**

Whilst diving operations are underway the diving platform should display a International Code Flag 'A' (meaning *I have a diver down; keep well clear and proceed at slow speed*) not less than 1 meter in height with measures taken to ensure its all round visibility. Where operations are to be conducted at night three all round lights in a vertical line shall be shown where they can be best seen. The highest and lowest of these shall be red and the middle light shall be white.

## **Duties of Master**

It is the duty of the master of a craft from which a diving project is undertaken to, so far as reasonably practicable, undertake no activities that might adversely affect the health and safety of any person engaged in the diving project, to position the craft in a safe location for the duration of the diving project and to ensure that all plant and equipment, other than diving plant and equipment, necessary for the safe conduct of the diving project are sufficient and available for that purpose.

## **Power of Master and Diving Supervisor to Give Directions**

A diving supervisor may, while supervising a diving operation in respect of which he is appointed, give such reasonable directions to any person in order to ensure the safety of the divers taking part in the diving operation. The master of a craft from which a diving operation takes place may give the diving supervisor and any person taking part in the diving operation such reasonable directions as are necessary in order to ensure the safety of the craft.

## **Communication Between Master, Diving Contractor and Supervisor**

The master must identify and discuss risks with the diving contractor during the preparation of the diving project plan and establish an agreed means of communication with the diving supervisor and advise on matter considered relevant during the diving operation.

## **WORKING PRACTICES**

### **Team Size**

There will be sufficient people with suitable competence to carry out safely and without risk to health both the diving project and any action (including the giving of first-aid) that may be necessary in the event of a reasonably foreseeable emergency connected with the diving project. The minimum core team size in benign condition (a familiar site with reasonably clear water, no tide or current, no trapping hazard, easy access/exit and a non arduous task shall be 3, consisting of a supervisor and two divers. In all other conditions the minimum team size shall be 4 and include a further diver as surface support or stand-by diver.

### **Supervisor**

Each diving operation will be under the control of an appointed diving supervisor who may give reasonable instructions to any person taking part in a diving operation. The diving contractor will appoint the supervisor in writing. The supervisor shall not normally dive or leave the site during the diving operation without first handing over to another diving supervisor and recording this handover in the Diving Operation record (the supervisor can dive if they can do so without risk to the health and safety of those taking part in the operation and the diving project plan that relates to that operations provides for the supervisor to so dive). The operation shall not end until it can be reasonably anticipated that the divers will not require therapeutic recompression, this period shall normally be considered to be six hours after the divers have returned to atmospheric pressure. There should be means of making contact (e.g. telephone) with the supervisor if the diving team has left the site during this period.

### **Standby Diver**

During all diving operations a standby diver shall be in immediate readiness and capable of providing immediate and effective aid to a diver in the water. This may involve two divers working as a buddy pair, or a working diver and a surface standby who is dressed to enter the water. The diver need not be wearing a mask, this however should be immediately to hand. In the case of the latter the supervisor must be satisfied that communication between the working diver and the surface is sufficient to be safe.

### **‘Buddy Pair’**

In normal circumstances divers will be deployed as a ‘buddy pair’ This is defined by the British Sub-Aqua Club as *‘two divers operating as a unit, each responsible for the safety of the other, in which one of the divers must be elected the dive leader.’* In this situation the standby diver is the diver’s buddy and there must be an effective means of communication between the two divers who must always be within constant sight of each other or connected by a rope ‘buddy line’ in conditions of very poor visibility or whilst drift-diving. Each diver must be ‘rescue competent’ and able to initiate appropriate actions in the event of an emergency.

## **Solo Diving**

Solo diving is allowed subject to the following additional restrictions:

- (a) The diver must have a dedicated supervisor
- (b) The diver must wear a full face mask with either an oral nasal or a mouthpiece
- (c) The diver must be on a tended tethered lifeline clipped to the divers harness with a gate type carabiner. It must not be clipped to his/her equipment
- (d) The diver must have two-way voice communication with the supervisor
- (e) A standby diver, equipped to the same standard and capable of providing immediate and effective aid must be present on site.

## **Use of checklists**

During all diving projects the pre dive checklist detailed below will be used.

The following should be checked and their status recorded;

- (a) Main gas breathing supply;
- (b) Secondary breathing supply;
- (c) Any non-return valve present in the diving system is working;
- (d) Lifeline;

The following will be checked by the diver and their status recorded as operational and accessible to the diver

- (e) Main gas breathing supply
- (f) Secondary breathing supply
- (g) Buoyancy
- (h) Weight releases
- (i) Knife
- (j) Depth gauge & timer
- (k) Tools

## **Dive monitoring**

Supervisors must monitor the position of divers and the duration of dives. The surfacing time for each diver must be known in advance and the supervisor must be able to recall individual divers if required. Each surface float should identify which particular diver it is marking.

The number of divers in the water at any one time is limited to what the appointed supervisor can properly manage. This will vary with the type of boat employed, the size of crew available for top-side duties and the prevailing sea and weather conditions but it is unlikely that, even in favorable

conditions, one person will be able to supervise more than one solo diver or three buddy pairs in the water at a time.

## **Decompression Tables**

All Diving Operations must be planned and executed according to the schedules laid down by an approved decompression table. Tables have been approved by the Scientific Diving Supervisory Committee for Scientific Diving. These are the; BSAC '88, SAA/Buhlmann, US Navy (1990) and DCIEM. For School Diving Projects BSAC '88 tables will be normally be used. On no account will tables be switched during a diving project.

## **Use of compressed air or gas mixtures**

Divers breathing a mixture of oxygen and nitrogen under pressure, whether compressed natural air or an artificial mixture (nitrox), are at risk of both oxygen toxicity and nitrogen narcosis as the depth increases. The maximum depth for breathing mixtures of compressed air or oxygen and nitrogen is 50 meters of water. The recommended maximum partial pressures for oxygen are 1.4 atmosphere for SCUBA and 1.5 atmosphere for surface-supplied diving plant. These limits do not apply to therapeutic recompression.

## **Note on the use of Nitrox**

The use of nitrox as the diver's main breathing gas can significantly reduce the dangers associated with decompression illness. Where nitrox is to be used all diving plant will be suitable for the gas mix in use. All members of the diving team will hold a suitable nitrox qualification issued by a recreational diving agency approved by the HSE for work in connection with recreational diving instruction.

## **Depth and time exposure**

Diving will not normally take place in excess of 30m of water. Where diving is to exceed 30m or decompression stops are to be undertaken (up to a maximum of 20 minutes) this will be considered to be Deep Diving, see below. Each diver will not exceed three dives in one day with a minimum surface interval of two hours between each dive. Where divers prematurely return to the surface the dive may continue as soon as is practical, but within 15 minutes of surfacing. This event shall be recorded in the dive log. Each diver shall have a continuous 24 hour break from diving every 7<sup>th</sup> day. Divers should avoid strenuous or other activity that may provoke decompression illness for two hours after any dive.

## **Attracting attention on the surface**

All divers should carry some means of attracting the attention of the surface support crew whilst they are on the surface. Visible signals such as extendible safety flags or the use of 'sausage' type SMB's can be used to attract attention from a distance. Sound signals such as whistles can be used if the diver is out of line of sight of the surface support.

# DIVING PRACTICES

## Night Diving

Where a diving operation is to be carried out during the hours of darkness each diver will carry an underwater torch (and a spare) that is both suitable for the dive and indicating their position on the surface. All surface floats should be marked by a suitable means of illumination such as a chemical light stick. The location on the surface from which the diving is being carried out will be illuminated adequately to be clearly visible to divers on the surface. Divers should signal to each other by shining their torches onto their signaling hand, taking care not to shine their torch in their buddies eyes. During night dives the following surface signals apply.

<b>Signal</b>	<b>Meaning</b>
A steady torch beam pointed at the surface cover by the surfaced diver	OK at the surface
A rapidly swinging torch on the surface	Distress at the surface
A slow controlled swinging torch on the surface	Pick me up

## Shore Diving

When diving takes place from the shore with no boat cover available, the following precautions will be taken:

- (a) There must be an easy point of entry and exit to and from the water. Consider how the divers get back on shore if the exit point is likely to be different from the entry point.
- (b) The shore party must be able to follow divers along the coast and to leave to fetch help if necessary. Two people are therefore required in the shore party with transport available to reach the nearest telephone in an emergency.
- (c) The location of the nearest telephone (or whether a mobile phone will have an adequate signal) must be known to the diving supervisor.
- (d) All safety equipment should be available on the shore: VHF radios, first aid kit, oxygen administration equipment.

## Cold water Diving

In northern UK latitudes and during winter months water in the UK can become very cold, reaching freezing point in many UK fresh-water dive sites. Pre-dive planning is essential during diving operations conducted in these conditions to ensure the safety of the dive team. The following points will be taken into account;

- (a) Dives of up to 45 minutes are possible in these conditions but efficiency rapidly decreases after 30min.
- (b) All dives will be planned to be 'no stop' as an inactive decompressing diver is very vulnerable to becoming hypothermic.
- (c) All divers will wear adequate thermal protection and will wear suitable gloves,

preferably of the mitten type.

- (d) Care will be taken to avoid drysuit leaks and the dive should be aborted should a serious leak occur.
- (e) Low air temperatures can make diving equipment unreliable and all regulators used will be environmentally protected and kept thoroughly dry before use.
- (f) Icing up of regulators causing a freeflow is a common occurrence that can empty a divers cylinder in a short time. The dive will therefore be abandoned should this occur.
- (g) Wet diving plant/divers can easily freeze to objects once out of the water and care will be taken to ensure that this does not occur
- (h) In low temperature conditions the surface team are also at risk from the cold and they will be suitable dressed and sheltered for the conditions.
- (i) Adequate shelter must be provides at the dive site for first aid treatment of hypothermic divers

Diving under ice is not covered by this document.

### **Altitude Diving**

Diving can occur at low-altitude (100-3000m above sea level) ranges in the UK. Acclimatization of at least 16 hours should be carried out for all low-altitude dives in addition to any travelling time. Decompression procedures should be followed as per the tables in use. Diving in excess of 3000m altitude is not covered by this document.

### **Deep Diving**

Diving to over 30m water depth, or undertaking decompression stops is considered to be Deep Diving. In these circumstances the team will consist of a minimum of 4 divers (supervisor, stand-by diver and two divers). All divers will be qualified as a minimum to those standards set out in the HSE *List of approved qualifications for the Approved Code of Practice for Scientific and Archaeological Diving*. Diving in excess of 50m water depth is not covered by this document.

### **Use of Airlifts and Water Dredges**

Where SCUBA divers are required to use this plant of this sort specific reference will be made to this in the risk assessment and the work will only occur in shallow water in benign conditions. All divers will be trained in its use (see Appendix 1) and be in constant voice communication with the supervisor. The items of plant deployed will be capable of easy handling by a single diver and equipped with a 1/4 turn valve that can be easily accessed by the diver to allow the item of plant to be turned off underwater. The plant should also be capable of being easily turned off by the surface team. If plant of this nature is to be used in anything other than benign condition surface supplied diving equipment will be used.

### **Other Tools**

SCUBA divers will not be required to use electrical equipment (other than battery powered) or other high energy tools or equipment.

### **Lifting Bags**

Lifting Bags are a major piece of lifting equipment and should be treated as such. They should be used with extreme caution and only under the supervision of the core diving team trained in their use. All components to be used should each be marked with their safe working load (SWL), will be inspected before use, be in good repair, compatible and suitable for the planned operation.

The weight of the object to be lifted should be calculated before the lifting operation is undertaken and the operation itself should be planned and conducted in a controlled manner by the diving team with adequate safety measures in place.

Lifting bags used should be of the parachute type equipped with a suitable attachment point to the top to allow the fitting of a restraining line and a dump valve that can be operated by a line that can be easily reached by the diver and operated from a safe location.

It should be remembered that archaeological objects will often have lost much of their original strength and consideration should be given to the use of a spreader bar to support the object to be lifted. Bags should be rigged correctly to ensure that they will lift the load in a controlled manner and consideration should be given to the use of groups of smaller bags rather than single large ones. The lifting of objects over 100Kg in weight falls outside the scope of this document. If plant of this nature is to be used in anything other than benign condition surface supplied diving equipment will be used.

## **Diving in Closed Artificial Environments**

Occasionally diving operations may need to be conducted in benign conditions in closed artificial environments such as swimming pools, tanks or aquariums. Benign conditions are defined as;

- (a) Inland within a tank or pool artificially constructed for the purpose of swimming, diving, or for use as an aquarium or media facility;
- (b) Where the diver is in full view from the surface at all times
- (c) Where no risk of entanglement or other hazards are present; and
- (d) Where there is no interference from other activities, e.g. no scenery or set in media diving or aggressive animals in fish storage tanks or aquariums, as justified in the risk assessment.

In these circumstances the following can apply

- (a) The team can be reduced to a supervisor, diver on a lifeline and a tender
- (b) The supervisor and tender need not be qualified divers but should be competent for the task
- (c) At least one of the surface party must hold a first aid at work qualification
- (d) The minimum approved qualification is CMAS 2\* issued by a recreational diving agency approved by the HSE for work in connection with recreational diving instruction

Whilst diving in closed artificial environments in circumstances other than those defined as benign the usual rules will apply.

## **Where the Diving Conditions/Practices Proposed Fall Outside these Generic Rules for SCUBA Diving**

Advice should be sought from the publications listed in the Bibliography, experienced colleagues and the Health and Safety Executive Diving at Work Team

## **SPECIFIC HAZARDS FOR SCUBA DIVING**

### **Separation**

If divers in a buddy pair become separated underwater, a brief attempt (approx. 30 seconds) to relocate should be made, after which the divers should surface. If the dive is subsequently recommenced appropriate decompression should be carried out.

### **Entrapment**

SCUBA divers can easily be entrapped or entangled. SCUBA diving operations should therefore not take place in the proximity of intakes or discharges or where there is a risk of entrapment near underwater nets or structures. Similarly SCUBA diving should not take place in the vicinity of remotely operated vehicles.

### **Restricted Surface Visibility**

The dive plan should identify when an operation should be suspended because of restricted surface visibility. The use of SCUBA drift-diving techniques is particularly vulnerable to poor visibility. In these cases supervisors must be aware of worsening conditions or poor forecast, diving must be suspended before conditions deteriorate.

### **Weather**

Adverse weather conditions may affect the safety of a diving operation and the dive plan should identify when an operation should be suspended. Small craft are quickly affected by worsening seas. Not only can a vessel's handling be affected, making it more difficult to reach a diver in the water but the ability to see a marker buoy also reduces rapidly as the sea state increases. Supervisors must be aware of this and suspend diving before conditions become hazardous. In normal circumstances diving operations will not take place if the sea conditions on site are greater than that expected at Beaufort wind scale Force 4 in open sea.

### **Underwater Currents**

Currents may impose limitations on a diver's operational ability and safety. Changing currents may separate divers that enter the water together. Supervisors must be alert to recalling divers if they are in danger of becoming so separated that they can no longer be monitored efficiently. No work shall take place where currents are expected to exceed 0.5 knot and a diver is expected to remain stationary on the bottom.

## MEDICAL SUPPORT

### Oxygen & First Aid Availability

Oxygen and suitable first-aid equipment, as set down in the *Health and Safety (First-Aid) Regulations 1981 Approved Code of Practice*, will be immediately available at all locations diving is to take place. In addition to the School's standard first-aid kits 4 aluminum foil blankets and a windproof body bag will also be carried. Sufficient oxygen will be provided for the duration of transfer of a diver to a recompression chamber, hospital or other place. It should be administered using a tight-fitting mask or by a mouthpiece with a noseclip.

At least two persons in each dive team will be qualified in first-aid to the standard as set down in the *Health and Safety (First-Aid) Regulations 1981 Approved Code of Practice*. At least two persons shall be qualified in the provision of oxygen first-aid. The supervisor should be responsible for arranging their duties so that one of the team should be able to administer first-aid and/or oxygen should it be needed, to a member of the dive team in an emergency.

### Availability of Compression Chambers

Provision of chamber facilities so that a diver can be recompressed in an emergency, should this be necessary, should be considered. The provision of a recompression chamber should be in accordance with the decompression procedures selected as part of the diving project plan to which the below minimum standards should also be applied:

- (a) For dives with no planned in-water decompression and that are less than 10 metres depth the diving contractor should identify the nearest suitable operational two-person, two-compartment chamber. Under no circumstances should this be more than 6 hours traveling distance from the dive site.
- (b) For dives over 10 and up to 50 metres depth with either:
  - no planned in-water decompression; or
  - with planned in-water decompression of up to 20 minutes,a suitable two-person, two-compartment chamber should be no more than 2 hours travelling distance from the dive site.
- (c) For dives with planned in-water decompression greater than 20 minutes a suitable, operational, two-person, two-compartment chamber should be provided for immediate use at the site of the diving project. The diver should be able to leave the water quickly and easily and be pressurised within the chamber to the appropriate recompression pressure as defined by the time in the decompression schedule being used. The controls of a surface compression chamber should only be operated by persons competent to do so. Such competence will be achieved by a combination of training and experience. The degree of supervision provided should reflect the experience of the operator.

In all cases where the recompression chamber is not located on the site, the diving project plan should include arrangements to ensure that in an emergency a diver will be able to be transported and recompressed to ensure, so far as is reasonably practicable, his or her safety. The diving project plan should record the suitable chambers which have been identified and the arrangements which have been made for emergency recompression throughout the course of the diving project.

## **REPORTING OF INCIDENTS AND DANGEROUS OCCURRENCES REGULATIONS 1995**

Under the Reporting of Incidents and Dangerous Occurrences Regulations 1995 (RIDDOR) the following diving relating incidents need to be reported:

### **Schedule 2 - Dangerous occurrences - Regulation 2 (1) - Diving Operations**

Any of the following in relation to a diving operation:-

- (a) The failure or endangering of:
  - (i) Any lifting equipment associated with the diving operation
  - (ii) Life-support equipment, including control panels, hoses and breathing apparatus

Which puts a diver at risk (this includes the potential for a fatality, major injury or reportable disease)

- (b) Any damage to, or endangering of, the dive platform, or any failure of the dive platform to remain on station, which puts a diver at risk
- (c) The trapping of a diver
- (d) An explosion in the vicinity of a diver
- (e) An uncontrolled ascent or omitted decompression which puts the diver at risk

### **Schedule 3 - Reportable Diseases - Regulation 5 - Part I Occupational Diseases**

Work involved breathing gases at increased pressure (including diving)

- (a) Decompression Sickness (DCI), commonly known as the *bends*
- (b) Barotrauma resulting in lung or other organ damage
- (c) Dysbaric osteonecrosis

A record must be kept of any reportable injury, disease or dangerous occurrence. This must include the date and method of reporting; the date, time and place of the event, personal details of those involved and a brief description of the nature of the event or disease. The record may be kept in any form you wish.

## INVOLVEMENT OF STUDENTS IN SCHOOL DIVING PROJECTS

The information below does not apply to diving activities that are part of a formal diver training and assessment scheme.

A student who holds a diving qualification listed on the Diving At Work Regulations list of approved qualifications for the class of Scientific and Archaeological Diving and who is considered competent by the schools diving advisor to discharge the duties required of them may, subject to compliance with the Standard Operating Procedures listed above and the Diving at Work Regulations, dive as part of a School core diving team.

In addition to the core diving team students of the School of the Conservation Science, or other institutions may be involved in diving operations subject to the following limitations

- (a) The project plans and risk assessment must specifically address the issue of the involvement of students diving in addition to the core diving team;
- (b) Each Student must have the written approval of their Program Leader and the Schools Diving Advisor;
- (c) Each Student must have diving skills and experience that make them competent for the work proposed;
- (d) Each Student must hold as a minimum a CMAS 2\* or equivalent diving qualification from a recreational agency/organization whose qualifications are approved by HSE for the class of Recreational Diving;
- (e) Each student hold a valid United Kingdom Sports Diving Committee (UKSDMC) Medical Declaration Form (details at <http://www.uksdmc.co.uk/>). (No student diving under a Medical Declaration Form will be expected to carry tasks that are more arduous than those commonly undertaken in sports diving;

### **Students involvement in non-School diving project as part of their university research.**

The Regulations apply where there is at least one person who takes part as a “diver”. As university students are not employees of the university and a student is not likely to be at work, the Regulations will not apply to this activity unless it is conducted as part of a university organised activity where there are persons at work.

However, the *Health & Safety at Work etc. Act 1974, Section 3 - General duties of employers and self-employed to persons other than their employees* - will apply. Health and safety law aims to protect both employees and non-employees (such as students and visitors) from risks to their health and safety arising from work activities. Universities have a duty under Section 3 to conduct their undertaking in such a way as to ensure, so far as is reasonably practicable, that persons not in their employment who may be affected thereby are not thereby exposed to risks to their health or safety. This duty extends to students undertaking or preparing coursework for universities and colleges (e.g. in laboratories or workshops). Should a student elect or wish to research coursework by diving, the university would have a duty to do all that which is reasonably practicable to ensure that the students are not exposed to significant risks to their health or safety while diving.

### **The School's Policy**

A student wishing to undertake research or coursework by diving in a non-School organized diving project will only be allowed to if permission is obtained in writing by the student's Program Leader and the Schools Diving Advisor. Permission will only be given if the School is happy that both the diving and course work can be undertaken in a safe manner. Therefore a comprehensive project plan and risk assessment will have to be provided by the student as detailed above.

As a minimum the School will expect to see that the diving is conducted under the auspices of a diving agency or organization whose qualifications are approved by HSE for the class of Recreational Diving and that diving is to be undertaken in accordance with the ACOP for Scientific and Archaeological Diving Projects.

Regardless of the above the School reserve the right to refuse permission without reason.

### **Note**

It is foreseeable that students could take up employment or undertake diving as a self-employed person as an outside activity not under the control of the School, e.g. as a recreational instructor or assisting with such activities. The Diving at Work Regulations will apply under these circumstances. If they collect samples or information at the same time then their safety will rest with the "diving contractor"

### **Use of School SCUBA Diving Equipment**

The School has a pool of SCUBA diving equipment available for use in university run teaching/research projects. This equipment can be made available for use by students for research to be undertaken by diving in a non School organized diving projects. This will however only be allowed if permission is obtained in writing by the students Program Leader and the Schools Diving Advisor. Permission will only be given if the School is happy that both the diving and course work can be undertaken in a safe manner. Therefore a comprehensive project plan and risk assessment will have to be provided by the student as detailed above.

Regardless of the above the School reserves the right to refuse permission without reason.

## DIVING WITH AMATEUR GROUPS

From time to time members of university staff may be asked to dive with amateur groups such as groups licensed to work on Protected Wreck sites. In these circumstances the following will apply:-

- (a) Part of the amateur group will comprise of the divers support team, with a minimum of Diving Supervisor and diver's buddy who are qualified to those standards set out in the HSE *List of approved qualifications for the Approved Code of Practice for Scientific and Archaeological Diving*.
- (b) Whilst a member of the amateur group will perform the role of the diving supervisor the appointed supervisor, and the attached responsibility, will be the staff member.
- (c) The project plan and risk assessment shall take into account the fact that the supervisor will dive as part of the diving operation.
- (d) Where it is not considered safe for this to occur a second suitably qualified member of staff will accompany the diver to act as supervisor.
- (e) Where amateur groups are directed to carry out diving related tasks it must be shown that the divers involved are competent (through training and/or experience) to undertake the work required.

## **TRAINING DIVES**

The School may undertake the training of its students in recreational diving techniques to ensure that their diver training is sufficient for them to be involved in school diving projects. Where this occurs the following will apply

- (a) All training will follow the BSAC training scheme
- (b) The supervisor will be the senior instructor on site and will normally be leading the dive
- (c) Where training is to be conducted in sheltered water conditions the minimum team size shall be 3; consisting of a supervisor, a second diver and one person on the surface. The person on the surface does not have to be a diver but should be familiar with the diving project plan and the arrangements for obtaining assistance in the event of an emergency
- (d) The divers should be capable of rendering assistance to each other in the event of an emergency underwater. The second diver can be a student undergoing training providing that the student has been trained in rescue techniques and has been assessed as competent to carry out rescue techniques to the level required by the appropriate recreational diving organization
- (e) Where training is taking place in a swimming pool the team size can be reduced to a supervisor and a second diver, if both are immediately available to render assistance to the other. The second diver can be a student undergoing training if that student has been trained in rescue techniques and has been assessed as competent to carry out rescue techniques to the level required by the appropriate recreational diving organization and they are familiar with the diving project plan and the arrangements for obtaining assistance in the event of an emergency
- (f) The instructor to student ratio shall not exceed 1:4 during practical skill teaching lessons and shall not exceed 1:2 on non sheltered water open water dives

### **‘In date’ Training dives**

Any diver is deemed to be ‘in date’ i.e. ready for a working dive if, within the last three months, they have undertaken a working dive, or a dive with a simulated task of work for at least 20 minutes in conditions similar to those in which they are to be expected to work.

## **APPENDIX 1 COMPETENCIES FOR AIRLIFT AND WATER DREDGE USE UNDER THE SCIENTIFIC AND ARCHAEOLOGICAL DIVING ACOP OF THE REGULATIONS (Scientific Supervisory Committee 1999)**

### **General**

On completion of the course the candidate will:

1. Understand the need for good communication between the diver and surface equipment operators.
2. Be competent in managing discharge.
3. Understand the impact of the following on the environment: excavation, spoil-heap accumulation, suspended sediment in the water column
4. Understand the characteristics of different types of sediment and their maximum safe unsupported slope angle.
5. Be aware that there may be statutory controls governing disturbance of sea, river and lake beds.
6. Be competent in the safe use of ancillary machinery used to power airlifts and water dredges, recognising the higher combustion risk of petrol-driven machinery.
7. Recognise the hazards of snagging and laceration posed by underwater objects.
8. Be practised in the construction of proper risk assessment with respect to the use of airlifts and water dredges underwater.

### **Airlifts**

The candidate will undertake both practical and theoretical course units, at the end of which they will:

1. Be competent in the handling and operation of an airlift in water.
2. Understand the differences in function and operation between industrial and scientific
3. and/or archaeological airlifts.
4. Recognise the design requirements for scientific and/or archaeological airlifts.
5. Understand the need for the diver to have absolute control of air flow.
6. Understand the relationships between intake velocity at the lower end and the pressure differential (top to bottom), volume of air (l/min), diameter and design of airlift
7. Understand the risk of dramatic changes in buoyancy through changes in airflow or intake blockages.
8. Understand what can be done to avoid uncontrolled changes in buoyancy.
9. Understand the risks from falling discharge.
10. Understand the risk and methods of prevention of uncontrolled burial in soft sediments.
11. Demonstrate a practical ability in the use of airlifts underwater to an acceptable standard.

### **Water dredges**

The candidate will undertake both practical and theoretical course units, at the end of which they will:

1. Be competent in the handling and operation of a water dredge.
2. Recognize the design requirements for scientific and/or archaeological water dredges.
3. Understand the need for the diver to have control of the water flow.
4. Understand the relationships between velocity at the intake end and the following: volume of water (l/min), diameter and design of dredge,
5. Recognize the problem of thrust caused by increasing discharge velocity as the input velocity is raised.
6. Understand the techniques that can be used to overcome the risks of excessive thrust.
7. Demonstrate a practical ability in the use of water dredges underwater to an acceptable standard.

## **BIBLIOGRAPHY**

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- Scientific Supervisory Committee 1999 *Competencies For Specific Task Areas Under The Scientific And Archaeological Diving ACoP* (3rd revision)
- The Combined Diving Associations 2004 *Guidelines for the Safe Operation of Member Club Dive Boats*
- The Diving at Work Regulations 1997 (S.I 2776)
- The Merchant Shipping (Distress Signals and Prevention of Collisions) Regulations 1989 (S.I. 1798)
- The Merchant Shipping (Diving Project) Regulations 2002 (S.I. 1587)
- QinetiQ Health & Safety Laboratory 2006 *Guidance in the event of Handling Diving Equipment Post Accident*



## DIVING PROJECT PLAN TEMPLATE

<b>Title of Project:</b>	
Dates:	
Location of diving operations:	
Diving Contractor:	Bournemouth University
Diving Project Manager:	
Names of Supervisors required (with Oxygen administration and 1 <sup>st</sup> aid qualifications):	
Names of Divers and qualifications:	
Names of other personnel required and their duties:	
Others:	
Task to be undertaken	
Any other groups / persons to contact before diving ops take place.	
Decompression schedule	
Equipment required:	
Emergency Oxygen equipment	
Special kit requirements	
Any special competencies required from any personnel:	
Project plan prepared by:	
Approved by the School Diving Advisor	

<b>Site specific details:</b>	
Sea / water conditions anticipated:	
Tidal conditions:	
Transport to site	
Anticipated minimum underwater visibility:	
Other hazards	
Pollution:	
Depth:	
Temperature:	
Access:	
Breathing gas:	
In-water and surface communications requirements:	
<b>Emergency Information</b>	
Emergency procedures:	Call in to Local Coastguard prior to and following each day's diving (also mobile phone available). Also contact police on 999.
HM Coastguard No.	
Chamber No.	
Royal Navy Diving Doctor	07831 1511523 (24 hrs)
Medical expertise:	
Medical equipment:	
Casualty evacuation plan:	

### **Other notes:**





## DIVING ACCIDENT INFORMATION

(After British Diving Safety Group)

Date	Time
Location/Site	Lat/Long
Boat Name	Call Sign
Sea State	Hardboat/RIB/Inflatable/Shore
Wind Speed and Direction	
Diving Supervisor	Telephone Number

Casualty Details	
Name	Age & Gender
Address	
Telephone Numbers	
Contact Ashore	Relationship
Telephone Numbers/Address	
Has Diving Equipment been secured ? Note Location	
Medical History of Casualty (Including allergies, medications, diseases, injuries)	

Buddy Details	
Name	Age & Gender
Address	
Telephone Numbers	
Contact Ashore	Relationship
Telephone Numbers/Address	
Has Diving Equipment been secured? Note Location	

Last Four Dives (if without 24 hour Gap)			
Time In	Time Out	Max Depth	Mix

## **Guidance in the event of Handling Diving Equipment Post Accident (QinetiQ 2006)**

### **Personal Safety**

If mishandled, diving equipment can be hazardous to health.

1. Do not place any person in a dangerous situation to recover any equipment.
2. Diving equipment may contain gas at high pressure.
3. Re-breathing equipment may contain hazardous chemicals.
4. Diving equipment may be heavy, ensure when lifting equipment that correct handling techniques are used.

### **General Procedure**

**HANDLE THE EQUIPMENT AS LITTLE AS POSSIBLE - DO NOT DISMANTLE IT**

Record the following dive information:

1. Date, time and location of incident.
2. Dive time and maximum depth of dive for the diver and any companions.
3. Dive plan, decompression schedules used and if completed correctly.

Note and record on recovery of equipment:

1. If buoyancy device or dry suit hoses are connected on recovery.
2. If equipment was damaged, prior to or during recovery.
3. Information displayed on a dive computer at time of recovery.
4. All pressure displays/gauges and record pressures.
5. Any details displayed on other electronic instruments.

Gather together and isolate all equipment involved in the accident, including:

1. Dive Slate/Logs covering previous 48 hours.
2. If available at least one other gas cylinder charged from the same source.

Attempt (do not force) to close all cylinder and isolator valves, note and record number of turns required for each valve (1 turn = 360°).

1. Tape valves on cylinders and manifolds in the closed position.
2. Tape any controls or valves on regulators, buoyancy devices and dry suits (including swivel inflation connections) in the position found to prevent any inadvertent movement.

### **Specific for re-breathers**

1. All re-breather mouthpieces to be closed.
2. The rebreather to be stored in an upright position.
3. Close any automatic overpressure exhaust valves (note number of clicks or turns needed to close valve).
4. Retain and keep with incident apparatus any samples of unused soda lime (from same batch) in the original container.

### **For storage and transportation**

Allow any computer(s) to go into standby mode preferably by air-drying or switch computer off.

### **DO NOT**

1. Seal wet electronic equipment in plastic bag (a discharged battery can wipe any memory available).
2. Leave valves open on cylinders.
3. Vent the gas in a cylinder prior to transport.
4. Move maximum depth recordings on analogue gauges.
5. Change position on any regulator controls.



# DIVING OPERATIONS DAILY RISK ASSESSMENT

Action required: Yes/no\*

Geographical location \_\_\_\_\_ Date \_\_\_\_\_

Diving Contractor: Bournemouth University, School of Conservation Science, Talbot Campus, Fern Barrow, Poole.BH12 5B \_\_\_\_\_

Shore/Vessel (name)\* \_\_\_\_\_ Equipment used: SCUBA /Other\*:

Breathing mixture: \_\_\_\_\_

Air/Other\*: \_\_\_\_\_ Stage decompression: Yes/no\*

Decompression schedule used: \_\_\_\_\_

Tables/Computers\*(State types) \_\_\_\_\_

Description of work / title of Diving Project \_\_\_\_\_

Diving supervisors	Period of supervision	Signature(s)

Tidal information:  
(time of slack water/HW/LW etc.)

Special risks or changes to the Diving Project Plan which should be taken into account before diving ops take place (volunteer divers, personnel, qualifications, shipping movements etc.)

**Emergency Information**

Coastguard Area  
 Coastguard telephone No.  
 Nearest chamber checked operational?  
 Diver first aid advice available from Royal Navy Diving Doctor, Tel. 07831 1511523 (24 hrs)  
 Coastguard on Channel 16 or telephone 999

Any emergency /incident: Yes/no*	Decompression sickness/illness/adverse effects: Yes/no*	Adverse environmental factors: Yes/no*	Equipment defects: Yes / no*
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If 'yes' to any of the above, give details: \_\_\_\_\_

\*Delete where appropriate

## BOURNEMOUTH UNIVERSITY AIR DIVING LOG

Date	Diver	Gear Number	Checks (tick)						Dive Details							Decompression				
			Depth Gauge & Timer	Knife	Weight Releases	Buoyancy	Life-line	Non Return Valve	Entry Tissue Code	Main Gas (WC/CP)	Bail Out (WC/WP)	Time Down	Time Up	Max Depth	For time	At Depth	Exit Tissue Code			
1																				
2																				
3																				
4																				
5																				
6																				
7																				
8																				
9																				
10																				
11																				
12																				







18. What is the minimum qualification required by a student in order for them to be involved in university diving projects?

19. What scheme will all training dives follow?

20. Following a diving accident what should you not do to the diver's equipment?