



Diving at Work for Scientific or Archaeological Purposes

Guidance

This is a controlled document whilst viewed at www.leeds.ac.uk/safety. Once downloaded or printed it becomes an uncontrolled copy. Please check the website to ensure you are using the latest version

Doc control no PRSG 30.2 WELLBEING, SAFETY AND HEALTH MANAGEMENT SYSTEM

| | | | | | | | |
|---------|-----|--------------|-----------------|-----------------|---|-------------|---------|
| Author: | HSS | Approved by: | <i>F Fowler</i> | Version number: | 1 | Issue Date: | July 16 |
|---------|-----|--------------|-----------------|-----------------|---|-------------|---------|

Introduction

The University of Leeds recognises that sub-aqua diving is a hazardous activity and takes the risks associated with it very seriously. Where diving work is conducted overseas, whether as a University of Leeds-led undertaking or in conjunction with another organisation, an equivalent standard of safety must be achieved. In particular with regard to standards of qualification, equipment, working practice and emergency arrangements. This guidance clarifies information on how the standard should be interpreted and implemented by all involved in the diving management process.

Definitions

Diving Project – this includes any diving for University business whether led by the University or by a third party. It will include a number of diving operations for the purposes of scientific or archaeological research and may take place at a number of different locations over a period of time.

University-led Diving Project – a diving project being coordinated by the University of Leeds and carried out as normal research operations for an academic group. It is likely that many of the diving team will be staff or students at the University but the operation is at least led and overseen by University of Leeds staff. The diving project manager is usually a University member of staff.

Third Party Diving Project – a diving project coordinated by a third party (e.g. an overseas University) but University of Leeds staff or students join as integral members of the diving team and dive under the operational requirements of the third party to achieve the requirements/objectives of a diving project.

Diving Operation – a dive or set of dives carried out within a set period of time (e.g. a day). The operation starts from the preparations to dive (including loading equipment to transport if applicable) and lasts for such a time that no member of the diving team is likely to require therapeutic recompression.

Diving Project Plan – a specific assessment of the Diving Project which specifically identifies how diving operations will be carried out and how diving will be conducted safely and how each operation will be supervised by a single nominated Diving Supervisor. This is prepared in conjunction with the project risk assessment and sets out key procedures within the diving operation prior to the project commencing. This plan is used to coordinate diving operations in practice and is supported by the completion of the Operational Assessment and Operational log to account for site-specific hazards.

University Divers – individuals diving on behalf of The University of Leeds are considered to have the status of a University Diver if they fall into one of the following groups:

- University staff
- PGR and Taught students
- Formal University Visitors who are entered on SAP
- Volunteers for the Diving Project (unpaid but with confirmation in writing of their status)
- Staff from other organisations such as other Universities where there is an agreed collaboration for divers to join a University of Leeds-led diving project

Non-University Divers – individuals who are engaged to dive as part of a Dive Team, but do not fall into the groups above are considered as University Divers but are still considered to be diving for University business (therefore requirements such as registration, qualification, and medicals likely still apply – see section 12). Examples of individuals who will be considered under this definition include:

- Individual being paid for diving/support but without University Visitor status (entered into SAP)
- Individual from another organisation (e.g. another University, NGO, small business etc.) paid by University of Leeds to take part in/support our diving operations (e.g. make up the minimum team size)
- Those charging consultancy fees and engaging in diving activities as part of the agreement

| | | | | | | | |
|--------|--|---------|-----------|-------------|---------|-------------|--------|
| Title: | <i>Diving at Work for Scientific or Archaeological Purposes – Guidance</i> | Number: | PRSG 30.2 | Issue date: | July 16 | Page Number | 2 of 9 |
|--------|--|---------|-----------|-------------|---------|-------------|--------|

Note: where the University pays a Diving Contractor to carry out a service on its behalf (e.g. paid a fee to supervise activities on our behalf) then the operation is considered as a third party operation and so individuals are not considered as part of the University Dive Team.

If a company is paid to simply provide divers who dive under University of Leeds control (e.g. under our supervision) then these divers are considered as non-University divers but the operation is University-led. This group of divers must be managed in the same way as University Divers but they are not covered by University insurance (see section below) and so must provide their own coverage which is checked before their registration is accepted.

Diving Team – this consists of all the personnel directly involved in a diving operation including divers, diving supervisor, standby-diver and any other competent personnel required for the safe undertaking of a diving operation. The diving team must be assembled based on the assessment of risk and the number of people and qualifications required to conduct operations safely. Within the UK, the absolute minimum team size is four but this can be subject to variation overseas, however, three will still be considered as the minimum to ensure two divers are in the water while a surface attendant maintains a watch over the operation.

The minimum Dive Team (as well as the rest of the team required for the operation) can be made up of divers who are considered as being at work and those who are not at work (e.g. volunteers, students etc.) but it is essential to confirm the liability insurance requirements for those who are not at work through the University Diving Officer.

Outside of the UK, where the Diving Project Plan has identified that conditions are suitably benign, a team of three (two divers and one surface attendant) may be justified. However, this must not be assumed as an automatic derogation and must be discussed with the University Diving Officer.

Guidance

- **University Diving Officer** – The University Diving Officer will be appointed by the University as the technical expert in relation to Diving, providing the first point of contact for diving activities. This will be the first point of contact for all diving activities who will be able to provide support and advice.
- **University Diving Advisory Group is established with set terms of reference** – The group will be set up and will have set terms of reference and as a minimum will consist of the Head of Health and Safety and the University Diving Officer. This group will meet as required to approve all diving operations.
- **Roles and Actions** – The health and safety responsibilities of staff, students or visiting personnel are set out in the University Health and Safety Policy (<http://www.leeds.ac.uk/safety/policy.htm>) however, due to the additional roles required to implement this standard these have been set out in a separate roles and actions document.

All individuals involved must be competent to carry out any task required of them during the Diving Project which can include diving or carrying out key support functions such as administering oxygen or first aid or operating plant and machinery used as part of the Diving Project. The training matrix (to follow) provides more information on the types of qualifications and experience that are acceptable for team members to be considered as competent.

- **Dive teams** – Will have a minimum of four members. A diving team consists of at least two divers in the water with a Diving Supervisor and a standby diver on the surface to monitor safety during the operation and to take emergency action should it be required. However, consult the definition of the dive team and the minimum dive team above for requirements for the size of teams when diving overseas.

| | | | | | | | |
|--------|--|---------|------------------|-------------|---------|-------------|--------|
| Title: | <i>Diving at Work for Scientific or Archaeological Purposes – Guidance</i> | Number: | <i>PRSG 30.2</i> | Issue date: | July 16 | Page Number | 3 of 9 |
|--------|--|---------|------------------|-------------|---------|-------------|--------|

- **Registering with the HSE as a diving contractor (including the University itself or others providing diving services to the University within the UK)** – The Diving Officer will register the University as a Diving Contractor as soon as the first Diving Project involving UK diving is initiated. Diving Contractor status is not required for projects carried out solely outside of the UK.

The Diving Contractor must be clearly identified for every diving operation and this will be included in the Diving Project Plan, as it ensures that there is no potential gap or overlap and that the diving contractor is reputable and competent. It is not permissible for two diving contractors to be in control of the same operation and so this must be clearly defined such that either the University is the Diving Contractor (University-led operation) or another diving contractor is in charge of the operation (third-party-led operation).

- **Notification of Diving Project** – It is important that the diving officer is involved in the early stages of planning or no later than 3 months prior to diving operations, this will ensure that all aspects are considered at an early stage and approval is attained so that there is no impact upon the proposed diving operation.

Whilst this protocol will address the diving elements of the operation, the fieldwork protocol will also apply. The appropriate level of fieldwork assessment form will need to be completed in parallel with the Diving Project Plan to allow hazards associated with travel and subsistence within a particular area to be identified and controlled.

It is important that all parties are fully insured and that they know who insurance is being provided by. The Diving Project Managers must be very sure that all dive team members who are not University staff or students either have a formal status with the University or are considered as non-University Divers as failure to have this can result in a gap in insurance coverage. Non-university divers are not covered by the University insurance arrangements and must provide evidence of their own cover (£10M public liability cover - TBC) before their registration as a diver will be accepted.

- **Diving overseas** – It is important that the minimum standards set by the University are achieved regardless of the location or the lead. The planning process must check that the standards regarding qualification, equipment, local working practice, emergency arrangements and all involved are aware of the requirements. The Diving Officer will be able to provide support and information regarding these requirements.

Diving operations overseas - Diving operations which are conducted outside of the UK are expected to be conducted under this protocol where it is practicable to do so. Some funding agencies (e.g. NERC) expect any operations carried out with their support to be carried out with full application of the Diving at Work regulations as if operations were in the UK. However, the University accepts that variations may be possible for operations outside of the UK, such as reduction of the minimum team size to three because conditions are suitably benign, the use of local experts who have not necessarily got an accepted qualification (but have experience) or the use of paid local divers working under the direction of University of Leeds staff (e.g. Project Coordinator).

It must be noted that lack of resources (e.g. for obtaining a CMAS 3* qualification or to assemble the minimum sized team) or lack of time (because the requirements of this protocol were not followed in advance) are not deemed as practicable reasons for variations in the requirements. Variations are allowable to facilitate pragmatism when designing operations overseas not to allow projects to be run without proper resourcing or planning.

- **Approval of Diving Project and Diving Operations** – The Diving Project Plan must provide control measures to reduce risks from diving in the chosen location that can be researched and identified before the project is started. This will include introduction of measures to ensure compliance with the rest of this protocol (which in turn allows compliance with the Diving at Work Regulations as applied to Scientific and Archaeological Diving) as well as determining control measures required to ensure safety within the parameters of the dives required and conditions that are likely to be encountered.

The Diving Project Plan procedure 1 describes the elements that need to be covered and are required for approval to be given. If you require any assistance in completing this please contact the Diving Officer. It is important that this plan is completed correctly and contains all necessary information otherwise when it goes to the Diving Advisory Group for approval, it will be returned and may delay the diving operations as no diving can take place until approval has been given. More information about the diving plan can also be found in section 13 below.

- **Third party diving projects** – Where the leadership is carried out under the leadership of a third party they need to comply with the relevant aspects of the standard and procedures. These projects must comply with the specific requirements to obtain information from the third party about their insurance, diving supervisor and diving operational plans. Further Information about these requirements is found in Procedure 2 – Joining a third party diving operation.
- **Diving Supervisor** – The Diving Supervisor is appointed by the University to act on their behalf in Diving Operations that are led by the University. They need to have the correct competency and qualifications to fulfil this role. It is not necessary to appoint a supervisor in projects which are conducted within operations coordinated by a third party (e.g. another University) because this role will be fulfilled by them unless advised otherwise.

The role of the Diving Supervisor during operations is different depending on where the project is taking place. Within the UK the diving supervisor must not dive during an operation they are responsible for while overseas they may dive as long as a suitably qualified attendant is on the surface who is clear on the dive plan and the emergency plan. This assists with the pragmatic application of the protocol to account for operational limitations when working overseas. Full details of the supervisor’s role can be found in the roles and actions document.

- **Appointment of Diving Project Co-ordinators** – Diving Projects conducted on behalf of The University of Leeds within operations which are coordinated by a third party (e.g. another University) must have an appointed Diving Project Coordinator unless the Diving Project Manager is present to represent the interests of University of Leeds divers

This is typically the lead researcher who physically carries out diving operations as part of a diving project and has the operational leadership of the project on behalf of the Diving Project Manager. If the nominated Diving Project Manager is present on Diving Operations then the role is fulfilled by them unless otherwise stated in the Diving Project Plan.

- **Registering Divers** – Divers who are carrying out diving activities on University of Leeds-led diving projects must be registered with the University by completing the Diver Registration Form (to follow) The registration is for 12 months and must be renewed on an annual basis.

The registration will require the following supporting evidence:

- a current diving medical issued by an approved practitioner.
- copy of their diving qualification
- first aid qualification, oxygen administration
- HSE Diving medical (or local equivalent for divers based overseas) certificate.
- non-University divers must also provide evidence of the liability insurance providing up to £10m cover for damages caused to others (e.g. University staff).

Any divers involved in Diving Operations while they are at work for University of Leeds (including staff and PG students) must have a CMAS 3* equivalent qualification (or EUF 14153-3 standard e.g. BSAC Dive Leader). Further, any divers who are part of a team to make up the minimum team number (4 for UK diving) must have a CMAS 3* qualification. University of Leeds staff or PG students are not permitted to dive on University business without a CMAS 3* equivalent qualification either in the UK or overseas. University visitors, volunteers and Taught students may make up the minimum team size as long as they hold a CMAS 2* qualification or may be included in the team as

| | | | | | | | |
|--------|--|---------|------------------|-------------|---------|-------------|--------|
| Title: | <i>Diving at Work for Scientific or Archaeological Purposes – Guidance</i> | Number: | <i>PRSG 30.2</i> | Issue date: | July 16 | Page Number | 5 of 9 |
|--------|--|---------|------------------|-------------|---------|-------------|--------|

extra divers (not making up the minimum team size) as long as they hold a recreational diving qualification which allows diving to the depths required by the project plan and includes training in diver rescue (e.g. BSAC Sports Diver, PADI Rescue Diver etc).

Non-University Divers diving on University-led operations must submit their qualifications, medical and insurance to be checked by the University Diving Officer OR have their suitability, experience, qualification, and insurance verified and confirmed (to the University Diving Officer) by a reputable diving services company such as the company charging for provision of suitable divers.

Variations can be applied for in the Diving Project Plan for the qualifications held by additional team members for operations carried out overseas but this requirement cannot be relaxed for the UK-based project. Further details can be found in the training matrix.

- **Proforma Risk Assessment** – All diving operations must be covered by a suitable and sufficient risk assessment that is specific to the Diving Project and further, specific to the site of each diving operation on a given day. Risk Assessments for Diving Projects can be divided into two separate sections which involve the preparation of the Diving Project Plan with reference to the University proforma risk assessment and a site or date specific risk assessment which is carried out once operations are ready to commence. The template can be found in Appendix 2.

This two-tier approach requires Diving Project Managers to use the processes outlined below to proactively assess potential risks and to put measures in place which are reflected in the project plan as well as work through the site-specific operational assessment and dive operations log to identify and control hazards once diving operations commence. To aid the risk assessment process a proforma risk assessment to cover general diving activities has been prepared. This assessment details how key risks from Diving at Work are controlled. This assessment is a proforma and by its nature generic, and so a suitably amended version relevant to the project needs to be produced and signed off by the Diving Project Manager. Further, this document guides Diving Project Managers/Diving Supervisors through the considerations for assessing a specific site on a specific date and putting diving procedures/precautions into place to maintain safety using the Diving Operations Assessment and Log template.

- **Emergency Procedures** – Typical and foreseeable emergencies associated with diving operations must be identified as part of the Diving Project Plan and measures put in place to ensure they can be dealt with quickly and efficiently in the context of the operation (e.g. taking into account the location). Further, the means to deal with emergency situations that are specific to the nature of the operation must be planned into the project plan.

Emergency procedures must be reviewed once at a diving location to ensure the planned action is possible and will adequately address the problem. For example, if a procedure requires contact with emergency services to be made using a mobile phone then there must be a signal and the user must be clear on what number to call, including any international or area dialling codes. Further, equipment required in an emergency plan must be available, functional and suitable for the environment it is to be used in. Procedure 3 provides more details about the specification of emergency procedures.

- **Conducting Diving Operations** – All Diving Operations must be carried out within the parameters given in the Diving Project Plan. Preparation of the plan requires background research to identify the likely conditions and therefore the key procedures that are required as well as planning to determine the nature of the diving operations to fulfil the aims of the project (e.g. depths, duration of dive, underwater tasks/operations required and equipment requirements).
- **The Diving Operations Assessment and Diving Operational Log** – These two processes ensure a site and date specific risk assessment has been carried out before operations commence and that key operational information about the dive is recorded.

Assessing Safety Implications/Requirements using the Diving Operational Assessment Template

| | | | | | | | |
|--------|--|---------|------------------|-------------|---------|-------------|--------|
| Title: | <i>Diving at Work for Scientific or Archaeological Purposes – Guidance</i> | Number: | <i>PRSG 30.2</i> | Issue date: | July 16 | Page Number | 6 of 9 |
|--------|--|---------|------------------|-------------|---------|-------------|--------|

Appendix 4- It is not possible to provide an exhaustive list of the different procedures and precautions that may be required for a diving operation to be conducted in a safe manner. The Proforma Risk Assessment (appendix 2) provides a framework to underpin operational procedures and the Diving Operations Assessment template provides a framework for site-specific risk assessment and specification of diving requirements. Procedure 4 provides a step by step guide on the considerations for assessing the diving operation. The information provided must be considered as minimum requirements for each diving operation. Each of the points covered by Procedure 4 expands on the considerations covered by the Diving Operations Assessment template to provide more information about each element of the assessment and management process.

Many of the considerations include areas which trained divers will consider as automatic procedures but these must be recorded as they are an essential part of the operational recording requirements. Diving Operations must still be conducted within the parameters detailed within the Diving Project Plan; this process must not be used for assessing previously unplanned operations.

The Diving Operational Log – This is an essential process in maintaining operational records in addition to the Diving Operational Assessment. It is the completion of a Diving Operational Log template Appendix 5 that documents the completion of key checks, briefings and plans ahead of the dive, and then records dive parameters such as the depth of the dive and the amount of time the divers were in the water.

This log is completed using the template (see procedure document) for all University-led diving operations. Divers must not enter the water until the checks, briefings and plans detailed by the log have been completed to the satisfaction of the Diving Supervisor. Third party-led diving operations should have a similar system in place which should include University of Leeds divers entering the water as part of the same operation.

A step by step guide on the requirements and considerations to complete the Operational Diving Log is found in Procedure 5.

- **Personal Diving Log** – All divers who carry out diving operations on behalf of The University of Leeds must keep a personal log of their dives using the template in Appendix 5. Records must be made as soon as possible after each dive and submitted to a University of Leeds Diving Supervisor or a Project Coordinator at the end of a Diving Project or the end of a diver’s involvement in a project.

The Personal Log must be completed in addition to the Operational Assessment and the Operational Log. More information can be found in Procedure 6

- **Essential equipment** – All equipment used in diving operations must comply with the University Work Equipment Protocol. Briefly, this requires it to be fit for purpose, suitable for the intended use (e.g. manufactured for the use it is being put to), used by competent and trained operators and recorded on the University equipment inventory. In the context of equipment used in Diving Operations this means the following:
 - Used in the conditions for which it was manufactured (e.g. depth limitations)
 - Used by those who are trained appropriately (e.g. rebreather qualification)
 - Free of faults such as leaks, loose connections, and compromised features (e.g. cracked glass on pressure gauge)
 - Subject to the required inspections and tests (see below)
 - Maintained as required by the manufacturer
 - Subjected to a user check for proper function before use in a diving operation
 - Has up to date records of inspection and service based upon manufacturers recommendations.

University-owned equipment will be maintained on a register held by the University Diving Officer and will be used and maintained subject to the requirements above by the research group or Faculty who purchased it.

Certain equipment used in Diving Operations is subject to additional requirements for inspection and testing because it is essential to the safety of a diver and failure would result in death or serious injury. This equipment is detailed in the table below along with the inspection and testing requirements and the means to obtain confirmation that suitable inspections, tests or maintenance have been carried out.

Equipment test / maintenance requirements

| Equipment | Servicing and/or inspection requirement | Comment |
|--|--|--|
| Cylinders - compressed air | Inspected within national requirements (e.g. 2.5 years) | The UK requires a visual inspection every 2.5 years and hydrostatic test every 5 years. |
| Cylinders - nitrox or oxygen | Confirmation of Inspection within national requirements (e.g. 2.5 years) Certificate to confirm oxygen service | The UK requires a visual inspection every 2.5 years and hydrostatic test every 5 years. Oxygen service requires oxygen compatibility at manufacture and oxygen service by a qualified technician. |
| Diving regulators – first and second stages used with <40% oxygen mixes | Confirmation (e.g. certificate) of service within last 2 years. | |
| Diving regulators – first and second stages used with >40% oxygen mixes (e.g. decompression gas) | Confirmation of service within last 2 years. Confirmation of Oxygen Service | The regulator must be oxygen compatible at manufacture and oxygen clean by a qualified technician. |
| Rebreather units | Confirmation of completed service within recommended time frame. | As recommended by the manufacturer. Often require annual service. |
| Compressors owned, hired or otherwise used directly by Dive Team member | Service confirmation for the unit. Inspection certificates for any pressurised elements. Air purity certificate, levels within accepted parameters. | Must be run by competent operators to ensure cylinders filled properly and safely |
| Compressors owned by third parties and used by Dive Team on a paid basis (e.g. commercial dive shop) | Air purity certificate, levels within accepted parameters. | A photograph of a certificate on display is adequate. Portable testing kits are available |

Divers may use their personal equipment on diving operations carried out by the University but the Diving Advisory Group must be provided with confirmation (as indicated in the table above) that suitable inspection/testing/maintenance has been carried out to the requirements in the table above or otherwise equipment must not be used. The University is not responsible for resourcing /inspecting/ testing or maintenance of personal diving equipment unless agreed and funded by the Diving Project Manager.

Equipment that is hired for diving operations must be provided with confirmation that inspection/testing/maintenance requirements have been carried out (e.g. cylinders must have test certificates). An air purity certificate must be obtained and kept in the operational records from compressors owned by third parties (e.g. commercial dive shops).

If specialist equipment is used for a diving operation then dedicated operators must be identified and be competent as required by the operation. Further, the servicing, maintenance, and inspection requirements must be obtained and adhered to. Highly specialised equipment may require a daily check before use and specific maintenance which must be outlined in the Diving Project Plan.

- **Reporting accident / incidents** – The University Diving Officer should be informed of any diving-related incidents at the first available opportunity once the casualty has been referred to medical attention. In the UK, this can be by telephone and overseas by email or telephone. If contacting by email ensure a telephone number is given to allow immediate follow-up. This is to ensure an investigation can be launched immediately and, if necessary, a report can be made to the relevant authorities.

Incidents which occur on diving projects but do not directly involve diving operations must be reported in accordance with the University fieldwork protocol so that a record can be made on the online system and follow-up can be coordinated as required.

- **Using a boat is used as a diving platform** – There are a number of different aspects that need to be considered if using a boat as a diving platform. Such as a suitably qualified skipper / owner needs to be used, Insurance etc. further and more specific information regarding the requirements can be found in Procedure 7.
- **Procedures, appendix and tables** – Due to the nature and complexity of diving at work, it has been necessary to produce a number of procedures and appendices to specify the requirements for various aspects of the process. These documents include guidance and explain the expectations that need to be achieved.
- **Variation to the standard or procedures** – In very occasional circumstances a variation to the Standard may be required. If this is the case, it is to be agreed in writing (and include an authorised written procedure) by the Diving Advisory Group. The Head of School/ Service would also be notified of this if it was within their remit.