

DIVING INDUSTRY STRATEGY

2015 TO 2018

STRATEGIC CONTEXT

1 This strategy sets out how HSE's Energy Division will regulate the health and safety of all diving at work activities. It covers what HSE will do to regulate the diving industry and also what diving contractors, their clients and other industry stakeholders should do to improve the health and safety performance of the industry.

2 HSE's Diving Group has responsibility for enforcing the Diving at Work Regulations 1997 (DWR97) which apply to all diving carried out in Great Britain where at least one person who is taking part is at work. Diving at work covers a wide range of activities from deep saturation diving in support of the offshore oil and gas industry to recreational instruction by an individual professional instructor.

DESCRIPTION OF THE INDUSTRY

3 This is a geographically and technically diverse industry which operates across the whole of the UK - from the most inaccessible inland locations to the furthest offshore installation. The industry has in excess of 50,000 people "at risk" (including members of the public undergoing paid instruction). The strategy aims to secure the safety of those working or affected by the different sectors of the diving industry.

The industry includes the following sectors:

Offshore

4. This sector includes all diving operations in connection with offshore installations, wells and pipeline works, any diving using closed bell or saturation diving techniques and where diving takes place from vessels maintaining station by the use of dynamic positioning. It also includes diving operations in UK designated areas of the continental shelf undertaken in connection with offshore installations, energy structures e.g. wind farms, emerging energy technologies (EETs), wells and pipeline works, and with those parts of mines which extend outside the 12-mile limit.

5 Worldwide, there continues to be a high level of demand for experienced divers, supervisors and support staff. The age profile of this internationally mobile workforce means that there are likely to be shortages of key personnel for some time. The commercial diving schools are training new divers at an unprecedented rate, but it will take time to close the gap in experience. Ensuring that all diving team members (including support staff)

are suitably qualified and competent is an ongoing challenge for all offshore diving contractors.

6. Saturation diving takes place from complex and expensive Diving Support Vessels (DSVs) which work around the world and vary greatly in size, capability and age. Some of the older vessels present significant challenges in terms of reliability and safety and many are no longer considered suitable for the North Sea. The latest generation of larger DSVs with complex computer controlled systems have proved to be very capable, but have also brought some new challenges for their operators, the classification societies and for the regulators. Adapting existing guidance and procedures to these Programmable Logic Controller (PLC) systems is an ongoing process and recent incidents have highlighted the need for further work in this area. Proactive inspection of these vessels and older assets within the offshore diving industry remains one of the highest priorities for HSE's diving inspection teams. Other diving techniques include installation based diving (IBD) where equipment and diving teams embark on an installation for a fixed duration. Some air range diving work is also carried out using small "daughter" craft operating from a "mother" vessel immediately adjacent to an installation or FPSO.

Inland/Inshore

7 This sector is perhaps the most diverse. It includes all diving projects conducted in support of civil engineering or marine-related projects and fish farming inshore (within territorial waters adjacent to Great Britain) and inland (docks, harbours, rivers, culverts, canals, lakes, ponds and reservoirs) and in tanks and swimming pools. The work involves a wide range of activities, ranging from complex marine construction and engineering tasks, salvage and ship repair through to simple underwater inspection.

8 This sector has experienced a marked increase in activity in some areas such as diving in support of offshore renewable energy projects, but other areas have suffered from the recent economic downturn. Much of the work is carried out in a highly competitive market with relatively low profit margins. This often results in pressure to reduce costs by using the absolute minimum resource in terms of team size and equipment.

Scientists and Archaeologists

9 This sector includes scientific research or scientific educational instruction and underwater archaeology - including investigation of sites of historic interest and the recovery from such sites of articles for preservation and further analysis.

10 This small and specialised industry sector has experienced relatively few problems in recent years and demonstrates a significant degree of self regulation. However, recent changes in environmental legislation are likely to

lead to an increase in both scientific and archaeological survey work prior to any marine construction, extraction or development projects.

Media

11 This relatively small sector covers activities such as film and television programme making. Media divers include stunt people, journalists, presenters, photographers, camera operators, sound and lighting technicians, and the unit crew required to dive in support of underwater media work. Media projects are often small scale and of short duration and therefore difficult to inspect at short notice. In the past, HSE has concentrated on the relatively small number of client companies involved in this sector and this is likely to continue.

Recreational

12 This is numerically the largest sector of the diving industry, with the majority of those at risk being members of the public paying for professional instruction. Recreational diving training is carried out in the UK by a number of national and international training organisations. The majority of this training is carried out by instructors who are “at work” but a significant proportion of this activity is conducted through clubs or associations who are not subject to the diving regulations.

13 SCUBA diving is a long established recreational activity with a safety record comparable to other adventurous sports. In recent years, there has been an increase in “technical diving” using mixed gases and rebreathers. This has increased the risk, and has resulted in a change in the type of accidents being investigated by HSE’s inspectors. Recent inspections and accident investigations have highlighted the consequences of poor planning, inadequate risk assessment and the failure to prepare for emergencies. This is being addressed through information and advice via the training agencies, but there is a need to reinforce this educational approach with site inspections and, where appropriate, enforcement action.

Military

14 This covers diving operations carried out by members of the armed forces. The MoD has its own dedicated diving safety inspectorate (now part of the Defence Safety Authority) which regulates these activities. HSE’s inspection work will be planned and carried out in accordance with the MoD/HSE General Agreement. Inspection will concentrate on the overall safety management process and this will primarily be achieved by a planned 3 yearly inspection of the Defence Diving School and through the MoD Diving Safety Management Panel.

Police

15 Police diving units are primarily used for search and recovery tasks in support of wider police operations. In recent years, many police diving and marine units have come under scrutiny due to the ongoing cuts in public spending. Amalgamation of diving teams and/or the use of commercial contractors has already taken place in many areas and this is likely to continue. Pro-active inspection of police diving operations is not a high priority. However, diving teams will continue to seek out opportunities to join wider HSE proactive interventions with police forces and ensure that diving is incorporated into their overall safety management system. Regular contact and a close working relationship allow HSE to remain an effective regulator in this sector for the minimum investment of time and resources.

Shellfish

16 The shellfish diving industry remains a challenging sector with 3 fatal accidents in 2011/12. Historically this sector has not been intensively regulated by HSE due to the low number of participants. However, a sharp increase in the selling price for shellfish has resulted in a very large influx of operators, some of which show little regard for regulations or established safe practice. Much of this activity is deliberately covert, taking place from secluded bays and jetties. The scale of the problem is such that HSE, Marine Scotland, and Police Scotland are cooperating in order to ensure comprehensive and effective action against identified criminal teams. Closely coordinated action of this nature is required to make the best of HSE's resources and ensure positive outcomes.

Commercial Diving Schools

17 The 12 HSE approved commercial diving schools have been very busy for the last few years and HSE currently issues around 1250 certificates per year. Diver training – particularly at the entry level, entails some additional risks and this requires a higher level of HSE oversight than is the case for other diving contractors. Diving schools will usually be inspected on an annual basis. HSE is currently working with the diving schools and other regulatory and certifying bodies to review and update diver training standards. The current focus is on closed bell (saturation diving) training, but the intention is to review surface supplied diving in the future.

THE PRINCIPAL HEALTH AND SAFETY RISKS

18 Diving is an inherently hazardous activity – whether undertaken for work or leisure. Divers are totally reliant on life support equipment and, in most cases, a dedicated support team on the surface. Underwater work can introduce significant hazards and many activities which can be carried out

without problems on the surface can be very dangerous underwater – e.g. using powered tools or mechanical lifting. The risks associated with diving are generally well known and can be controlled effectively by appropriate training, planning, equipment and procedures. However, HSE continues to investigate preventable deaths and has investigated an average of 3 diving at work fatalities per annum since 1996.

Major hazard risks

19 Diving is an essential part of the offshore oil and gas industry, providing key services at every stage of the process from drilling, construction, production and decommissioning. In the offshore sector, HSE's priority is to prevent high potential consequence diving and diving-related incidents such as a dropped diving bell, sudden decompression of a saturation system, or damage to an installation or pipeline during subsea operations.

20 DSV operations adjacent to installations represent a significant major hazard risk. A collision between a large vessel and an installation can be catastrophic (as illustrated by the Mumbai High incident in 2005) or at least result in significant damage and loss of containment. Subsea operations - particularly lifting of large objects in the vicinity of seabed infrastructure, along with other routine diver interventions, have potential to cause unplanned hydrocarbon releases with the associated risks of fire, explosion and pollution.

21 Saturation diving involves keeping up to 24 divers under pressure for prolonged periods. Failure of complex life support systems or a threat to the vessel itself (e.g. fire or collision) can place all of these people at immediate risk from a catastrophic decompression of their hyperbaric living chambers. While modern DSVs have hyperbaric evacuation facilities, these are also vulnerable and only offer a limited means of escape.

22 Installation based diving has the potential to impact the structural integrity of the installation as a result of the additional weight on board. The integration of common systems and an inventory of high pressure gases can increase the risk of fire and explosion, and may reduce the availability and effectiveness of the installation's fire fighting and deluge systems.

Diving health and safety

23 Divers are exposed to a range of inherent hazards in their working environment. A person is only able to survive underwater for more than a few minutes with the appropriate life support equipment – breathing apparatus, thermal protection, etc. Exposure to increased pressure brings its own problems, with suitable breathing mixtures, decompression tables and ascent rates all being essential. Divers in saturation need complex systems and a team of highly trained life support personnel throughout their exposure which may last up to 28 days. All divers, across all industry sectors, rely to at least

some extent on surface support teams to keep them safe throughout their dive.

24 Divers must be medically fit to dive, as even minor ailments can have a profound effect whilst diving. This is an issue in all diving sectors and there seems to be a rise in the number of cases where divers have undeclared medical problems or have taken inappropriate medication prior to diving and have subsequently become unwell underwater.

25 Work activities can introduce many additional safety hazards – for example underwater explosions from burning/cutting, power tools, lifting/slinging, noise and vibration, and high pressure water jetting. Mechanical handling and lifting operations present a significant risk to divers and surface support teams and this is an area that will be prioritised during HSE inspections both offshore and onshore.

26 Diving platforms and other vessels pose risks from propellers, intakes, discharges and sonars. Diving from dynamically positioned (DP) vessels introduces a particular risk to divers in the water or in the bell from unplanned loss of position, as well as posing a major hazard risk to adjacent installations. Differential pressures arising from locks, sluice gates, and blanked void spaces are a particularly insidious hazard and may easily be underestimated.

27 Potential health hazards include noise, vibration, cold, and exposure to toxic substances as well as the long term health effects of diving which are well documented.

HEALTH AND SAFETY REGULATION

28 The Diving at Work Regulations 1997 (DWR97) and associated Approved Codes of Practice (ACoPs) apply to all diving carried out in Great Britain where at least one person who is taking part is at work.

29 The Health and Safety at Work Act 1974 Application outside Great Britain Order 2013 applies prescribed provisions of the Health and Safety at Work Act and associated regulations to specified offshore health and safety matters – including diving.

30 For most offshore oil & gas related diving operations, the Offshore Installations (Safety Case) Regulations 2005 will apply. HSE inspectors assess offshore safety cases submitted by operators and diving related issues will be assessed by specialist inspectors. HSE inspectors then carry out inspections to ensure that standards set out within the safety case are met in practice. This will include the Offshore Dutyholder Diving Management Review (ODDMR) programme which is now well established and remains the main focus for HSE's approach to offshore diving company clients. These reviews will be conducted in conjunction with the Inspection Management Teams and will focus on the management of diving operations as detailed in their respective safety cases. This type of inspection provides an opportunity

for HSE to influence the client directly and facilitate formal agreements between the client and contractor which encourage industry best practice. A good example is the requirement for effective and realistic emergency diving drills to be conducted as part of a diving project. Client pressure as a result of HSE inspections is driving a marked improvement in this area.

31 Inspectors may also investigate accidents to and complaints from workers and the circumstances associated with any dangerous occurrence.

32 Inspectors will undertake their work in line with the HSE's [HID Regulatory Model](#). They will sample key risk control systems to assess the overall management performance of the dutyholder. During inspections and investigations, inspectors will seek to identify both the immediate reason for the failure and its underlying cause. They will take action both to remedy the immediate problem and secure change that ensures the problem will not recur.

33 Inspectors will inform dutyholders of actions necessary to comply with the law. Where inspectors are of the opinion that there is a risk of serious personal injury, they may prohibit the activity. Where they identify significant failures to comply with the law, leading to risk to workers, they will require the dutyholder to comply within a suitable period.

34 Inspectors may also refer failures to comply with the law to the courts (via the Procurator Fiscal in Scotland, or directly in England and Wales). Matters are referred to the courts to secure either compliance with the law or obtain justice.

35 HSE inspectors exercise their powers in line with the Regulator's Compliance Code and the regulatory principles under the Legislative and Regulatory Reform Act 2006. They will follow HSE's Enforcement Policy Statement and make judgements in line with the Enforcement Management Model.

36 HSE's Enforcement Policy Statement requires our work to be:

Transparent - we should be able to demonstrate what we do, why we do it and how we reach our conclusions. This strategy is an important element of transparency in our dealings with the offshore industry.

Targeted - in the case of the offshore industry major accident hazards are our main concern and duty holders should be targeted for interventions on the basis of the level of risk they manage and their performance in managing that risk.

Proportional - all our actions should be proportional to risk.

Consistent - we should take similar action in similar circumstances to achieve similar ends. The strategy sets out these ends.

Accountable - the industry and public can and should expect us to work to the aims and standards within this strategy and bring it to our attention when we fall short.

37 To achieve this HSE must maintain its capability to deliver its range of interventions. This includes ensuring:

The competence of individual inspectors and other staff.

The competences match those needed to deliver the strategy.

It has sufficient total resource.

That the available resource can be applied flexibly and can respond to changing circumstances.

AIMS & OBJECTIVES

Ensuring dutyholders¹ apply inherent safety principles in managing risks.

Prioritising interventions based on the inherent hazards of the diving being undertaken, the performance of duty holders in controlling risks and other defined operational intelligence.

Undertaking interventions in line with HSE's [HID Regulatory Model](#) and the [HID Principles for Prioritising Major Hazard Inspections](#). In particular, interventions will focus on the management of risk by sampling arrangements in key areas.

Identifying the underlying as well as the immediate causes of any deficiencies in dutyholders' arrangements for managing risks.

Taking action to ensure immediate and underlying causes of failures of risk management are addressed.

Dealing with matters of evident concern identified during inspections and investigations.

Investigating accidents and complaints in accordance with mandatory incident selection criteria and complaints policies.

AIM 1 – LEADERSHIP: The diving industry demonstrates effective leadership in managing the risks associated with diving at work.

Objective 1:

The diving industry sectors have effective arrangements for identifying and managing risks associated with diving by following appropriate guidance and adopting best industry practice.

Objective 2:

The diving industry has effective arrangements for sharing and learning lessons from incidents and near misses with the aim of controlling the risks associated with diving.

AIM 2 – COMPETENCE: Dutyholders demonstrate competence to manage the risks associated with diving.

¹ The term “dutyholder” includes diving contractors, clients and others whose actions may affect the safety of the diving team.

Objective 3: Dutyholders have arrangements to ensure that divers, supervisors and their associated support teams are competent, suitably qualified, equipped and resourced to discharge their duties.

AIM 3 – MAJOR HAZARDS: Offshore dutyholders address the most significant issues.

Objective 4: Offshore dutyholders address the major hazard risks associated with diving on offshore installations & pipelines in their safety cases and through their management of diving contractors.

AIM 4 – DIVING HEALTH & SAFETY: Dutyholders address the most significant issues.

Objective 5: Dutyholders ensure that appropriate diving life support equipment is selected, used and maintained for all diving projects.

Objective 6: Dutyholders ensure that subsea lifting operations are planned and conducted safely.

Objective 7: Dutyholders ensure that for all diving projects, there are suitable and effective plans in place to manage all reasonably foreseeable emergencies - including recovery of an incapacitated diver and (where appropriate) hyperbaric treatment and/or evacuation to a place of safety.

AIM 5 – REGULATORY APPROACH: Regulation is proportionate, targeted, consistent and transparent and HSE is accountable to the industry, workers and the public for its actions.

Objective 8: HSE ensures interventions are targeted, transparent and consistent.

Objective 9: HSE has the capability, capacity and competence to deliver the strategy.

Objective 10: HSE works with the different sectors of the diving industry in the UK, Europe & elsewhere to develop and promote robust standards for managing risks associated with diving.

AIM 6 – INVESTIGATIONS & SECURING JUSTICE: HSE promotes sustained compliance with the law and holds dutyholders to account where failures give rise to significant risks.

Objective 11: HSE undertakes investigations in accordance with HSE/HID investigation policies.

Objective 12: HSE secures compliance with the law by taking action in accordance with its [Enforcement Policy Statement](#) and [Enforcement Management Model](#).

Objective 13: HSE initiates prosecutions in accordance with the requirements of the Code for Crown Prosecutors in England & Wales and in Scotland, recommends prosecution to the Crown Office & Procurator Fiscal Service in line with the Lord Advocates Code Practice.

DELIVERING THE STRATEGY - What HSE's regulatory activity will look like

1 To deliver its strategy, HSE will:

Undertake a range of regulatory interventions, including inspections and investigations, which are informed by regulatory intelligence, industry performance, trends and other information to target its resources to reduce risks associated with diving at work using the approach detailed in HSE's [HID Regulatory Model](#)

Maintain a dialogue with dutyholders to ensure that interventions are effective and make the best use of HSE's resources.

Engage and collaborate with industry stakeholders to pursue initiatives and provide guidance for risks across all sectors of the diving industry.

Secure compliance and prosecute dutyholders in line with its [Enforcement Policy Statement](#). This means using all the enforcement tools we have – advice, letters, notices and ultimately prosecution.

2 The [HID Regulatory Model](#) underpins all regulatory activity. It emphasises that inspectors will make judgements about the health and safety performance of an organisation by sampling and the primary aim of inspection and investigation is to identify any underlying deficiencies in managing risk and ensure that these are addressed.

Key regulatory activities are:

Assessment of offshore safety cases

3 This work will ensure that operators have identified key risks associated with offshore diving on or from their installations and have identified suitable measures to control those risks. The forthcoming changes associated with the implementation of the revised [Offshore Safety Directive 2013/30/EU](#) will require detailed modifications to safety cases to align with environmental requirements, but the fundamental principles applied will not change.

Planned interventions

4 **Targeting** - HSE targets its inspection of diving contractors (and their clients) on the basis of risk. This takes into account the inherent hazard of the diving work, and their assessed ability to manage risks.

5 **Addressing underlying causes** - The aim of every intervention is to ensure that risk is being effectively managed. Where deficiencies are identified, action is taken to remedy failures. Failures in safety management will be identified in two key ways. Firstly, management systems will be examined to ensure they are appropriate, applied, understood by those who

have key roles to play and subject to regular review. Second, where technical failures are found, their causes will be identified. Inspectors will drill down into the causes of failure to ensure that not only is the actual failure remedied, but the underlying causes and failures in management systems are identified and remedied.

6 **Preparation** - Planned inspection includes the preparation for the inspection, the post inspection analysis and recording of conclusions. Inspectors will prepare for inspections by considering documents, processes and procedures. Where they request material or information from a duty holder in advance of a visit, this is a key part of the inspection. The aim of a site/vessel visit is to test and verify that the procedures and processes set out by the diving contractor are understood, consistently applied in practice and deliver appropriate control of risk.

7 **Involving the workforce** – Where appropriate, inspectors will invite safety representatives and/or other employees to provide input to site visits.

Investigations

8 **Priorities for investigation** - Accidents and dangerous occurrences will be selected for investigation based on published criteria. Concerns raised by workers relating to health and safety standards will also be investigated.

Closing out

9 Inspectors will summarise for the senior duty holder representatives and any workforce representatives, their key findings at the close of every visit. Inspectors may give advice and comment on issues at this point. They may also need to take further expert advice, or await the results of testing etc. before making a final decision on some issues. Inspectors will confirm all significant findings to relevant duty holders. Significant findings are limited to issues that constitute a failure to meet a defined standard.

10 **Recording performance** – Following all significant interventions, inspectors will score and record the performance of the dutyholder against a set of key topics. These scores will be used to track the progress of the dutyholder in moving towards full legal compliance, and will guide the priority for further HSE interventions on that topic, installation or duty holder and recognise good standards.

11 **Letters** - Following an inspection or investigation, inspectors will confirm in writing to the relevant duty holder any significant failures of safety management. Where issues are raised, they will be followed up. Where duty holders do not take sufficient remedial action, inspectors will take formal action to secure compliance.

12 Where any requirements appear unreasonable, or how compliance is to be achieved or measured is unclear, dutyholders should seek clarification from the inspector or the inspector's line manager.

Enforcement action

13 Formal enforcement action is taken to protect against injury. Action may be taken to prohibit defined activities when circumstances are such that the inspector believes there is risk of serious personal injury. Improvement notices may be served where there is a contravention of a legal requirement or where there has been a contravention in circumstances that make it likely that the contravention will continue or be repeated.

14 Inspectors will follow the provisions of [HSE's Enforcement Policy Statement](#) and [Enforcement Management Model](#) to ensure that their actions are proportional to the risks they are designed to control. Duty holders may appeal to an Employment Tribunal regarding the service of a notice.

15 The service of a notice is not a punishment. A notice provides an opportunity for duty holders to comply with legal requirements. Failure to comply with a notice will be referred to the courts.

16 Where standards fall unacceptably short of the legal standard, or where a failure to comply has led to death or injury, matters may be referred direct to the courts for consideration.

17 **Fatal accidents** - In the event of a fatal accident in England & Wales, the Police will also investigate under the terms of the [Work-related Deaths Protocol](#). The Police will consider if the death(s) were due to manslaughter and they may initiate action against individuals or corporations. In Scotland, inspectors will liaise with the Procurator Fiscal and Police in accordance with the [Scotland Work Related Deaths Protocol](#).

Stakeholders

18 In general, technical and/or procedural solutions to control the risks associated with diving are already available. Failures of risk controls and associated failures in legal compliance frequently arise because either insufficient attention is given to identifying and controlling risks, or solutions once applied are not maintained. These issues can only be addressed by focussing on health and safety leadership throughout the industry and ensuring adequate competence at every level. In particular the workforce needs to be not only competent to understand what is necessary and what should be in place to protect them, but they also need to be actively engaged in the process of safety management.

19 Equally, innovative solutions to some issues emerge and lessons are learned from incidents etc. about how better to implement and maintain established processes and procedures. This learning is a valuable resource and should be available to and exploited by the whole industry. A range of relevant stakeholders are already engaged in the identification and sharing of important learning across the industry. These include HSE's Diving Industry Committee (DIC), and the Recreational Diving Industry Committee (RDIC), the British Diving Safety Group (BDSG), as well as many industry led

committees and working groups in the UK, Europe and worldwide. HSE will look to these groups to share lessons learned from incidents and from technical advances as well as promoting best industry practices to improve diving safety across all sectors of the industry.