SAFETY TIPS FOR DIVE OPERATORS

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DAN created this book to help dive operators and professionals gain a better understanding of the risks inherent to their operations. It outlines minimum safety standards for various aspects of dive operations. It also provides a foundation for refining safety protocols by offering dive safety officers and other dive pros a tested approach for assessing safety and modifying practices to prevent incidents and limit liability.

All the safety tips in this book are from the *DAN Risk Assessment Guide for Dive Operators and Dive Professionals*, a comprehensive guide to the unique and unexpected risks present in dive operations. This guide is available to dive businesses at no cost.

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OUR DREAM BOAT
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CUSTOMER SAFETY

Every business wants its customers to have a great experience. In diving, this means providing safe as well as memorable dives. Promote your divers' safety by establishing and enforcing clear policies, managing their expectations, and striking the right balance with the information you provide prior to travel.

Divers tend to be adventurous and may appreciate opportunities to sample local cuisine. Be sure to observe food safety guidelines when preparing and serving food to your customers.

CUSTOMER SAFETY

MANAGE EXPECTATIONS

Customers may have incorrect or unrealistic expectations of your dive operation, and this could potentially lead to illness or injury of the customer or staff member. It could even lead to legal action. For these reasons, a thorough briefing of services offered should be given before the beginning of the trip— and perhaps even before customers book their dives.

This briefing will be dependent on the diver's goals and could include issues such as the scope of training courses, conditions of service, prerequisite qualifications, equipment or insurance requirements, local environmental requirements (such as prohibition of the use of gloves or dive knives), and costs.

FITNESS TO DIVE

It is possible that your request for more information from a customer might be interpreted as invasive or discriminatory. However, this is important information that you need in order to keep everyone involved safe. It's necessary to make sure customers are diving within the scope of their training, are physically and medically fit to dive, and are not being exposed to undue risk.

Operators should put policies in place that are designed to provide consistent, systematic screening of customers, especially if they are expected to engage in higher-risk activities such as technical or deep diving or diving in a remote location. This screening should include proof of certification, the date of the customer's last dive, language comprehension, age, experience level, and comfort in the water. Additionally, a fitness-to-dive questionnaire or questions relating to preexisting medical conditions should be required. This should include some assessment of the diver's physical abilities before they enter the water.

RIGHT OF REFUSAL

Many dive operators are hesitant to decline service in the event of potential concerns if those concerns are unrelated to medical issues or certification. However, dive operators have the right to refuse service if their decision is based on sound, consistent and safety-related reasons.

If a client will expose you, your staff, or other customers to risks that can't be suitably mitigated, you should consider declining to take them diving. This decision can be made at any stage, whether they are inquiring about registering or sitting on the boat on the way to the dive site. Some reasons you may want to consider denying service to a customer include inability to perform basic functions, appearing to be under the influence of drugs or alcohol, being medically unfit to dive, exhibiting behavior such as aggression or not following instructions, or having equipment that is clearly damaged or unsuitable for the dive.

A clear and concise policy should be communicated to customers via your website, a sign posted in your shop, and/or an email sent to customers when they register to dive. Canceling a dive or refusing service should always be consistent with your stated policy and based on safety considerations.

DIVE SITE RISK ASSESSMENT

Some dives are easy, while others are demanding or technically challenging. Depth, temperature, currents, bottom topography, marine life, visibility, and more determine the risks that a certain dive site will pose to your customers and staff. Remember it is almost impossible to identify every single hazard, and customers will always be exposed to some level of risk. Mitigation of these risks is therefore imperative.

Establish a policy requiring a formal risk assessment, and set site-specific requirements regarding certification, experience, and fitness for divers who will be diving there. Sea and water conditions, entry and exit considerations, environmental risks, and adequate gear are just a few of the things you should consider during site assessments.

Depth, temperature, currents, bottom topography, marine life, visibility, and more determine the risks that a certain dive site will pose ...

TRAVEL AND HEALTH ADVICE FOR CUSTOMERS

Dive operators who offer experiences in remote and less-developed locations must strike a sensible balance between offering sufficient practical advice and deterring the more timid of their potential dive clients.

New or less-well-informed divers will need enough information to be able to plan for their health and safety and gain an understanding of local financial and customs practicalities.

Discovering that customs requires specific documentation for dive gear on arrival, that one should not walk around in public without culturally accepted clothing, or that local health care facilities are not what you are accustomed to (or are even hazardous), could easily lead to negative reviews online.

Providing sensible advice to visitors will make them better prepared, especially when traveling to far-flung locations. This is essential to ensuring repeat business. Relying on travelers' common sense does not always work.

ENDEMIC DISEASES

Vaccination requirements vary greatly among countries, and one cannot assume that visitors are automatically immunized against diseases such as yellow fever or typhoid. While malaria is perhaps expected in some regions, we know that some of the prophylactic medications are not compatible with diving.

Ensure that clients are alerted to local and regional vaccination requirements, that they consult with a travel medicine specialist as needed, and travel with any required documentation.

Informing your guests about local travel logistics and customs practices may contribute to repeat business.

VECTORBORNE DISEASES

While some local insects may simply be annoying and local residents may have learned to just live with them, we know that other insects can cause more serious conditions such as Zika, dengue, chikungunya, and leishmaniasis to name a few. Although there are no prophylactic medications for these, when used properly, bed nets, repellents, and adequate clothing can be very effective.

Advise clients in advance that they should bring lightweight long-sleeve shirts and trousers with closed-toe shoes for the evenings. Locally effective repellents and netting may assist in making them in feeling more secure.

LOCAL FOOD AND WATER

Among the most common travel ailments are “travelers’ diarrhea” and food poisoning. Once again, locals may be immune to contamination of fresh produce and water whereas the visitor might react poorly. Travelers will of course wish to steer clear of any nasty disorders or unpleasant experiences that prevent them from being able to dive.

A dive center should ensure that safe, potable water is available on the premises and aboard boats. If food is served on any occasion, strict sanitary measures must be adhered to. Fruits and vegetables served fresh should be washed in drinking water.

AVAILABILITY AND COST OF HEALTH CARE SERVICES

Local health care services may not be able to meet the needs of clients with preexisting medical conditions or handle some emergencies including diving injuries. In some areas, providers may charge visitors much higher fees for service, ask for cash payment in advance, require excessive payment guarantees, or not accept valid insurance policies.

Dive businesses familiar with local practices, constraints and acceptable methods of payment should inform clients about this in advance. This will help ensure that travelers purchase suitable health insurance policies and bring cash (or other locally accepted means of payment) as well as sufficient supplies of their medications. It is wise to bring more medication than is needed in case of an extended stay, whether by choice or for some unavoidable reason.

TRAVEL AND HEALTH ADVICE FOR CUSTOMERS

Dive operators should advise customers (and other visitors) about health, safety, financial, and other relevant considerations before they make reservations and travel plans for a dive excursion.

Excessive advisories may deter some customers from making a reservation; however, insufficient advisories may expose operators to liability claims for nondisclosure of known or expected risks.

Dive operators should strike a suitable balance between over- and under-admonishments, being mindful of the health and safety of all parties and of the risks and benefits involved in any course of action.

HEALTH AND SAFETY

ELEMENT	RISKS	RECOMMENDATIONS
Insurance	Dive operators may be exposed to liability, as well as potential negative publicity, if injured customers cannot be treated or evacuated because they have neither sufficient resources to pay directly for their medical care and/or evacuation. Operators may face the prospect of business disruption if they have to cease activities while evacuating an injured customer. Operators may also be liable for the cost of emergency services if a customer receives care but is unable to pay for it. These considerations may be especially applicable if a dive excursion to a remote area or a liveaboard excursion is sold as a package deal.	Dive operators should advise all customers to carry adequate insurance and to specifically check these factors of their coverage: • that their health insurance policy covers injuries incurred while diving (and whether that coverage is subject to depth restrictions); • that their health insurance policy or a separate policy covers medical evacuations; • that they also consider carrying general travel insurance; and • that none of their policies include geographical limitations relevant to their intended excursion, especially regarding evacuation, which may be very expensive or even impossible in some remote areas. Some dive operators may need to purchase special insurance products to cover their customers, such as if their operation is vulnerable to specific risks that may not be covered by typical dive and travel insurance products.

DIVE OPERATION SAFETY

Take steps to ensure your dive operation is a safe place to conduct business and spend time. Your employees and customers will appreciate an orderly, comfortable environment in which hazards are properly managed. And by effectively mitigating the risks associated with operating a dive business, you can limit your liability.

When you invest in employee health and safety, your staff will feel valued and take pride in their work, creating a richer and more enjoyable customer experience.

STAFF HEALTH AND SAFETY

The mantra “Take care of your employees and they will take care of your business,” is especially true in the dive industry. Taking care of your employees helps builds morale, enhances efficiency, reduces lost time and staff turnover, helps lower insurance costs and, importantly, ensures compliance with the law.

Owners sometimes assume their responsibilities extend only to formally appointed employees, perhaps not considering contractors, seasonal employees, interns, and others. Health and safety (H&S) legislation applies to everyone working on your premises, where you are responsible for providing a safe working environment. This includes full- and part-time employees, interns, commission-based operators, freelancers, contractors, seasonal workers, and even friends of the family. They are all covered by H&S laws.

Countries who are signatories to the Internal Labor Organization (ILO) are required to have H&S legislation in place — even if it is somewhat difficult to retrieve or comprehend. As a business owner, safety in the workplace is your responsibility, and this requires you to perform an appropriate risk assessment to identify and manage workplace hazards.

OCCUPATIONAL HAZARDS IN THE WORKPLACE

A thorough assessment of all potential workplace hazards is essential. This will enable you to address, mitigate, or at least contain the risks under your control.

Some often-neglected or unassessed hazards include overexposure to ultraviolet rays, noise-induced hearing loss, long-term effects of working with harmful cleaning chemicals, exposure to biological pathogens, decompression stress, musculoskeletal injuries incidental to the occupation, and even workplace stress due to performance pressure, overwork, and burnout.

There are practical ways of preventing harm, reducing exposure and empowering staff to protect themselves through education, training, and personal protective measures.

INSURANCE COVERAGE

Dive businesses should ensure they take advice from appropriate insurance providers. There are important differences between general business and professional liability coverage, property and marine insurance, occupational H&S and workers compensation, and health and dive accident insurance.

Employees, clients and the broader public all have safety rights when engaging with a dive business. A thorough review of insurable risks is part of protecting your investments.

H&S SURVEILLANCE AND FITNESS FOR DUTY

Some health-related issues may be based on preexisting conditions, and some are purely a result of aging. Screening employees both prior to employment or appointment and then periodically throughout employment (and when exposed to any identified workplace hazard) will provide you with a good degree of protection against future occupational-health-based compensatory claims. Relevant examples include existing hearing or skin conditions and a dive professional with a (perhaps concealed) history of asthma.

Fitness-for-duty is about more than just a form that is completed during the appointment process. Daily monitoring of any unfitness for work is essential and should include conditions such as symptoms of respiratory or gastrointestinal infections, effects of alcohol or drugs, exhaustion, and physical injuries.

RECORD KEEPING

Let's consider these wise words: "If it doesn't exist in writing, it doesn't exist." A lack of comprehensive personnel records detailing employees' health, current qualifications and job responsibilities may render you vulnerable to employee-related actions or claims of discrimination or unfair treatment.

File all personnel records, exposure records, incident and accident reports, medical surveillance records and claims, and necessary disciplinary documentation in your business's information database. This provides you with easy-to-retrieve and credible records and will serve you well should a compensatory claim be made—even if it pertains to a years-old incident.

INVEST IN YOUR STAFF

When you invest in employee health and safety, the results permeate into all aspects of your business. Your employees will feel seen and valued and take pride in their work, creating a richer and more enjoyable customer experience. The investment now will pay dividends in the future.

INSURANCE COVER
H&S SURVEILLANCE AND FITNESS FOR DUTY
RECORD KEEPING
INVEST IN YOUR STAFF

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S S 6-7
XL 11-12
L 9½-10½
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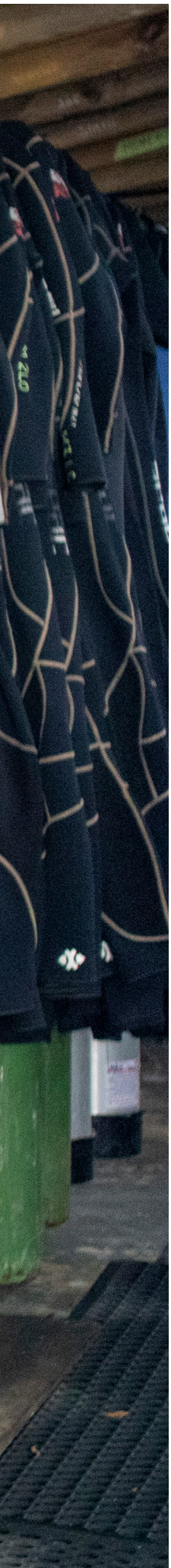


CREATING A SAFER RETAIL SHOP

Retail areas are designed to be attractive to customers; they are often the first part of dive businesses that customers see. They also tend to be high-traffic areas. Compared to other areas of dive businesses, which may have obvious hazards, retail areas may be perceived as safer. While this may be true in some ways, it doesn't mean that the retail section of a dive business is free of risk or hazards. Here are some recommendations for improving safety in areas of your business that customers frequent.

VENTILATION AND TEMPERATURE

Providing customers with a comfortable environment to shop in is important. If you are in a tropical environment, it is important to keep your retail area cool, well-ventilated, and ideally climate controlled, which may require a powerful air conditioning system. Keeping your shop climate controlled will help preserve the integrity of your products, prevent your retail area from becoming stuffy and unpleasant for customers, and prevent mold and mildew growth, which is a major deterrent for potential customers. Mold and mildew can also present a serious health hazard to customers and staff.

CLEANLINESS AND ORGANIZATION

Having a clean and easy-to-navigate shop is not only enticing to customers, it also makes things safer for everyone. Decluttering your dive shop can significantly reduce the risks your employees and customers face, and it eliminates hazards that can cause injuries. One of the easiest ways to eliminate tripping hazards is to ensure your retail space has clean and unobstructed walkways. To prevent people from being hit by falling objects, carefully consider what you put into overhead storage, and keep it properly secured.

One hazard that is common in dive shops is wet floors. Keeping the floor clean and dry is paramount in keeping your customers safe from nasty slips and falls. To prevent these injuries and more, consider placing nonslip mats throughout your store and installing nonslip flooring.

Maintaining a clean and organized area will not only protect staff and customers from injury, it will also show that you value cleanliness, organization, and safety.

EMERGENCY EXIT ACCESSIBILITY

In a shop with a fully stocked retail area, there may be shelves and racks to work around. You need to ensure that it would be reasonably easy to evacuate a busy shop full of people in a timely manner in the event of an emergency. Do a walk-through of your operation and note areas that are often busy or may become congested. Could everyone make an easy exit from these areas if your shop was full and a fire broke out or a cylinder exploded? It may be necessary to do some reorganization to facilitate a quick and easy emergency evacuation. To help reduce confusion in an emergency, place clearly visible exit signs.

FIRE SAFETY

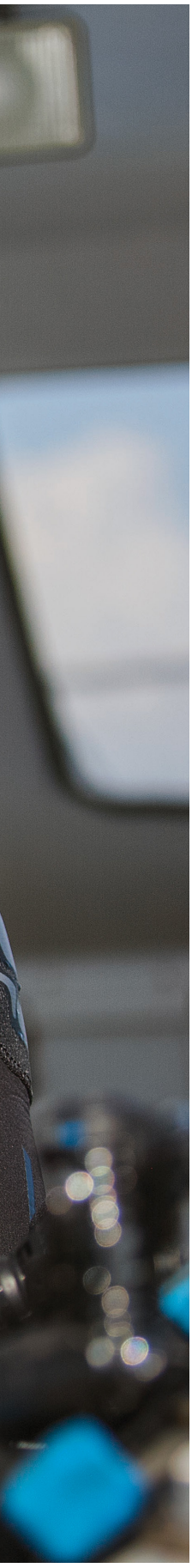
Effective fire-control procedures and firefighting equipment are essential for protecting customers, staff, and valuable inventory. The best way to protect your dive shop from fires is to prevent them from ever happening. To limit the threat to your business from fires that can't be prevented, install fire alarms, keep fire extinguishers in key positions, and train your staff to use them. Also, be sure to conduct regular assessments of your fire extinguishers to ensure that they are in working order. According to the Occupational Safety and Health Administration (OSHA), visual inspections must be conducted on your fire extinguishers once per

month and maintenance inspections once per year, so consider adding this to your maintenance schedule or emergency action plans. Proper training and functioning firefighting equipment are critical to reducing damage and saving lives in the event of a fire.

While preventative actions like cleaning up your retail area or assessing your electrical wiring as a potential ignition source may not seem like pressing considerations, it is important to do whatever you can to prevent accidents before they happen, especially when hazards can be eliminated quickly and easily. Whenever business is slow, consider using the opportunity to conduct a thorough assessment of safety considerations in your retail shop.

FIRE SAFETY		
ELEMENT	**RISKS**	**RECOMMENDATIONS**
Fire-safety procedures	Protection primarily of customers and staff, but also of valuable inventory, may depend on effective fire control procedures and equipment. Common ignition sources for unintended fires (including electrical wiring and connections, sparks, and heated surfaces) may be present in dive shops. An inability to escape from and to at least attempt to control a fire raises the risk to people, inventory and buildings.	Dive operators should take the following steps to prevent fires and to mitigate injuries and damage if a fire does occur: • analyze and actively manage all fire risks; • establish appropriate fire-fighting procedures; • place fire extinguishers and other firefighting equipment in easily accessible locations; • select appropriate fire-extinguishing agents based on the situation; • ensure that fire extinguishers are unexpired; • clearly indicate the location of fire extinguishers and exit routes; • consider installing fire detectors, especially in areas where there is a higher risk of fire; • enforce a no-smoking policy; and • install appropriate, clearly visible signage to alert staff and the public to fire risks.


SCUBAPRO



INFECTION CONTROL

Infection control should be a priority at any dive business, especially those that rent out equipment. Regulators, masks, snorkels, and BCD oral inflators go into divers' mouths, and wetsuits, booties, and other miscellaneous pieces of equipment contact their bodies. While some may think that rinsing these with water is sufficient, it would be better to ensure that they are cleaned thoroughly to prevent the transmission of disease between divers. Here are some recommendations for improving infection control in your dive business.

ASSESS YOUR INFECTION CONTROL PROCEDURES

It's important to disinfect dive gear, especially gear that contacts the eyes, nose, or mouth. While rinsing your equipment in fresh water is important to remove any salt after a day of diving, this is insufficient to kill potentially pathogenic microorganisms that may be present.

Take some time to find out what cleaning products are available near you, then do some research to find out which ones are OK to use on scuba equipment. Not all cleaning, sanitizing, or disinfecting products are made equally; some differences include price, active ingredient, and whether the product is ready to use or should be diluted first. Additionally, many products require that items dry completely after being disinfected—an important step in the process. If you are in a particularly hot or humid area, this may require you to make some changes, such as increasing ventilation in your rental equipment room.

It is important to ensure that your infection control procedures will reliably remove any contamination from the equipment you are using or renting, so reading and following the directions for the product you have chosen are necessary to get the advertised benefits. This includes following directions for dilution, contact time, rinsing, and drying. Once equipment is clean, it is important that it is not made dirty again. Along the same vein, any clean areas should not be contaminated with dirty equipment. For example, if you elect to rinse equipment in a communal freshwater rinse tank before disinfecting, make sure that clean equipment does not enter this dirty water.

ASSESS YOUR VENTILATION AND TEMPERATURE

REVIEW YOUR STANDARD OPERATING PROCEDURE

Divers who bring personal items should not be allowed to rinse their equipment unsupervised as they may upset your infection control system. Advise them of your disinfection policy—if they decline to have their equipment disinfected, encourage them to take their equipment and rinse it at home or in their hotel room. You may also consider providing individual rinse tanks or spraying their equipment with a hose to remove any salt or other matter.

ASSESS YOUR VENTILATION AND TEMPERATURE

In hot and humid areas, mold and other microorganisms can grow more readily on surfaces, especially on items that do not have the chance to dry completely. This can include masks, snorkels, and the mouthpiece and interior surfaces of scuba regulators. If equipment is being stored and not used frequently, it is even more important to ensure that it dries to prevent the growth of mold. Be sure that equipment is stored in well-ventilated areas and away from other wet equipment.

REVIEW YOUR STANDARD OPERATING PROCEDURES

Your standard operating procedures (SOPs) should include a section on disinfectant use, disposal, and storage. It is important to do a walk-through of your rental equipment area, rinsing area, or wherever you perform disinfection to be sure the layout is convenient and conducive to disinfecting gear quickly and easily.

SOPs are important when using a product that has directions that must be followed, such as dilution and personal protective equipment (PPE) for cleaning products. These procedures allow your staff to find instructions easily and help them to know exactly what is expected in terms of procedures to be performed. Additionally, this helps you ensure that instructions are being followed by staff and can help you evaluate whether everything is being done correctly. If you do not have a set of SOPs already, take some time to write down directions and steps for how most tasks in your business should be performed. SOPs are different from emergency action plans (EAPs) and typically do not include emergency information. After doing this, make your staff aware of the new document and conduct a training session or high-level review to familiarize staff with your expectations.

Most importantly, monitor your staff's performance for effectiveness and compliance, and be sure to make staff aware whenever a policy or procedure is updated. This is important not only for infection control procedures but also for all SOPs in your business.

While preventative actions such as disinfection may not always seem like pressing concerns, it is important to do whatever you can to prevent the spread of diseases and infections, especially since this can be accomplished relatively easily.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Protect Wild Dolphins
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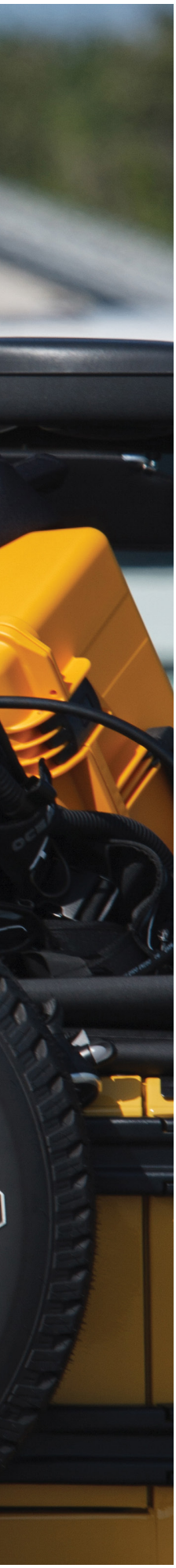


VEHICLE SAFETY

Some dive professionals may be in the habit of transporting their clients or students to the dive site or the dock using their own vehicle. In many places, however, motor vehicle driving licenses and insurance coverage do not apply when transferring fare-paying passengers. If you charge for your dive services, this likely extends to all the activities you expose clients to.

This is but one of several considerations that dive operators and professionals need to consider when using vehicles for their business. Here are some issues for you to reflect upon to protect yourself and your business.

REGISTRATION OR LICENSING

POLICY REGARDING ALCOHOL AND DRUG USE

REGISTRATION OR LICENSING

The use of vehicles for transporting customers or for other business-related purposes requires compliance with all applicable regulations. If all relevant regulations are not followed, dive operators or professionals may be subject to legal action and/or claims for injuries or damages. The same applies to vehicle liability insurance coverage where policies differ between personal and professional use. All regulations and insurance requirements should be considered, even when you may not consider that clients are paying you for transportation. Payment may be direct or indirect. The key is if it is part of the service you are offering or your clients have an expectation that it is included.

POLICY REGARDING ALCOHOL AND DRUG USE

Even in more relaxed diving locations where the use of recreational drugs may be ignored, dive operators may be held liable for accidents that occur when the driver is under the influence of alcohol or drugs. The key to avoiding this situation is a clear policy and, more importantly, enforcement of this policy. Transgressions should be dealt with formally and documented. Notify staff that you as the business operator have the right to periodically screen staff for the presence of any alcohol or drugs in their system.

VEHICLE EMERGENCY ACTION PLANNING

We are perhaps accustomed to expecting and dealing with a vehicle accident; however, in the event of conducting business, additional risks are involved. Consider unexpected emergencies such as vehicle seizure, arrest of the driver, or aggressive behavior by a client. Realistic and well-thought-through emergency action plans are needed in order to prepare and empower you and your staff to deal with the unexpected.

VEHICLE SAFETY

ELEMENT	RISKS	RECOMMENDATIONS
Use of seat belts	The use of seat belts is mandatory in most jurisdictions. Even though many dive sites are located away from public roads, the protection of passengers remains the responsibility of the dive operator.	Failure to enforce relevant seat belt laws may subject operators to legal liability. Dive operators should ensure that passengers in vehicles owned by the business use their seat belts in the following circumstances: • if the vehicle is being driven on a public road or in public areas; or • if the vehicle is capable of being driven faster than 15 miles per hour (20 kilometers per hour). Noncompliant passengers should be instructed to use their seat belts. Drivers should be allowed to refuse to transport any passenger who does not comply with seat belt instructions.
Cylinder-transport procedures	If high-pressure cylinders are handled improperly or roughly during loading, transport, or unloading, there is a risk of rupture and uncontrolled release of compressed air. If damage or injury occurs as a result of such a breach, dive operators may be subject to legal and/or financial liability.	Dive operators should ensure that cylinders are transported in a suitable vehicle, such as a truck; are placed outside the driver/passenger compartment; and are secured to minimize cylinder movement and damage to valves. Care should be taken to avoid dropping, banging, or otherwise abusing cylinders. Cylinders should not be exposed to extreme heat or stored in a vehicle for long periods.


DAN


EVO
BARE
RAINBOW REEF

DIVE TRAINING AND EQUIPMENT

Dive professionals spend a great deal of time and energy teaching students and managing equipment. Enhance your students' and staff members' experience by ensuring your classroom and training pool are clean, organized, and welcoming, and prevent equipment-related mishaps by assessing your rental gear area, workshop, and fill station.

Divers are attracted to organizations that make safety their top priority, and if you want to keep them coming back, make a point of promoting your commitment to safety.


Submersible
Starboard
Port
Sign-up list.

TIPS FOR CREATING A SAFER LEARNING ENVIRONMENT

A downturn in business is never welcome, but it can present opportunities. For one, it offers a chance to address important but lower-priority aspects of your operation. Among the aspects of running a dive business that matter but don't always rise to the top of the to-do list are occupational health and safety issues. Taking the time to consider, identify and address any concerns in this area can make a positive impact on your future business. Below are a few considerations to take into account when assessing and improving your business's occupational health and safety in the classroom.

ORGANIZATION

Having a clean and organized space is key to facilitating your students' learning. It also promotes your ability to effectively teach. A messy or disorganized classroom can distract students from important information and potentially dissuade prospective customers from choosing your business. While decoration can enhance a classroom space, try to keep your classroom conducive to learning by not overdoing it. Reduce and organize untidy electrical cables, use bookshelves to arrange teaching materials, and remove and store teaching aids that won't be used in the class you are teaching that day. Ideally the classroom should be for teaching only — avoid using it as a storage area. This will not only make your classroom look more professional, but it will also help your instructors teach more effectively and make them proud to work for you.

Divers are attracted to organizations that make safety their top priority, and if you want to keep them coming back, make a point of promoting your commitment to safety. Make time to thoroughly assess your business and undertake any necessary improvements.

NOISE

A noisy classroom is not conducive to learning. Make sure your students have a quiet environment in which to concentrate, especially when they are learning skills that are vital to keeping themselves and others safe in the water. Noise can come from many sources in a dive shop, including the compressor, venting gases, cylinder filling, traffic, and human interaction. Ideally, the noise level in the classroom should be kept to around 65 decibels when no one is talking and all appliances are off. For reference, a wall-unit air conditioner is around 60 decibels, and normal conversation is around 65.

1. Start by measuring the noise level in the classroom with your equipment operating as normal. If you don't have a sound level monitor or decibel meter, download an app on your phone or tablet. There are several available including Decibel X: dB Sound Level Meter, NIOSH Sound Level Meter, and Decibel X PRO: dBA Noise Meter.
2. Use the following chart to measure the noise level in your classroom. Document your measurement for future refence.
3. If the noise level in your classroom measures higher than 65, here are a few changes that might make a difference: Remove noisy equipment such as a refrigerator or a loud fish-tank pump.
4. Ensure that classroom sessions are conducted when compressors and other machinery are not running. Place sound-dampening materials such as curtains or sound-absorbing panels between the classroom and the sources of the noise.
5. Post signs asking people to not congregate outside the classroom.
6. Change out windows or install block-out panels to reduce outside road noise.

ACCEPTABLE NOISE LEVELS

	RECOMMENDATIONS	
AREAS OR SOURCES	**dB(A)**	**DURATION**
Quiet rooms (e.g. sleeping areas)	40	Indefinite
Classrooms, retail areas, offices	65	Eventual fatigue
Compressor, filling and blending areas	85	8 hours
Large, unsilenced compressors	95	1 hour
Noisy areas (e.g., generator areas)	100	15 minutes
Safety valves, venting HP lines	110	1.5 minutes
Unacceptably noisy areas	120	9 seconds

LIGHTING

Proper lighting is important for learning, even if electronic learning materials are being used. Improper lighting can cause eye strain, headaches, and glare on screens, all of which infringe on students' ability to concentrate and effectively learn. Lighting is measured in lux and can be measured with an inexpensive meter or phone app, although apps are not as accurate. Ideally, classrooms should be kept at 250–500 lux. If your classroom seems dim, try brightening it up by painting the walls a lighter color, taking steps to reduce glare, and cleaning walls or surfaces.

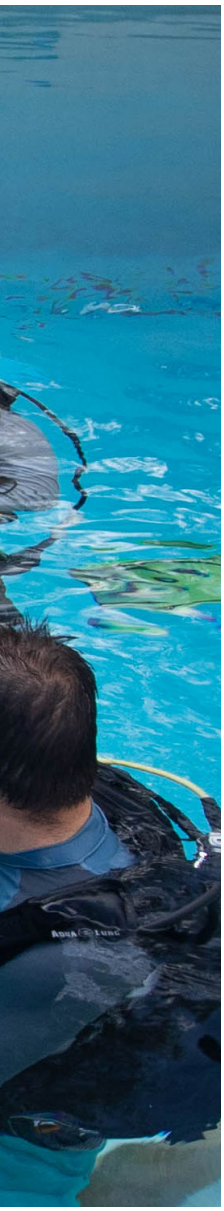
1. As with noise, begin by measuring the lighting levels in the classroom under normal learning conditions. If you don't own a light meter, you can download a mobile app such as Lux Light Meter Pro or Lumu Light Meter.
2. Use the following chart to determine the lighting level in your classroom. Document your measurement for future refence.
3. If the lighting in the classroom falls below the suggested range, you can add natural light by unblocking or installing windows or skylights, adding low-energy light fixtures, painting the classroom with a lighter color or using light-deflecting panels to better utilize natural or existing light.
4. If the room is brighter than recommended, you can block out windows or hang light-blocking curtains, reduce the intensity of room lighting by using lower-lux lamps or installing dimmer switches, or paint a wall or surface that is reflecting too much light a darker color.

ACCEPTABLE LIGHTING LEVELS

AREAS	RECOMMENDED MINIMUMS	SUGGESTED RANGES
Classrooms	200 lux	200–500
Retail shops	100 lux	100–150
Offices	300 lux	300–500
Compressor, filling, and blending areas	200 lux	200–500
Storage rooms	150 lux	150–500
Instrument workshops	250 lux	250–500
Precision work areas	750 lux	750–1,500
Changing rooms	100 lux	100–150
Equipment washing areas	100 lux	100–150
Halls (passages)	75 lux	75–100
Video labs	100 lux	100–150
Photo labs	150 lux	150–200

CREATING A SAFER CONFINED WATER TRAINING AREA

Safety in confined water is extremely important because this is typically where an open water scuba student takes their first breath underwater. But confined-water training areas can be hazardous due to slippery floors, heavy cylinders, and inexperienced students who are still learning the ropes. By conducting an assessment and noting potential issues, you can create a safe training area for these new divers.



ASSESS YOUR SITE

If your confined water site is not a swimming pool, make sure to assess the conditions to ensure they are calm and clear without any currents or hazards. Entry and exit points should be easily accessible and identifiable. Most importantly, it should be conducive to safe and effective learning. Whether your confined water training area is a pool or another site, it should be at a temperature that is comfortable to students, and adequate exposure protection should be used.

ASSESS YOUR EMERGENCY PROCEDURES

Emergency preparedness during confined water training is essential, especially when you must navigate a slippery pool deck in wet garments. Map out the evacuation route and be sure to explain it to new students. If the confined water area is attached to your shop, be sure to have emergency evacuation routes posted in a clearly visible area.

ASSESS THE CLEANLINESS OF YOUR SPACE

Keeping students feeling safe and comfortable is an important part of teaching scuba. It doesn't matter if they are taking their very first breath underwater or completing divemaster training—safety and comfort should be your top priorities. Look around—is your pool deck cluttered with miscellaneous items? A cluttered or dirty pool deck can give the wrong impression to people diving with you and create a potentially hazardous space. If, while in the confined water area, students will see a fill station or rental area, are these clean and orderly, too? Be sure that the fill station is marked so that students don't linger near cylinders, and be sure the rental area is free of clutter that could make selecting equipment hazardous.

While preventative actions such as organizing your pool deck may not seem important, it is an important step in preventing and reducing accidents. Simple organization and planning can eliminate hazards quickly and easily. These assessments can be completed during non-business hours or during a period of slow foot traffic.

ASSESS YOUR SITE

ASSESS YOUR EMERGENCY PROCEDURES

ASSESS THE CLEANLINESS OF YOUR SPACE


NITROX
BHM
BONAIRE
FILL PANELS
Empty Nitrox
BDR
NITR
X ONL
ROX O
ONLY
NLY N
TROX

COMPRESSOR ROOM AND FILL STATION SAFETY

If not properly set up and maintained, compressor rooms and fill stations can be among the most hazardous areas of a dive business. Determine how safe your compressors and fill stations really are by conducting a dedicated risk assessment of your facility. A single high-level walk-through of the rooms that house your compressors and associated equipment can clue you in to a variety of hazards that you can address—before they cause a devastating accident.

COMPRESSOR ROOM

There are quite a few safety considerations to keep in mind when assessing a compressor. Contamination can come from many different sources, including exhaust from a nearby boat or parking lot, smoke from cigarettes or cooking, cleaning products, and other volatile chemicals and generators. To prevent air contamination, be sure your compressor's air intake is positioned far away from potential sources of contamination. Consider posting a sign near the air intake prohibiting running motors, smoking, etc. nearby. Better yet, complement the sign by installing a physical barrier, or move the intake so it is out of reach of any of these sources of harm.

In addition to taking steps to prevent contamination, use logs and checklists on the compressor to track and ensure essential functions, and reliability. In addition to logging information about each fill, log the date and type of service performed on the compressor, the reason for the service, actions taken, parts replaced, the name of the technician, and the date of the next planned service.

FILL STATION

Most dive shops have unique fill station configurations that reflect their business and customer demands. This means that there is no single correct way to set up your fill station; rather, there are guidelines that must be followed. The

HIGH-PRESSURE HOSE ASSESSMENT			
LENGTH	**MATERIAL**	**HOSE ENDS**	**CONDITION**
High-pressure (HP) hoses should be kept as short as practicable.	The material should be appropriate for the application, the maximum allowable system pressure, and the expected operating conditions.	Hose ends should be made of suitable products that are corrosion-resistant, rated to at least the maximum allowable system pressure, and appropriate for the gas that will be used.	The condition of all hoses should be assessed periodically, as hoses can deteriorate due to exposure, rough handling, poor-quality materials, age, abrasions, etc.
Rigid piping should be considered to reduce the length of flexible hoses.	The material's kink- and abrasion-resistant properties should be maximized.	Certain hose ends (e.g., clamped, barbed fittings) should not be used in HP applications.	Hoses and hose ends should undergo regular (at least annual) visual inspections and leak checks, and the results should be logged.
The use of flexible hoses longer than 6.5 feet (2 meters) should be considered carefully. Such hoses should be subject to stringent visual inspections and maintenance regimens; they should also include anti-whip characteristics and should be specifically designed for use in extensive, unsupported lengths.		Swivel ends should be considered if stress due to twisting is likely.	As a general rule, flexible hoses used for HP gas transfer should be replaced every 5 years.
Consider installing longer HP hoses within suitable protective conduits or pipes to limit the potential for damage in a hose failure.		Hose-end connections should be fitted with whip-restraint devices designed to reduce whipping action in case hose ends fail or hoses are not properly vented while being connected or disconnected.	

most important of these is probably that your fill station be inaccessible to anyone but trained employees. Fill stations are potentially dangerous spaces in which hazardous work takes place; they are not suitable for heavy traffic or socializing.

Once you have ensured restricted access to your fill station, make sure you have set fill procedures that all employees are required to follow. These procedures may address inspection of customers' cylinders prior to filling, safe fill rates, coupling and uncoupling, cylinder thread types, knowledge of maximum pressure ratings for cylinders, oxygen analysis, and record keeping. Create separate procedures for each type of mixed gas your operation offers.

HIGH-PRESSURE HOSES

High-pressure hoses used to fill cylinders can be dangerous given the right circumstances, so these should be assessed on a regular basis. Hoses should be as short as practically possible; the longer the hose, the greater risk of damage caused by a loose fill whip in the event of a failure. Wherever possible, consider using rigid piping to reduce the length of flexible hoses.

All high-pressure hoses should be fitted with whip restraints to prevent any hose from whipping if it becomes separated from its end-fitting. These can cause serious and even fatal accidents. Assess the condition of all flexible hoses on a regular schedule, and consider replacing any hoses that are used daily every five years.

EMERGENCY ACTION PLANS

In addition to covering your response to dive accidents, your emergency action plans (EAPs) should also address problems that may arise in the fill station or compressor room. If you don't already have EAPs for your fill station or compressor room, draft them. Effective EAPs for these areas should include, at a minimum, procedures for responding to contaminated breathing gas, high-pressure component rupture (fill whip, cylinder, etc.), fire, and injury. Compile or review your EAPs, and consider doing high-level walk-throughs or simulations for each potential emergency

As you conduct your risk assessment, bear in mind that not all risks carry the same weight. Prioritize areas in which exposure is regular and in which the consequences of an accident would be significant. Remember, even a cursory inspection of rooms that house bank and cascade systems, chemicals, or spare parts can alert you of numerous potential hazards. Taking just a few hours to assess these areas and use what you observe to refine the safety of your operation can prevent serious accidents.


SCUBAPRO
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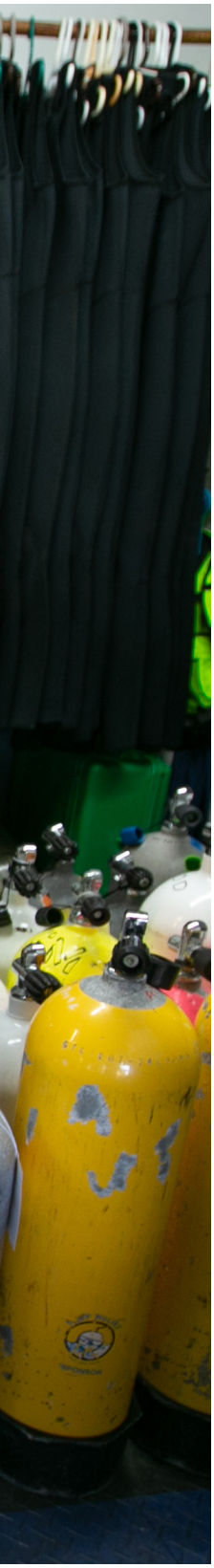

RENTAL EQUIPMENT

Scuba rental equipment can be important for business because it attracts customers who might not otherwise be participating in scuba activities. This includes not only certified divers who do not own complete scuba setups but also those who would like to give scuba a try for the first time. Proper storage of this equipment is important to keep it functioning correctly and to avoid spreading diseases among staff and customers. Here are some key points to consider when assessing your equipment rental room.

ASSESS CONDITIONS OF THE RENTAL EQUIPMENT ROOM

SCHEDULE REGULAR INSPECTIONS

ASSESS CONDITIONS OF THE RENTAL EQUIPMENT ROOM

In addition to obvious considerations such as cleanliness and organization, there are other, equally important aspects that may go underappreciated. Poor lighting represents a safety risk (staff could trip or drop items), and it may also impair staff members' ability to detect deteriorating equipment or other risks such as fungal contamination before assigning equipment to a client. Humid and/or poorly ventilated environments can encourage bacteria and mold to grow on rental equipment, and temperature extremes can lead to deterioration of equipment and even gear failures.

When considering staff safety, it is important that the rental equipment room have fall-prevention procedures such as securing heavy items to the wall to prevent injury to staff. This is especially important if customers are allowed to enter the area.

SCHEDULE REGULAR INSPECTIONS

Quick postdive inspections of rental equipment are a great way to ensure that quality and high standards are maintained. Customers may not always notify you of issues with rental equipment, so it is always a good idea to ask if everything was working as it should, and any issues should be noted and fixed before renting the equipment again. Be sure to record the issue, who fixed it, and the outcome since failure to address such concerns could result in legal liability.

In addition, regular inspection and testing of all rental equipment can help identify these issues so that customers are not given faulty equipment. Be sure to record the results of these tests, and repair any broken or damaged equipment before adding it back into circulation.


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INFECTION CONTROL PROCEDURES

It is not always possible to know if customers have communicable diseases, so having infection control policies and procedures in place for rental equipment will help stop the spread of disease.

Pieces of equipment that come in contact with mucous membranes are more likely to transmit diseases. This includes masks, snorkels, second stage regulators, and BCD oral inflators. Dive operators should ensure that these pieces of equipment are adequately cleaned between users. Be sure to use a disinfectant that is safe for use on scuba equipment and will work against any specific pathogens known to be in your area.

FIRE SAFETY

Rental equipment usually requires a large investment, so ensuring that these items are protected in case of fire is always a good idea. Fires can spread rapidly in confined areas and can cause injuries or death if a person is caught without escape.

A fire safety plan may include: an analysis of any fire risks; firefighting procedures; an assessment of fire extinguisher locations, intended use, and inspection schedules; and exit routes. You should also consider installing fire detectors in areas that may be at higher risk of fire, establishing a no-smoking policy, and posting signage to alert staff and the public of fire risks.

BREATHING GAS QUALITY ASSURANCE

Ensuring safe breathing gas and establishing what to do in the event of contamination (or suspected contamination) are essential actions that must be considered by all who operate gas filling stations.

Whether you fill cylinders for your own business or others—or have cylinders filled for your clients—it is important to take note of the quality assurance measures covered in this article. No matter how or where your cylinders are filled, you are responsible for providing your clients with safe breathing gas.

HOW OFTEN SHOULD I HAVE MY AIR QUALITY TESTED?

Testing frequency is not really established by U.S. regulations, but some dive certification agencies and other countries do provide requirements.

We should keep in mind that any air quality test is taken on a particular day at a particular time; this does not guarantee that the air will not become contaminated a few months, days, or even minutes later.

A test is thus only one of many important actions to consider in ensuring safe gas. How often you test therefore depends on an assessment of relevant contamination hazards near your facility.

DO CONTAMINANT LIMITS ACTUALLY MEAN SOMETHING?

In most cases we rely on safety, research, and regulatory organizations to determine acceptable contamination limits. Not much work has been done to understand how contaminants such as CO, CO2, and particulate matter affect breathing gases for scuba diving. DAN has assessed limits with regard to the three primary types of hazards that these contaminants may present to scuba divers: fire, mechanical, and physiological.

WHAT SHOULD I BE DOING?

There are certain preventative steps dive operators can take to ensure quality breathing gas. Proper compressor maintenance, monitoring filter effectiveness, controlling the air intake location, inspecting cylinders, and clean handling during cylinder maintenance are some of the actions you can take.

Monitoring your actual air quality test reports to see whether there are any patterns in rising contaminant levels or instances in which the limits were approached will provide additional early warnings. The atmospheric value of CO2 today is around 420 ppm. Depending

on your recent test results this may lead you to ask yourself why a test result may be higher than that, even if it meets the specification. This could help you in tracking variables, such as a new compressor intake position, for example, or a restaurant that opened next door with an extractor fan near your facility.

Good record-keeping of all your actions to ensure clean gas will not only provide you with better information but also better validation if something were to happen and you were held accountable in some way.

RESPONDING TO CONTAMINATION

Sometimes accidents happen despite our best efforts to prevent them, and sometimes they happen because of a lack of discipline—or even negligence. In the moment it doesn't really matter what the cause was; it is essential to know how to react once you find out (or even suspect) that gas may be contaminated.

You need an effective and appropriate emergency plan that details who to notify, what steps to take to assist any injured diver, how to prevent further contamination injuries, and how to prepare for any subsequent investigations or actions.

Never attempt to hide any of your actions—doing so could result in repeated incidents or lead to serious legal trouble.

EQUIPMENT REPAIR WORKSHOP

Life-support diving equipment must be kept in a good state of repair, be adjusted correctly, and be regularly maintained to reduce the likelihood of its failure during use. If you wish to do this yourself and establish a dedicated workshop there are several key safety factors you must consider.

You are responsible for the safety of your staff as well as the safety of the divers who use this equipment. Here are some key risks to pay attention to.

ASSESS THE ESSENTIAL WORKING CONDITIONS

ASSESS THE ESSENTIAL WORKING CONDITIONS

A clean and orderly workspace will go a long way to eliminating mistakes and will prevent contamination of components such as oxygen cylinders that must be kept clean. Similarly, inadequate lighting can compromise the integrity of serviced items and may lead to eyestrain or injuries to technicians. The guide provides information about suitable lighting levels for a range of workshop activities.

Poorly ventilated environments reduce staff members' ability to concentrate, and hot and humid environments promote deterioration of service items and corrosion of tools.

ASSES THE USE OF ANY HAZARDOUS CHEMICALS

Technicians often use cleaning chemicals to remove dirt and contamination. These may be toxic, corrosive, or flammable.

Obtaining and storing safety data sheets for all potentially hazardous materials, ensuring that safe handling procedures are in place, and providing suitable warning signs are essential in protecting staff and anyone else who has access to the workshop.

A thorough risk assessment of all hazardous materials is needed to provide technicians with essential PPE required for eye, breathing, hearing, skin, and even foot protection. Be sure to issue and implement the use of PPE, provide training, and monitor the use thereof—failure by staff to use protection equipment provided to them may still result in liability problems should you not bring them to account when they fail to or elect not to use them.

ASSESS THE NEED FOR OXYGEN-SAFETY PROCEDURES

Any servicing of equipment used with oxygen requires specialized knowledge to ensure safety—both in the workshop and when in use.

All that is required to cause a fire is a volatile fuel and a source of heat. Knowing which lubricants and sealing materials to use is critical in this regard.

You might believe that only very high levels of oxygen can support burning materials; however, our regulatory codes and safety standards regard any concentration greater than 23.5 percent, especially at pressures above 125 psi (0.9 MPa), as needing to be treated as pure oxygen.

Proper oxygen-cleaning requires thorough training, suitable tools, a clean workshop area, and the appropriate inspection equipment.

PAY ATTENTION TO WORKSHOP LOGS

If it doesn't exist in writing, it doesn't exist. People often find themselves unable to provide any proof of what was done, by whom, and when. Assuring customers of proper servicing and being able to trace components and work performed will help you maintain your reputation as an excellent repair center.

Remember to maintain records of client complaints and failure reports. While you might assume these could be used as evidence against you, presenting them will make your case easier to defend.

Digitizing documents is helpful in protecting against loss or damage of paper records, and digital records are generally easier to retrieve and regarded as more credible.

ASSES THE USE OF ANY HAZARDOUS CHEMICALS

ASSESS THE NEED FOR OXYGEN-SAFETY PROCEDURES

PAY ATTENTION TO WORKSHOP LOGS


Red Sea
Aggressor II

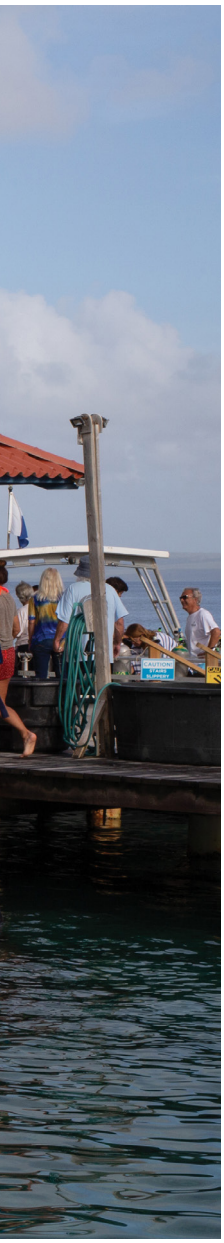
DIVE OPERATIONS

Whether you dive from boats, the shore, or both, there are some crucial protocols you'll want to have in place to optimize your divers' safety. Review your operational procedures to ensure you're doing everything you can to look out for your divers on board, at the dock, at the dive site, on the beach, and wherever else you dive.

Formalize your entry and exit procedures, and emphasize risk areas such as the ladder and around the propeller(s).

SAFER DIVE BOAT OPERATIONS

Among the primary responsibilities of a boat owner or operator are the safety of the vessel, passengers, crew, and captain. Taking care of divers on board requires additional considerations. Here are a few tips to ponder and include in your interactions with your divers to help ensure trouble-free boat diving. These are based on DAN's experiences and include some often-overlooked areas.



BOARDING THE VESSEL

It is a good idea to designate specific areas of the boat for specific types of equipment. Point out the cameras-only bin as well as storage areas for spear guns and dry gear.

As any seasoned dive boat crew member will tell you, it is easy to spot who is experienced and inexperienced just by observing how they stow their gear and how they assemble it. As divers are assembling their equipment, take a moment to see if anyone needs assistance, and offer to help if needed.

DIVE SITE BRIEFINGS

One of the most important aspects of a dive is a proper site briefing. It is helpful to give particulars about the site, including depths, drop-offs, visibility, thermoclines, currents, and known hazards such as certain marine life, overhead environments, and entanglement risks. Be sure to point out some key features that divers may want to look for during their dive.

Of particular importance are entry and exit procedures. Emphasize risk areas, such as the ladder or around the propeller(s)—these are of particular concern. If the boat is utilizing a "live boat" pickup of divers, be sure all divers understand the procedure for your vessel. Also inform divers what the recall signal will be in the event of an emergency.

DURING THE DIVE

As you know, just because divers are no longer on the boat does not mean you can just sit back and relax. There should always be a lookout monitoring the divers, especially when seas are rougher. Ensure the dive flag and/or alpha flag are properly displayed. This is also a good time to resecure any equipment that may have been left unsecured during the gear-up and entry process.

AT THE END OF THE DIVE

The end of a dive presents some notable hazards for divers. Moving ladders, heavy seas, spinning propellers, and divers slipping back into the water on top of others are examples of potential hazards. As divers are ending their dive, help them get back on board using the method(s) covered in your dive briefing. Encourage divers to keep their regulator in their mouth until they are safely back on board. Assist with any accessories they may have, such as cameras, SMBs, fins, and spear guns. Help divers secure their gear as they are getting seated and removing their scuba unit.

It is essential to do a formal, recorded roll call after all divers are thought to be out of the water to ensure you have everyone on board before you depart the site.

RETURNING TO THE DOCK AND DISEMBARKING

Assist divers with their gear as they are getting off the boat. This is not only courteous but also helps keep divers safe; engaging in strenuous physical activity after a dive may increase the risk of DCI, so help your guests avoid overexerting themselves.

IN SUMMARY

Diver safety is paramount for the dive operator during boat excursions. Courteous staff and safe, enjoyable dives are signs of a good operation and will help grow your clientele. Take the time to prepare and look after your divers, and they will look after you.

BOAT SAFETY EQUIPMENT

The safety equipment needed for boat diving can be divided into three categories: assisting or reaching equipment, signaling equipment, and first aid equipment. Local regulations may require you to have certain equipment; the recommendations in this article are intended to supplement any mandatory safety gear.

ASSISTING/REACHING EQUIPMENT

A tagline should be deployed off the stern of the boat so divers can hold themselves in place while waiting to board the vessel or pull themselves to the boat in the case of a current. The length of the line will vary, but it should float on the surface, and a small buoy at the end of the line may be useful.

Another helpful item to have on hand is a throw bag, sometimes called a throw line. A throw bag is a bag that holds 75 to 100 feet (22 to 30 meters) of floating braided line. The responder grabs the tail end of the rope and throws the bag—ideally beyond (over the shoulder of) the person in need of assistance. These are very handy in assisting divers who may be tired or struggling against the current to get back to the boat.

A reaching pole or boat hook is another handy tool to have. It can be extended and used to assist a diver who is closer to the boat or even to snag a piece of gear or debris that should not be in the water.

SIGNALING EQUIPMENT

Every vessel should have more than one way of communicating in the event of an emergency.

Verbal communication can be achieved several ways. On dive boats it is usually via two-way radio. In the United States, the emergency channel is channel 16. If the vessel is in range of a cell signal, a cell phone can also be used. For boats that operate outside of cell range, a having a satellite phone may be advisable.

A flare gun can be used to signal other vessels to come render aid. Flares come in day, night and day/night options.

Many vessels also have an emergency position-indicating radio beacon or EPIRB. This device automatically activates and sends out a constant signal, which is used by search and rescue teams to locate the emergency and provide assistance.

Some low-tech options for signaling devices are a signaling mirror and a loud whistle.

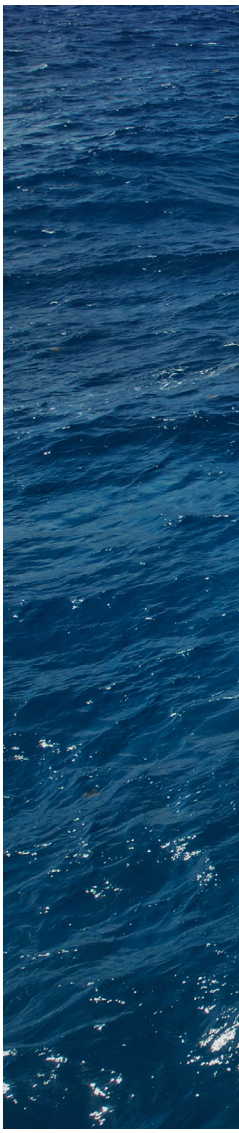
FIRST AID EQUIPMENT

Every vessel should have the equipment necessary to deal with minor to moderate injuries. At a minimum, a good first aid kit should contain personal protective equipment (PPE), items to stop bleeding (including a tourniquet), a few cravats, splinting material, bandages for minor cuts and scrapes, and some waterproof paper and a pencil to take notes.

Other recommended items include cold and heat packs and a DAN Neurological Assessment slate.

An oxygen unit is another essential piece of equipment for dive boats. The size of the unit and the delivery system(s) should be determined by your training and the distance to definitive medical care. To learn more, enroll in a DAN Oxygen First Aid for Scuba Diving Injuries course.

Another recommended piece of first aid equipment is an AED, or automatic external defibrillator. These require proper training, which is part of most CPR courses. With an AED, you are far more likely to successfully rescue a person experiencing a cardiac event than you are without one.



DIVE BOAT SAFETY

Perhaps the most common way to get divers to a dive site is to make use of either a chartered boat or one owned by the dive shop. There are a multitude of boating-safety issues that need careful consideration during your risk assessment, over and above the safety of divers in the water. Your clients rely on you to take care of them during the time they spend with you, and in doing so proactively you build a reputation as a business that cares about your customers' well-being.Here are some items that will set you on the right path to protecting your business.

CREW TRAINING AND COMPETENCE

The jurisdiction that a vessel will be operating in may have legal requirements related to the training, competence, and licensing of crew. In addition, an improperly trained or insufficiently skilled crew may make owners and/or operators accountable in the event of damage, injury, pollution, or other unexpected events. Insufficient training or skills may also render crew members incapable of handing a boat emergency or effecting a successful rescue. Appropriate training, refresher training, licensing, carrying out emergency drills, and monitoring performance are essential aspects of a safe dive boat operation.

SAFETY EQUIPMENT ONBOARD

Boating and diving involve risks that may be exacerbated by the environment, the location, its remoteness, and/or the prevailing conditions. Most boats will be fitted with standard first aid supplies, however these may not be sufficient for dealing with the most likely medical situations in a diving environment. In addition, these degrade in humid conditions and often expire due to a lack of regular inspection. Boats should be fitted with equipment appropriate for the most likely medical emergencies, including emergency oxygen and even AEDs. All of these require protection against the elements as well as regular monitoring of their contents, condition and expiration dates. The DAN Risk Assessment Guide for Dive Operators and Dive Professionals offers comprehensive guidelines for the safety equipment that should be considered based on the actual operational circumstances and recommendations regarding inspection and maintenance.

BOATING EMERGENCY ACTION PLANNING

Dive boat excursions are subject to unusual and sometimes unexpected risks, including but not limited to bad weather, a compromised vessel, diving injuries, and passenger illness. The lack of appropriate emergency action plans (EAPs) can quickly make a bad situation much worse.

EAPs are often created for theoretical situations but never practiced. This can result in a totally ineffective procedure that does not mitigate the emergency. Coast guard organizations may have mandatory drill requirements that the operator may be unaware of when venturing into other jurisdictions. A thorough risk assessment of actual operations, locations, and prevailing conditions and circumstances should reveal situations that could quickly turn into emergencies or require very specific actions.

Boat owners and operators often have many years of experience and may be experts in their field of operations. However, diving operations present unique hazards. Additional knowledge and effort are required to ensure you are prepared and properly equipped to ensure the safety of everyone on board.

SHORE DIVING SAFETY

Just as boat diving involves specific hazards, so does diving that doesn't involve a boat. Whether you wade through crashing surf, descend a flight of stone stairs, or jump from a platform, you'll want to consider a few relevant concerns when diving from shore.

ASSESSMENT OF DIVE CONDITIONS

Divers know that conditions can change rapidly, and conditions that are perfect in the morning may become unsuitable later in the day. Some places have weather or current conditions that are so variable they might change while you are underwater.

It is important to not only make an initial dive site assessment, but also to continue evaluating conditions during the dive until it is completed. Changing conditions might affect dive plans such as entry and exit procedures, so it is important to pay attention during the assessment to better ensure the safety of divers.

EQUIPMENT CONSIDERATIONS

Dive sites might have restricted or challenging access, especially when located off the beaten path. Additionally, in the case of an emergency, other equipment may be necessary for evacuation. These challenges may be exacerbated without proper equipment.

Assess your need for support equipment such as ladders, ropes, or other devices that facilitate access. Communications equipment should also be included; make sure it is in working order and reliable at the dive site.

FIRST AID EQUIPMENT

Diving will always involve risk, and for this reason it is imperative to always be prepared. The environment, location, and remoteness all contribute to specific risks or hazards that you might encounter. Standard first aid equipment might not be enough to deal with possible medical situations on location, and humid environments might cause first aid equipment to degrade more rapidly.

Your first aid kit should include supplies for treating likely hazardous marine life injuries, and it should be protected from the elements and regularly monitored for

expiration of its contents. The container or case in which these supplies are kept should be accessible and clearly labeled.

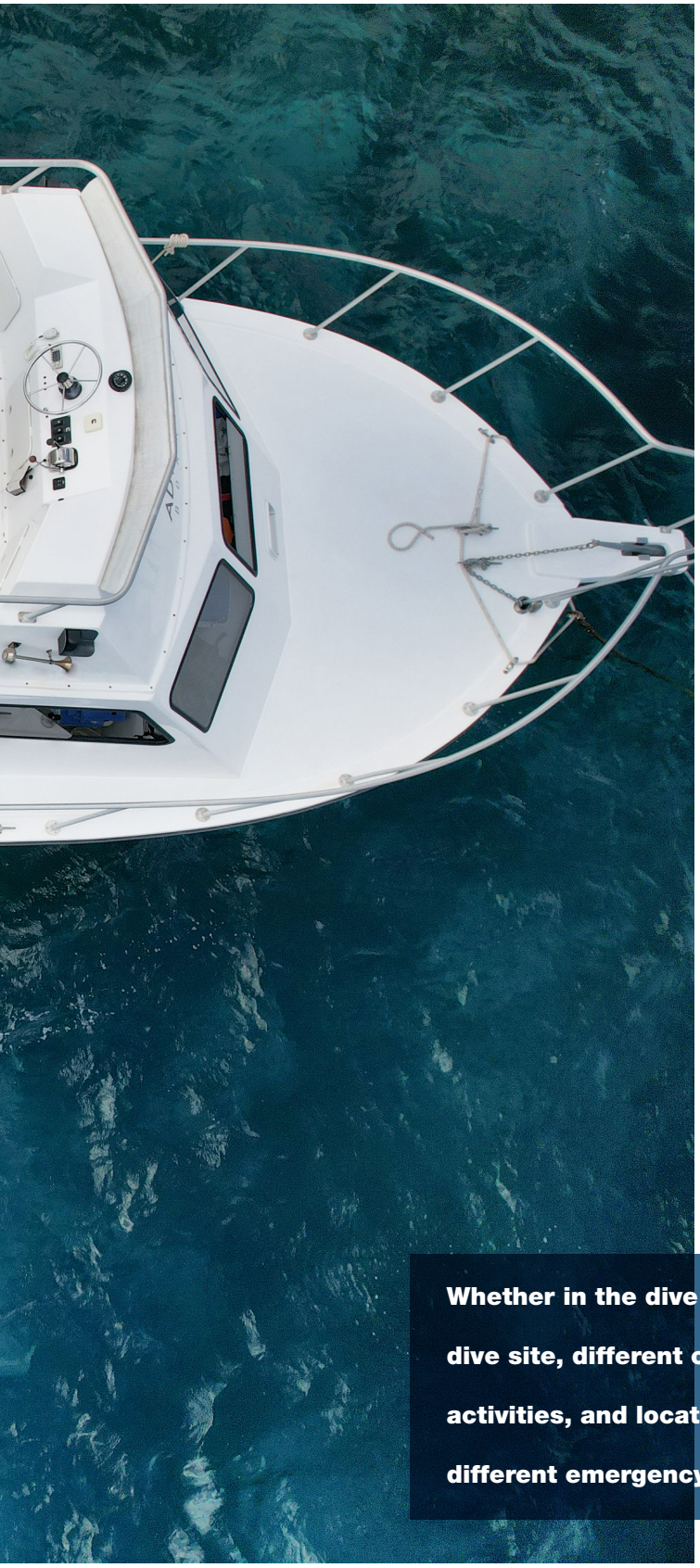
In addition, oxygen is the standard of care for a range of diving-related injuries and should be administered using an appropriate delivery device. An oxygen unit should be readily available for the immediate treatment of injured divers. Depending on conditions and risks involved in the dive, there should ideally be sufficient oxygen for two divers for the full duration of time until they can be evacuated or EMS can reach them. Like the first aid kit, emergency oxygen should be clearly labeled and easily accessible.

If at all possible, an AED should also be present at the dive site or within a reasonable distance. Note that defibrillation should be administered by appropriately trained personnel.

SHORE DIVING OPERATIONS

ELEMENT	RISKS	RECOMMENDATIONS
EAPs	Emergency situations often unfold rapidly and rarely allow those on site to evaluate the situation and decide on a suitable response. The establishment of emergency action plans (EAPs) covering likely exigencies can mitigate the risks involved. The mere existence of EAPs is not sufficient, however. EAPs that are drafted but never practiced may be ineffective, due to issues such as the complexity of a given emergency, a lack of access to the site, unfeasible or restricted escape routes, inadequate or unfamiliar equipment, unsuitable communication devices or methods, inadequate training, and/or inappropriate reactions due to staff being under pressure. Lack of training and lack of consistency in carrying out EAPs can expose a dive operator to legal liability.	Dive operators should establish EAPs that are based on a site risk assessment, the prevailing conditions, the dive plan, and any other variable factors. Plans should be documented and tested by all dive professionals on staff. Such plans should address at least the following situations: • Aggressive behavior (by customers, staff, or others); • Bad weather and/or effects of exposure; • Injured divers (in water or onshore); • Decompression illness (DCI); • Marine life injuries; • Heart attack and other health problems; • Lost diver; • Transfer of an injured diver or staff member to the nearest emergency service; • Motor vehicle or other transport-related accidents; and • Death of a diver or support-crew member, including retrieval of the body.

DIVE



EMERGENCY PLANNING

Despite our best efforts to prevent them, accidents still happen. Be prepared for anything by creating emergency action plans (EAPs) for all aspects of your dive operations. With effective training, proper equipment, and sound planning, you can be confident that your staff can effectively manage whatever emergencies arise.

Whether in the dive center or at a dive site, different circumstances, activities, and locations will require different emergency action plans.

EMERGENCY ACTION PLANS: WHEN THINGS GO WRONG

Scuba experiences are not without risk, and accidents are always possible. But with the right plans in place, incidents can be managed, and harm can be limited. Emergency action plans (EAPs) are essential risk mitigation tools for dive operators and dive professionals to limit liability and ensure the safety of divers, staff, and the public.

Each aspect of a dive operation has its unique risks. Understanding what these risks are and how various accidents should be managed is a key element of safe operations. Whether in the dive center or at a dive site, different circumstances, activities, and locations will require different emergency action plans. Customizing your plans for each potential situation is crucial for ensuring customer and employee safety.

ASSESS YOUR DIVE CENTER

Dive centers may have any or all of the following areas: retail shop, classroom, service workshop, gear rental storage area, and cylinder filling station. Each has its own unique list of emergencies that may include medical emergencies, pressurized equipment explosions, electrocution, and even aggressive behavior. Each requires its own action plan, emergency equipment, outside assistance services, and, most importantly, specific training to know how to react appropriately.

Consider sitting down with staff and working together to identify potential risks. From this list, start brainstorming possible plans based upon what resources are available and what is realistic to achieve.

ASSESS YOUR DIVE SITES

You may use a pool or other confined-water location for training or use dive boats or other shore-based means to access your dive sites. Weather and sea conditions vary dramatically, as do remoteness, exposure to diving emergencies, and access to emergency assistance. These are all factors to consider when assessing risks and creating plans. Being aware of and understanding the accidents and incidents that may occur are essential aspects of your preparation for safe operations.

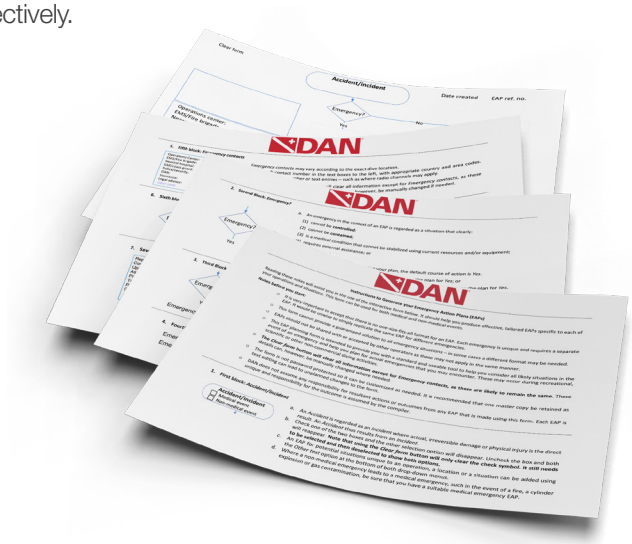
ASSESS YOUR VEHICLES

Several factors need to be considered when assessing vehicles used for transporting divers. Beyond licensing and equipment requirements, you are responsible for planning for and carrying out emergency procedures that are not always top of mind. In some cases, the emergency action plan is going to include steps that require careful planning, training, and equipment.

Vehicle road accidents, fires, death onboard your vessel, and in some areas even hijacking are emergencies we generally would prefer not to think about—but it is important to consider and develop plans for risks such as these.

ASSESS YOUR EMERGENCY ACTION TRAINING — REGULARLY!

Compiling and implementing emergency action plans require very specific training to ensure that you will be able to respond appropriately during times of potential chaos and that assistance numbers and emergency equipment will help you manage. Keep your emergency plans at the forefront of your mind as a dive operator. This means you should not simply file your emergency action plan for when you might need it; rather, you should perform walk-throughs to review the effectiveness of the plan and then do realistic drills at least once a year to ensure you and your staff are able to execute all the necessary emergency actions effectively.



Scan here to create custom emergency action plans for all aspects of your operations.

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