In response to a number of inquiries, and my own personal experience, it has become necessary to create my own approach to the Advanced Level courses. I reserve the right to adjust and adapt to our local conditions and the needs and interests of students.

Traditionally the Advanced Level (formerly known as AOW) course has been used to introduce students to new types of dives they may not have experienced previously. The Advanced Level III course expands on this and is probably a more valuable training tool for both student and instructor. But I also needed to address the student who does not have the time or perhaps resources to do the Advanced Level IV course. The fact that they may not be able to avail themselves of the benefits of the course should not be taken as a sign they would not like to take the course. It is my feeling, therefore, that even the Advanced Level III course should provide solid educational value. This does not rule out or in any way diminish the value of the Advanced Level IV course as the Advanced Level IV course offers the advantage of additional dives and increased classroom time by going into even more detail.

I am strengthening the standards in all of my courses, so these two must be addressed as well. The question then becomes "How do I do this and not make them so tough that no one wants to take them?" I believe the answer to this is simple. I provide not only the experience of the dives themselves, but also a solid educational experience, in the form of classroom time and, when necessary, additional pool sessions. I will not make the mistake made by other agencies and allow students to take the course when they are not ready for it. A diver who cannot control their buoyancy, is not comfortable in the water, or has poor buddy skills is not ready to take an advanced course which will give them a card they can use to get access to dives they are not ready for.

The previous prerequisites for Advanced Level were:

1. Age 15 years or older (12 to 15 see Policies, Procedures: Junior Diver Policy).
2. Medical Questionnaire or medical by a physician.
3. Statement of Understanding/Waiver & Release completed and signed if adult or completed and signed by student and parent or guardian if a minor (under age 18).
4. Open Water Diver, Open Water Plus or equivalent from another recognized agency where the diver has logged at least four training dives.
5. Prospective students are to be informed of all required equipment prior to the course, i.e., a light for the night dive, compass for navigation dive.

These, while similar to other agencies, are insufficient to create a diver capable of meeting the requirements for this new course. 4 open water dives does not give the student time to effectively practice the skills learned in Basic OW and become comfortable with them. Even with the 16 hours of pool required by OW standards for the agency I represent, students need time to work on buoyancy control, trim, and other skills in open water on their own. They also need to independently plan dives, execute them, and return from them. This builds confidence and adds to diver comfort.

Students who come to me for this course from other agencies most likely have not had the benefit of OW training as extensive as that offered by UDM Aquatic Services. They likely have not had the task loading and comfort building exercises I offer. Their buoyancy and trim may be severely lacking or even nonexistent. They may not have had proper buddy skills reinforced throughout their training. This is not

an automatic disqualification for training, but rather an opportunity to showcase the higher standards I adhere to and the importance I place on skills and education.

Assessing the diver through a thorough interview and, if necessary, a pool session or two and perhaps a dive in open water will give me a clearer picture of the students abilities, strengths, limitations, and overall comfort. By doing this I am able to show the student that I practice what I preach and place their safety and welfare above everything else. Based on the actual experience I have with teaching this course to divers of various skill levels and from other agencies I have adopted the following prerequisites for this class

1. Age 15 years or older (12 to 15 see Policies, Procedures: Junior Diver Policy)
2. Medical Questionnaire or Medical by a Physician
3. Statement of Understanding/Waiver & Release completed and signed if adult or completed and signed by student and parent or guardian if a minor (under age 18).
4. Open Water Diver, Open Water Plus or equivalent from another recognized agency
5. 10 logged dives post Open Water Certification
6. Interview and, if warranted, In-water assessment of basic skills and comfort level
7. Prospective students informed of all class requirements and materials needed to complete said dives not provided by the instructor. I.e. light for night dive, compass for navigation, redundant air supply, etc.
8. Students should also be fully informed of the academic and dive skill proficiency requirements for successful completion of the class

I realize that these are very new and perhaps seem a bit excessive to those who are familiar with the traditional structure of the Advanced Level courses. This is not the traditional AOW course by any means. The student who elects to take a course termed “Advanced” is expecting to get an “Advanced” education. They are expecting to learn new skills and gain more knowledge. The reasons for this are many and could take several pages to describe based on talking to divers, reading message board posts, and my own experience. What it really boils down to as a general rule is the dives they will gain access to with an Advanced Level certification.

Many times the students who elect to take the AOW or Advanced Level courses do so with the intention of gaining access to those very dives that require an advanced rating. Whether it is a deep wreck, artificial reef, drift dive in stronger currents, or a night dive many resorts and operations around the world require an advanced card and/or documented experience in these disciplines. To give them this card and not impart to them a solid understanding of these dives is doing them a great disservice and placing UDM Aquatic Services at the level of other instructors and agencies whose standards may not be as stringent.

This is one of the things that will continue to set UDM Aquatic Services apart. My program is based on solid training principles. I am a skills and education based trainer, as opposed to one based on profit. As such every course must reflect this philosophy. Even courses that traditionally provide an introduction to new activities must have more content than was traditionally provided. If students are going to take the course and then go dive the Spiegel Grove I must be sure they have a solid understanding of the effects of nitrogen narcosis, increased gas usage, and the dangers of wreck penetration. Even though many passages are classified as “swim-thrus” they are nonetheless overhead environments. I must then provide them with a list of hazards and associated risks. I must do this not in a quick review at the dive site or even an hour in the classroom.

I treat this as any other course I teach and set a minimum amount of time to be spent in the classroom covering the dives that will be done during the course. In this outline we will look at some recommended guidelines for conducting these courses and providing students with the education they deserve. As a final note I feel it is in the best interests of UDM Aquatic Services to provide this type of training. In today's times I realize that students want value for their money. I have said time and time again that I have the chance to truly set myself apart from other agencies/ instructors by giving students more, for not only their money, but their time and effort as well. I hope this outline will demonstrate that commitment. Thank you.

What are Advanced Dives and Why Do Them?

In order to develop new guidelines for the AOW and AOW Plus courses (now Advanced Level II-VI) I need to define what these dives are. For experienced divers it is easy to define what advanced dives are. We have seen and experienced situations and events that the bulk of people who will take this course may never see. But the fact is that you, in most cases, are taking these courses in order to get access to dive sites that could put you at considerably more risk than the dives you are accustomed to. So let's define these dives.

1. **Dives that pose additional risks from increased gas usage, increased nitrogen uptake, colder water, and more challenging conditions from current, depth, low visibility, and perhaps overhead environments in the form of so-called "swim thrus". All of these require more training to successfully execute the dive.**

2. **Dives that require a higher level of skill to avoid accidents, not disturb the bottom while performing a new or specific skill. Tasks such as Underwater Navigation or Search and Recovery require greater buoyancy skills, anti-silting kicks, and gas management skills.**

3. **Dives that are viewed by resorts and operators from a liability standpoint as involving more risk or are more challenging than say a simple reef dive to less than 60 feet. These could be dives on wrecks or artificial reefs, drift dives, or those that may require skills beyond those found in some Open Water courses.**

4. **And while not exceeding recreational limits, many advanced dives led by Dive Masters or Dive Guides, as they are now known, approach those limits frequently enough that it would be remiss to not discuss them and make sure that you know that some of the best advanced dives are the ones that are not done. They are those that are called off by those who know and recognize their training and experience levels. They know that the presence of these "professionals" does not guarantee your safety. Only you are responsible for it and must be prepared for that.**

In undertaking to write this guide I have drawn on my own experience with different agencies and looked at their training methods and materials. And while there are some very good materials and instructors out there, the quality of their Advanced Open Water Diver programs leaves much to be desired. Usually it consists of the student doing some home study, taking a quiz (open book), and doing 5-6 dives. Unfortunately many times these dives have little actual value in improving the diver's skills or

are things that should have been covered in the Open Water class. For example many places will use a boat dive as one of the qualifying dives. What actual value does this have other than to teach a diver how to get on and off a boat? Or another may use “Fish Identification” as one of the dives. How does telling a blue parrot fish from another fish improve the diver’s actual skills? Frankly, it does not.

As an Instructor I have a duty to my students to offer dive training that will truly benefit them. Dives that make use of good buoyancy control, better than average skills, greater knowledge of dive theory, and technique is what I use to set myself apart from those whose standards are not as stringent. I chose dives based on the premise that they will truly test and encourage students to develop their skills and abilities, and just as importantly expand their knowledge of diving. As was stated before:

The reason many students choose to undertake an advanced course is to enable them to do dives that while perhaps being more rewarding, they pose greater risks. They want to do drift dives at 70 feet, explore wrecks and artificial reefs at depths approaching recreational limits, and they want to do night dives. I therefore set up dives and classroom sessions to make them aware of what they are getting into. We need to discuss the risks as well as the rewards. For deep dives they should know how to manage their gas supply and calculate the amount needed, available, and reserve necessary. “Be back on the boat with 500psi does not cut it!”

I therefore need to cover and reinforce the effects of narcosis and choose methods to demonstrate it clearly.

When we do the navigation dive it should be with the intent of giving a basic yet solid foundation. It should also be the basis for encouraging you to take further training in this discipline. A display of solid navigation skills by the instructor and a challenging exercise that can still be successfully completed by the student will accomplish this as well as a good session in the classroom to cover navigation methods, challenges, and hazards.

Any advanced course should also include a night/low visibility dive. The techniques for each being similar, it stands to reason that at some point the student will encounter, if a regular diver, conditions which require the skills taught in this section. Again, along with the dive, a classroom session covering night diving should be included. This can cover the obvious things like lights, markers, and buddy skills. It should also include hazards, communication methods, and navigating at night.

These three sections are usually found in an AOW course. Although night/low vis may be an optional one for some agencies, for me it is required. The great likelihood that you will do these types of dives behooves me to instruct you in the proper procedures for conducting them. The additional dives are bound to vary due to local conditions and availability of resources. They may include Search and Recovery of small objects and diving on wrecks (if available). An Advanced Skills dive that includes anti-silting kicks, performing basic skills at a higher level while swimming or hovering, and shooting a bag to aid in ascents is mandatory. This dive is flexible; if I see the student is somewhat proficient in these skills I’ll kick it up a notch to refine them further. Finally in light of the number of deaths and accidents that have occurred as a result of poor or nonexistent buddy skills; a Buddy Skills and Assist Dive along with adherence to strict buddy protocols on all dives will, in my opinion, benefit every student and it is also mandatory.

I avoid things such as “Fish ID” or even UW Photography and, while having a separate dive for working on buoyancy control may be useful, it is more beneficial to insist on buoyancy control on all dives and make adjustments as the need arises. The following pages will contain my guidelines for conducting these dives.

I hope you find this material helpful.

James Lapenta
SEI Instructor #204.
SDI/TDI Instructor #16810

AOW DIVE GUIDELINES

1. Advanced Skills Dive- This dive is used to enhance the OW divers skills by reinforcing and improving basic skills as well as introduce the following new ones:
   A: Anti-silting kicking techniques consisting of frog and/or modified frog kicks, helicopter turns, and back kicks, we will also use this to get an idea of the distance a diver travels using these kicks.
   B: Performing basic skills while swimming and hovering including mask removal and replace, regulator retrieval, weight removal and replacement, and sharing air.

   Students coming from other agencies may not have had to perform these skills while hovering or swimming. You should be able to start the course while performing these skill with no more than a 2 foot (+/-) change in depth. By the end of the course it should be no more than 1 foot (+/). This is well within the capability of every student I have trained.

   C: Shooting a lift bag to assist in ascents.
   D: Reinforcing proper weighting and trim.
   E: Deployment of redundant air source (pony/stage bottle)
   F: Buddy Skills and Procedures are reinforced and strictly followed!

   These skills are best done in relatively shallow water (25-30 feet), and should be demonstrated by the instructor as with any other class. The bag shoot can be demo’d and then performed by the student on a subsequent dive as an option.

2. Underwater Navigation- This dive is used as a follow up to the basic compass skills as performed during the OW checkouts. In addition to the basic patterns of a square and triangle the instructor should repeat the patterns but also have the student select an object on the bottom to use a reference at each turn. This small exercise in combined compass and natural navigation is used to illustrate the increased accuracy of this method and interest the student in further Navigation training. The following skills should be emphasized and evaluated.

A: Holding the compass properly
B: Maintaining horizontal trim
C: Maintaining position in the water column; close attention to depth variations!
D: Buddy awareness and communication
E: Accuracy
F: Attention to detail and selection of landmarks
G: Measuring distance through kicks, time, air consumption, or a line
H: Awareness of Gas Supply

3. Night/ Low Visibility- This dive is used to familiarize the student with the fascinating world of diving without natural light. The use of dive lights, strobes, markers, and new methods of communicating with the dive buddy are introduced. Night diving, while fun, presents new challenges and risks. The instructor needs to make absolutely sure the divers know the plan. They should also receive a thorough site briefing and know the procedures should the team or group become separated. The following skills should be practiced and evaluated.
   A: Buoyancy control
   B: Light use and selection
   C: Use of strobe or marker to mark the anchor or down line
   D: Buddy contact and communication – separation is not acceptable nor inevitable.
   E: Lost diver procedures
   F: Navigation
   G: Site choice

4. Deep Dive- The deep dive is one of the primary reasons that divers take the AOW course. They wish to do dives exceeding the recommended OW limit of 60 feet. Whether it be a wreck, wall, or reef there is usually some reason for them to get a card that will demonstrate to a resort or boat operation that they are qualified to do the dive. Unfortunately this is usually the dive that also presents the most risk to the diver. Increased air usage demands a better understanding of management of the air supply.

   When doing this dive they may also be coming closer to the No Decompression Limits much faster than they realize. More attention to depth and times must be impressed upon them. Many will elect to begin looking at redundant air sources such as pony bottles. This is an area we should cover as well to be sure they get the proper equipment and know how to use it. And it goes without saying that we need to again make them aware of the effects of nitrogen narcosis. Skills evaluated would be:
   A: Buoyancy control
   B: Horizontal descent and ascent
   C: Maintaining rate of descent
   D: Situational Awareness via tests to judge effects of narcosis – In my class this consists of descending to a min depth of 90 ft, performing some basic math problems, then tying off a line, navigating a course with the line and having student take control of the reel for return to the tie off point. I will then signal an OOA and we will do a HORIZONTAL AIR SHARE ascent to approximately 50 ft., retrieve and deploy stage bottles and finish the dive.
   E: Communication
   F: Management of air supply
   G: Use of stage bottles to finish the dive

H: Ascent utilizing deep stops

5. Search and Recovery- This dive introduces students to basic underwater search patterns and recovery techniques. It must be made clear that this is not a public safety course but an introduction to the use of basic patterns to locate lost objects of small size. The techniques and tools are suitable for locating things like fishing rods, small boat motors, wallets, and other such items. The lift bags used should not exceed 100lb capacity and smaller ones are preferred. 25-50 lbs. is an ideal size for lifting an object such as a concrete block or bucket filled with weight. The use of a reel and line is also required for this dive to execute a circular pattern, grid, or as insurance should visibility be reduced by natural conditions or the actions of the searchers. These skills are used in this dive:
   A: Buoyancy control
   B: Selection of search pattern based on object size, approximate location, environmental conditions
   C: Attention to terrain detail
   D: Maintaining trim and buoyancy while conducting a slow search using good anti-silting techniques and buddy skills. I do not separate buddy teams for this. They will tie off to a fixed point and execute the search as a team.
   E: Once object is located we determine position by taking a compass heading
   F: Securing object to be lifted
   G: Lift bag use – raise object at even rate, achieve neutral buoyancy with the bag, swim object a horizontal distance of 100 ft., bring object to surface and return to depth maintaining neutral buoyancy of diver and object.

6. Buddy Skills and Assist- The Buddy Skills and Assist Dive is intended to reinforce proper buddy skills and also introduce the student to new skills that may be used to assist a dive buddy who has
   encountered different issues and now requires assistance from his buddy. At all times safety protocols must be observed and adhered to. This does not however preclude creating scenarios to test and challenge the student with the goal of increasing confidence, situational awareness, and overall safety of the divers. With this in mind the following scenarios can be used:
   A. 100 foot no mask swim
   B. 100 foot no mask air share swim
   C. 100 foot no mask air share swim and ascent
   D. Loss of buoyancy ascent assist
   E. Unconscious Diver from depth (not to exceed 25 feet)
   F. Rescue tow of unconscious diver

These 6 dives make up the core of the AOW program that I teach. The Deep, UW Nav, Night/Low Visibility, Advanced Skills, and Buddy Skills and Assist are not optional. Students will benefit greatly from the new kicks, increased buoyancy skills, and the bag skill should they plan to dive in conditions where it could be useful. The rescue skills in the Buddy Skills and Assist can be invaluable to any diver.

Another dive that could be inserted in the course would be Wreck with no penetration (see end of this outline). What I do avoid is putting in a dive that does not benefit the student by enhancing their dive skills. It should also be noted that during the dives and classroom sessions that I will inform you of the benefits of the higher Advanced Level Programs. Not only will you experience more dives under instructor supervision but also get more information on gas management, navigation skills and

techniques, and the opportunity to perhaps do all of the dives discussed, and really give you a varied experience of dives that are considered advanced.

Other resources would be found in the basic text- Scuba Diving by Dennis Graver, the NOAA Dive Manual, the US Navy Dive Manual, and numerous other publications. I also use my own book, **SCUBA: A Practical Guide for the New Diver** for a great deal of information. It also clearly illustrates my training philosophy. Getting into a guideline for classroom that is too specific may actually hinder your development. Local conditions, dive sites, and instructor knowledge is at this level more important than specific guidelines.

James Lapenta SDI/TDI Instructor #16810

Why Select These Dives

When developing the Advanced Level course outlined here I had one goal in mind. To keep divers safe. Since getting certified it has come to my attention that many divers are gaining access to what I have previously described as advanced dives. They are doing this by possessing an Advanced Level certification card from any number of agencies. Unfortunately while they do indeed possess the card they do not possess the knowledge and skills. They have taken a course that is little more than a "tour" of these dives. Some knowledge is passed on but again it is mainly in the form of self-study followed by a quiz and a quick review. On the dives themselves few if any new skills are taught and many times basic skills not verified.

Before permitting a student to take the training to do these types of dives it stands to reason that they have a very firm grasp of basic skills. Sadly this is all too often not the case. As an Instructor with Scuba Educators International it soon became clear that to stay true to our mission of skills and education based training and high standards it was necessary to create a course that clearly reflected this. In doing so I drew upon my own experience, education, and training. In addition I drew upon the experience and knowledge of many other divers and instructors. I also consulted many written references and put all this together to create this course. Again with the goal of keeping divers safe. As such, taking the dives individually and assessing the risks and possible hazards that could be encountered, the skill sets necessary to deal with them were created, tested, and actually taught to students of various levels of experience and who had received their OW training from different instructors and agencies.

One of the first things to assess when a student inquires about this course is not only their basic skills but their level of comfort in the water. This is especially important when the student comes from another agency. While we use a number of methods to develop the comfort level of students we cannot count on this being done by instructors outside of our agency. Even with SEI Diving trained divers it is beneficial to give them time to work on skills learned in OW class. For this reason it is suggested that a minimum of 10 dives post OW certification be required before starting the Advanced Level class.

For non SEI Diving students I may require more experience or, at a minimum, a couple dives with the potential student to assess their fitness for this class. I myself conduct a thorough interview, fully explain all requirements of the class, and explain the process or certification through Scuba Educators International. Based on this I determine if I wish to see the divers' skills in the pool or open water before allowing them to take the class. The reason for this is that the skills required for completion of the

course are such that solid basic skills such as buoyancy control, trim, and watermanship must be sufficient to perform them with little or no remediation. If a student has poor buoyancy control, bad trim, or is not comfortable under or in the water they will not be able to complete the course with sufficient proficiency to earn certification.

This is a critical part of this revised Advanced Level course.

While other agencies may have minimal requirements for certification, in fact the courses are little more than "tours" of dives that can be defined as advanced and few if any new skills are required, UDM Aquatic Services is not in the business of selling certifications. I therefore set requirements for certification that include proficiency with all basic Open Water skills, an understanding of the new dives, the knowledge to safely plan and perform these dives, and finally, learning and demonstrating the new skills under instructor supervision.

Only after successfully completing these requirements will certification be issued. In the event that there is a question in the mind of the instructor in any of these areas the certification will not be issued until the question has been addressed and remedied. In order for there to be no surprises the student is made aware that in the event they do not meet the requirements they will not receive a card.

While payment of tuition guarantees training, certification is earned! The reason for this is as previously stated. Gaining access to these dives with an Advanced Level card exposes the diver to new risks with consequences that can happen quicker and with more serious results.

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The Dives

Advanced Skills Dive- **The advanced skills dive was developed to impart skills that will prove to be not only helpful but perhaps essential to do these types of dives with confidence, comfort, and safety. The propulsion techniques, performing skills while neutral, in trim, and in midwater, shooting a liftbag, and deployment of a redundant air source in the form of a slung pony bottle are all skills that divers taking part in these new dives may find not only useful but essential. Frog kicks and modified frog kicks are not difficult to learn and perform**.

They are easily taught in one pool session. Neutral buoyancy demonstration of skills is also something that every instructor should be able to do with ease. I require this of students as well. Many agencies talk about it but do not require it.

Performing skills in good trim, neutral, and in midwater are skills that the diver will use in real life situations. Ideally they should be taught this way in OW class.

But not all students who come to me will have had the benefit of this teaching. Shooting a lift bag is another skill that anyone doing these types of dives should be shown. It is also a rather easy skill to perform and master with proper instruction and practice. Never doubt for a minute that many students will use the AOW card to gain access to dives where a current, poor visibility or other condition may cause them to lose the anchor or mooring line.

Using a lift bag or smb with a reel or spool will make an ascent safer and easier to perform. Having a visual and tactile reference is preferable to performing a blue water free ascent.

Adding the redundant air source deployment in the form of a pony bottle reinforces the need to have adequate air supplies for all dives. Covering SAC rates and gas management prepares the student to decide on whether or not to carry a backup supply of air for certain dives. Deep dives may require this in order to assure the safety of all the team members (dive buddies). Adding this skill is also another very good task loading exercise dealing with buoyancy control, trim, and buddy skills.

Reinforcing proper weighting and trim is accomplished by these tasks as well as a thorough buoyancy check. The student should be instructed on how to adjust their weighting for different suit thicknesses and how to distribute it to aid in achieving good horizontal trim.

Underwater Navigation- **This discipline should be one of the core elements of the competent diver. Unfortunately it is often not stressed enough to provide the student with a good foundation in it**.

In the AOW class it would ideally be the time to build and introduce new navigation skills but with the possibility of students coming to me from other agencies I need to focus on the basics.

Those being compass and natural navigation. With only one dive it becomes even more necessary to clearly explain the skills in the classroom and practice them on land before entering the water. The practice can be done on land between dives and if possible in the classroom.

For natural navigation the primary skills to be used along with good dive skills are those of observation and recording of details.

Stressing this will allow the diver to begin to take notice of details and make notes, written or mental, of them. When we actually do the dive the skills should be combined and the students challenged to keep a slow steady pace, stay in good trim, be purposeful in their movements, and pay attention to the details. This includes measuring distances and paying attention to times and air pressure. All of these play a part in successful navigation.

In the classroom other items to be stressed are good buddy skills and the great importance of communication between buddies. Successful navigation is as much a team effort as it is an individual one. This is another area in all of these dives that must be stressed and insisted upon.

Good buddy skills are fostered and grown when the divers are required to complete tasks. Tasking each team member with certain aspects of the navigation dives will reinforce buddy skills, add to the safety of the team, and make success more attainable.

This in turn will add to the students comfort and confidence. This skills learned on this dive will carry over into the next 3 dives and be reinforced by them as we shall soon see.

Night/ Low Visibility Dive- The night/low visibility dive has only a few actual new skills. Those being primarily in the area of communication using lights and lost diver procedures. The remainder of the information to be covered is addressed in the classroom and includes selection of lights, use of strobes, site choice, and hazards of night/ low visibility diving.

Dive planning also becomes more important and buddy skills and communication are critical areas of attention. Navigation at night is also an opportunity for you to practice the use of lines and reels if the site conditions are amenable to it.

As with all the dives in this course good buoyancy control, trim, and propulsion techniques are mandatory for a successful dive. When covering communication between divers during night dives it must be stressed that

The signals and methods for communication chosen must be clear, concise, and clearly understood by all team members. Night dives will usually cover less area than those done in daylight. This does not mean they will be less interesting. In fact some night dives may contain more life than seen during the day. They will certainly have different animals that are primarily nocturnal.

This is an excellent time to also work on observation skills that will serve divers on any dive they may do. It will also go a long way to improving their situational awareness.

Diving at night when the only area that can be seen is normally that illuminated by the diver's lights requires the diver to heighten their senses. Paying attention to features and waypoints will reinforce navigation skills.

It can also be the ideal time to practice some basic skills that could happen on a night dive. Skills such as mask remove and replace and regulator retrieval are two skills that have real life applications.

Having a mask accidentally knocked off or regulator kicked out are things that could happen on night dive when diving with a group.

If not practiced they could become very real problem in that the stress of the incident could be magnified by the absence of natural light. I gauge the comfort and overall skill of the student when creating task loading exercises on night dives.

Deep Dive- Probably the most often cited reason for taking the Advanced Open Water course is to gain access to dives beyond the recommended Basic Open Water limit of 60 feet. It is also arguably the dive that poses the most risk to divers outside of those conducted in overhead environments. As such a detailed explanation of the risks presented by deep dives is a given.

The effects of Nitrogen Narcosis, increased gas usage, possible colder temperatures, lack of natural light, and increased task loading due to all of these being experienced at the same time are possible

and are covered in detail. Increased gas usage requires more detailed planning and an understanding of the use of SAC rates, Rock Bottom calculations, and deco procedures in the event of an unforeseen problem need also be discussed. These lead into the covering of the use of redundant air sources to provide a necessary margin of safety for the buddy team. Recent findings of the benefits of deep stops in divers doing deep dives is also worthy of discussion. Performing these stops and of course the safety stop itself cannot be glossed over. Divers need to understand the very real benefits of them and the consequences of not doing them. And on this dive, as with all dives in this course, proper buddy skills must be stressed and the student informed of the best methods to use.

No more than a slight turn of the head should be required to locate the diver's buddy.

In conditions of low light and/or low visibility the importance of maintaining even closer distances and the benefits of actual touch contact and communication should also be covered.

Search and Recovery Dive - is another introductory dive to a new discipline but that does not mean that it should not contain real skills that could be useful to the diver. It will not qualify the diver to make evidence or body recoveries but it will allow them to take a few skills and some simple tools and let them locate lost wallets dropped overboard by a careless person, fishing rods that went over when the angler was busy opening a cold one, or recovering the driver of the golfer who just shanked his fourth drive into the lake followed by the club he threw!

Use of a lift bag will enable him/her to safely raise the boat motor that fell off the transom of the boat because someone did not tighten the mount. The classroom portion will cover what search pattern to use, what tools (line, reel, size of lift bag) to make use of, and when the conditions are such that the effort be best left to a professional. It would also behoove the instructor to discuss the possible hazards of undertaking a search and recovery and what can be done to reduce those risks.

The concentration required for search and recovery is not dissimilar to underwater navigation. In fact underwater navigation may be used to relocate the object in order to return to it with a larger lift bag, better conditions, or with more help in the case of a larger object. As such, careful planning, excellent communication, above average buddy skills, and attention to every detail of the dive is called for. All of the skills used in the previous dives may come into play. Excellent buoyancy control while using anti-silting kicks is a must. Low visibility and lack of natural light are possible. To this we add the additional task of using a separate buoyancy device to perhaps raise an object to the surface. Controlling two buoyancy devices necessitates the diver be alert to small changes so as not to create a runaway ascent of the object or the diver. Safety also demands we attach the object to the bag as securely as possible.

The student should be informed of the possible ways to do this and how to select the best method. Bringing the object up once secured and avoiding getting under the object or keeping other divers from under it must also be addressed. Finally it should be stressed that certain items are better left to professionals even if they are not large or in difficult conditions. Recovering items such as firearms, human remains, even illegal drugs are always the purview of law enforcement and should never be attempted.

Buddy Skills and Assist- **The buddy skills and assist is a direct result of research into a number of fatal accidents that could have been prevented with the use of good buddy procedures. Drawing on this research a number of accidents were analyzed, the contributing factors looked, witnesses spoken to, and the buddy skills or lack thereof in numbers of new and not so new divers observed**.

In developing this dive it also became a secondary consideration to encourage divers to become interested enough in rescue skills to consider enrolling in the SEI Diving DRAM course. When deciding what skills to add I based it on the rescue skills we have in the Open Water course.

Then new skills were created based on actual situations that could be encountered on advanced dives or most any dives. Another consideration was the main idea that proper buddy skills and positioning would be essential to successful execution of these scenarios.

Taking all this into consideration I looked at what the best task loading exercises would be to encourage good buddy contact. As a result the no mask swims, ascents, air share swims and ascents, along with the loss of buoyancy assist were tested and taught to actual students with very good results. Before doing the actual dives it is necessary to make clear to the students what proper buddy procedures are and why they are so important. It is not out of line to use accident reports, photos of deceased divers, autopsy reports, and witness statements to get this point across.

It also must be made clear that when proper buddy procedures are followed most situations requiring assistance are little more than inconveniences.

They are not life threatening as illustrated in the power point presentation that accompanies this course.

Positioning, Communication, Navigation responsibilities, and Setting a Pace are all subjects to be covered in the classroom. Positioning is critical to successful buddy diving but just what is correct? I use

the rule of "no more than a slight turn of the head" is all that should be required to know where your buddy is. Cave and wreck divers may sometimes use single file positioning in narrow passages but in open water recreational situations divers should maintain a position that allows them to communicate and able to assist the other in a quick manner. The best position is two abreast with a maximum distance of one body length between the divers.

This can and should be adjusted for various conditions but always with the realization that if an incident were to occur how fast can the divers respond to each other. In less than ideal visibility it may be necessary to actually position the team so that touch contact is possible.

Assisting a buddy with a problem can be as simple as helping to replace a mask strap underwater or as complicated as providing a guide to the surface in an Out of Air situation. But the truth is to the well trained team neither of these need cause excess stress to either diver. Practicing such skills under controlled conditions with an instructor present will prepare the team to address such situations calmly, efficiently, and with minimum risk to either diver. Some skills such as Air Shares should be practiced on a regular basis in order to keep one of the perhaps most stressful situations a diver can encounter in its true perspective. That being the fact that a low on air or even out or air situation is

not life threatening to a well-trained team. To one inexperienced it can indeed be a serious issue. We must also realize that other than due to an equipment failure a diver should never run out of air.

This is the reason that gas management and calculations using SAC rates must be covered and is included in the appendix on gas management included with this course. Loss of buoyancy is likewise a minor issue to a well-trained team. Assisting a buddy to the surface and supporting them there until they resolve the issue is not difficult but has unfortunately resulted in the deaths of at least two divers in the last two years that I am personally aware of.

A more serious issue is that of recovering the unconscious diver from depth. While as SEI Diving Instructors we are familiar with teaching this skill in OW class many, if not most, other agencies do not offer this skill until their Rescue classes. As such we should consider this as possibly requiring a pool session to introduce and properly demonstrate it. Doing this is not only for the benefit of the student but also the simulated victim (usually the instructor himself!) as a runaway ascent has the potential to cause serious injury to one or, possibly, both divers.

Finally, while the scenarios outlined are very good for the reasons stated the instructor should feel free to add any that will benefit his/her students based on local conditions, level of student skill, and equipment configurations. This last item will be discussed in the following section.

Advanced Equipment Configurations

While diving equipment is covered to different degree in every Open Water Course it would be remiss to look at doing advanced dives without discussing what options are available to divers undertaking these new tasks. Some dives may be done with what is normally thought of as recreational gear but by choosing gear for advanced dives based on some new guidelines we can add to the safety and comfort of the diver while at the same time simplifying configurations and reducing the amount of task loading. Using my own experience as a beginning technical diver, the advice of more senior instructors, and guidelines borrowed from Tom Mount's IANTD Encyclopedia of Technical Diving, I suggest the following guidelines for students entering this course. Again Instructors should feel free to modify or add to these guidelines to meet the needs of their students. The suggested guidelines for advanced equipment configurations are:

1. **Safe and Reliable**
2. **Comfortable and Well Fitting**
3. **Provide for adequate redundancy without being excessive.**
4. **Configured for self-sufficiency and self-rescue**
5. **Simple and Streamlined**
6. **All accessories and valves easily reachable**
7. **Allows for Buddy Assist and Rescue**
8. **Has a Low Drag Profile- Streamlined**
9. **Adaptable to the Divers Needs**
10. **Adaptable to the Diver's Objective**
11. **All Equipment Identifiable by Touch and Location**

12. **Standardized with Fellow Divers Yet Versatile to Meet the Needs of the User**
13. **Equipment Placement is balanced and Instinctive**
14. **Any Changes have been made Gradually and with Careful Thought**
15. **Diver is open to Improvement to his/her Setup**
16. **All Cylinders are Properly Labeled with the Gas Mixture, MOD, and the Diver's Name**

Taking each item we can look at the reasons these are suggested and what some of the options for them are.

1. When we speak of safe and reliable equipment it is not generally an issue when dealing with products from virtually any manufacturer of scuba equipment today. Where the issue usually becomes a problem is with equipment that is not regularly and professionally maintained, kept clean and rinsed, and is suitable for the environment. Without recommending a specific line of equipment we can make a few generalizations. The first being that certain regulators are better choices for deep dives. Specifically those with balanced first stages. Unbalanced first stages have the tendency to breathe harder or stiffer as one goes deeper. The differences in a well maintained reg may be small but under conditions of increased task loading, coupled with the possible effects of nitrogen narcosis would lead one to choose a reg that breathes as easy on the surface as it does at depth. Other items of equipment such as the buoyancy compensator have few moving parts but a power inflator that sticks or does not work could lead to very serious issues. In the same vein while we think normally do not think of exposure suits in the same way as regulators and BC's, a faulty dry suit or wetsuit that is not appropriate for the conditions can cause serious issues on advanced dives.

2. Comfortable and well-fitting gear is essential to every diver but on advanced dives it becomes more important as it is one less task load the diver must be concerned with. In addition some of these dives may be done in less than ideal conditions so proper exposure protection that is adequate for the dive is essential. Every diver knows that masks, boots, and BC's should likewise be fitted to the diver. What they may not realize is how accessories that may be carried should also not compromise comfort and interfere with the fit of other gear. Adding items such as lights, lift bags, pony bottles, etc. should be done in such a way that they do not place undue stress or strain on the divers' basic gear

3. Providing for adequate redundancy without being excessive is a key component of what is sometimes known as "technical diving". One school of thought is known as Hog or Hogarthian principles. Attributed to a technical diver by the name of William Hogarth Main, these principles promote the idea that unnecessary items should not be carried on a dive while those that will be or may be needed be doubled to provide safety in the event one item be lost or broken. Items such as lights, cutting instruments, reels, spools, and even masks may be doubled up in order to provide sufficient redundancy for a particular dive. Redundant air supplies in the form of pony bottles may also be carried to provide a sufficient safety margin for the dive team. By the same token when increasing the amount of gear carried we do not go overboard. For example carrying two or even three different cutting instruments in the form of EMT shears, a standard dive knife, and a zip knife for cutting monofilament line would not be considered excessive. Strapping a huge knife to each leg, one on each forearm and a set of shears on each hip would be going way overboard. On night dives a primary and small backup would not only meet the requirements but in many instances be considered the ideal setup.

4. When we talk about configured for self-sufficiency and self-rescue we are not talking about configuring the equipment with the idea that we are planning to dive alone. What we are talking about is that the equipment should allow the diver to make use of every feature in the event of a buddy separation or when it is a relatively simple matter to address a problem on one's own. Overly complicated configurations add to the task loading and increase the risk in the event of a problem. While the purpose of diving with a buddy is to look out for each other and reduce risk, every diver should be capable of rescuing themselves in the event or an emergency.

5. Simple and streamlined is a common sense item that only adds to the safety of the team. With the increased task loading of advanced dives the last thing needed is a lot of "bells and whistles" when it comes to gear. Simple configurations mean less "failure points". They add to the reducing of swimming effort and aid in reducing air consumption. Stream lining is taught or at least mentioned in every Basic Open Water class. You would not know it though by looking at some of the OW divers on boats around the world!

6. All accessories and valves easily reachable is another common sense item. Any item carried on a dive, especially and advanced one should be easily accessible by the diver. Ideally with either hand. They should also be accessible to the diver's buddy. Carrying an item that is to be used on the dive and having to go through complicated maneuvers to reach it can result in delayed reaction times and increased stress. Valve accessibility usually applies to those who use double tanks, stage bottles, etc. But for the advanced recreational diver who chooses to carry a pony bottle they also need to be able to reach and control the valve on it.

7. Allows for buddy assist and rescue. An extension of the predive buddy check this requirement goes a bit further and contends that not only should buddies be familiar with each other's gear but that it should be configured so that in the event of an incident it is set up so that the buddy can easily remove or adjust the gear to aid the victim. While this sounds like the predive check it adds the requirement that buddies take into consideration any changes they make in their gear so that they can be assisted if needed.

8. Has a Low Drag Profile is done for several reasons. The main being to reduce swimming effort. This reduces air consumption and may have some effect of reducing DCS risk that can be elevated by overexertion. In addition reduced drag aids in diver comfort which reduces overall stress. Clean, simple, streamlined divers also seem to enjoy the benefits of being able to step onto a dive boat and garner the respect of boat Captains, Mates, and Dive Masters who see a diver that is skilled, competent, and safe. They also serve as role models for other divers.

9. Adaptable to the Divers Needs means that the diver chooses equipment that should their experience level change or the dive demand it they can make the changes necessary without fundamentally changing the base equipment. Certain types of equipment configurations lend themselves to this easily. Others are not so adaptable. The brands and models of these are numerous. This course is not designed to recommend one over another. That will be left to you and your instructor to cover according to your needs and means.

10. Adaptable to the Diver's Objective is key when it is expected to be diving in a number of various areas with markedly different conditions. The ability to use the equipment with a variety

of exposure suits, in warm and cold water, in fresh or salt, and to even be able to travel with it is of great benefit. Not only to advanced divers but all divers. Especially those who are unable or perhaps just do not want to have a different set up for every change in conditions. Some however have no problem with owning several sets of gear. Yet even those of us who do keep this in mind along with the next item no matter what gear we are wearing.

11. All Equipment Identifiable by Touch and Location. Advanced dives can be in warm crystal clear water or cold low visibility conditions. In any case it all comes back once again to task loading and what can be done to reduce it. Making sure that you know where every piece of equipment is by touch assures that no matter what the conditions accessing an item is instinctual, smooth, and quick. Placing items in the same location every time adds to this. For example if you carry EMT shears and place them in the left pocket and things go smoothly on every dive, why would you suddenly choose to put them in the right for a dive where monofilament line would be a possibility? Getting tangled in this line would suddenly result in a rise in the stress level. This sudden rise would not be alleviated when the diver reached into the left pocket where the shears were always located and find them missing. This could lead to panic. Panic has a bad tendency to kill divers.

12. Standardized with Fellow Divers Yet Versatile to Meet the Needs of the User. A number of different agencies promote standardized equipment setups. This is for the benefit of the diver who will be diving with the same person or persons every time. Some subscribers will even go so far as to not dive with others who do not adhere to these rules. This may work for them and the dives they do. It does not have to be this way for every diver. If it was there would not be so many equipment manufacturers in the world. You need not be a carbon copy of the diver next to you. But by the same token there are some items that every diver needs. Remembering this it is a good idea to not stray into unusual configurations but at the same time individual taste and choice should not be given up if it works for you.

13. Equipment Placement is Balanced and Instinctive. As with item #11 when deciding on equipment placement in addition to having items in the same place every time we must also look at out trim and how this placement affects it. As well as being able to reach the item it should be located so that any extra weight does not cause undue problems staying in trim. It should also lend itself to allow access without thinking of where to locate it.

14. Any Changes have been made gradually and with Careful Thought. When we add or subtract an item or change a part of our equipment we do it by carefully considering the consequences of doing so. We ask ourselves if it will first of all affect our safety. Will it add to our task loading? Does it change the fundamental aspect of our equipment? Is it necessary for us to make the change? When we have asked these questions and are satisfied with the answer we can begin to make changes. When we make these changes we try to keep the numbers of items or type of change to a minimum and take time to get used to the change before making another. In this way we give ourselves time to acclimate to it without our biggest challenge to dive safety. Excessive task loading. By keeping changes gradual and over time we give ourselves the ability to adapt and become familiar with them. We do not make changes on a whim or because someone we know has a similar set up or because the local dive shop said it was the latest best thing. Sometimes the latest best thing can turn out to be junk for the diver who does not truly need it.

15. Diver is open to Improvement to his/her Setup. Even after choosing what we may consider to be the perfect equipment for us there may come a time when other more experienced divers will point out that there may be a better one for a given set of circumstances. We should never disregard outright this suggestion unless it is one that simply does not fit the type of dives we plan to do. Or one that we feel we are not capable of successfully implementing. But if the change does make sense and we are able to make it successfully we should be at least open to the idea.

16. All Cylinders are Properly Labeled with the Gas Mixture, MOD, and the Diver's Name. Another idea taken from technical diving, this recommendation is also for those divers who use other than air for their diving. We are speaking of Nitrox or Enriched Air. Many think that the correct way to label Nitrox tanks is with a huge bumper sticker type label. The problem is these labels are an unnecessary cost and can disguise defects in a tank. They may also promote rust on steel tanks. For this reason they must be replaced with every visual inspection. The proper way to label cylinders is with the O2 clean sticker used when the tanks is cleaned for use with enriched air or if using banked Nitrox, then with a piece of duct tape with the gas mixture as determined when the diver analyzes his/her tank, the maximum operating depth (MOD), the divers name, and the date of the analysis. This way all the necessary info is contained and easily read yet also allows the diver to change gases without great additional cost. Some use tags on the valve with this info. I do not recommend these as they can become detached in handling, become caught on other things, and again are not necessary.

I hope that what has just been presented will encourage you to continue to learn and dive. To add to your comfort level and skill and demonstrate the value of your decision to train with UDM Aquatic Services and Scuba Educators International.

In conclusion this new Advanced Level Course is designed to provide as much information and impart as many skills as possible in a time frame that is comparable to other AOW courses. What sets it apart from the others though is the amount of information to be passed on, the requirements for entry to the course, the skills to be imparted to the students, and the high standards it represents. I feel that what this represents is the future of diving.

Taken from the lessons of the past that many have forgotten, it has been my experience and firm conviction that rather than discourage students, comprehensive and thorough courses will have the opposite effect. You the student will serve as a role model for future generations of divers. The other reason I believe a course like this has a very good chance of bringing new divers is that divers are more than ever looking for true value for their money. I offer training that makes students want to come back for more as opposed to those who base their programs on the idea that the student HAS to come back; many times to learn skills and knowledge that I cover in my Basic Open Water program.

Wreck Dive – The UDM Aquatic Services Wreck Dive in the Advanced Level Course is designed to be a non- penetration dive. This is due to the fact that divers not specifically trained in overhead protocols have no business inside a submerged structure at any time. Therefore all skills and knowledge development will be done to discourage divers from penetrating wrecks. This will be done in the classroom by looking at the numerous fatalities that have occurred. Including those of experienced and

trained wreck divers. We will discuss all the ways penetrating a wreck as a non-overhead trained diver can kill you and endanger others who may have to recover your corpse.

In water skills will focus on identifying hazards on the wreck, making detailed notes of them on a slate or wetnotes, and dealing with getting entangled on a wreck. Buoyancy and trim skills will be heavily emphasized and required. We will look at buddy procedures while exploring the outside of a wreck. If you cannot see them because they went around a feature you are not observing proper procedures. Other details will be outlined as necessary depending on the wreck selected for training and its location and depth.

NOTE: Some of the subjects in this course are not covered in many AOW texts. I use for this class Dennis Gravers: SCUBA Diving 4th Edition, my own book: SCUBA: A Practical Guide for the New Diver, and various handouts I have written. All of which are included in the 425.00 tuition cost.
Additional and highly recommended reference materials are:
The Six Skills by Steve Lewis
Staying Alive by Steve Lewis
The US Navy Dive Manual – free download
The NOAA Dive Manual
The NAUI Master SCUBA Diver manual

Social Media – The Facebook group SCUBA Diving Accidents and the Lessons They Teach.
https://www.facebook.com/groups/1612046102342961/