



DIVING SAFETY AND ACCIDENT
ENQUIRY COMMITTEE
HKUA
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Recreational Diving Safety Manual for Hong Kong

*Diving Safety and Accident Enquiry Committee
Hong Kong Underwater Association*

Manual for recreational diving clubs/centres, instructors and divers to ensure safe and enjoyable diving.

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Recreational Diving Safety Manual for Hong Kong

INTRODUCTION

Scuba Diving is a very safe and enjoyable sport but you must receive proper training, be medically and physically fit and always follow the rules of safe scuba diving

Diving accidents as in any active sport may happen. Especially, if the safety rules are either not understood or ignored. As the recognized and authorized body for the sport of underwater diving by the Hong Kong Government, many members have for a long time considered it was essential that the Hong Kong Underwater Association (HKUA) should set-up a Diving Safety & Accident Enquiry Committee(DSAEC). This issue was again brought to fellow members' attention by the tragic fatal accident of Dr. Rosie Fan, a young female 'trainee/novice' diver, on the 4th November 2007 whilst on her alleged first open water dive.

A dedicated group of experienced, professional and qualified scuba divers who were members of the HKUA, decided in December 2007 to establish a special independent organisation within the HKUA to look into diving safety issues.

The Board of Directors of the HKUA at their board meeting on 13th November 2007 endorsed the proposal to set-up a DSAEC. Government support with direct feedback from the Chief Executive supported the proposed DSAEC.

A Resolution to establish A Diving Safety and Accident Enquiry Committee was supported and approved at the HKUA Annual General Meeting on 26th January 2008. The DSAEC is an independent body within the HKUA and directly responsible to the Chairman of the HKUA. The DSAEC through the Diving Safety Officer reports to the HKUA Board of Directors on any safety issues and accident enquiry at their monthly meeting. The committee comprises members with considerable diving experience and expertise. They include diving and rescue instructors, a diving & hyperbaric medical practitioner, lawyer, law enforcement officers, an engineer, an arbitrator, corporate management professionals and ad hoc government representatives from Leisure and Cultural Services Department, Marine Department, Agriculture, Fisheries and Conservation Department and Marine Police.

With reference to various safety standards/manuals from overseas and certifying organisation, the DSAEC compiled this manual taking into account the local diving environment for local divers, instructors and diving clubs for their reference.

1.1 Purpose

The DSAEC compiled this manual taking into consideration the local diving environment & has incorporated various overseas safety standards/manuals and certifying organisation targets for local recreational divers, instructors and diving clubs as a core safety reference.

It is appreciated that there are difficulties in the implementation of statutory requirements which frequently results in a mass of detailed and technical rules, often difficult to understand, and difficult to keep up to date with. In the past, requirements were implemented ad hoc to resolve problems as they arose, and concentrated mainly on particular physical hazards, resulting in uneven coverage. Specific requirements did not encourage or even enable people involved to be innovative and to look for solutions.

Scientific divers are employed to dive for the purpose of underwater research but are exposed to a less hazardous working environment as involved in industrial diving activities. Nowadays, scientific divers normally adopt and follow safety standards [1] to ensure their safety. This is a self regulatory method under the principle of health and safety. Self-regulation describes the move away from specification standards, and allows duty officials to choose the means by which they will comply with general duties and process-based and performance-based standards.

Recreational diving and divers should normally be safer as they allow a diver to dive on selected days and under better environment conditions making diving risks and hazards more controllable. However, some of the safety support systems required for scientific diving are not necessarily available with recreational diving and this can expose the recreational diver to increased risk, especially when diving in remote locations. Statutory requirements created a climate of dependence on regulations, with little involvement to health and safety by divers, diving clubs and diving operators. Statutory requirements may not be appropriate for recreational diving.

The DSAEC is of the view that a self-regulation approach similar to scientific diving safety standards should be adopted in recreational diving. Parties involved in recreational diving including divers/instructors/diving clubs should be conservative and always apply their common sense to adopt the general principle of diving safety to plan and conduct any diving activities. However, in comparison with other recreational activities, recreational diving involves specific risks and hazards. Fatal accidents can arise in recreational diving, which this manual attempts to alleviate by explaining the principle of safe recreational diving practices.

1.2 Scope

This Safety Manual is designed to cover recreational diving using compressed gases and self-containing underwater breathing apparatus (SCUBA). It applies to all recreational divers, diving instructor, diving clubs as well as dive boat operators. Each of these involved parties must hold some level of duty and responsibility in providing a healthy and safe environment for recreational diving. Instead of telling the duty officials exactly how they are to achieve compliance, this safety manual defines the duty official's duty in terms of goals they must achieve, or problems they must solve, and leaves it to the initiative of the duty official to work out the best and most efficient method for achieving the safety standard in recreational diving. As the knowledge and concept of safety will change with the advance in diving technology, the following manual therefore is not intended to provide recreational diving safety with a complete or fully comprehensive manual. It will be as far as possible regularly updated to improve recreational diving safety as the need arises.

INTERPRETATION

Confined water - Any body of water is of similar conditions to a swimming pool with respect of depth which is with water shallow enough to stand up in, clarity, calmness and current.

Direct supervision – instructor shall be in a position to provide immediate assistance and guidance in water to visually observe and evaluate students' safety and performance.

Dive boat and support boat – Dive boat can be a large craft, rigid-hulled inflatable boat, a day boat, liveboard or sampan. In general, a support boat is used as a cover boat for divers whilst underwater.

Dive club – Dive club refers to a group of people, a dive centre or dive operator that organizes dives or scuba diving training for divers.

Dive group leader - To provide a direction and co-ordinated support for the Group and to ensure that all are working towards the defined Objectives of the Group.

Dive master - A Divemaster is qualified to organize and conduct dives for certified divers if the diving activities and locale approximate those in which the Divemaster is trained. Additional training, knowledge or experience is necessary for the Divemaster who wishes to organize highly specialized activities, such as wreck penetration, cavern or ice dives or enter a new locale.

Diving medicine, also called undersea medicine - is the diagnosis, treatment and prevention of conditions caused by humans entering the undersea environment. It includes the effects on the body of pressure on gases, the diagnosis and treatment of conditions caused by marine hazards and how relationships of a diver's fitness to dive affect a diver's safety.

Diving instructor – A diving instructor is a certified professional from a diving organization (e.g. BSAC, CMAS, CUA, HKUA, NAUI, PADI, SDI, SSI) that assumes a leadership position in diving and can safely instruct and supervise open water to divemaster level divers.

Dive Professional – A dive professional is a leadership rank of diver including diving instructor, dive master and teaching assistant.

Experienced diver or Advanced diver: Requires a diver to have at least 50 dives on a basis of regular diving experience in various diving environments.

Indirect Supervision –There should be an instructor or dive master in the water responsible for certain training activities. The on board instructor or dive master should oversee the planning, preparation, equipment inspections, entries, exits, debriefings and control the activities on site and should be prepared to quickly respond to any incident in the water.

Open water – Any body of water which is subject to natural current, wave, tidal and wind.

Shall – a statement is mandatory

Should – a statement is recommendation or suggestion

Small group - Small group diving refers to a group of divers of a maximum size of 10 divers, or divers who are involved in diving training activities. This group may be renting a non-purpose built dive boat for diving activities, or are a small group within a bigger group in a dive boat.

Teaching assistant – A teaching assistant who has undergone formal training, for diving activities in addition to supervising for certified divers should assist instructors with training student divers. This rating denotes an individual who has exemplary diving skills and role model behaviour, solid rescue skills, professional level knowledge of dive theory, dive management and supervision abilities and competence as a certified assistant.

RESPONSIBILITIES

3.1 General

Diving Safety should be the top goal of achievement by all divers, instructors, dive masters, diving clubs locally. This is the individual responsibility of every diver in the diving fraternity, and is a “Duty of Care” for anyone who facilitates diving activities for others.

3.2 Responsibilities of a Diving Club

- Promulgate the Safety Manual to all parties within the diving fraternity.
- Ensure that their diving equipment is well maintained in a safe and prudent manner.
- Frequently conduct inspections and maintenance of their diving equipment.
- Ensure that all their compressors for the supply of compressed air/gasses for divers breathing meets the relevant standard requirement.
- Ensure safety and emergency equipment is in working order and readily available at the dive site or on the diving boat.
- Supervise all training activities in accordance with the standards & procedures of the certifying diving agencies.
- Report back the nature and cause of diving accidents/incidents to the DSAEC on the Scuba Diving Incident Report Form(SDIRF) in a timely manner.

3.3 Responsibilities of Diving Instructor/Dive Master/Dive Professional

- Ensure that every diver possess current certification and is qualified and appropriately equipped for the type of diving operation.
- Follow the training standards & procedures of the certifying diving agencies during training dives.
- Plan dives according to relevant safe diving practices.
- Brief the divers on details of dive site, dive procedure, estimated dive time, emergency procedure and unusual hazards or environmental conditions likely to affect the safety of the divers.
- Suspend diving if in his/her opinion conditions are not safe.
- Take all precautions and implement any measures to provide a safe diving environment for divers which should be on conservative side to diving safety.
- Should be conservative on the instructor to students ratio

3.4 Responsibilities of a Diver

- Maintain equipment in good condition.
- Check the equipment used by himself/herself before diving.
- Remember and follow the briefing given by the dive master/instructor.
- Follow the safety rules during diving.
- Report any sickness/discomfort or if under any medications of himself/herself to the dive master/instructor.
- Have periodic medical check with a doctor knowledgeable in diving medicine to verify suitability for diving.
- Maintain physical fitness for diving.
- Know personal limitations and abide by them according to training level and experience.
- Do not dive if feeling unwell and/or if having signs or symptoms after a previous dive.
- Ensure you are well hydrated before and after diving.

COMPETENCE OF DIVERS AND DIVING PRACTICES

No person shall engage in scuba diving in Hong Kong unless he/she holds a current certification issued pursuant to certifying organization adopted by Hong Kong SAR

4.1 Competence of a Diver

Training certification organizations normally group recreational scuba diving training into 4 levels from beginner to advanced diver.

Level 1 is commonly named as open water diver or scuba diver with appropriate experience in 4- 5 dives under supervision of an instructor;

Level 2 further consolidates divers' experience in various environments such as deep water, night dive, etc. and enhancing the divers' navigation skill. It is normally known as advanced open water diver with about 10 dives experience. Although a term "Advanced" is used, the diver is not considered to be an experienced diver with limited diving hours;

Level 3 training is normally designed to ensure a diver understands common causes of dive emergencies; ways to prevent dive accidents; and how to assist another diver in trouble. However, it is only recreational scuba diving training. Although a certified diver of level 3 is commonly known as rescue diver, it is not intended to meet requirements for professional dive rescue and water safety teams. They are normally with at least 20 dives experience.

Level 4 normally requires a diver to have at least 50 dives with experiences in various diving environments. Considered to be **an experienced diver or advanced diver** in this manual.

Divers of level 1 to 3 training are all considered to be entry or beginner level in this manual. The beginner level diver shall dive within their limit in an easy and safe diving conditions as per the following:-

1. Depth: Level 1 < 18m; Level 2 or above < 30m;
2. Underwater current: none to mild, never in strong current without drift dive training;
3. Underwater Temperature: > 20 °C with wet suit
4. Visibility : at least 3m – 5m
5. Good surface conditions

4.1.1 Dive with a professional after Entry Level training course

- In view of the low underwater visibility environment in Hong Kong, a level 1 diver shall dive with an instructor or dive master for their 1st 10 dives in various local diving environments to ensure their safety.
- Level 2 or 1 divers with more than 10 dives experience should be accompanied by level 3 diver in the above said diving conditions in a ratio of 1 to 3.
- Level 2 or 1 divers, in visibility of less than 3m, they should be at least accompanied by a level 4 diver, dive master or instructor in their dives in ratio not higher than 1 to 3.
- The above is summarized in below:-

Diver's Experiences	Dive team shall/should be accompanied by	Maximum number of divers in the dive team(including the leader)
Level 1 Diver less than 10 dives experience	Instructor or Divemaster	4 – 6
Level 1 Diver more than 10 dives experience and Level 2 Diver	(1) Level 3 diver in normal condition (2) Level 4 diver, Instructor or Divemaster in visibility of less than 3m	4

4.1.2 Diving skills in various conditions

- Divers shall attend special training courses held by qualified instructors before diving in certain environments including night, cold water, drift-current, wreck or using nitrox dives.
- After attending specialty training courses and diving in such conditions with qualified instructors for at least 4 dives on two days or number of dives recommended by a certification organization whichever is higher, level 1 to 3 divers shall dive in such special conditions with a level 4 diver in a ratio not exceeding 1 to 3.

4.1.3 Diving skills tune up

- To ensure the diver is comfortable with his/her diving skills, the diver shall undertake a skill tune up session in a pool with a qualified dive master or instructor after 6 months to 12 months of not taking part in any underwater diving activity. If the diver is a Level 1 or 2 diver they should be accompanied by a Level 4 diver on their first open water dive after a break of 6-12 months.

4.2 Standard Safe Diving Practices

4.2.1 Adapting to the local environment by divers who received training overseas

- Diver's responsibility - Compared to lots of overseas dive sites, especially South East Asia, the Hong Kong environment is often low in visibility and with a lot of boat traffic in the common dive sites. As such, a diver who received training overseas shall have at least 4 introductory or familiarization dives with a divemaster or instructor to adapt to the local Hong Kong environment of low underwater visibility and heavy boat traffic.
- Dive club's responsibility - dive clubs shall not offer dives without a local divemaster or above to divers who received training overseas and do not have any logged dives in Hong Kong. Dive clubs shall arrange divemaster/instructor to lead these overseas-trained divers within their 1st 4 dives in Hong Kong to assist such divers to familiarize themselves with local environment at conditions. After they have received 4 introductory dives or familiarization dives, dive clubs should pair up these overseas-trained divers with experienced divers or/and divemaster within their next 6 dives in Hong Kong. Dive clubs shall verify divers' certificate level and experiences by checking their licenses and logbooks during their registration or aboard.

4.2.2 Low visibility conditions in Hong Kong

- Underwater visibility in Hong Kong does vary considerably and is subject to prevailing seasonal wind and tide conditions. Hong Kong diving is sometimes challenging as tides and wind conditions can reduce visibility to 2-3 m.
- The major problems that low visibility diving causes to the diver is that it reduces the ability to communicate with their buddy and, unless steps are taken to compensate for this, both the diver and buddy are put at increased risk.
- Diver's responsibility –
 1. At all times the divers should be in view of each other within a 1-2m distance. Should the divers become separated or lost underwater a brief search in the near vicinity for 1 min should be made before heading up and waiting on the surface. Divers may also wish to use underwater noises to attract each other's attention, communications should be pre-dive arranged (underwater horn, dive alert, banging rocks/knife on tank etc).
 2. Descents and ascents need special care in low visibility water. Divers should descend feet first to avoid banging into the sea bed with their head. Surfacing is usually performed cautiously, with a hand above the head, to avoid bumping into surface objects such as jetties or moored boats. Desirable that an inflatable orange coloured dive-float attached to the diver shall be released prior to ascent to warn surface boats of "diver below", "diver ascending".
- Dive professional's responsibility –
 1. The diver to dive instructor ration should be reduced when environmental conditions are reduced such as in a strong current, poor visibility, muddy sea bed etc.

- Dive club's responsibility –
 1. Loss of confidence and panic are also a major problem in low visibility, especially for the inexperienced diver. In this sort of situation, an inexperienced diver should be accompanied by a divemaster or instructor, with ratio not more than 1 divemaster or instructor to 4 divers.

4.2.3 Knowledge of local dive sites

- Diver's responsibility:- (10 accompanied and 2 introductory dives completed)
 1. A diver should be familiar with a dive site before diving the site. If a diver has no previous experience on a particular dive site, he should be accompanied with an experienced diver for his 1st attempt of diving the site and should obtain diving information about the site in pre-dive site briefing from a knowledgeable, local source.
- Dive club's responsibility:-
 1. A dive club shall provide a detail dive site briefing to their diving members on site before diving.
 2. If diving conditions including current, visibility, temperature, etc. are worse than those in which divers have experience, postpone the dive or select an alternate site with better conditions.
 3. Dive site map should be provided on board.

4.2.4 Equipment/Maintenance/Equipment Examination and Testing

It is the diver's responsibility to ensure proper maintenance of their own equipment. The dive club is also responsible for all rental equipment supplied by them. Diver is responsible for final check of the rental equipment from the dive club before using them for diving. The following suggested maintenance requirements were extracted from [1] for reference.

Regulators

- Inspection and testing. Scuba regulators shall be inspected and tested prior to first use and every twelve months thereafter and if there is any sign of wear and deterioration of rubber based items.
- Regulators shall consist of a primary second stage and an alternate air source (such as an octopus second stage or redundant air supply).
- Ensure mouth pieces of regulators shall be in good condition and firmly secured.
- To minimize the risk of cross infection, regulators (and masks and snorkels) used for loan or hire must be thoroughly cleaned and sterilized according to appropriate guidelines after each use by a particular individual.

Scuba Cylinders

- Scuba cylinders shall be hydrostatically tested in accordance with relevant standards or statutory requirements of Hong Kong.
- Scuba cylinders shall have an internal inspection at intervals not exceeding twelve months.
- Scuba cylinder valves shall be functionally tested at intervals not exceeding twelve months, 'o' rings to be checked for wear/splitting before a dive.

Gauges

- Gauges shall be inspected and tested before first use and every twelve months thereafter.

BCD

- Personal flotation systems, buoyancy compensators, dry suits, or other variable volume buoyancy compensation devices shall be equipped with an exhaust valve(OPRV).
- These devices shall be functionally inspected and tested at intervals not to exceed twelve months.

Timing Devices, Depth and Pressure Gauges

- All members of a diving group shall have an underwater timing device, a depth indicator, and a submersible cylinder contents pressure gauge.
- Determination of Decompression Status: Dive Tables, Dive Computers
- A set of diving tables shall be available at the dive location.

First aid supplies

- A first aid kit and suitable emergency oxygen unit shall be available. Regular evaluation to ensure they are well-stocked and clean, and oxygen cylinder full and ready for emergency use.

Diver's Flag

- A diver's flag recognized by the Hong Kong SAR shall be displayed prominently whenever diving is conducted under circumstances where required and where there is water traffic.

All dive equipment shall be regularly checked to ensure safety in diving.

4.2.5 Dive Plans

Dives should be planned around the competency of the least experienced diver. Before conducting any diving, the dive club for a proposed activity should formulate a dive plan which should include the following:

- Divers qualifications, and the type of certificate or certification held by each diver, experience of diver and number of dives logged.

- Emergency plan with the information including Name, telephone number, and relationship of person to be contacted for each diver in the event of an emergency.
- Nearest operational recompression chamber
- Nearest accessible hospital
- Available means of transport
- Approximate number of proposed dives.
- Location(s) of proposed dives.
- Estimated depth(s) and bottom time(s) anticipated.
- Proposed activities, equipment, and boats to be employed.
- Any hazardous conditions anticipated.
- Dives – including communications, procedures for reuniting in case of separation and emergency procedures
- List of emergency calling list i.e. Marine Police, Marine Dept., procedure for calling a government flying services helicopter for acute rescue etc

4.2.6 Pre-dive Safety Check

Diver's Responsibility:

- Each diver shall conduct a functional check of his/her diving equipment in the presence of the diving buddy.
- Each diver shall judge if the dive condition is suitable for him/herself. It is the diver's responsibility to abort the dive if he/she considers the dive condition is not favourable to him/her or exceed his/her training limit. However, if the diver is very inexperienced and it is obvious that he/she is planning to dive beyond his/her capabilities, the dive master / dive leader should clearly advise the diver of this and take appropriate action.
- Each diver shall ensure that his/her equipment is in proper working order and that the equipment is suitable for the type of diving operation.
- Each diver shall ensure that on the day of diving, he/she shall be medically, physically and mentally fit to dive
- Each diver shall ensure their personal limitation for such a dive is correct i.e. training qualifications and experience

4.2.7 Dive briefing

- A dive site briefing should at least include:- Name of site, General description, Site map, Expected depth, Maximum depth in area, Bottom characteristics, Tides and Current,

Contingency plan, Particular risks (e.g. Traffic congestion, Limited visibility, local dangerous marine life, etc)

- Dive club's responsibility

It is the responsibility of a dive centre to provide an experience divemaster or above personnel with diving experience of the site giving a detail dive site briefing.

- Diver's responsibilities

Listen carefully to dive briefings and directions and respect the advice of those supervising diving activities. Query anything not fully understood.

4.2.8 Buddy system

- The buddy system is a procedure in which two people, the buddies, operate together as a single unit so that they are able to monitor and help each other. The main benefit of the system is to improve safety: each may be able to prevent the other becoming a casualty or rescue the other in a crisis. The system is likely to be effective in mitigating out-of-air emergencies, non-diving medical emergencies and entrapment in ropes or nets. When used with the buddy check it can help avoid the omission, misuse and failure of diving equipment

- 'odd numbers' diving group should be avoided.

- Dive club shall ensure buddy system

Dive centre has a responsibility to ensure buddy system is strictly followed. This can be done by marking the buddy pair on a board.

- Diver's responsibility

With buddy diving, each of the divers is presumed to have a responsibility to the other. The "buddies" are expected to care for each other, to stay close enough together to be able to help in an emergency, to behave safely and to follow the plan agreed by the group before the dive. When the system fails, it is generally because one of the divers does not fulfil his or her responsibilities as a buddy.

It is the responsibility of divers to agree within the Divemaster's general dive plan on the following with their buddy before their dive: Entry point, Exit points, Dive objectives, Depth limits, Establish and review communications procedure, and emergency procedures.

- Buddy divers shall check the safety and full function ability of their buddy divers equipment prior to a dive

4.2.9 Dive limit and Procedure

Most cases of decompression illness (DCI) occur in divers who had dived within the limits of their dive computers or tables. All dives should be planned conservatively, especially deeper dives, repetitive dives and multi-day diving. Surface intervals longer than 2 hours are recommended.

- Dive club's responsibility
 1. Ensure that conditions of a dive site are suitable for divers' experiences
 2. Ensure divers know the emergency procedure
 3. Ensure divers know the recalling procedure
- Diver's responsibility
 1. Ensure weights are correct and can be quickly released in any emergency ;
 2. Should not overexert themselves underwater;
 3. Shall never hold their breath or skip-breathing when breathing compressed air;
 4. Shall not exceed "no decompression" limit and shall use conservative no-stop times;
 5. Shall not dive during any known unfavourable conditions which are likely to affect their safety and health, such as red-tide condition, oil pollution, local fishermen using explosives, drag net fishing, etc.;
 6. Should evaluate the weather and sea conditions in order to ensure that divers' experiences is appropriate for the conditions;
 7. Shall dive within diver's qualified depth and dive experience, such as not to attempt:- drift diving, cave diving, penetration of a wreck without appropriate prior training;
 8. Should try to ascend at around 10 metres per minute, or follow the suggestion of the dive computer;
 9. Should do a safety stop at about 5 metres for 3 to 5 minutes;
 10. Should reserve sufficient air at the end of a dive, not less than 50bar for shallow water dive or not less than 70 bar for deep dive at 20-30m or more;
 11. Should release an inflatable signal before ascent to alert other water sport users that divers are below e.g. water skiers, powerboats, etc..
 12. Should keep positive buoyancy on the surface when swimming and resting or when in distress;

4.2.10 Post Dive Action

- Diver should keep their dive information including date, time, depth, site conditions, etc. in an appropriate diving log book.
- Diver and dive club are responsibility to provide and submit scuba diving incident report form(SDIRF) within 5 days to Diving Safety and Accident Enquiry Committee(DSAEC) in case of any diving accident or incident. Relevant information kept in DSAEC is solely for the purpose of enhancing safety standards of Hong Kong via issuing guidelines to Divers/Diving Centres and will be held in confidence by members

of the DSAEC and any information passed on to other institutions, such as Divers Alert Network, for research purposes will be de-identified.

- Diver should report any physical discomfort such as headache, joint pain or discomfort, dizziness, fainting, vomiting to diver club immediately

4.3 Small Group Diving Practices

4.3.1 Definition

- Small group diving refers to a group of divers of a maximum size of 10 divers. This group may be renting a non-purpose built dive boat for diving activities, or they are a small group within a bigger group in a dive boat.
- All the recommended practices in Section 4 are also applicable to small group diving activities.
- Any divers who are involved in diving training activities are consider to be in small group diving. The below advice is applicable.

4.3.2 Leading by an experienced diver

- There shall be a designated group leader in the small group to ensure safety. The designated diver shall be an experienced diver defined in S.4.4 or Competence of Diver. The group leader shall be familiar in the selected dive sites, have good local environment and navigational skills.

4.3.3 Selection of dive sites

- If the small group is renting a non-purpose built dive boat for diving activities, they need to consider whether there is a support boat nearby and suitable oxygen kits are easily available. Also, that a hired dive boat operation is thoroughly briefed on your dive-plan and understands dive group requirements e.g. pick-up system, noise signals, hand signals keeping a look-out for divers, etc.
- If such equipment is not readily available, it is advisable that the small group rent the equipment from a diving club or liaise with a diving club to provide necessary support in advance and choose a common dive site with other dive clubs nearby, or shore dive where emergency exit is readily accessible.
- If a small group rents equipment/boat with diving clubs, they should inform diving clubs about their nature of activities.

4.3.4 Releasing of inflatable signal before ascent

- To ensure communication with other water sports users, it is crucial that the small group shall hang up a diving flag from the dive boat and release an inflatable signal before ascent.

4.3.5 Surface support

- At least one of the group members shall remain on board to provide surface support to divers and the coxswain or master.
- Dive plan shall be communicated with the skipper or boat handler and make sure he/she understands how to provide surface support.

- A ladder and rope with float attached should be made available for inflatable signal.

4.4 Common Dangerous Marine Creatures

General guidelines for encountering marine creatures[2]:-

Hands off. Never touch, handle or ride marine wildlife. Touching wildlife, or attempting to do so, can injure the animal, put you at risk and may also be illegal for certain species. The slimy coating on fish and many marine invertebrates protects the animal from infection and is easily rubbed off with a hand, glove or foot. To achieve this, you'll need a good neutral buoyancy control.

Do not feed or attract marine wildlife. Feeding or attempting to attract wildlife with food, decoys, sound or light disrupts normal feeding cycles, may cause sickness or death from unnatural or contaminated food items, and habituates animals to people.

Never chase or harass wildlife. Following a wild animal that is trying to escape is dangerous. Never completely surround the animal, block its escape route, or come between mother and young.

A variety of potentially dangerous marine creatures inhabit waters surrounding Hong Kong and these include cone shells; blue-ringed octopi; a variety of spiny fish such as stone fish, lion fish, scorpion fish and stingrays; sea urchins; sharks, eels and other large toothed fish; some venomous jellyfish; and sea snakes. The signs and symptoms and first aid for injuries from these creatures is summarized below[4]:

4.4.1 Cone shells

Cone shells are sea snails with a shell shaped like an ice-cream cone. They can fire a small harpoon to inject a toxin into their. The toxins of some of the tropical cone shells can be dangerous to humans.

Habitat: It may be found under rocks in the lower intertidal and shallow subtidal zones.

Signs and Symptoms: Symptoms of a cone snail sting may include pain at the site, numbness and tingling. Severe cases involve changes in vision muscle paralysis and respiratory failure that can lead to death.

1st-Aid procedure: Pressure-immobilization is a recommended first aid and should be applied as soon as possible. Prolonged CPR may also be required.

4.4.2 Blue-Ring Octopus

The blue-ringed octopus is a small, shy, non-aggressive creature. When it becomes agitated it displays iridescent blue flashing rings over its body. There is a powerful toxin in its saliva which can paralyze humans and cause respiratory failure.

Habitat: The octopus are found in shallow coral and rock pools, under rocks, in cracks and crevices on the reef, in tidal pools, inside shells, and in discarded bottles, cans and other

detritus on the sea floor. They may also be present in sandy or muddy stretches of the sea bottom where seaweed is plentiful.

Signs and symptoms: The bite is usually painless. Numbness, difficulty swallowing, nausea and visual disturbances may result after 5-30 minutes. In severe cases, this is followed by paralysis, respiratory failure, and potentially death through asphyxia.

1st-Aid procedure: Prompt pressure-immobilization is a recommended first aid. Prolonged CPR may also be required.

4.4.3 Scorpion fish, Lionfish, Stonefish and Sea Urchins

A variety of fish, and molluscs have poisonous barbs to protect themselves from predators. Some of these spines can inject poison that can be harmful to humans. The stonefish is the most venomous of these fish and its sting can occasionally prove fatal. The other injuries can be very painful and can easily become infected.

Habitat: Scorpionfish with camouflage can be found at corals, caves, crevices or on mud. The lionfish is an inhabitant of near and offshore coral and rocky reefs. The main habitat for stonefish is on coral reefs, around dull coloured plants, near and about rocks, or can be found dormant in the mud or sand.

Symptoms: Severe pain, substantial swelling and discolouration of the stung area. Severe reactions include nausea, vomiting, abdominal cramps, tremors, abnormal heart rhythms, breathing difficulty and collapse

1st aid procedure: An effective first aid treatment is to immerse the affected area in hot water (approximately 45-50°C). The first aider should first test the water themselves to ensure it will not scald the victim. The heat should be maintained for 30-60 minutes. It provides both pain relief and breaks down the venom. Tweezers can be used to remove any spines on the wound. Scrub the wound with soap and water. Then flush the affected area with fresh water. Do not apply tape to close the wound. Medical care should be sought to prevent infection - which is common.

4.4.4 Sharks

Once the sea surface temperature rises to above 23°C large sharks start to patrol the local waters. There have been attacks on swimmers and spearfishing divers. Most of these attacks have occurred around Clearwater Bay. But shark sightings have been reported all around Hong Kong. It is a good idea to check on shark sightings before diving in Hong Kong. Several groups of divers here use Shark Pods for protection during the so called shark season.

Because shark injuries are often lethal, avoidance is highly desirable. Some of the suggestions for preventing unfavourable shark encounters may be useful.

- Do not swim in waters known to be frequented by sharks if visibility is obscured for any reason.
- Avoid diving with bleeding wounds, exit the water promptly if you are wounded while diving
- Dive with a group of divers

Symptoms: Shark bites can cause dramatic blood loss and tissue damage and sometimes amputation. Death from a shark attack usually results from massive blood loss and shock.

1st aid procedure: The first priority is to stop the bleeding by applying direct pressure on to the wound as soon as possible and elevating the wound if possible. Because shock is likely, the victim's body temperature should be maintained, and the victim kept in the supine position (lying flat on the back), unless they are unconscious in which case they are placed in the recovery position, if breathing. Oxygen should be provided.

A tourniquet can be applied as a last resort if the bleeding cannot be controlled using a pressure pad and bandage (i.e. direct pressure) and elevation.

4.4.5 Sea Urchins

Sea urchins are small, spiny sea creatures. Their shell is round and spiny, typically from 3 to 10 cm across.

Habitat: They live in shallow, rocky bottoms, or hide in sandy crevices

Symptoms: Redness, swelling and excruciating pain will be caused if hurt by the spines

1st aid procedure: Immerse the affected area for 30-90 minutes in water as hot as the injured person can tolerate. Repeat as necessary to control pain. Then, use tweezers to remove any large spines in the wound. Remove the spines by applying shaving cream to the affected area and gently scrap with a razor. Afterwards, scrub the wound with soap and water followed by extensive flushing with fresh water. It is important that the wound should not be closed with tape or glue skin. If signs of infection, such as pus, redness, or heat occur, apply topical antibiotic ointment and ask the doctor who may prescribe antibiotics.

4.4.6 Jellyfish

Jellyfish come in a variety of shapes and sizes but the most venomous ones are box-shaped with tentacles at each of the four corners. Some have single tentacles at each corner while other have multiple tentacles. There are millions of stinging cells on the tentacles and also on the body of certain species. Some species of box jellyfish, even as small as the size of a fingernail, can be a threat to life.

Habitat: Jellyfish can be found in both shallow and deep water.

Signs and Symptoms: If one is stung by the venomous tentacles, redness, swelling and itching will be resulted in minor case. In serious case, excruciating pain, breathing difficulties,, muscle cramps, unconsciousness and even death can occur.

1st aid procedure: Immediately pour vinegar over a sting thought to have been caused by a box-type jellyfish. CPR should be begun if necessary. Do not rub the wound. Tentacles can be removed with tweezers or even fingers once vinegar has been applied. Ice packs can then be applied to provide pain relief. Medical aid should be sought, urgently for a severe sting.

The stings from other jellyfish are usually not serious, although they can be painful. Tentacles can be washed of with sea (not fresh) water, and ice packs can be used to reduce the pain. Medical aid should be sought if necessary.

4.4.7 Sea Snake

Sea snakes can be found throughout the world, mainly in tropical waters. All have fangs that can inject poison but most are not harmful to humans. However, some species have strong venom and large fangs and can inflict potentially fatal bites. Fortunately many bites fail to inject venom effectively but must always be managed as a potentially serious bite.

Habitat: Sea Snake can be found in shallow waters, around islands and should be not far from land.

Sign and Symptoms: Puncture marks or scratches, headache, nausea, vomiting, abdominal pain, breathing difficulty, paralysis, unconsciousness, death.

1st aid procedure: the victim must be kept still and quiet and a pressure-immobilisation bandage should be applied to as much as affected limb as possible, starting over the bite site. The bandage should be as tight as for a sprain and the fingers or toes beyond the bandage should remain pink. Urgent medical aid should be sought. The bandages must be left intact until medical personnel can administer treatment.

4.4.8 Bristle Worm

Habitat: Live in sand or within live rocks. They are nocturnal and not usually seen during the day.

Signs and symptoms: If one's skin is punctured by these sharp bristles, the venom will cause itching, redness, swelling and blisters.

1st aid procedure: Visible bristles should be removed by forceps. To remove invisible bristles, the injured area is covered with adhesive tape, which, when removed, will cause the bristles to adhere to it. This method should be repeated three more times. After the bristles are removed, household ammonia diluted 3 parts water to 1 part ammonia is applied to relieve pain. If ammonia is not available, the injured area can be soaked in isopropyl alcohol.

4.4.9 Stingray

The stinger of stingray is a razor-sharp, spine and possessed specialized venom.

Habitat: The flattened bodies of stingrays allow them to effectively conceal themselves in their environment. Stingrays do this by agitating the sand and hiding beneath

Signs and Symptoms: Contact with the stinger causes local trauma (from the cut itself), pain and swelling from the venom, and possible later infection from bacteria. Immediate injuries to humans include, but are not limited to: poisoning, punctures, severed arteries and possibly death. Fatal stings are very rare.

1st aid procedure: Treatment for stings includes application of near-scalding water, which helps ease pain by denaturing the complex venom protein, and antibiotics. Immediate injection of local anesthetic in and around the wound is very helpful, as is the use of opiates such as intramuscular pethidine. Local anesthetic brings almost instant relief for several hours. Any warm to hot fluid, including urine, may provide some relief. Vinegar and papain are ineffective.

“ Interested divers may seek more comprehensive details about dangerous marine creatures from appropriate sources”

5. MEDICAL and FITNESS OF a DIVER

5.1 Medical Fitness to Dive in recreational diving

5.1.1 Introduction

Recreational scuba diving is an enjoyable sport and the risks and hazards in this class of diving should be less intense in comparison with commercial diving. However, to be safe and enjoyable recreational divers should be healthy, dive-fit, well-trained, disciplined as well as well-equipped for their type of diving activities.

In order to protect their safety at work, commercial divers generally are examined and certified regularly according to standards set forth by relevant government or agencies. While currently, except in U.K. and Queensland of Australia, scientific divers are regulated by their respective “code of practice”, there are no regulations or legislative requirement specifying standards for recreational divers. However, it should not be an excuse of recreational diver training organizations being immune from their responsibility. Therefore a proper and clear understanding of possible risks, hazards and medical limitations in recreational diving is necessary both applicable to recreational diving operators and divers.

For the medical assessment of fitness to dive in recreational divers, two major underlying principles must be considered. The first is that the diver should be free from any underlying medical problem or illness that may put him/her at increased risk for Decompression Illness, Pulmonary overinflation syndrome with subsequent arterial gas embolization and other conditions such as loss of consciousness, impaired judgment, risk of disorientation as well as impaired mobility, which could lead to drowning. The second principle is that a diver should be free from any underlying medical problem or illness which may render his/her buddy at risk of the above problem.

5.1.2 Minimum Medical Standards for recreational diver

Medical Requirements

General

- Any recreational diving operator shall determine that divers must pass at least one pre-dive (pre-training/Entry level scuba divers) diving medical examination and have been declared by the examining physician to be fit to engage in diving activities as may be limited or restricted in the diving medical report.
- All medical examinations required by this standard shall be performed by, or under the direction of, a licensed physician of the applicant-diver’s choice, preferably one trained in diving/undersea medicine. Medical physician without training in diving medicine may not be aware of the unique potential dangers of diving and he/she bears responsibility because generally there will be no review of the doctor’s decisions. If for some reason this pre-dive medical has to be done by physician untrained in this field, then any abnormalities detected, on either history or examination, should result in the candidate being made unfit to dive, until specialist medical advice, or an examination by a medical physician with training and experience in diving medicine has been obtained.

- If the recreational diver continues to dive but at some material time being suffers from new medical illness or problem that develops after the above pre-dive medical examination, he/she must consult and be declared again by the treating physician or physician trained in diving/undersea medicine.
- Any additional clubs/organization or insurance related requirement in recreational diving medical examination must be in compliance with such as the frequency and detail of examination.

Diving Medical Examination content

- A review on the diver's medical history and physical examination should include as a minimum the points listed below. The following list of conditions that might adversely affect the diver is not all-inclusive, but contains the most commonly encountered medical problems. These also represent the current consensus diving safety standard in recreational diving. The potential diver and his or her physician must weigh the pleasures to be had by diving against an increased risk of death or injury due to the individual's medical condition. As with any recreational activity, there are no data for diving enabling the calculation of an accurate mathematical probability of injury. Experience and physiological principles only permit a qualitative assessment of its degree of risk & hazards.
- World Recreational Scuba Training council in co-operation with Undersea & Hyperbaric Medical Society developed a four pages **Guidelines for Recreational Scuba Diver's Physical Examination** (available from internet, under the name of RSTCMedStatementGeneric; <http://www.wrstc.com/downloads.php>) with a brief description & explanation. It has been endorsed by world-class diving/undersea medicine experts therefore it serves as guidelines for all divers' examining Physician. The following classification of risks in recreational diving is the same as the guidelines.

Severe Risk - implies that an individual is believed to be at substantially elevated risk of decompression sickness, pulmonary or otic barotrauma or altered consciousness with subsequent drowning, compared with the general population. It should generally be regard as disqualifying or discourage a student with such medical problems from diving.

Relative Risk - refers to a moderate increase in risk, which in some instances may be acceptable. To make a decision as to whether diving is contraindicated for this category of medical problems, physicians must base on an assessment of the individual patient. If the divers' examining physician is in doubt or has any uncertainty, he/she should refer the diver to a physician trained in diving/undersea medicine. (Diver Alert Network, associated with Duke University Health System is available for consultation by phone +1 919 684 2948 during normal business hours and UK Sport Diving Medical Committee would be the most appropriate sources of diving/undersea medicine physicians)

Temporary Risk – the medical problem or illness is temporary in nature and responsive to short-term treatment allowing the student to dive safely after the medical problem is resolved.

Some Severe Risk medical problems which may preclude diving are:

- (1) History of seizures other than childhood febrile seizures
- (2) History of Transient Ischemic Attack (TIA) or Cerebrovascular Accident (CVA)
- (3) History of Serious (Central Nervous System, Cerebral or Inner Ear) Decompression Sickness with residual deficits
- (4) Hypertrophic cardiomyopathy and valvular stenosis
- (5) History of spontaneous pneumothorax
- (6) Altered anatomical relationships secondary to surgery or malformations that lead to gas trapping
- (7) Gastric outlet obstruction of a degree sufficient to produce recurrent vomiting
- (8) Chronic or recurrent small bowel obstruction
- (9) Severe gastroesophageal reflux, Achalasia, Paraesophageal Hernia
- (10) The potentially rapid change in level of consciousness associated with hypoglycemia in diabetics on insulin therapy or certain oral hypoglycemic medications can result in drowning.
- (11) Inappropriate motivation to dive – solely to please other
- (12) Claustrophobia and agoraphobia
- (13) Active psychosis
- (14) History of untreated panic disorder
- (15) Drug or alcohol abuse
- (16) Monomeric Tympanic Membrane
- (17) Open Tympanic Membrane perforation
- (18) Tube myringotomy
- (19) History of stapedectomy
- (20) History of ossicular chain surgery
- (21) History of inner ear surgery
- (22) Facial nerve paralysis secondary to barotrauma
- (23) Inner ear disease other than presbycusis
- (24) Uncorrected upper airway obstruction
- (25) Laryngectomy or status post partial laryngectomy
- (26) Tracheostomy
- (27) Uncorrected laryngocele
- (28) History of vestibular decompression sickness
- (29) History of cerebral gas embolism or cerebral decompression sickness with residual deficits

Some Relative Risk medical problems which may preclude diving are:

- (1) Complicated Migraine Headaches whose symptoms or severity impair motor or cognitive function, neurologic manifestations
- (2) History of Head Injury with sequelae other than seizure
- (3) Herniated Nucleus Pulposus
- (4) Intracranial Tumor or Aneurysm
- (5) Peripheral Neuropathy
- (6) Multiple Sclerosis
- (7) Trigeminal Neuralgia
- (8) History of spinal cord or brain injury
- (9) History of Coronary Artery Bypass Grafting (CABG) & Percutaneous Balloon Angioplasty (PCTA) or Coronary Artery Disease (CAD)
- (10) History of Myocardial Infarction
- (11) Congestive Heart Failure

- (12) Hypertension
- (13) History of dysrhythmias requiring medication for suppression
- (14) Valvular Regurgitation
- (15) History of Asthma or Reactive Airway Disease (RAD)
- (16) History of Exercise Induced Bronchospasm (EIB)
- (17) Chronic obstructive pulmonary disease
- (18) History of solid, cystic or cavitating lesion
- (19) Pneumothorax secondary to: Thoracic Surgery, Trauma or Pleural Penetration, Previous Overinflation Injury
- (20) History of Immersion Pulmonary Edema Restrictive Disease
- (21) Interstitial lung disease
- (22) Inflammatory Bowel Disease
- (23) Amputation
- (24) Scoliosis must also assess impact on respiratory function and exercise performance
- (25) Aseptic Necrosis possible risk of progression due to effects of decompression
- (26) Sickle Cell Disease, Polycythemia Vera, Leukemia, Hemophilia/Impaired Coagulation
- (27) Hormonal Excess or Deficiency
- (28) Obesity
- (29) Renal Insufficiency
- (30) Developmental delay
- (31) History of drug or alcohol abuse
- (32) History of previous psychotic episodes
- (33) Use of psychotropic medications
- (34) Recurrent otitis externa
- (35) Significant obstruction of external auditory canal
- (36) History of significant cold injury to pinna
- (37) Eustachian tube dysfunction
- (38) Recurrent otitis media or sinusitis
- (39) History of Tympanic Membrane perforation, History of tympanoplasty, History of mastoidectomy
- (40) Significant conductive or sensorineural hearing impairment
- (41) Facial nerve paralysis not associated with barotrauma
- (42) Full prosthodontic devices
- (43) History of mid-face fracture
- (44) Unhealed oral surgery sites
- (45) History of head and/or neck therapeutic radiation
- (46) History of temporomandibular joint dysfunction
- (47) History of round window rupture
- (48) Patent foramen ovale

Some Temporary Risk medical problems which may preclude diving are:

- (1) on going upper respiratory tract infection
- (2) active asthma
- (3) peptic ulcer and gastric reflux
- (4) unrepaired hernia
- (5) on going back pain

The detail list of medical problems/illness risks in recreational diving may reviewed periodically that divers' examining physician should try all means to keep himself/herself updated from the lists of bibliography and reference as in the Appendix of this manual.

5.1.3 Frequency of Diving Medical Examination

A Diving Medical Examination shall be completed:

- **Before a diver begins diving**, unless an equivalent Initial (Pre-dive) Medical Examination has been given within the preceding 5 years (3 years if over the age of 40, 2 years if over the age of 50), the diver must produce the report to the diving operator, and those results have been reviewed and found satisfactory by the diving operator.
- **Regular Diving Medical Examination** may follow divers' clubs/organization or insurance related requirement at 5 year intervals up to age 40, every 3 years after the age of 40, and every 2 years after the age of 60 or more frequency as diving clubs/organization specified.
- **Clearance of return to Dive-Medical Examination** must be obtained from a physician following any major injury or new illness developed after the Initial (Pre-dive) Medical Examination, or any condition requiring hospital care. If the injury or illness is diving related, then the clearance to return to diving must come from a physician trained in undersea/diving medicine.

5.1.4 Recommended Laboratory & Content of the Diving Medical Examination

Initial (Pre-dive) Medical Examination items:

- Detail Medical History covering at least the above mentioned different types of "Risk"
- Complete Physical Examination, emphasis on cardiovascular, pulmonary, neurological and otological components
- Spirometry (Lung Function Testing), Complete blood picture, Urinalysis
- Any further tests deemed necessary by the physician.

Regular Diving Medical examination items:

- Medical History & Complete Physical Examination – as the above initial (pre-dive) Medical examination
- Any further tests deemed necessary by the physician

Remarks for further tests deemed necessary by the physician:

** The divers' examining physician may add extra assessment items covering divers' coronary artery disease as based on their risk factor as divers' past medical record, age, lipid profile, blood pressure, diabetic screening as well as smoking status;*

** Resting Electrocardiography and Exercise stress testing may be indicated based on risk factor assessment;*

** Routine Chest X-ray (AP view with full inspiration) at Initial Diving Medical Examination is not required except when indicated by the diving candidate's clinical history or finding suggesting any recognizable clinical need (such as the detection of chest pathology).*

5.1.5 Physician's written Report

After any medical examination relating to the diving candidate's fitness to dive, the diver must produce the written report to the dive club as prepared by the examining physician that shall contain the examining physician's opinion of the individual's fitness to dive, including any recommended restrictions or limitations. The diving club shall keep a copy of the physician's written report at least five years.

5.2 Physical Fitness of Divers

Recreational diving may sometimes be a strenuous activity. The recreational diver should possess and maintain a level of physical fitness capable to respond to an emergency, unexpected current or heavy seas demand.

Recommended level of physical fitness for recreational diver, able to walk 1.6 km within 12 mins.

6. LOCAL DIVING TRAINING REQUIREMENTS

6.1 Local Pool Training Requirements

- The prerequisites for course attendance shall be as follows:
 1. Minimum age: as per recommendation of certification organisation (for minors: a consent form shall be required, signed by parent or legal guardian).
 2. Medical confirmation to determinate the candidate's fitness for scuba diving and skin diving.
 3. Minimum physical fitness as per stated in S.5.2.
 4. Personal insurance covering the risks of scuba diving should be recommended.
 5. shall be able to swim 200m .
- Training shall be conducted in a swimming pool because no water clarity from beaches in Hong Kong are of similar condition as a swimming pool and would normally meet confine water definition by certification organization.
- 1st session of training must be in shallow water swimming pool where students can stand up.
- The 1st session of training in PUBLIC diving pool, where there is no shallow water so student can stand up, is not suggested. If there is no alternative, precaution/safety measures including a buoy with rope allowing student holding to descend must be provided. In such situation, instructor to student ratio should not be higher than 1:2, maximum of 1:4 with teaching assistance.
- In view of a lot of boat traffic in the common dive sites in Hong Kong, entry level diver training should include practicing and using inflatable signal in pool session to ensure all divers know how to release inflatable signal before ascent.

6.2 Local Open Water Practice Requirements

- Entry level diver training is for safety using scuba equipment and other underwater dive equipment. The following are the minimum competencies recommended for an entry level diver. It is encouraged that the highest possible standards are used in open water practice, and merely provides the following as recommended minimum competencies.
- To ensure the waterskill of diver, the diver should have the following skin diving competencies. The Level 2 diver can use mask, snorkel and fins to at least :
 1. Swim continuously 400 metres without the use of arms within 10mins,
 2. Undertake a 7 metres breath holding horizontal swim under water and
 3. Undertake a breath holding dive to a depth of approx. 3 metres.

Preferable, the Level 3 diver is able to

4. Swim continuously 800 metres without the use of arms within 20 mins,
 5. Undertake a 15 metres breath holding horizontal swim under water,
 6. Undertake a breath holding dive to a depth of approx. 5 metres and
 7. Undertake in water, with a depth of about 3 metres put on the skin diving equipment (consisting of mask, snorkel and fins).
- Entry level divers shall practice at least 10 dives with instructor in open water by using full set of scuba gear in various local diving environments. Each dive shall be of at least 20 minutes of a maximum depth not less than approx. 5m. Maximum three practice dives shall take place on one day. Repeated descents within 10 minutes surface time count as a single dive.
 - Entry level divers shall be assessed with competence on diving knowledge in accordance with the minimum requirements recommended by Recreational Scuba Training Council RSTC.
 - Instructor shall ensure student divers wear appropriate wet suit to prevent hypothermia.
 - In situation of underwater visibility > 2m, instructor to students ratio shall be of maximum of no higher than 1:6, with teaching assistant 1:8. In case of low visibility < 2m, the maximum instructor to students ratio shall be 1:2, with teaching assistant 1:4 only.
 - 1st open water training session should not be conducted in visibility < 2m. In such condition, the maximum instructor to students ratio of shall be 1:2, no further increase with teaching assistant.
 - No students shall be allowed to stay underwater without direct supervision by instructor or teaching assistant. When instructor accompanies a student to practice skill and ascent to surface, student shall not be left unattended underwater.
 - In case the instructor is attending a skill practice underwater with students, other students at the surface shall be directly supervised by a teaching assistant or at least have indirect supervision by on board duty divemaster in the condition that a floating buoy shall be provided for students at the surface. The instructor shall directly instruct and ensure that the students establish positive buoyancy of their BCD and float on the surface before leaving them for teaching assistant.
 - When students enter into the water, an instructor or a teaching assistant shall be in the water to manage and to supervise the students' safety. The instructor and teaching assistant shall not leave any student unattended. On board duty divemaster shall assist student to enter the water.
 - Instructor shall use floatation buoy to assist students decent during 1 to 4 open water dives. An appropriate sea bed of sand, no coral/mud/silt, should be selected for training. Suggested common locations for training in Hong Kong and their characteristics are in section 9.
 - It is essential to notify any boat to steer clear for the safety of the diver before ascent. An inflatable signal (safety sausage) shall be used to indicate the diver's position to the dive boat to reduce the risk of losing contact when air, light or sea conditions reduce the visibility of the divers from the boat.
 - No training shall be conducted under typhoon number signal 3 and black rain warning signal. When there is a thunder storm warning, heavy raining and strong wind warning, instructor should consider the actual site condition. In any case, diver safety should be on 1st priority. Instructor's decision should be on conservative side to ensure students' safety.

6.3 Advanced Recreational Rescue Diver Requirements

In addition to recreational rescue diver normally offered by certification organisation mentioned in Section 4.4, an Advanced Recreational Rescue Diver[6][7] standard is recommended for divers who are dive leader, on board duty dive master or dive tour/activities organiser. A certified Advanced Recreational Rescue Diver is a person trained with advanced skills to use scuba equipment and other underwater dive equipment for search, rescue, and recovery. He should at least demonstrate (1) with above average water skills, stamina and skin diving skills to quickly respond to any incident within shallow water in the vicinity of a boat or shore without scuba equipment; (2) familiar with line-guided search dive acting once as diver or as guide; (3) with above average scuba diving skills to recover and to respond unconscious divers and to tow divers at various surface conditions; (4) participation in formal continuing education; (5) with current diving experiences in various environments including 10- 30m depth, night dive and water with current; (6) valid 1st aid certification; and (7) refreshing his rescue diving skills for every 3 years.

6.4 Specific Local Open Water Practice Support

- Sufficient surface support
 - Buoy with dive flag and decent line shall be provided on the surface.
 - Manoeuvrable support boat with dive flag displayed shall be available.
 - On board divemaster or instructor shall indirectly supervise¹ the students on board and provided surface support to the divers and instructors in water.
- Sufficient Safety Equipment Support shall be on Boat
 - Automatic External Defibrillators
 - First Aid Box
 - Oxygen Kit suitable for diving accidents
 - Sound Signalling System
 - Floatation Spine Board
 - Visual Signal
 - Marine Radio

¹ Indirect Supervision –There should be an instructor or dive master in the water responsible for certain training activities. The on board instructor or dive master should oversee the planning, preparation, equipment inspections, entries, exits, debriefings and control the activities on site and should be prepared to quickly respond to any incident in the water.

- Mobile phone
- Search light (night diving)
- Emergency flares/smoke signal
- Vinegar for box-type jellyfish stings

7. DIVING CLUB

7.1 On Board Duty Staff Qualifications and Responsibilities

Duty staff qualification:

- Shall be a Certified Divemaster or above
- Shall hold a valid/refreshed First-Aid qualification
- Shall have a properly trained operator of the First-Aid Oxygen Equipment
- Shall be trained Emergency/Accident Management Team
- Shall be of up-to-date in water Rescue Skills with qualifications similar to Advanced Recreational Rescue Diver recommended in this manual

Duty Staff Responsibilities

- Shall provide a clear dive briefing that covers dive objectives and follow-up sequences, dive site information, diver accounting method and emergency procedures
- Shall check diver's log book and certifications and screen divers' experience and qualifications
- Shall assign diver buddies/ grouping, divers with less local diving experience/lower qualifications is recommended to group/buddy up with experienced divers.
- Shall ensure that qualification and experience of group leader of a dive team, in accordance with S.4.1, should have sufficient experiences of local diving conditions
- Should assist divers or student divers entering and exiting water
- Shall observe change of dive conditions including weather, wind, rain, temperature, tides, current and visibility and determine the acceptability of the conditions in terms of divers' qualifications and experiences
- Should give advices to divers planning their dives
- Shall account for divers entering and exiting the water
- Shall inform and manage the emergency procedure including communication methods to recall divers
- Shall closely liaise with coxswain on the boat operation at all times
- Shall ensure that Solo-dive is prohibited
- Should ensure divers have a proper weight check before entering the water to avoid over "weighting" and have neutral buoyancy

7.2 On Board Duty Staff and Experienced Diver for Entry Level Divers

- Should Pay extra attention to divers who received training overseas or divers who have not dived recently. S.4.2.1 should be referred to introductory dive is recommended for Divers without local diving experience with Divemaster/instructor
- Shall ensure that divers who have not dived recently within 6 months, are recommended to attend a refresher program
- Should ensure that divemaster or above qualified diver conduct Introductory Dives/Refresh Program
- Shall group up Entry Level divers with experienced local diver or to be lead by Divemaster/Instructor
- Shall explain the diving conditions of the local dive site such as: Visibility, Current, Temperature, sea bed composition, , surface conditions, surge, dangerous marine life or any other possible hazards

7.3 Diver Accounting Procedures

Dive roster to include:-

- A roster listing out names of all divers/passengers onboard is essential on a dive boat
- List of dive groups/buddy teams
- Additional information top be included such as divers' qualification, experience and equipment rental is important

Procedures shall be followed:-

- Check and confirm all divers/passengers listed on the roster are on board before the first dive
- Proper procedure is essential to check off divers on entry into and exit from the sea. Recording essential information such as in/out water time, use of air and maximum depth dived
- Roll call must be performed before departure from dive site
- Perform a **Visual** roll call after every dive, make sure each diver is present during the roll call. Answering for another diver is not acceptable during the roll call

7.4 Dive Boat

Definition of dive boat

- A boat supporting 10 or more Scuba divers for a diving activity
- Scuba dive training being undertaken onboard

The dive boat shall have:-

- Sufficient and stable space to layout equipment, especially a secure area for Scuba tanks to prevent them rolling around
- First-Aid Kit and First-Aid Oxygen System are required onboard and should be readily available and checked to be functional well prior to each dive outing.
- Adequate and sufficient life-saving apparatus, eg. Fire extinguisher, life jacket, life raft as required by law
- Adequate area at rear platform for preparation before entry into and exit from the water
- A floating buoy with ropes attached to the boat recommended for supporting divers who are waiting on the surface
- Solidly constructed and readily available ladder(s) for divers to exit water
- Guard at the rear platform to prevent divers slipping underneath the platform when exiting from the water
- A guard cage to be constructed around the propeller to protect divers from the propeller should the engine be inadvertently started

Supporting boat

- An rubber inflatable boat(RIB) with outboard engine and safety cage around the propeller is ideal.
- An RIB is easy to exit and enter into the sea, to get out of the sea and to be also highly manoeuvrable in rough seas.
- Required at all times during any diving activity.
- Boat man who operates supporting boat must hold valid licenses according to statutory requirements of HKSAR and have a deck hand on board to assist divers getting on board.
- Manoeuvrable support boat with dive flag displayed is essential. A rowing boat is not acceptable.
- Boat shall be operated at slow speed in the area when divers are below. Crew member and coxswain shall keep divers surfacing under constant observation.
- Engine shall be stopped or in neutral before approach is made to divers on the surface. Divers shall not swim close to the dive boat or support boat whilst propellers are revolving. The coxswain and diver master shall check before starting engine that no divers are near and/or beneath the dive boat or support boat.
- Ladder on supporting boat and a rope and buoy are useful for divers to hold on to when preparing to get on board
- Radio communication with mother boat should be strongly recommended

- Protection guard cage around the propeller is essential and shall be provided

Rental Equipment

- Rental regulators and wet suit should be cleaned and disinfected using appropriate solutions and procedures after use.
- Rental equipment should be properly maintained with an annual log book-records kept. A waterproof maintenance label should be attached to the equipment showing the last checking date and signed by the checker.
- The maintenance label should be immediately detached from equipment which is reported defective to avoid further use in diving activities.

7.5 Accidents and Emergency Procedures

- Dive Safety Manual/Guidelines shall be easily accessible by Duty Staff/Crew members
- Duty Staff shall manage and plan for any Missing Diver Search Procedures
- Report to police shall not be delayed at all – helicopter emergency assistance can be requested through the Police for search and evacuation of a casualty.
- A rescue search team shall be formed and trained comprising qualified divers(Best by Advanced Rescue Divers, Divemasters, Instructors, or divers who are well trained in search & recovery)
- Emergency Procedure check list shall be on board at all times. Emergency contact list is in the Appendix.
- Emergency Procedure Annual Drill is highly recommended for Dive clubs and Boat managers/rescue teams.

7.6 First Aid Equipment

First Aid Kit

- First Aid Kit shall be on every dive boat
- Shall be well-stocked, following items are recommended
 - Emergency phone numbers/coins/phone card
 - Gloves, Ventilation barriers
 - Large absorbent dressings, sterile cotton, Cotton tipped swabs
 - Pressure pads
 - Sterile gauze pads, clinging rolled bandages,
 - Adhesive bandages/tape, Triangular bandages
 - Dry pads
 - Bandage scissors
 - Tongue depressors
 - Tweezers, Needle
 - Safety pins, Penlight
 - Oral thermometer
 - Squeeze bottle of water
 - Splints
 - Emergency blanket

- Cold packs/Hot packs
- Vinegar
- Plastic bags, Small paper cups
- Denatured alcohol – for disinfectant (not to be used on wounds)
- Antibacterial soap, Antiseptic solution or wipes, Antibiotic ointment
- Hydrocortisone ointment
- Aspirin and non-aspirin pain relievers
- Antihistamine tablets
- Activated charcoal
- Anti-nausea drugs
- Nasal decongestant spray
- Tourniquet

Oxygen Kit

- Size of Oxygen Kit cylinder should last for at least 45 mins for local water areas or appropriate size to wait for emergency support
- Should have both continuous flow and demand-valve systems suitable for different status of patients
- Should be kept clean and disposable masks discarded replaced after use

Defibrillator

- Automatically External Defibrillator should be on dive boat
- Duty Staff/Crew should be well trained on operation of AED

7.7 Air Compressor Requirements

- Areas containing exhaust fumes or other contaminants shall be kept away from all air compressor intakes. Flexible air intake hose can be used to obtain the best location for pure air intake.
- The Dive club should maintain a log book to keep all compressors' operation, data, replacement of filters, repairing, overhaul. In regular intervals of no more than 100 hours operation or six months, whichever is less, the dive club should analyze and test the compressor gas against standards from the specifications from Compressed Gas Association (CGA Pamphlet G-7.1) and referenced in OSHA 29 CFR 1910.134

CGA Grade E

Component Maximum

Oxygen 20 - 22%/v
 Carbon Monoxide 10 PPM/v
 Carbon Dioxide 500 PPM/v
 Condensed Hydrocarbons 5 mg/m³
 Water Vapour NS
 Objectionable Odours None

- The results of these tests should be entered in a formal log and be maintained by the Dive Clubs.

7.8 Record-Keeping

- Dive Operator should keep activity logs, including roster, forms and all other documents
- Dive Operator should keep records of each item of equipment maintenance, i.e. every equipment modification, repair, test, calibration, or maintenance service shall be logged, including the date and nature of work performed, serial number of the item, and the name of the person performing the work for the equipment including Regulators, Submersible pressure gauges, Depth gauges, Scuba cylinders, Cylinder valves, Compressors, Gas control panels, Air storage cylinders, Air filtration systems, Analytical instruments, Buoyancy control device and Dry suits.

7.9 Specific Safety Practices for Diving Trips Outside of Hong Kong

Extra caution is necessary for Dive Clubs/Boat owners when planning and organizing a trip outside Hong Kong waters.

Communication Equipment

- VHF radio
- Radiotelegraph
- Radiotelephone signal
- Flags

Support

- Fuel, fresh water, food sufficient for the whole journey
- Prepare the size of First Aid Oxygen adequately
- Manoeuvrable cover boat is required. Rubber inflatable boat rib is a good option but cover boat operator and deck hand needed.

Administration Procedure

- Prior to departure from Hong Kong Area, Captain must obtain port clearance from Marine Department
- Collect I.D. of every passengers for immigration procedure when required

Flying After Diving

The following guideline has been adapted from the DAN “2002 Flying After Diving Workshop”, recommendations for flying after diving. It is applied to air dives followed by flights at cabin altitudes of 2,000 to 8,000 feet (610 to 2,438 metres) for divers without symptoms of decompression sickness (DCS).

- Divers shall have a minimum surface interval of 12 hours before flying or ascending to altitude after a single dive not requiring decompression stops.

- If Divers did Repetitive dives or multiple day diving, minimum preflight surface interval is 18 hours
- If divers did dives requiring decompression stops, there is little evidence on which to base a recommendation, and a preflight surface interval substantially longer than 18 hours appears prudent.
- Divers shall follow the no flight time of his/her Dive Computer if used, if this advice is longer than the above DAN Guidelines. If the time indicated by the computer is shorter than the above, the DAN guidelines should be used.
- Consider air flight schedule of divers before planning dive activities
- If helicopter rescue is necessary, pilot should be advised to fly at low altitude

7.10 Dive Safety Manual and Safety Audit Plan

- Dive Safety Manual/Guideline in Chinese and English should be readily accessible to Duty Staff/Crew members
- Dive Club should make reference to suggested checklist from [1] extracted in Appendix I to formulate a diving safety audit plan.
- Annual emergency drill and practice for searching missing for divers and handling unconscious divers should be included in the audit plan.
- Divers Safety audit should be conducted annually by independent instructors/trainer. Records of recommendation from the audit and sequence follow up actions should be formally kept and maintained by the dive club.

8. DIVING SAFETY PRACTICES FOR VARIOUS DIVE LOCATIONS LOCALLY AND OVERSEAS

8.1 Shore Dive

Preparation:

- Dive club facilities are not normally available around dive sites for shore dives in Hong Kong. Thus, equipment/facilities may not be readily available to divers
- Divers should concern about logistics problem such as equipment delivery, changing facilities, looking after personal belongings
- Divers should evaluate conditions before entry into the sea and should know the characteristics & Hazards of dive sites, e.g. Surf/waves, Depth, Tidal change, Shape & Seabed composition of Shoreline, currents, any other water sport activities taking place
- Divers should have safety accessories e.g. Dive Flag, Marker Buoy, good strong line with a hook preferably on a reel etc.
- Divers should identify at least two possible exit points prior to entry.

Entry Procedures:

- Shall be fully equipped and shall have a complete Pre-dive Safety Check before entry
- Be aware of obstacles under water e.g. rocks, fishing nets, shark nets, etc.
- Be aware of surf/waves, current while entering the sea
- Be prepare to swim for a distance to reach dive sites as shoreline slopes in Hong Kong are normally gentle

Exit Procedures:

- Conserve/reserve sufficient air for swim toward the shore/exit point
- Prepare navigation plan to swim back to exit point
- Be aware of any underwater obstacles e.g. rocks, muddy bottom. etc
- Be prepared for surf/waves while exiting the sea

8.2 Night Dive

Preparation:

- Boat Dive for a night dive is highly recommended; Divers should ensure there is sea surface support available on board. e.g. a dive cover boat
- Good strong water proof lights shall be on board. It is recommended to have Primary, backup and marker light with new batteries
- A light or a flash shall be placed at the Entry point and Exit point. When dive with a boat, strobes are suggested being hung just below the boat and on or near the anchor point.

- Diving instruments should be luminous
- Surface float with weight reference line is highly recommended

Procedures:

- Reduce instructor to student ratio for low-visibility dives. On board duty staff should listen for any diver distress signals. Therefore silence on board dive boat is essential.
- Use reference line on descent/ascent
- Always start from shallow water
- Ascend to surface when /if buddy becomes separated. Under water search is not recommended

8.3 Drift Dive

Preparation:

- Most of the dive sites in HK are located in Eastern/North Eastern Coastal areas
- Some dive sites are facing East China Sea
- Areas can be affected by strong monsoon winds
- Visibility is not as good as drift dives overseas

Equipment:

- Have at least one and preferably more Surface Marker buoy(s) for every dive team to dive in such sites
- Have Air horn/Whistle /Dive Alert for below and on the surface for each diver
- Have other surface alert tools, such as light reflecting object, dye marker, even old CD discs which are useful for reflecting the sun's rays and torches if diving near the end of day or at night.
- Have an alert and briefed attendant on a support boat preferably with a pair of binoculars.

8.4 Wreck Dive

Preparation:

- Artificial reef projects are found in Hong Kong
- Ship Wrecks, Used Tyres, redundant marine structure or custom made structure were used to attract and support large populations of fish, provide sheltered area for marine animals
- Most of them are located in areas with low visibility, deep water, current, or in fairway areas so beware of any hazards. Areas include Hoi Ha Wan, Yan Chau Tong, Outer Port Shelter, Kau Sai etc.

- Most of these locations are not suitable for recreational diving. Only a few ship wrecks are possible for recreational diving activities located around area of Hoi Ha Wan Marine Park and Tsim Chau

Equipment:

- Full set of scuba equipment
- Knife (strong and sharp with a serrated edge), gloves, light, reel with over 100 foot of strong line , line with hook, old CD disc for catching sun rays reflection

Hazard and Consideration:

- Visibility is low in comparison to areas of coral
- Broken and drifting fish nets and /line attached to rocks and any wrecks may be found so beware of entanglement
- Layer of silt over wrecks, disturbing silt and mud can very quickly cause dangerously reduced visibility
- Size of wrecks are not enough for penetrating. Penetration of the wrecks is not recommended
- Sharp objects e.g. rusted metal, splintering wood can be encountered

8.5 Nitrox, mixed gas and technical Dive

- Most of dive sites in Hong Kong are shallow in depth above 20M
- Mixed gas or technical dives are not beneficial to the local dive environment
- Mixed gas or technical dives are normally for training purposes only
- Availability of gases is a consideration

8.6 Spear Fishing

- Ownership of a spear-gun requires a Police License and a special lockable security box, when not in use
- Use of a spear-gun requires special training by an authorized instructor
- Never load a spear-gun above water or when pointing at anyone. Always apply safety catch when loading
- Spear-fishing is not allowed in Marine Conservation areas or off public beaches

8.7 Useful Information When Diving Overseas

- Join agencies licensed by the Travel Industry Council of Hong Kong
- Be covered with personal & travel insurance policy to include scuba diving with a company that is experienced in managing diving accidents
- Have a full question and answer briefing with expedition organizers on all aspects of the expedition
- Good communication with local dive operator essential
- Determine what essential equipment is needed for specific areas
- Ensure that suitable oxygen equipment and oxygen supply will be available at the dive site
- Understand characterizes of dive area e.g. weather, depth, visibility, tide changes etc.
- Possible hazard e.g. marine life, current etc.
- Qualification of tour leader and overseas local dive leader
- Nearest emergency medical services
- Obtain as much information as possible from experienced Hong Kong divers who know the location of the planned dive location
- Read-up and study publications e.g. books, dive magazines on areas/locations to be dived
- Ensure your own personal diving equipment is in to working condition, replacements may be difficult to obtain
- Take spare items of equipment as necessary
- Ensure dive boat has a trained, reliable crew; surface cover boat with coxswain and deckhand
- Leave a responsible member of your team on the dive boat whilst group are diving to ensure coxswain remains “on-station” and alert

9.0 Reference

1. The American Academy of Underwater Sciences, “STANDARDS FOR SCIENTIFIC DIVING”, 2001
2. Watchable Wildlife Marine Viewing Working Group, “MARINE WILDLIFE VIEWING GUIDELINES”, 2004 January
3. www.wikipedia.org
4. Divers Alert Network Asia-Pacific “FIRST AID FOR HAZARDOUS MARINE LIFE INJURIES”, 2003.
5. Edmonds C. “DANGEROUS MARINE CREATURES” Flagstaff AZ, Best Publishing, 1995.
6. CMAS “ DIVER TRAINING MANUAL”
7. International Life Saving Federation “ILS CERTIFICATION GUIDELINES APPENDIX 14 AND 15”

APPENDIX I DIVE AUDIT CHECK LIST

SAMPLE Dive Audit Check List

Extracted from

“STANDARDS FOR SCIENTIFIC DIVING”

by the American Academy of Underwater Sciences

for reference

Dive clubs are advised to refer to the below sample dive audit check list to formulate their own audit check list. Annual emergency procedure drill is highly recommended in any circumstances.

A. EMERGENCY INFORMATION

1. Was the nearest medical facility (i.e., hospital or clinic) identified?
2. Was a method of communication with the nearest medical facility established?
3. Was the nearest operational recompression chamber identified?
4. Was a method of communication with the recompression chamber established?
5. Was a method of emergency evacuation identified?
6. Was a method of communication with the means of emergency transportation established?
7. Are the emergency telephone numbers, numbers for medical advice and locations of recompression chambers listed?

B. PROJECT SPECIFIC INFORMATION

1. Did the dive plan describe the proposed dive project?
2. Were the objectives of the proposed dive project clearly identified?
3. Were the potential hazards identified?
5. Were other environmental conditions identified and discussed in the dive plan?
 - a. tidal heights
 - b. water currents
 - c. max. dive depth
 - d. in-water visibility
 - e. weather
 - f. boat/vessel traffic

6. Were the divers, boat operators, and support personnel identified in the plan?

II. PREDIVE BRIEFING AND ACTIVITIES

The divemaster for the dive should gather all project personnel together just before diving operations are to start and review the following topics.

1. Was there a review of emergency evacuation procedures?
2. Was there a review of diving accident management and emergency equipment (e.g., first aid and oxygen kits)?
3. Were any safety protocols for the dive reviewed (e.g., a safety stop at 15 ft. for dives deeper than 60 ft., buoy line descent/ascent, low air supply procedures/alternate air source use)?
4. Was there a review of the project description and objectives?
6. Was there a review of the potential hazards:
8. Was there a review of any specialized equipment for the dive (e.g., pinger, pinger locator, current meters, ROVs, dive sleds, oxygen meters for Nitrox)?
10. Did the divers check all of their dive equipment prior to each dive?
11. Were the tank pressures checked and recorded before each diver entered the water and subsequent dive start times by the divemaster?
12. Was the personal emergency information available for each diver (e.g., medical history, family notification)?
13. Was vessel traffic control notified, if necessary?

III. OPERATIONS DURING THE DIVE

During the dive it is important to observe the position of the support vessel(s), operation of the equipment, and the topside diving personnel.

1. Was the tender monitoring the divers and not performing another function that could interfere with tending responsibilities?
2. Was the support vessel clear of the diving area?
3. Were the appropriate dive flags displayed on the vessel tending the divers?
 - a. red/white "diver down" flag on inland/coastal waters?
 - b. r/w flag and blue/white code alpha flag in waters with international vessel traffic?
4. Were the size of the dive flags appropriate for the diving operation?
5. Was a standby diver equipped and ready to provide immediate assistance?
6. Was a tender-to-diver communication system deployed (i.e., diver recall unit)?
7. Were the emergency first aid and oxygen kits readily available to the diving personnel?

IV. POST-DIVE PROCEDURES

Monitoring post-dive diving operations is important to ensure that divers are taking the necessary precautions to avoid injury, protect themselves from environmental conditions, and maintain their equipment.

1. Did the divemaster and/or tender monitor each diver exiting the water for signs and symptoms of "bubble trouble".
2. Were the divers protecting themselves from hypothermia or hyperthermia?
3. Was freshwater (or other appropriate fluids) available to prevent dehydration?
4. Were the water depths, bottom time, and tank pressures of each diver recorded after each dive?
5. Was a dive report prepared that included appropriate information specific to the diving operation (e.g., water depths and bottom times for the dives, tank pressures, achievement of objectives, hazards encountered, malfunctions and lost equipment)?
7. Did the divers properly clean and store their equipment when they were not diving or after they had completed the diving operations?

V. DIVING PERSONNEL

An evaluation of the training, background, and capabilities of each diver involved in the diving operation is of primary importance.

1. Were all divers current with diving physical examinations (within one year)?
2. Were all divers current with CPR certification (within one year)?
3. Were all divers current with first aid training (within 3 years)?
4. Were all divers trained in oxygen administration (initial training only required, 2 yr. refresher recommended)?
5. Were all divers certified for their respective levels of responsibility (i.e., as Working Divers or Divemasters)?
6. Had all divers maintained their proficiency (i.e., dived within the last three months)?
7. Were all divers experienced with the working conditions that were expected during the project?
8. If the answer to nos. 4 or 5, above, is negative, what provisions and preparations has the divemaster undertaken to prepare the diver for the new situation?
9. Were all divers using the air compressor, trained in its operation, if one was at the dive site?

VI. DIVE EQUIPMENT

Diving equipment must be maintained according to the requirements in the Diving Safety Policy, the manufacturers specifications, whichever are the most conservative.

A. SCUBA EQUIPMENT

1. Were all SCUBA cylinders tested within the 5-year hydrostatic test date?

2. Had all SCUBA cylinders been visually inspected within the past 12 months?
3. Were all regulators critically examined, calibrated, or overhauled within the past 18 months?
4. Had all of the diver's gauges (e.g., pressure, depth, compass, bottom timers, and watches) been critically examined and calibrated or replaced within the past 18 months?
5. Had all valves and hoses been critically examined and replaced or overhauled as needed?
6. Were all belts and buckles in good condition?
8. For wet suit diving, were all buoyancy compensators in good condition and maintained in accordance with manufacturers specifications?
9. Were all buoyancy compensators capable of being inflated by two methods (one other than oral)?
10. Had the diver communication equipment been checked prior to use?
11. Was a dive ladder available for the divers to enter the tending vessel? (Some boats are low to the water or have swim step and do not require a dive ladder.)
12. Was hygienic maintenance performed on all full-face masks?
13. Were all full-face masks free of corrosion and in good operating condition?
14. Were the head harness and buckles in good condition?
15. Were the manufacturers repair and maintenance manuals available for the specialized dive equipment (e.g., the communication equipment, and full-face masks)?
16. Was the dive equipment, in general, free of corrosion and in good working condition?
17. Were adequate spare parts and repair materials available at the dive site?

B. FIRST AID EQUIPMENT

1. Was the emergency oxygen kit capable of servicing two divers with demand second stage regulators at the same time?
2. Did the emergency oxygen kit have an oxygen cylinder that was size "E" (626 liters) or larger?
3. Had the regulator on the oxygen cylinder been maintained according to the manufacturers specifications?
4. Did the oxygen kit contain a cylinder wrench (or wheel) for opening and closing the tank valve?
5. Were the hoses, valves, and regulators in the oxygen kit in good condition and clean, particularly of oil and grease?
6. Were the oxygen cylinders within 5-year hydrostatic test date?
7. Were the valve seats and [washer seal(s)] (on the valve) in good condition?

8. Was the oxygen cylinder stored in an area where the temperature may exceed 125 degrees Fahrenheit?

9. Was there a fully equipped medical (first aid) kit for divers?

10. Were spare oxygen [washer seals] available?

11. Was there a backboard for emergency use on board the survey vessel?

APPENDIX II EMERGENCY CONTACTS

Hong Kong Diving Related Emergency Contacts

Emergency Number(Police、Fire Services)	999
Decompression Chamber of Fire Services Department :	2723-2233
D.A.N. Hong Kong Representative	3611 7326
Hong Kong Marine Police :	2367-0666
Marine Rescue Centre: :	2233 7999
Marine Department	2542 3711
Vessel Monitoring Centre(24 hours)	2233 7801
Government Flying Services Department :	2305-8301
飛行服務隊	2769 4451
Fire Services Department Ambulance Services	2735 3355
Hong Kong Observatory :	2926 8200