

CHAPTER 6

STANDARD OPERATING PROCEDURES – SHIP’S DIVING

GENERAL

601. INTRODUCTION

1. The primary purpose of Ship’s Divers (SD) is the protection of the ship from underwater sabotage attempts. This protection will include rapid hull inspections and limpet mine removal.
2. SD are also able to fulfill many other diving requirements of ships. This Chapter describes procedures peculiar to operational ship’s diving. It should be used as a guide in planning and conducting operations involving ship’s divers. Relatively simple tasks, such as recovering lost equipment or even locating the work site, may in some cases be complicated. Therefore, it is not possible to encompass all situations that have occurred or that are likely to occur. Accordingly, Ship’s Diving Supervisors (SDS) must be prepared to innovate and adapt while staying within the framework of the diving regulations.
3. When working underwater, particular care should be taken with tools and articles easily dropped and lost. A tool bag or bucket should be used when carrying several tools or articles to the work site. In addition, a length of yellow or brightly coloured polypropylene line may be tied to each object so, if dropped, it may be more easily located. If the depth of water below the diver is greater than his/her qualification, recovery of an object can be difficult and at times impossible. This can compromise the task or result in a lengthy delay.
4. A few of the more common tasks encountered by SD are:
 - a. General ship’s bottom/anode inspections;
 - b. Dome routines and inspections;
 - c. Plugging or patching discharges or intakes;
 - d. Propeller pitch calibration; and
 - e. Poker gauge tests.
5. Each ship’s team should have sketches or photos of the entire underwater portion of the hull readily available for use in locating hull openings and discharges. These drawings should indicate all underwater components, such as inlets, discharges, fittings and anode locations. SD should take advantage of any dry- docking to familiarize themselves with all underwater ship’s fittings.

602. DIVING OPERATION REQUIREMENTS

1. When diving operations are planned to be under ships/vessels/submarines, the Diving Officer/Diving Supervisor shall ensure that a Diving Safety Checklist is completed.
2. This checklist shall be retained by the Diving Officer/Diving Supervisor or in the case of diving conducted by a Fleet Diving Unit team, by the FDU Team Supervisor.
3. When diving under or in the vicinity of Ships/Vessels, an appropriate Safe-To-Dive checklist must be completed for each ship within 100 meters.

603. DIVING ON OR NEAR A SHIP'S BOTTOM

1. When diving operations are being conducted on or near a Ships bottom, the diving supervisor shall ensure that safety precautions are fully adhered to in accordance with the appropriate references listed above. For diving under the hulls of vessels (including submarines), it is impossible to list specific precautions for every class of vessel within the scope of this order except to provide general guidance and policy. In general it is policy that all manners of equipment that may have a detrimental effect on divers is to be fully secured and/or turned off and that any and all forms of in-water transmission be completely ceased unless it can be ascertained that there are no safety implications. This includes, but is not limited to, all forms of:
 - a. Propellers and propulsion systems;
 - b. Rudders;
 - c. Bow thrusters;
 - d. Underwater emitters (including sonars, depth sounders, EM Logs, cathodics etc.);
 - e. Hull suction openings;
 - f. Hull outlet opening;
 - g. Shafts;
 - h. Pumps and service equipment (such as generators, turbines etc.);
 - i. Movable domes or other movable fitted structures on the hull (such as sonar domes or fitted VDS systems);
 - j. Main vents;
 - k. Bow planes; and
 - l. Blowers.

2. The following general precautions are to be strictly adhered to:
 - a. The Commanding Officer or OOW/OOD or Master shall be informed before divers enter the water;
 - b. The Commanding Officers or OOW/OODs or Master of alongside ships and vessels within 100 metres shall also be informed and shall confirm to the diving supervisor a diving check-off has been completed, before the divers enter the water;
 - c. The appropriate visual diving signals are to be displayed;
 - d. The Queen's Harbour Master (during working hours) or the Maritime Operations Centre (during silent hours and weekends) or the appropriate harbour or port authorities are to be informed of the location, nature, and expected duration of the diving operation;
 - e. A Class specific "Diving Safety Checklist" (DSC) shall be completed for all CAF vessels;
 - f. Where foreign warships or non-military vessels are involved, an appropriate checklist is to be obtained from the vessel and reviewed by both the dive supervisor and an appropriate technical authority from the vessel to ensure the safety of the dive using guidance included in references A to C; and
 - g. A safety boat will be in the water at all times that divers are in the water, unless the diving operation can be conducted safely from a platform close to the dive site or a jetty.

3. The above precautions are considered to be the minimum, which must be followed to ensure the safety of diving personnel. They are not in any way considered all-inclusive, as unpredictable situations will occur which may alter circumstances and which will necessitate further precautions being employed. References A and B contain generic diving check lists which are to be used as models for class specific diving check lists. Under no circumstances should this be taken as direction to relax current safety precautions in force but should rather stimulate a comprehensive safety review of all necessary precautions on a continuous basis by the appropriate safety and technical authorities. Precautions must be reviewed after any major technical, structural or engineering changes that could possibly affect the safety of divers on, under or near a ship, vessel or submarine.

4. Deviations from safety regulations are only permitted under special circumstances and must invariably be supported by written authority; for example, in the case of LMDE placement for the defence against underwater attack, or the Commanding Officer's approval in the case of moving sonar domes, rudders or other ship systems during observation or repair by divers. In the latter case this is to be noted on appropriate diving safety checklist under comments.

5. Approved Diving Safety Checklists can be found in the annexes of this chapter for each ship/submarine class. Diving Safety Checklists shall be completed prior to diving being carried out. The diving supervisor shall retain it during the dive and retain it for a period of one year as a minimum.

604. DIVING OPERATIONS ON FOREIGN VESSELS BY CAF DIVERS

1. When diving on foreign warships the Commanding Officer shall ensure that:
 - a. Only diving that is deemed operationally essential is conducted on foreign warships/vessels.
 - b. Routine or pre-planned employment of CAF divers for operations such as inspections and maintenance is to be avoided. Such underwater services should be referred by the requesting navy up its respective national chain of command. Several navies have fly-away or deployable teams specifically for such purposes.
 - c. In the event essential diving ops must occur, the following additional safety precautions beyond Article 602 are to be taken:
 - (1) Diving Supervisor in company with HMC ship's Marine Systems Engineering Officer (MSEO) are to physically sight that the MSEO/or equivalent of the foreign warship has secured the foreign ship for diving IAW NATO Safe to Dive Certificate;
 - (2) Both ship's MSEOs and the ship's Diving Supervisor are to co-sign the certificate;
 - (3) HMC ship's MSEO and Diving Supervisor are to brief HMC ship's Commanding Officer on completion of securing the foreign warship for diving;
 - (4) A sentry shall be posted on the upper deck on the foreign vessel to assist the Diving Supervisor. This sentry shall be thoroughly briefed by the CAF Diving Supervisor and have a ready means of communicating within the foreign vessel;
 - (5) Ensure methods of efficient communication to the foreign ship's engineering department are well known in the event underwater systems are inadvertently activated during the dive (e.g. internal broadcast systems, intercoms or PRCs); and
 - (6) If the above measures cannot be accomplished diving is NOT to occur.
2. EXCEPTIONS: the only deviations from this policy are:

- a. Clearance Diving Teams (CDT) composed of clearance divers under supervision of a CLDO, CL DVR QL6A or 6B do not deploy with an MSEO and thus do not require a Canadian MSEO to accompany the Diving Supervisor when determining the safe-to-dive status of a vessel. When available, a senior MAR ENG ART/TECH (or equivalent) should be requested to assist in verifying status;
- b. On written authority of CO FDUs, a QL 4 Port Inspection Diver (PID) in charge of a diving team supporting diving operations may follow the direction at paragraph 3.a.; and
- c. On written authority of CO PSU (when stood up), a QL 4 Port Inspection Diver (PID) in charge of a diving team supporting the PSU operation may follow the direction at paragraph 3.a.

SHIP'S DIVERS DIVING SEARCHES

605. GENERAL

1. Underwater searches are broken down into several categories, including:
 - a. SHIP'S BOTTOM SEARCHES;
 - b. SEABED SEARCHES; and
 - c. JETTY SEARCHES.
2. This chapter will deal with the naval diver's (CL DVR, PID, SD) role in ship's bottom searches. Seabed and jetty searching is covered in Chapter 5.

606. SHIP'S BOTTOM SEARCHES

1. As with seabed searches, ship's bottom searches are an important part of the duties of SD. The problem is similar: the area to be searched is smaller but so is the object to be located, e.g. a ship's fitting or a limpet mine placed by underwater saboteurs.
2. The principles applied in seabed searches are also applied to ship's bottom searches, with techniques suitably modified. It is extremely important to the safety of the divers to adhere to the search methods as described and to avoid local modifications and any attempt to combine other diving modes, such as buddy diving, with a partial search team method. Such modifications have caused fatalities in the past.
3. Divers must be given every opportunity to become familiar with the various configurations of ship's bottoms. Whenever a ship is alongside the diving team should take the opportunity to exercise with hull search and disposal equipment. In addition, when dry-docked the diving team should familiarise themselves with the hull configuration and all of the ship's underwater fittings.
4. A selection of underwater lights is available to assist the diver in searching a ship's bottom. The particular type of illumination and techniques used depend on the underwater conditions. Plankton and particles in suspension in the water may often preclude the use of high-power lighting, but low-power lights or divers' search lamps may be effective. However, divers should never become wholly reliant on lighting and must practice operating solely by touch.
5. A number of search schemes are described in subsequent articles. Within the scope of the diving regulations, these articles may be adapted as necessary to suit the ship and local conditions. SD or the Diving Supervisor will base the choice of search scheme on the following factors:
 - a. Underwater visibility;

- b. Tidal conditions or current;
- c. The underwater fittings of the ship concerned;
- d. The number of divers available and their state of work-up; and
- e. The diving equipment available.

607. FREE AREA AFT SEARCHES

1. Free area aft searches for search schemes “A” and “B” shall be conducted IAW the rules and regulations laid out in Articles 120 and 121.

608. SEARCH SCHEME “A” – NECKLACE SEARCH

1. Experience has shown that the necklace search (Figure 6-4) or variant thereof is the most adaptable for searching a ship’s bottom or jetty. It is faster than any other search and all divers are in constant communication with each other. For safety it is important that the divers frequently verify the presence of the divers adjacent to them, particularly when visibility is poor. The absence of a diver is to be treated as a lost diver emergency IAW Chapter 2.
2. The following equipment is required:
 - a. One lightweight line (the necklace line), long enough to reach from the waterline, around the ship’s bottom amidships, to the waterline of the opposite side;
 - b. Two floats;
 - c. Indicating lights for floats; and
 - d. Diving equipment.
3. The necklace line is made up as follows:
 - a. The line is prepared in two sections joined at the middle with non-swivel Inglefield clips. It shall be long enough to pass under the hull and reach the surface on each side;
 - b. A light float is spliced at each surface end of the necklace line; and
 - c. At desired intervals a diver’s hand loop, 1 meter maximum in length, is spliced into the necklace search line. Alternatively, non-locking Carabiners secured to the diver may be attached to the search line. This method speeds up connecting divers to the search line and permits ease of search intervals if the visibility changes.

4. Divers enter the water, take up their allocated positions and attach themselves to the search line. The surface swimmers at each end of the search line need not be divers as long as they are capable of swimming with a snorkel and facemask and understand diving signals. They hold the necklace line, attend the float and search above and below the waterline.
5. All divers and surface swimmers shall wear an indicator light at night.
6. The search should generally start from forward and work aft, but this will depend on local tide and weather conditions.
7. If a mine is found, the drill taught by the FDUs and Command is to be carried out. Further information may be found in NAVORDs, Ship Standing Orders, CFCD 102, 108, Force Protection SOPs and Orders and classified publications held aboard each ship.

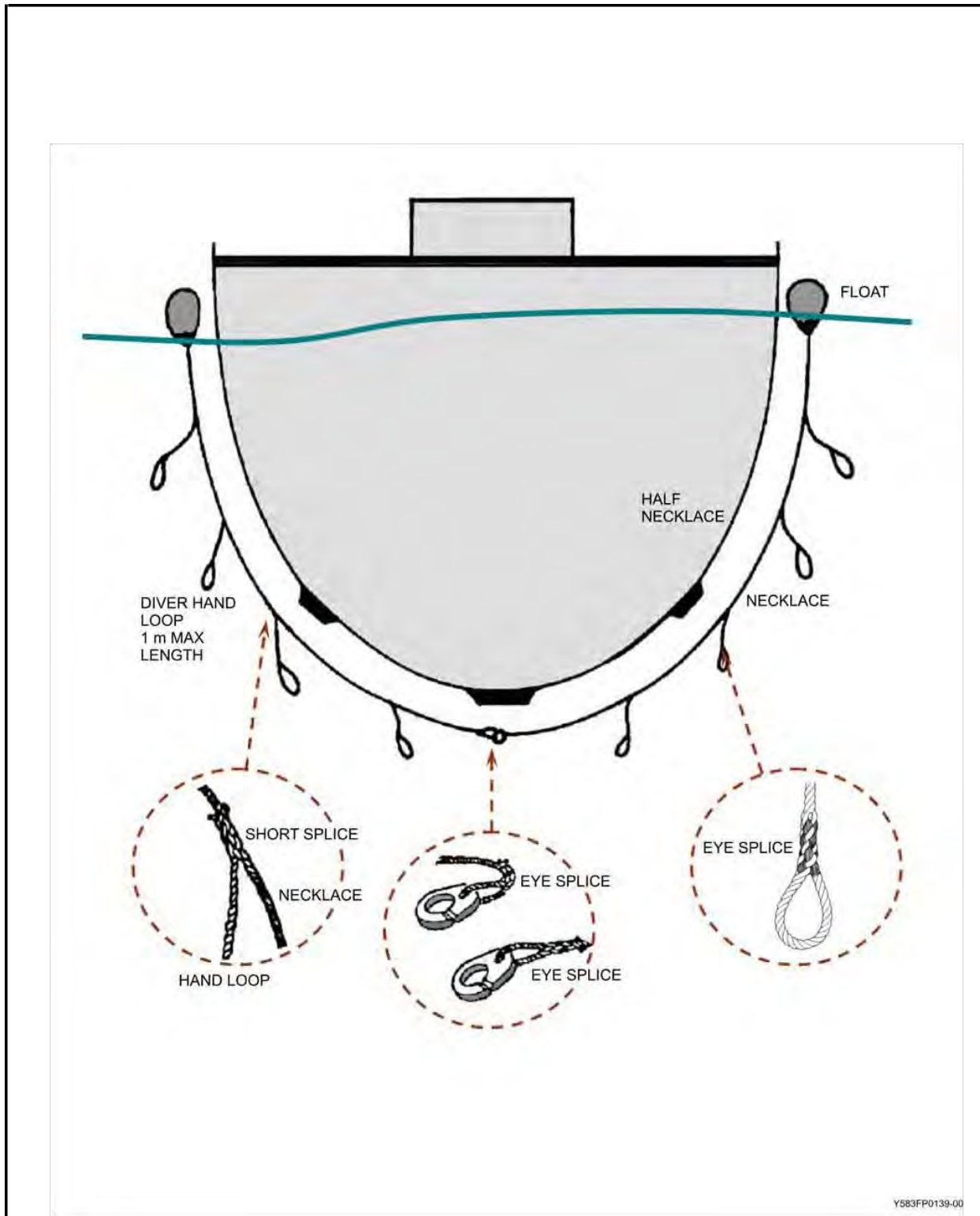


Figure 6-1 Search Scheme "A" – Necklace Search

609. MODIFIED SEARCH SCHEME “A” – HALF-NECKLACE SEARCH

1. Instead of having a necklace of divers encircling the complete hull, the search can be used efficiently in two passes or sweeps as a half-necklace, by searching from the keel to the surface on one side and then repeating the operation on the other side.
2. The half-necklace line is made in the same way as a full necklace line, with a float at one end and the Inglefield clip at the keel end.

NOTES

1. In depths of water greater than 30 msw, the CAF Diver’s Float shall be used for all necklace searches;
2. In depths of water 30 msw or less, the standard CAF Diver’s Float is not mandatory for use on the necklace search. A smaller marker float capable of being pulled under obstructions such as fender logs or other ships may be substituted; and
3. The necklace search may also be used by diving teams to search jetty faces/seabeds under the same restrictions as paragraphs 1 and 2, subject to the least depth qualification on the team.

610. SEARCH SCHEME “B” – ZIG-ZAG SEARCH

1. Search Scheme “B” is for SD not meeting the standard of efficiency required for necklace searches and requires a lifeline. The zig-zag search is a very thorough search, although much slower than the necklace search.
2. Carry out Search Scheme “B” using the following in addition to normal diving equipment:
 - a. Bottom lines, one for every 60 meter of ship’s length;
 - b. One (64-meter) codline jackstay wound on a wooden core for each diver; and
 - c. A lifeline for each diver.
3. The search scheme is executed by divers swimming between bottom lines using the jackstay to trace the course of their search.
4. Divers may be employed on simultaneous jackstay searches in as many areas as their numbers permit.
5. If all areas cannot be searched at once, give priority to the most vulnerable parts of the ship.

6. Each zig-zag search proceeds as follows:
 - a. Diver secures jackstay to bottom line “A” at “P” (visibility distance (V) above the keel). When visibility is nil, “diver’s arm reach” should be substituted for “visibility distance”;
 - b. The diver swims to bottom line “B” paying out the jackstay and searching below as the diver proceeds;
 - c. If the keel cannot be distinguished, the diver may go to the bilge keel or return to the waterline to “B” in order to continue the search without interruption. Care must be taken to place the jackstay on “B” at “Q” (V above the keel) ensuring that the jackstay is hauled taut;
 - d. The diver swims along the jackstay to “P”, searching above. The diver must search below as well if not already done;
 - e. On arrival at “P”, shift the jackstay up the bottom line twice visibility (2V) distance to “R”;
 - f. The diver swims back along the jackstay, searching above and below it;
 - g. On arrival at “Q” shift the jackstay up the bottom line twice visibility distance to “S”; and
 - h. The diver continues this process until reaching the waterline.

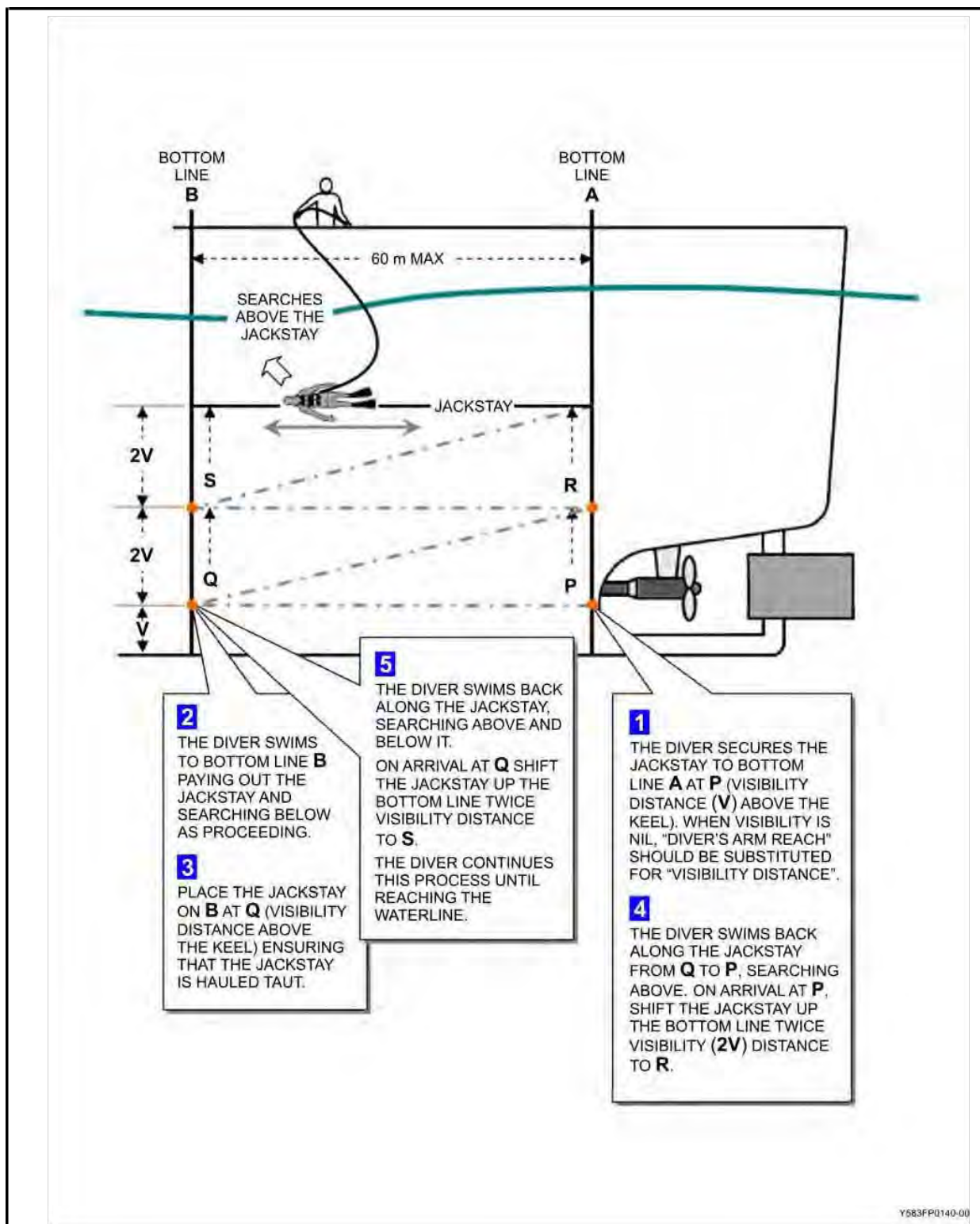


Figure 6-2 Search Scheme "B" – Zig-zag Search

611. SEARCH SCHEME “C” – LADDER SEARCH

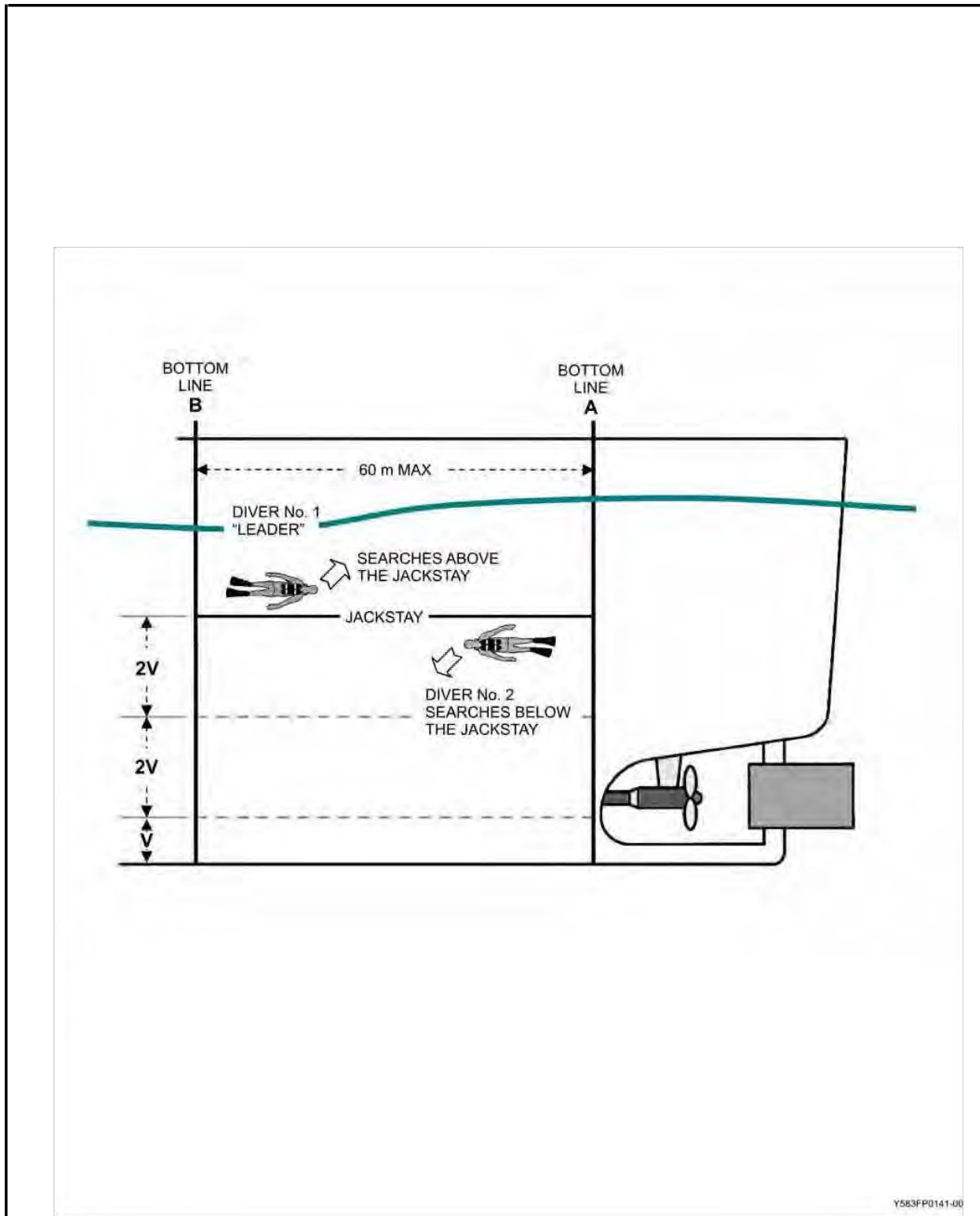
1. Search scheme “C”, the ladder search, should be used when underwater visibility is such that a necklace search or a half-necklace search cannot be carried out. This search scheme requires more divers than search scheme “B” (zig-zag search).
2. Only Clearance Divers may use search scheme “C” (ladder search), as free-swimming is essential.
3. The advantages of search scheme “C” over search scheme “B” are as follows:
 - a. Overlaps do not occur; therefore the search is completed more quickly; and
 - b. Divers work in pairs, an added safety factor.
4. In addition to normal diving equipment the following equipment is also required to carry out search scheme “C”:
 - a. Bottom lines, one for every 60 meters of ship’s length; and
 - b. One 64-meter codline jackstay wound on a wooden core for each pair of divers.
5. The search scheme is executed by a pair of divers who trace the course of their search with jackstays, one diver swimming below the jackstay, the other above. They swim in opposite directions.

NOTE

When visibility is nil, “diver’s arm reach” should be substituted for “visibility distance”.

6. Divers search as many areas at once as their numbers permit. If all areas cannot be searched together then priority must be given to the most vulnerable parts of the ship.
7. Each search proceeds with divers working in pairs, one member of each pair being designated as leader (DIVER No. 1):
 - a. With their jackstay between them, the divers go down their respective bottom lines – “A” and “B” – to the keel;
 - b. On arrival at the keel, DIVER No. 2 secures the end of the jackstay to bottom line “A” at visibility distance (V) above the keel and gives 2 -PULLS on the jackstay to inform DIVER No. 1 that the jackstay is secured;

- c. DIVER No. 1 hauls taut the jackstay and secures it to the bottom line “B” at visibility distance above the keel. DIVER No. 1 then gives 2 -PULLS on the jackstay;
- d. Both divers then swim along the jackstay, DIVER No. 1 searching above and DIVER No. 2 searching below;
- e. On completion of the first search, the leader gives two pulls to instruct DIVER No. 2 to move his/her end of the jackstay up the bottom line twice the visibility distance (2V). When this has been done, DIVER No. 2 diver gives 2 -PULLS on the jackstay and the leader moves his/her end up the bottom line twice the visibility distance (2V);
- f. The leader gives 2 -PULLS as a signal to search as before, DIVER No. 1 above the jackstay and DIVER No. 2 below; and
- g. The divers continue this process until they reach the waterline.



Y583FP0141-00

Figure 6-3 Search Scheme "C" – Ladder Search

612. EMERGENCY STATIONS

1. The ship may go to emergency stations for a number of reasons; however, divers are not required in all situations. The following is a list of emergency stations that may require SD involvement:

- c. RESCUE STATIONS;
- d. RAFT STATIONS;
- e. ABANDON SHIP;
- i. EMERGENCY FLYING STATIONS;
- j. FORCE PROTECTION PROCEDURES; and
- k. SABOTAGE EXERCISE (SABEX).

2. When a ship goes to emergency stations requiring divers, the SDS shall take positive control of the diving activities as required by the Commanding Officer.

3. Standard operating procedures, emergency procedures and divers' emergency station responsibilities shall be promulgated and posted in the diving locker area.

613. LIMPET MINE DISPOSAL EQUIPMENT

1. Limpet Mine Disposal Equipment (LMDE) is the primary weapon utilized by Ship's Divers to neutralize underwater anti-ship sabotage devices.

2. The LMDE is a weapon and shall be exercised and maintained by the diving team on a regular basis.

3. LMDE standard operating procedures, safety precautions and maintenance instructions are outlined in BR 8525, LMDE Manual, and MARCOM BR 8525, addendum. Also refer to Article 121, Free-Swimming – General Rules.

SUBMARINE SHIP'S DIVER

614. GENERAL

1. SD in HMC Submarines will encounter tasks unlike those found in ships. Procedures for plugging inlets and conducting underwater searches are basically the same. Brief notes on those items unique to submarines are contained in subsequent Articles. Note that this section contains general guidance only and does not reflect the specifics of the VICTORIA class. All new procedures developed must be approved by Formation authorities in consultation with the appropriate FDU, in order to ensure safety and if necessary, the development of formal training. Diving in confined spaces is of particular concern in this regard.

615. BLANKING PLATES

1. Blanking plates are used to seal off the free flood openings of the ballast tank. A “blow-around” must be conducted before blanking off any ballast tank.
2. Once the blanking plate is secured in position and before opening the manhole, the main vents for that particular tank must be opened to check that the seal on the blanking plate is watertight.

616. BOW CAP SEALS

1. SD can replace bow cap seals. The underwater weapons personnel should be consulted to verify that the fitting of the seal is correct.

617. VELOCIMETER

1. The transducer is secured behind a hinged grate. The procedure for removal is straightforward once the grate (held by Allen screws) is removed.

618. UNDERWATER TELEPHONE

1. Removing the transducer is a simple procedure but replacing it is more difficult due to the weight of the transducer and the angle of the transducer receptacle.
2. A suggested method is to thread three (3) steel guide rods, each 305-mm in length, into the bolt holes to assist in sliding the transducer into place. Start some of the securing bolts before removing the guide rods.

619. TORPEDO TUBE TEST DOORS

1. Check current publications for details and procedures on fitting of torpedo tube test doors.

620. DECOMPRESSION IN SNORTING SUBMARINES

1. Pressure variation caused by snorting will affect post-dive decompression similarly to flying after diving. Refer to Articles 312, Diving and Snorting Submarines and 313, Flying After Diving.

AIRCRAFT RESCUE AND RECOVERY

621. GENERAL

1. Several classes of ships carry helicopters; and SD must be familiar with the techniques for the rescue and recovery of these aircraft.
2. Shipboard publications (e.g. HELP) cover in detail the methods for recovery of a downed helicopter and safe procedures for crew rescue.
3. SD should make themselves completely familiar with their ship's aircraft so that in the event of a mishap they can react quickly and correctly in the rescue and recovery operations.
4. Helo floatation collars may be available in some ships. The team should be familiarized with correct procedures of use.

ANNEX A HALIFAX CLASS – DIVING SAFETY CHECKLIST

HMCS _____

REFS: A. B-GG-380-000/FP-002

B. ADivP-1(A)

1. All Diving Operations that take place on any HALIFAX Class ships shall be planned IAW reference A and conducted IAW the following Diving Safety Checklist (DSC) which is promulgated in order to meet the requirements of reference A for CAF vessels. It must be completed before diving operations take place and shall be used as is and not modified in any way.
2. The OOW/OOD/DWS of the ship conducting the diving operations is responsible for ensuring that:
 - a. permission to dive has been obtained from QHM or relevant authority;
 - b. adjacent ships have been informed and have taken all necessary precautions and safety actions including tag-out for divers;
 - c. CAF vessels within 100m of the planned location have completed the applicable Diving Safety Checklist and non-CAF vessels completed the generic form from reference A or B;
 - d. in Non-Naval Ports, relevant authorities for the berth, dock, or port have been informed and have taken all necessary precautions and safety actions;
 - e. the ship is “tagged out” for diving IAW this Diving Safety Checklist, that it is completed and signed, and the Diving Supervisor advised of any exceptions or discrepancies;
 - f. appropriate signals (flag ALPHA during the day, RAM lights at night, shapes at sea) are displayed in the most prominent position available;
 - g. the diving team has been fully briefed by the OOD/MSEO/Dive O on the tasks required; and
 - h. a warning pipe is made to the ship’s company prior to Diving Operations commencing and then every 15 minutes whilst Diving Operations are taking place. “Diving precautions in effect, Divers Down”; and
 - i. parts 1 to 6 of this Diving Safety Checklist are completed.
3. The OOW/OOD/DWS of an adjacent ship (i.e. not conducting diving operations but within 100m of the planned dive location) is responsible for ensuring that:
 - a. the ship is “tagged out” for diving IAW this Diving Safety Checklist, that parts 1 to 5 are completed and signed as applicable, and the Diving Supervisor advised of any exceptions or discrepancies.

PART 1 – DIVING OPERATIONS

DATE: _____ TIME: _____ LOCATION: _____
 DIVING TEAM: _____ SUPERVISOR: _____
 PURPOSE OF DIVING OPERATIONS: _____
 PLANNED DURATION: _____

PART 2 – OOD/OOW

No.	REQUIREMENT	INITIALS
1.	CO / XO Notified	
2.	MSEO/CSEO Notified	
3. *	QHM/Port Authority informed	
4. *	Adjacent ships informed / Diving Safety Checklist obtained as applicable	
5. *	Appropriate diving signals/lights displayed	
6.	Anchors secured	
7.	Warning pipe made	
*	* denotes applicable only for ship actually conducting diving operations	

PART 3 – EQUIPMENT TAG-OUT

1. The Duty Tech / EOW shall ensure that the following systems have been locked and tagged out for Dive Ops:

No.	EQUIPMENT ISOLATION	INITIALS
1.	Key Removed from HMS SCC	
2.	Transducer Raised and Key Removed	
3.	Echo Sounder Main Fuses Removed and Tagged	
4.	U/W Telephone Power Isolated and Tagged	
5.	Degaussing Switched Off and Tagged at Breaker	
6.	Cathodic Protection Switched Off and Tagged at Breaker	
7.	Turning Gear Disengaged	
8.	FER/AER LOPs keys removed and locked in Eng office keyboard*	
9.	Rudder locked amidships*	
10.	Steering motors switched off and tagged at breaker*	
11.	CRPP hydraulic motors switched off and tagged at breaker*	
12.	Shafts at rest**	
*	*Alongside only ** At sea when ordered by OOW	

PART 4. - Machinery Status

(to be completed by the EOOW/Duty Technician)

2. Only vital systems may operate during a dive. All others shall be isolated. The following legend shall be used:

S - Suction;**D**- Discharge;**I**- Isolated and tagged at breaker;**ST** - Standby in the event of power failure; and**US** – Unserviceable.

Frame	Location	Machinery	Machinery	Machinery	Machinery
Fr 20.5		Fridge Cooling____			
Fr 25.5	FAMR Seabay	#1 ASC ____	#DG ____	#2DG ____	#1MDFP ____
Fr 25.5		Galley Garborator____			
Fr 34	Stbd FER Seabay	#1MSC ____	#1DDFP ____		
Fr 34	Port FER Seabay	#2MSC ____	#2DDFP ____		
Fr 39	Stbd AAMR Seabay	PDE____	#3MDFP ____	MDJP____	#3 DG____
Fr 39	Port AAMR Seabay	#2 ASC ____	#3ASC ____	#4DG____	#4MDFP ____
Fr 47.5		Blackwater____			
Fr 52.5		#2DDFP ____			
Fr 58		Steering Cooling____			

PART 5 - TAG OUT COMPLETE, WITH THE FOLLOWING EXCEPTIONS:

[Empty rectangular box for listing exceptions]

PART 6 - SIGNATURE BLOCKS

Duty Technician/EOOW (at sea) certifies the above systems in Part 3 have been Tagged Out except as stated in Part 5.

_____, _____, _____
(Print Name & Rank) (Signature) (Date and time)

SAFE TO DIVE STATEMENT (OOW/OOD/DWS)

I _____ (OOD/OOW), confirm that _____
(Print Name & Rank) (Print Vessel's Name)

is safe for diving operations to proceed. Precautions listed have been taken and will remain in effect until notified by the Diving Supervisor, in person, that the diving operations are complete.

_____, _____, _____ (Print Name & Date and time)
Rank) (Signature)

SAFE TO DIVE STATEMENT ACCEPTED: (DIVING SUPERVISOR)

_____, _____, _____ (Print Name & Date and time)
Rank) (Signature)

Note: This completed form is to be retained by the Diving Supervisor until the completion of the diving operations. It then shall be forwarded to the unit Diving Officer and must be retained for one month after completion of the dive.

ANNEX B KINGSTON CLASS – DIVING SAFETY CHECKLIST

HMCS _____

REFS: A. B-GG-380-000/FP-002

B. ADivP-1(A)

1. All Diving Operations that take place on any KINGSTON Class ships shall be planned IAW reference A and conducted IAW the following Diving Safety Checklist (DSC) which is promulgated in order to meet the requirements of reference A for CAF vessels. It must be completed before diving operations take place and shall be used as is and not modified in any way.
2. The OOW/OOD/SWK of the ship conducting the diving operations is responsible for ensuring that:
 - a. permission to dive has been obtained from QHM or relevant authority;
 - b. adjacent ships have been informed and have taken all necessary precautions and safety actions including tag-out for divers;
 - c. CAF vessels within 100m of the planned location have completed the applicable Diving Safety Checklist and non-CAF vessels completed the generic form from reference A or B;
 - d. in Non-Naval Ports, relevant authorities for the berth, dock, or port have been informed and have taken all necessary precautions and safety actions;
 - e. the ship is “tagged out” for diving IAW this Diving Safety Checklist, that parts 1 to 5 are completed and signed, and the Diving Supervisor advised of any exceptions or discrepancies;
 - f. appropriate signals (flag ALPHA during the day, RAM lights at night, shapes at sea) are displayed in the most prominent position available;
 - g. the diving team has been fully briefed by the OOD/Chief Engineer/Dive O on the tasks required;
 - h. a warning pipe is made to the ship’s company prior to Diving Operations commencing and then every 15 minutes whilst Diving Operations are taking place. “Diving precautions in effect, Divers Down”; and
 - i. parts 1 to 5 of this Diving Safety Checklist are completed.
3. The OOW/OOD/SWK of an adjacent ship (i.e. not conducting diving operations but within 100m of the planned dive location) is responsible for ensuring that:
 - a. the ship is “tagged out” for diving IAW this Diving Safety Checklist, that parts 1 to 5 are completed and signed as applicable, and the Diving Supervisor advised of any exceptions or discrepancies.

PART 1 – DIVING OPERATIONS

DATE: _____ TIME: _____ LOCATION: _____
 DIVING TEAM: _____ SUPERVISOR: _____
 PURPOSE OF DIVING OPERATIONS: _____
 PLANNED DURATION: _____

PART 2 – OOD/SWK

#	REQUIREMENT	INITIALS
1.	CO / XO Notified	
2.	Chief Engineer notified	
3. *	QHM/Port Authority Informed	
4. *	Adjacent Ships Informed / Diving Safety Checklist Obtained as applicable	
5. *	Appropriate diving signals/lights displayed	
6.	Anchors secured	
7.	Warning Pipe made	
*	* denotes applicable only for ship actually conducting diving operations	

PART 3 – EQUIPMENT TAG-OUT

7. A qualified MCR Watchkeeper shall ensure that the following systems have been tagged out.

#	DESCRIPTION	INITIALS
MACHINERY CONTROL ROOM (MCR)		
1.	Main Power & Propulsion Switchboard De-energized	
2.	Z-Drive Hydraulic Power Unit De-energized	
3.	Port & Stbd SCR Main Breakers Locked & Tagged Out	
4.	All Main Diesel Alternator crash stop buttons depressed	
5.	Auxiliary Diesel Alternator crash stop button depressed	
6.	Both Fire pumps placed in local control	
7.	“Diver Down” tags placed over the diesel control panel	
FORWARD MACHINERY ROOM (FMR)		
8.	FMR Sea suction and Overboard Discharge valves closed	
9.	Auxiliary Diesel Alternator Overboard Discharge closed	
10.	GSP Sea Suction and Overboard Discharge valves closed	
11.	Bilge Eductor Overboard Discharge closed	

12.		
AFTER MACHINERY ROOM (AMR)		
13.	AMR Sea Suction and Overboard Discharge valves closed	
14.	Sea Chest Cathodics (Cathelco) Off	
BOW THRUSTER COMPARTMENT		
15.	Hull & Fire Pump Sea Suction Valve closed	
FORWARD AUXILIARY MACHINERY ROOM (FWD AMR)		
16.	Hull & Fire Pump Overboard Discharge valve closed	

Notes:

1. Flow rate (litres/min) for Fire pumps IAW MCDV TDP for each pump are as follows:
 - a. Hull & Fire Pump (700 litres/minute); and
 - b. General Service & Fire Pump (700 litres/minute).

PART 4 - TAG OUT COMPLETE, WITH THE FOLLOWING EXCEPTIONS:

PART 5 - SIGNATURE BLOCKS

MCR Watchkeeper certifies the above systems in Part 3 have been Tagged Out except where stated in Part 4:

_____, _____, _____
(Print Name & Rank) (Signature) (Date and time)

SAFE TO DIVE STATEMENT (OOW/OOD/SWK)

I _____(OOD/OOW), confirm that _____
(Print Name & Rank) (Print Vessel's Name)

is safe for diving operations to proceed. Precautions listed have been taken and will remain in effect until notified by the Diving Supervisor, in person, that the diving operations are complete.

_____, _____, _____ (Print Name &
Rank) (Signature) (Date and time)

SAFE TO DIVE STATEMENT ACCEPTED: (DIVING SUPERVISOR)

_____, _____, _____ (Print Name &
Rank) (Signature) (Date and time)

Note: This completed form is to be retained by the Diving Supervisor until the completion of the diving operations. It then shall be forwarded to the unit Executive Officer and must be retained for one month after completion of the dive.

ANNEX C

VICTORIA CLASS - DIVING SAFETY CHECKLIST

Ref: D (http://halifax.mil.ca/SEA_TRG/documents/submarines/VCSOP_VOL2.pdf)

HMCS _____

REFS: A. B-GG-380-000/FP-002

B. ADivP-1(A)

1. All Diving Operations that take place on any submarine shall be planned IAW reference A and conducted IAW the following Diving Safety Checklist (DSC) which is promulgated in order to meet the requirements of reference A for CAF vessels. It must be completed before diving operations take place and shall be used as is and not modified in any way.

2. The OOW/OOD/SWK of the submarine conducting the diving operations is responsible for ensuring that:

- a. permission to dive has been obtained from QHM or relevant authority;
 - b. in Naval Ports, the Ops Room has been informed;
 - c. adjacent ships have been informed and have taken all necessary precautions and safety actions including tag-out for divers;
 - d. CAF vessels within 100m of the planned location have completed the applicable Diving Safety Checklist and non-CAF vessels completed the generic form from reference A or B;
 - e. in Non-Naval Ports, relevant authorities for the berth, dock, or port have been informed and have taken all necessary precautions and safety actions;
 - f. the ship is “tagged out” for diving IAW this Diving Safety Checklist, that parts 1 to 5 are completed and signed, and the Diving Supervisor advised of any exceptions or discrepancies;
 - g. appropriate signals (flag ALPHA during the day, RAM lights at night, shapes at sea) are displayed in the most prominent position available;
 - h. the diving team has been fully briefed by the OOD/Chief Engineer/Dive O on the tasks required;
 - i. a warning pipe is made to the ship’s company prior to Diving Operations commencing and then every 15 minutes whilst Diving Operations are taking place. “Diving precautions in effect, no bilges to be pumped, no tanks to be blown until further notice, Divers Down”; and
 - j. parts 1 to 5 of this Diving Safety Checklist are completed.
3. The OOW/OOD/SWK of an adjacent ship (i.e. not conducting diving operations but within 100m of the planned dive location) is responsible for ensuring that:

- a. the ship is “tagged out” for diving IAW this Diving Safety Checklist, that parts 1 to 5 are completed and signed as applicable, and the Diving Supervisor advised of any exceptions or discrepancies.

PART 1 - DIVING OPERATIONS

DATE: _____ TIME: _____ LOCATION: _____

PURPOSE FOR DIVING OPERATIONS: _____

PLANNED DURATION: _____

PART 2 – EQUIPMENT TAG-OUT

An SCC/MCC Watchkeeping Certificate holder shall be pre-arranged to ensure that the following systems have been tagged out. As well, the following must be completed:

1. “DIVERS DOWN” tallies on the SCC and MCC;
2. The remote control switches for the HP Bilge and HP Ballast Pumps on the SCC shall be tagged out by the use of one large “Tagged Out For Divers” tally;
3. The remote control switches for the Sea Water Pumps on the MCC shall be tagged out by the use of one large “Tagged Out For Divers” tally;
4. The rudder and hydroplanes at the OMC shall be tagged out by the use of one large “Tagged Out For Divers” tally; and
5. The Hydraulic Control Package (Port and Stbd) shall be tagged out by the use of one large “Tagged Out For Divers” tally.

WSC

INITIALS

TAG #	NAME / DESCRIPTION	POSITION	TALLIED
1	TOC	OFF	
2	EHS 830 SUPPLY TO WEAPONS DISCHARGE	SHUT	
3	WH 816 (1-6) SV, BC, & BS PACKAGE SUPPLY	SHUT	
4	ANCHOR WINDLASS BRAKE	ON	
5	HPB 816 FWD EMERG BLOW CONTROL V _v	SHUT	
6	SAN 803 LOW LEVEL HULL DISCH V _v	SHUT	
7	SAN 804 LOW LEVEL BACKUP DISCH V _v	SHUT	
8	LPB 901 #1 LP MASTERBLOW	SHUT	
9	LPB 902 #2 LP MASTERBLOW	SHUT	

ATP SPACE

INITIALS

TAG #	NAME / DESCRIPTION	POSITION	TALLIED
10	FOREPLANES LINKAGE ASSEMBLY	IN or OUT & ISOL	
11	WHDS PFV Hydels	SHUT	

MASTWELL & ELECTRICAL SPACE**INITIALS**

TAG #	NAME / DESCRIPTION	POSITION	TALLIED
12	SAN 601 LOW LEVEL HULL DISCH V _v	SHUT	
13	SAN 602 LOW LEVEL BACKUP DISCH V _v	SHUT	
14	GARBAGE EJECTOR	POS 2 & 3	

AMS**INITIALS**

TAG #	NAME / DESCRIPTION	POSITION	TALLIED
15	HP BALLAST PUMP STARTER SWITCH	LOCAL	
16	LP BLOWER STARTER SWITCH	OFF	

CONTROL ROOM**INITIALS**

TAG #	NAME / DESCRIPTION	POSITION	TALLIED
17	HPA 653 HP AIR SUPPLY TO AFTER PLANES	SHUT	
18	OMC RATE MAIN SWITCH	NORMAL	
19	HPB 601 & 602 EMERG. BLOW SELECTORS	SHUT	
20	SCC HP BALLAST PUMP STARTER SWITCH	OFF	
21	SCC HP BILGE PUMP STARTER SWITCH	OFF	
22	MAIN BLOWING / MAIN VENT PANEL	ALL SHUT	
23	HP BILGE / BALLAST BACKUP V _v PANEL	SHUT	
24	D TANK BLOW	SHUT	
25	778 ECHO SOUNDER	OFF	
26	780 ECHO SOUNDER	OFF	
27	2008 UWT	OFF	

ENGINE ROOM**INITIALS**

TAG #	NAME / DESCRIPTION	POSITION	TALLIED
28	HP BILGE PUMP STARTER SWITCH	LOCAL	
29	PORT ENGINE LCP	OFF	
30	STBD ENGINE LCP	OFF	

MOTOR ROOM**INITIALS**

TAG #	NAME / DESCRIPTION	POSITION	TALLIED
30	FWD & AFT MAIN MOTOR BREAKERS	OPEN	
31	HPB 216 AFT EMERG BLOW CONTROL V _v	SHUT	
32	LPB 903 #3 LP MASTERBLOW	SHUT	
33	LPB 904 #4 LP MASTERBLOW	SHUT	
34	HSD 219 RUDDER SUPPLY V _v	SHUT	
35	HS 265 SUPPLY TO EMERG STEERING	SHUT	
36	HSD 218 AFTER PLANES SUPPLY V _v	SHUT	
37	SHAFT LOCK	ENGAGED	
38	TURNING GEAR	DISENGAGED	

MAIN VENT STATUS**INITIALS**

#1 MAIN VENTS	SIGHTED HARBOUR COTTERED	
#2 MAIN VENTS	SIGHTED HARBOUR COTTERED	
#3 MAIN VENTS	SIGHTED HARBOUR COTTERED	
#4 MAIN VENTS	SIGHTED HARBOUR COTTERED	

PART 3 – OFFICER OF THE DAY/DUTY WATCH SUPERVISOR

No.	REQUIREMENT	INITIALS
1	CO / XO NOTIFIED	
2	MSEO/CSEO NOTIFIED	
3	QHM/PORT AUTHORITY INFORMED	
4	ADJACENT SHIPS INFORMED / TAG OUT SHEET OBTAINED	
5	FLAG ALPHA RAISED	
6	WARNING PIPE MADE EVERY 15 MINUTES	
7	NIGHT DIVE PRECAUTIONS MET	

PART 4 - TAG OUT COMPLETE, WITH THE FOLLOWING EXCEPTIONS:

--

PART 5 - SIGNATURE BLOCKS

SCC/MCC Watchkeeping Certificate Holder certifies the above systems in Part 2 have been Tagged Out.

(Print Name & Rank) (Signature) (Date)

SAFE TO DIVE STATEMENT (OOD/DWS)

I _____(OOD/DWS), confirm that _____

(Print Name & Rank) (Print Vessel's Name)

is safe for diving operations to proceed. Precautions listed have been taken and will remain in effect until notified by the Diving Supervisor, in person, that the diving operations are complete.

(Print Name & Rank) (Signature) (Date)

SAFE TO DIVE STATEMENT ACCEPTED: (DIVING SUPERVISOR)

(Print Name & Rank) (Signature) (Date)

This completed form is to be retained by the Diving Supervisor until the completion of the diving operation. It then shall be forwarded to the unit Diving Officer and must be retained for one month after completion of the dive.

Notes:

1. An individual diving safety checklist is to be completed by each unit on which diving is to be conducted and for all vessels within 100 meters of the planned dive.
2. Flow rate (liters/min) for sea water cooling pumps IAW BRF 1966(16)01 from each pump are as follows:
 - a. 2 pumps fast 1463;
 - b. 2 pumps slow 950; and
 - c. 1 pump slow 1250.

COMMENTS:

ANNEX D SMALL VESSEL CHECKLIST

Ref: B-GG-380-000/FP-002

NOTE 1: All vessels within 100 meters of any planned dive site are to complete a Diving Safety Checklist. NOTE 2: This Small Craft Diving Safety Checklist is intended to address safe clearance of small craft where the majority of equipment and machinery specified at Ref is not applicable.

NOTE 3: Small craft are defined as naval auxiliary vessels and civilian boats less than 100 ton that clearly do not incorporate the fitted machinery and underwater hazards that would be normally present on a ship.

NOTE 4: When doubt exists as to whether the vessel may be considered small craft – a Diving Safety Checklist shall be completed IAW the Ref.

NOTE 5: When multiple small craft are nested together under the charge on one Master/Captain/OPI, a single small craft Diving Safety Checklist may be used. All craft are to be listed and confirmed to be in the same safe to dive state.

A) TO BE COMPLETED BY DIVE SUPERVISOR:

1. LOCATION OF DIVE: _____
2. NAME OF VESSEL(S): _____ / _____ / _____
 _____ / _____ / _____
3. VESSEL'S CAPTAIN / OIC: _____
4. CONTACT INFO: _____
5. DATE / TIME: _____ / _____
6. DURATION: from _____ (local) / until _____ (local)
7. PURPOSE OF DIVE: _____
8. DIVING SUPERVISOR: _____
9. LOCAL HARBOUR AUTHORITIES (QHM) NOTIFIED _____
10. DIVING SIGNALS DISPLAYED: _____

B) TO BE COMPLETED BY VESSELS CAPTAIN / OIC:

11. MAIN ENGINES SHUT DOWN _____
12. THROTTLE CONTROL PIN IN: _____
13. IGNITION KEYS REMOVED: _____
14. AUXILLARY MACHINERY SHUT DOWN: _____
15. U/W INTAKES SECURED: _____
16. ALL MEANS OF OVERBOARD DISCHARGE ISOLATED: _____
17. RUDDER / Z DRIVE / IO LEG SECURED: _____
18. BOW THRUSRTER SECURED: _____
19. STABILIZERS / TRIM TABS SECURED: _____
20. CATHODIC PROTECTION OFF: _____
21. ALL U/W ELECTRONIC TRANSMISSION (sonar, etc) OFF: _____

I confirm that _____ is safe for diving operations as described above. Precautions listed have been taken and will remain in effect for the time period indicated or until notified by the dive supervisor (in person) that diving operations are complete. The following exceptions to (B) are noted as follows:

 Vessels Captain / OIC _____ Dive Supervisor: _____
Signature/date/time *Signature/date/time*

NOTE 6: the diving supervisor shall hold this completed form until completion of the dive. It must be retained for a period of one month upon completion of the dive. A completed copy shall be provided to the vessels Captain / OIC upon request.

ANNEX E NATO SAFE TO DIVE CERTIFICATE



NATO Safe-To-Dive Certificate

REFERENCES ADivP para 0201e

e.g. OPORD/Serial _____

FOR _____

Ship's name

START TIME _____ DTG (local times to be used)

COMPLETION TIME _____ DTG

OTHER UNITS INVOLVED (Ships adjacent or within 100 metres) _____

DIVING TASK

Purpose _____

Location _____

Port _____

Vessel(s) to be dived on (includes seabed under) _____

Berth _____

Area of Ship (if applicable) _____

Authorized Deviations from Standardized Safety Precautions _____

I certify that the diving team is properly equipped and trained to carry out the required task.

Signature of Diving Supervisor *Name & Rank*

It is certified that all required actions as stated on the attached checklist have been taken IAW: National Regulations / A DivP-1 para 0216 (delete one if applicable) to ensure that it is safe to dive on or in the vicinity of:

_____ during the period stated.

Signature of Commanding Officer *Name & Rank* *Date/Time*

NOTE: ADivP-1 is to be consulted, since NATO may have promulgated modifications to this procedure. Refer to Article 603. for additional Canadian Forces safety precautions applicable when diving on foreign vessels.



NATO Safe-To-Dive Certificate

PERIOD OF DIVING OPERATION _____ DTG to _____ DTG (local)

PURPOSE OF DIVING OPERATION

(what & where)

In all cases controls must be labelled 'TAGGED-OUT FOR DIVING OPERATIONS' to prevent inadvertent operation.

CHECKS TO BE COMPLETED

MECHANICAL ENGINEERING

- Propellers, other thrusters, rudder(s), stabilisers and other underwater moveable gear (e.g. S/M hydroplanes) **IMMOBILISED.**
- All underwater inlets and outlets rendered **INOPERATIVE** (particularly main circulators and boiler blow-down valves).
- Cathodic protection **SWITCHED OFF.**

COMBAT SYSTEMS

- No sonar transmissions to be made (includes fathometer/echo sounder & UWT).
- Sonar domes and probes **IMMOBILISED.**
- Inform Ship's Company at 15-minute intervals that diving operations are taking place.

- Diving signals displayed.
- Degaussing system **SWITCHED OFF.**
- Torpedo tubes rendered **INOPERATIVE** /tube caps **IMMOBILISED.**

DECK

- No heavy items to be deployed over the side or moved (e.g. anchors, boats, cargo & large fenders).
- No boat traffic to be permitted except for the diving safety boat(s).

GENERAL

- Local Port Authority informed and permission to dive obtained including confirmation that no operations hazardous to divers will be undertaken within 100 m of the dive site during the period of the dive (e.g. operation of dock inlets/outlets).

PERSONS RESPONSIBLE

Signature & DTG

Name & Rank

NOTE: The minimum safety requirements for diving on vessels are listed above. They also apply to other vessels within 100 metres of the diving operations. Additionally, nations may use these requirements as a basis for more detailed checklists that are ship or class-specific.