NATO STANDARD

MPP-02.3.2

SUBMARINE TRANSFER PROCEDURES

Edition (A) Version (2)

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NORTH ATLANTIC TREATY ORGANIZATION

MULTINATIONAL PROCEDURAL PUBLICATION

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NATO LETTER OF PROMULGATION

23 June 2016

1. The enclosed Multinational Procedural Publication MPP-02.3.2, Edition A, Version 2 – SUBMARINE TRANSFER PROCEDURES, which has been approved by the nations in the Military Committee Maritime Standardization Board, is promulgated herewith. The agreement of nations to use this publication is recorded in STANAG 1462.

2. MPP-02.3.2, Edition A, Version 2, is effective upon receipt and supersedes MPP-02.3.2, Edition A, Version 1, which shall be destroyed in accordance with the local procedure for the destruction of documents.

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4. This publication shall be handled in accordance with C-M(2002)60.

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NATO Nations, NATO Partner or Participating
Nation's Letter of Promulgation

RECORD OF RESERVATIONS

CHAPTER	RECORD OF RESERVATIONS BY NATION
Chapter 1	**FRA, TUR**
General	**GRC, ROU**

NOTE

THE RESERVATIONS LISTED ON THIS PAGE INCLUDE ONLY THOSE THAT WERE RECORDED AT TIME OF PROMULGATION AND MAY NOT BE COMPLETE. REFER TO THE NATO STANDARDIZATION DOCUMENT DATABASE FOR THE COMPLETE LIST OF EXISTING RESERVATIONS.

RECORD OF RESERVATIONS

RECORD OF RESERVATIONS BY NATION
FRA - a) 0103 Wind speeds: ¬Alouette 3: Wind speed shall not exceed 35 knots; ¬Lynx, Panther, Dauphin, EC225, NH90: Wind speed shall not exceed 45 knots. b) 0104 Submarine transfer point: French submarines use the fin for transfers. c) 0109 Helicopter essential information: The transfer location is determined with the agreement of the submarine CO.
GRC - Hellenic submarine conducts hoisting only to the forward casing and sets up a relative wind within 150°-210° off the bow. Transfers are not attempted, at sea state in excess of 4 and / or relative wind speed above 35 kts or during night time, unless operational or medical requirements impose so.
ROU - The standard can be implemented after the "Delfinul" submarine's refitting. Limitations are related to sea state and wind speed during transfer as well as the maximum diameter of materiel to be transferred.
TUR - a. Para (0103) The transfers for Turkish Submarines shall be conducted up to sea state 4. Ceiling/Visibility: The transfers for Turkish Submarines shall not be conducted below 500 ft ceiling and 1 NM visibility. b. (Para 0104) For Turkish Submarines; forward casting transfer should be conducted in conditions of maximum sea state 2. On sea state conditions 3-4, only transfer from conning tower/sail plane is used. When transferring from the sail planes, a submarine course providing relative wind of red 15-20 degrees is ideal. The helicopter aligns itself at 10 o'clock relative wind to the submarine's sail plane. c. (Para 0105 Night Submarine Transfers) For Turkish Submarines; transfers are limited

NOTE

THE RESERVATIONS LISTED ON THIS PAGE INCLUDE ONLY THOSE THAT WERE RECORDED AT TIME OF PROMULGATION AND MAY NOT BE COMPLETE. REFER TO THE NATO STANDARDIZATION DOCUMENT DATABASE FOR THE COMPLETE LIST OF EXISTING RESERVATIONS.

RECORD OF RESERVATIONS

RECORD OF RESERVATIONS BY NATION
TUR (cont) - to daytime only. d. (Para 0106 Equipment Considerations) Load and personnel transfers are possible up to 200 lbs (90 kg). When exceeding 200 lbs load, pilots and submarine should be informed beforehand. Maximum diameter of a load for Turkish Submarines is 60 cm.

NOTE

THE RESERVATIONS LISTED ON THIS PAGE INCLUDE ONLY THOSE THAT WERE RECORDED AT TIME OF PROMULGATION AND MAY NOT BE COMPLETE. REFER TO THE NATO STANDARDIZATION DOCUMENT DATABASE FOR THE COMPLETE LIST OF EXISTING RESERVATIONS.

RECORD OF OBSERVATIONS

RECORD OF OBSERVATIONS BY NON-NATO NATIONS

NATIONAL COMMENTS

NATO NATIONAL COMMENTS
CZE - The Armed Forces of the Czech Republic do not have Navy. This CZE replay is also valid for any RD of higher editions of this STANAG.
DNK - Currently the Danish Navy does not have any submarines. Subsequently the Danish helicopter training standard with submarines is insufficient, therefore transfer to/from submarines is only allowed in emergencies.
EST - Estonian Navy does not operate relevant capability.
FRA - a) ALFOST approval must be sought: - for any helicopter hoist on a French SSBN; - for any night helicopter hoist on a French submarine. b) Except for a proven operational or medical emergency, ALAVIA approval must be obtained for any night helicopter hoist by a French Navy helicopter on a submarine. In all cases, any hoist on a submarine is subject to a decision from the operational controller who shall first ensure that the crew is qualified. c) In the (FRA) note after paragraph 0104, read: “France only uses the fin for transfers.” d) Add a FRA note after paragraph 0109: “The transfer location is determined with the agreement of the French submarine CO.”.
HRV - The Croatian Navy currently doesn't have submarine and required equipment for submarine transfer procedures.
NLD - NLD will add a note to MPP02.3.2 pending the results of the test and evaluation program (NH90 versus Walrus class).
SVK - There are no Naval Forces in the structure of the Armed Forces of the Slovak Republic, no organizational branch, nor subject matter expert dealing with the issue listed in this STANAG. This reply is also valid for any RD of higher editions of this STANAG.

NATIONAL COMMENTS

NATO NATIONAL COMMENTS
SVN - SVN does not have means covered by this agreement.
USA - Change the following USA Note on page 6 of MPP-02.3.2: "NOTE (USA): Generally, US submarines will employ a wind-sock and, upon request, a smoke float to indicate wind direction and speed." To read: "NOTE (USA): Generally, US submarines will employ a wind-sock to indicate wind direction and speed." Rational: Smoke Floats were removed from the USA submarine's passenger transfer bag list of items.

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LIST OF REFERENCES

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2. AAP-06 – *NATO Glossary of Terms and Definitions (English and French)*

3. AFSP-2 –*Aircraft Marshalling Signals*

4. NAVAIR 00-80T-122 (USA) –*Helicopter Operating Procedures for Air-Capable Ships*

CONVENTIONS USED IN THIS PUBLICATION

RESERVATIONS AND OBSERVATIONS

NATO Reservations and Partner/Global HOSTAC Participating Nations' Observations will be delineated by their respective 3-letter national country code within the margin. Refer to the Record of Reservations and Observations for details.

CHANGE SYMBOLS

Revised text from new versions are indicated by a black vertical line in the margin of the page, like the one printed next to this paragraph. The change symbol indicates added or restated information. A change symbol in the margin adjacent to an annex number and title indicates a new or completely revised annex.

WARNINGS, CAUTIONS, AND NOTES

The following symbols and definitions apply to warnings, cautions, and notes used in this publication:

WARNING

AN OPERATING PROCEDURE, PRACTICE, OR CONDITION THAT MAY RESULT IN INJURY OR DEATH IF NOT CAREFULLY OBSERVED OR FOLLOWED.

CAUTION

AN OPERATING PROCEDURE, PRACTICE, OR CONDITION THAT MAY RESULT IN DAMAGE TO EQUIPMENT IF NOT CAREFULLY OBSERVED OR FOLLOWED.

NOTE

AN OPERATING PROCEDURE, PRACTICE, OR CONDITION THAT REQUIRES EMPHASIS.

WORDING

Word usage and intended meaning throughout this publication is as follows:

“Shall” indicates the application of a procedure is mandatory.

“Should” indicates the application of a procedure is recommended.

“May” and “need not” indicates the application of a procedure is optional.

“Will” indicates future time. It never indicates any degree of requirement for application of a procedure.

CHAPTER 1—STANDARD SUBMARINE TRANSFER PROCEDURES

0101 Purpose

The purpose of this standard is to establish guidelines for helicopter transfers to and from submarines. The safe transfer of equipment and personnel at sea is best accomplished by the establishment of basic procedures and standards to be used by both helicopter and submarine crews.

0102 Agreement GRC

Participation nations agree to adopt the submarine transfer procedures as laid out in this standard.

0103 General

Transfers of personnel to and from submarines should be planned with appropriate consideration to the increased difficulties presented by such operations; hoisting to a very small moving platform with greatly reduced pilot visual references makes this a challenging evolution even under favorable conditions. Major factors affecting transfers:

1. **Wind Speeds.** Wind speeds in excess of 20 knots significantly increase the risks involved in submarine transfers. FRA

2. **Sea States.** Routine transfers should not be attempted in sea states greater than four (4) using the World Meteorological Organization Sea State Code (Significant wave height 1.25-2.5 meters, sea state characterized as ‘moderate’). TUR

3. **Submarine Type.** Submarine type (and in some cases helicopter type) must be considered in determining the best transfer point, i.e. casings or fin (see **0104).**

4. **Planning, Coordination and Communications.** Sound planning/coordination and clear communications are essential; prior to actual pickup or delivery all items listed at **0108** should be determined along with additional considerations such as equipment provided by helicopter and/or submarine, order in which the transfer will proceed, ambulatory status of the passenger, equipment return, etc.

WARNING

MAST AND ANTENNA EXPOSURE BY THE SUBMARINE SHALL BE MINIMIZED TO ENHANCE VISIBILITY FROM THE BRIDGE, REDUCE THE RISK OF INJURY TO TRANSFER PERSONNEL, AND REDUCE THE CHANCE OF HOIST CABLE ENTANGLEMENT FROM THE HELICOPTER.

WARNING

AIRCREW SHALL BE VIGILANT IN MAINTAINING SAFE ROTOR CLEARANCE FROM SUBMARINE PERSONNEL AND FITTINGS AT ALL TIMES.

0104 Submarine Transfer Point **TUR**

National submarine transfer point locations are contained within the HOSTAC publication. In general terms a transfer point should maximize pilot/hoist operator visual references, minimize aircrew workload/fatigue and also be safe for deck personnel. There are a wide variety of submarine types and sizes but essentially three areas for transfer; the after casing, the forward casing and fin/conning tower:

1. **After Casing.** Hoisting from the after casing (deck area aft of fin, often referred to as the centre of the main deck – USA SSBN only) provides the Pilot and Hoist Operator relatively good visual references and, provides the best working position for the deck handlers. A submarine course which provides a relative wind of Red 15- 20 degrees at 10 – 20 knots is ideal. The helicopter aligns itself at 10 o'clock relative to the vessel's bow with the fin and forward casing as a hover reference, (see **Figure 1** 'after casing').

2. **Forward Casing.** Hoisting from the forward casing, (deck area forward of the fin), provides adequate visual reference for the

helicopter crew and an acceptable transfer position for the deck handlers. It requires that the submarine steer downwind providing a relative wind off the starboard quarter (Green 120-150 at 5-15kts). The helicopter aligns into the relative wind, at 4 o'clock relative to the sub's bow. The right seat pilot can use the after casing and possibly fin as hover references. There must be sufficient true wind to counter the submarine's movement downwind, (see **Figure 1**, 'forward casing').

3. **Conning Tower/Fin or Sail Planes.** Transfers from the Conning tower/sail planes are the most difficult and should only be conducted when adverse conditions prevent the use of either the Forward or After Casing and/or there is a justifiable requirement for medical, safety or operational reasons. Fin and sailplane surfaces are small and can exhibit considerable lateral movement with any appreciable submarine roll. Pilot visual references are reduced; that said, the submarine's course and relative wind must allow visual contact with some portion of the hull/casing throughout the evolution. A relative wind from the starboard quarter (Green 120-150 at 10-15 kts) will enable the right seat pilot to use the after casing as a hover reference. The helicopter aligns itself into the relative wind, similar to Figure 1 'forward casing'. In the case of large USA nuclear submarines, hoisting to the port or starboard sail plane is another option. When hoisting to the port sail plane (or cockpit area of the fin), the submarine positions itself with a relative wind of Green 10-40 at 15-20 kts. The helicopter takes position on the submarine heading into wind and conducts the transfer to either surface. When hoisting to the starboard plane, the submarine manoeuvres downwind at slow speed. As in paragraph 0104.2 above, minimum true wind speed should be sufficient to allow the sub to maintain accurate steerage while providing a relative wind from 160 to 200 degrees. The helicopter aligns parallel right, facing aft. **FRA**

NOTE:

The helicopter orientation/relative winds recommended above are for aircraft with a starboard side hoist and counter-clockwise main rotor rotation. For helicopters configured in a different manner aircrew should inform the submarine in advance stating preferred hoist location and/or relative wind.

NOTES (DNK):

Currently the Danish Navy does not have any submarines. Subsequently the Danish helicopter training standard with submarines is insufficient, therefore transfer to/from submarine is only allowed in emergencies.

NOTES (FRA):

a) During transfers, Alouette 3 wind speed shall not exceed 35 knots; Lynx, Panther, Dauphin, EC225, and NH90 wind speed shall not exceed 45 knots.

b) France only uses fin for transfers.

c) The transfer location is determined with the agreement of the French submarine CO.

d) ALFOST approval must be sought:
- **for any helicopter hoist on a French SSBN**
- **for any night helicopter hoist on a French submarine.**

e) Except for a proven operational or medical emergency, ALAVIA approval must be obtained for any night helicopter

hoist by a French Navy helicopter on a submarine. In all cases, any hoist on a submarine is subject to a decision from the operational controller who shall first ensure that the crew is qualified.

NOTES (GRC):

a) Hellenic submarines conduct hoisting only to the forward casing and set up a relative wind within 150°-210° off the bow.

b) Transfers are not attempted, at sea state in excess of 4 and/or relative wind speed above 35 kts or during night time, unless determined by operational or medical requirements.

NOTES (ITA):

Italy has the following restrictions on submarine transfers:

a) Sea state max 3/true wind max 25 kts/relative wind max 30 kts.

b) The sub will normally set up for a relative wind 80-90 degrees off the bow.

c) Night transfers and transfers by cargo hook are not allowed.

NOTES (ROU): **ROU**

The standard can be implemented after the "Delfinul" submarine's refitting. Limitations are related to sea state and wind speed during transfer as well as the maximum diameter of material to be transferred.

NOTES (TUR):

a) Transfers for Turkish submarines shall be conducted up to sea state 4. Ceiling/Visibility: The transfer shall not be conducted below 500 ft ceiling and 1 NM visibility.

b) Forward casing transfers should be conducted in conditions of maximum sea state 2. For sea state 3-4, only conduct transfer from conning tower/sail plane. When transferring from sail planes, a course providing relative winds of red 15-20° is ideal. The helicopter aligns itself at 10 o'clock relative wind to the submarine's sail plane.

c) Transfers are limited to daytime only.

d) Load and personnel transfers are possible up to 200 lbs (90 kg). When exceeding 200 lb loads, pilots and submarine should be informed beforehand. Maximum diameter of a load is 60 cm.

NOTE (USA):

Generally, US submarines will employ a wind-sock to indicate wind direction and speed.

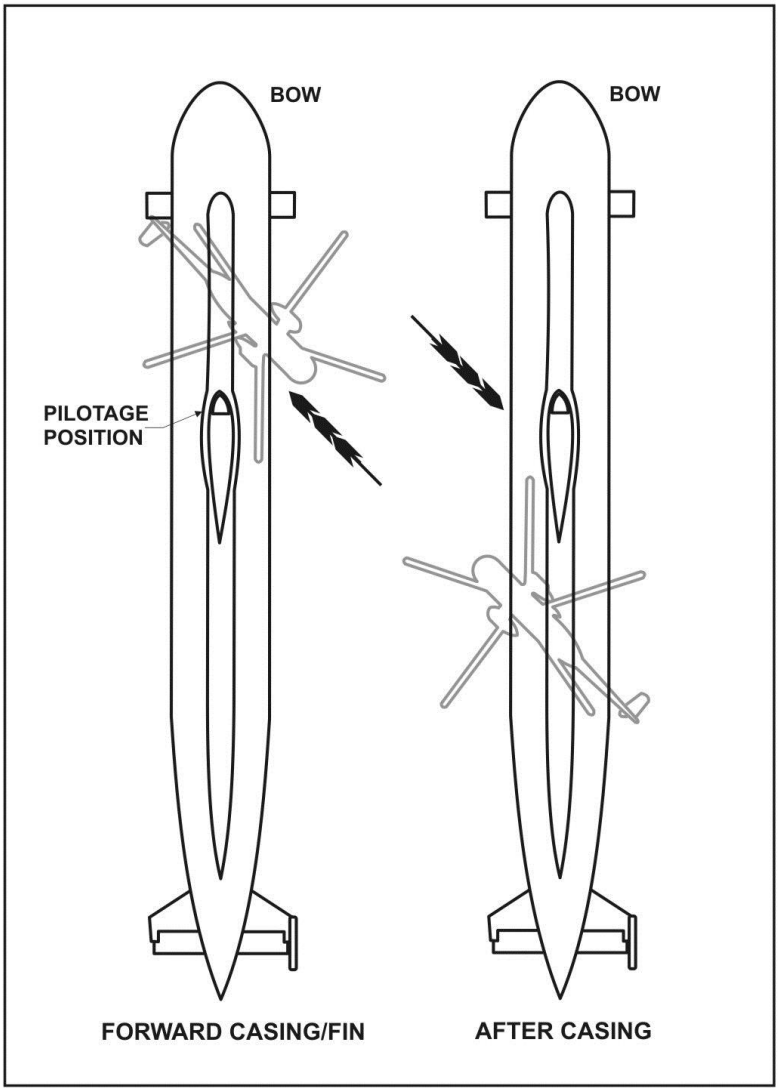


Figure 1 Submarine Transfer Points

0105 Night Submarine Transfers TUR

WARNING

NIGHT TRANSFERS TO SUBMARINES ARE EXTREMELY CHALLENGING AND SHALL ONLY BE ATTEMPTED WHEN DEALING WITH AN EMERGENCY OR OPERATIONAL IMPERATIVE. SOME NATIONS DO NOT ALLOW NIGHT TRANSFERS, SEE HOSTAC.

Relative wind parameters will be the same as those for daylight operations. The submarine should attempt to rig lighting that will illuminate the top of the fin, sail planes (as applicable), and the afterdeck. A small light should be attached to the highest point of the submarine. The helicopter may illuminate flood or hover lights to provide visual reference with the submarine.

0106 Equipment Considerations TUR

When preparing for a cross operational MEDEVAC it is essential that, prior to flight operations the submarine and helicopter crews specify which party is to supply the stretcher. The helicopter operator's stretcher basket shall be used whenever possible as this will avoid uncertainty related to either the hook up, or the stretchers stability while subject to rotor downwash. In exceptional circumstances (helicopter operators stretcher is unavailable, will not fit through the submarines hatches, medical considerations, etc.) the submarines

stretcher may be used, but only with the knowledge and consent of both the submarine CO and the Aircraft Captain.

WARNING

EXERCISE CAUTION WHEN USING UNFAMILIAR AND/OR NON-AIR CERTIFIED STRETCHER BASKET; CLOSELY MONITOR FOR ANY INSTABILITY DURING THE HOIST SEQUENCE.

0107 Communications

1. The submarine, in its rendezvous message, will have assigned UHF/VHF radio frequencies to guard. Short-duration communications should be established to confirm the details of the transfer. Operational security considerations may dictate a minimum of radio communications.

2. The primary signals used by the submarine VERTREP Control Officer and response by pilot, during the transfer are provided in **Figure 2**. These hand signals conform with ICAO signals and AFSP-2.

0108 Execution

When the submarine is ready for transfer, the helicopter will be informed by radio and/or the appropriate transfer signals. Initial communications between the helicopter and the submarine should

clearly establish, as a minimum, the intentions and conditions for the transfer including:

1. Transfer type (i.e. horse collar, stretcher, weighted bag, use of guideline etc.);

2. Flying course;

3. Relative wind and true wind;

	Signal	**Meaning/ Intention**	**Marshalling Signal**
DAY	Hand raised, thumb up or, green flag/paddle (USN). Aircrew: One flash. Conforms with ICAO signal	Ready for Transfer	1  AFFIRMATIVE (ALL CLEAR)
NIGHT	Same as day signal, with wand/light held as extension of arms or, green wand (USA)	Ready for Transfer	
DAY	Arm held out, hand below waist level, thumb turned Downwards or,red flag/paddle (USA) Aircrew: Steady light	Negative (Not Clear)	2  NEGATIVE (NOT CLEAR)
NIGHT	Same as day signal with wand/light held pointing Down or, red wand (USA).	Negative (Not Clear)	

Figure 2 Submarine Transfer Signals

4. maximum pitch and roll;

5. Load type and weight;

6. Hoist position (i.e. after casing, fwd casing, sail etc.);

7. Submarine position; and

8. Man overboard recovery procedure.

0109 Helicopter Essential Information

In addition, the helicopter should pass essential information to the submarine, including own position relative to the submarine, call sign, aircraft type, number of personnel onboard, fuel state, port or starboard hoist fitting as appropriate, weather in vicinity of transfer position and heading and altitude. In most instances, the helicopter will determine the location of the hoist transfer position to the submarine, taking into account the sea conditions, visibility and reference points for safe hovering and transfer conditions. **FRA**

0110 The Transfer

Once ready in all respects for the transfer, the submarine will advise the helicopter of the numbers and order the helicopter “DELTA HOVER”. The helicopter will conduct an approach to a point where the VERTREP Control Officer (VCO) and the transfer point are visible. The VCO initiates the transfer by providing the affirmative signal. The helicopter will move over the designated hoisting location, and lower the hoist and/or guideline. As the hook/guideline approaches the deck the deck handlers move underneath. The ground personnel grounds the hoist cable, gains control of the cable,

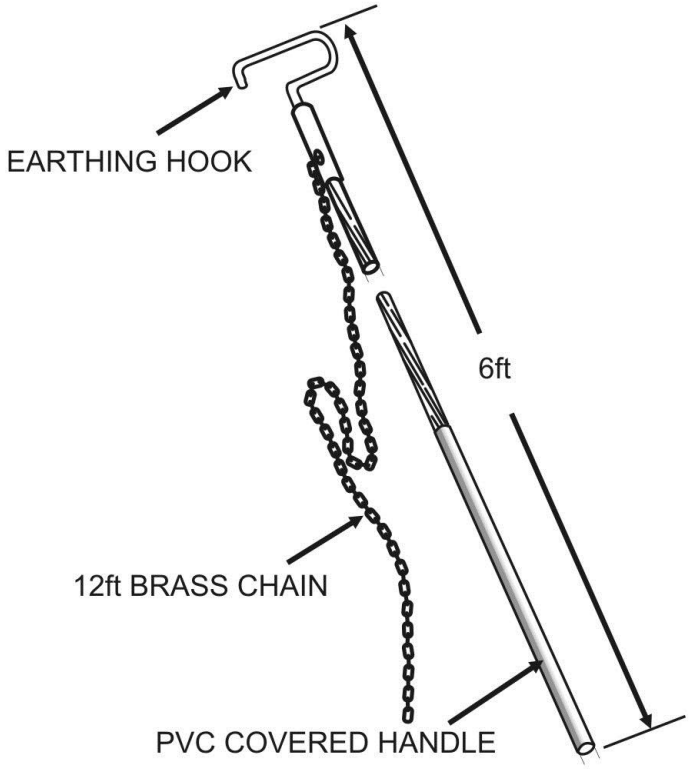
and completes the hook up or release of the horse collar/stretcher or weighted bag.

WARNING

HELICOPTERS IN FLIGHT CAN BUILD UP A CONSIDERABLE CHARGE OF STATIC ELECTRICITY, THEREFORE THE HELICOPTER HOIST CABLE AND HOOK/LOAD SHALL BE GROUNDED PRIOR TO ANY PERSONNEL TOUCHING IT. THIS IS ACCOMPLISHED BY GROUNDING THE CABLE VIA A GROUNDING WAND (ALSO KNOWN AS AN EARTHING POLE), WHICH IN ITSELF IS BONDED TO A SUITABLE PART OF THE SUBMARINE STRUCTURE.

FAILURE TO DO SO CAN EXPOSE PERSONNEL TO SIGNIFICANT STATIC DISCHARGE.

INFORMATION ON THIS GROUNDING WAND IS FOUND AT FIGURE 3.



A grounding wand or earthing pole consists of a 1-inch diameter hardwood pole with one end covered in PVC tubing for a length of 36 inches to form an insulated handle, while the other end is fitted with a bolted-on steel collar to which a steel grounding hook is welded. A twelve-foot (or longer as required), length of brass chain is secured to the collar for grounding/earthing the hook to the deck.

Figure 3 Grounding Wand/Earthing Pole

NOTE:

Hoists from the fin or submarine casing are generally conducted using a smaller party due to the confined spaces involved. In all instances the submarine will employ national procedures. Consideration should be given to using a guideline to expedite the transfer.

CHAPTER 2—EMERGENCY PROCEDURES

0111 Submarine Emergencies

WARNING

THE SUBMARINE SHALL NOT RAISE MASTS, FIRE SSES OR BLOW BALLAST TANKS UNTIL THE ROTOR ARC IS CLEAR OF THE CASING AND FIN.

Submarine emergency response may require the raising of masts, the blowing of ballast or other actions that would prove hazardous to a helicopter hovering overhead or near the fin. In the event of a submarine emergency the VCO should immediately wave off the helicopter.

The helicopter should:

1. Complete the stage of the hoist being conducted;

2. Move well clear of the submarine as soon as practicable; and;

3. Await direction from the submarine.

0112 Man Overboard

In the event of a man overboard the Submarine Rescue Swimmer will likely be deployed to provide assistance. The submarine CO will

determine the specific recovery method taking into account sea state, temperature, post-rescue medical intentions etc., with appropriate input from the Helicopter Crew Commander. Recovery actions should be promulgated prior to commencing the hoist transfer.

0113 Helicopter Emergencies

In the event of a minor engine or flight control malfunction the helicopter crew will normally complete the present stage of the hoist, declare an emergency and recover. Emergencies involving engine failure or a significant flight control malfunction may require the helicopter to depart the hover or, immediately conduct a forced water landing. The submarine deck team and VCO should be aware of any noticeable change in engine noise or flight profile as it may indicate a developing problem. If the malfunction requires an immediate forced landing the helicopter crew will:

1. Cut the hoist cable if required; and

2. Attempt to move clear of the submarine before settling to the water.

0114 Hoist Malfunction

In the event of a hoist malfunction the crew will cease hoisting, analyze the problem and begin rectification which may include:

1. Manual recovery of cargo or personnel that have been partially lowered/raised to/from the deck, weight permitting; or

2. Conning the helicopter to a lower hover in order to place the personnel or cargo on the deck, due to weight limitations; and

3. Increasing aircraft altitude and repositioning over the water in order to commence conning to a low hover, and cutting the cable to drop the personnel or cargo in the water for recovery by the submarine.

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