NATO STANDARD

MPP-02, VOLUME I

HELICOPTER OPERATIONS FROM SHIPS OTHER THAN AIRCRAFT CARRIERS (HOSTAC)

Edition (H) Version (1)

APRIL 2017

NORTH ATLANTIC TREATY ORGANIZATION

MULTINATIONAL PROCEDURAL PUBLICATION

Published by the
NATO STANDARDIZATION OFFICE (NSO)

INTENTIONALLY BLANK

April 2017

PUBLICATION NOTICE

1. MPP-02(H)(1), Volume I, HELICOPTER OPERATIONS FROM SHIPS OTHER THAN AIRCRAFT CARRIERS (HOSTAC), is effective upon receipt. It supersedes MPP-02(G)(3).

2. Summary of changes:

a. General: Removes maritime VSTOL data throughout the publication, including Chapter 3 and Annex 3A.

b. Chapter 1, Article 0105, incorporates assurance questions for crossdeck procedures.

c. Chapter 1, relocates and updates Sections II, III, and IV to new annexes: IAN Annex 1A; PAC Annex 1B; and ME Annex 1C.

d. Chapter 1, Article 0117, updates crossdeck operations report.

e. Chapter 2, Article 0201, updates face-to-face brief.

f. Chapter 2, Article 0236, updates HOSTAC SHOL.

g. Chapter 2, Article 0239, updates aircraft approach, landing, and departure.

h. Chapter 2, Annexes 2C thru 2G, removes superseded material for HOSTAC SHOL.

i. Chapter 4 (now Chapter 3), Article 0403 (now Article 0303), updates marshaling signals to align with AFSP-2 and ICAO.

j. Editorial corrections update the lexicon and references throughout the publication.

This notice will assist in providing information to cognizant personnel. It is not accountable.

INTENTIONALLY BLANK

NORTH ATLANTIC TREATY ORGANIZATION (NATO)

NATO STANDARDIZATION OFFICE (NSO)

NATO LETTER OF PROMULGATION

11 April 2017

1. The enclosed Multinational Procedural Publication, MPP-02, Volume I, Edition H, Version 1, HELICOPTER OPERATIONS FROM SHIPS OTHER THAN AIRCRAFT CARRIERS (HOSTAC), which has been approved by the nations in the Military Committee Maritime Standardization Board (MCMSB), is promulgated herewith. The agreement of nations to use this publication is recorded in STANAG 1194.

2. MPP-02, Volume I, Edition H, Version 1, is effective upon receipt and supersedes MPP-02, Edition G, which shall be destroyed in accordance with the local procedure for the destruction of documents.

3. No part of this publication may be reproduced, stored in a retrieval system, used commercially, adapted, or transmitted in any form or by any means, electronic, mechanical, photo-copying, recording or otherwise, without the prior permission of the publisher. With the exception of commercial sales, this does not apply to member or partner nations, or NATO commands and bodies.

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

Dieter Schmaglowski
Deputy Director NSO
Branch Head P&C

Edvardas MAŽEIKIS
Major General, LTUAF
Director, NATO Standardization Office

INTENTIONALLY BLANK

RECORD OF RESERVATIONS

CHAPTER	RECORD OF RESERVATIONS BY NATIONS
Chapter 2	GBR
Chapter 2	USA
General	LTU

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 DATABASE FOR THE COMPLETE LIST OF EXISTING RESERVATIONS.

RECORD OF RESERVATIONS

NATION	SPECIFIC RESERVATIONS
GBR	Para 0204. Deck Markings. Sub Para 6. Vertical Replenishment Markings. GBR ships with Flight Decks do not use the Rotor-Centre Limit-Line Markings (STANAG 1162 - GBR RATIFYING BUT NOT PARTICIPATING). GBR standard VERTREP delivery point for ships with flight decks is the centre of the landing circle (off-set to avoid deck lock grids)/spot number (multi spot ships) or as directed by the Flight Deck Officer. Small Ships without Flight Decks but having designated VERTREP/transfer decks may be marked using Rotor-Center Limit-Line Markings or a “hoist mark.”
USA	a. Paragraph 0227, subparagraph 2: USA does not incorporate altitude criteria. Lateral separation is based on 50 miles vice 40. b. Paragraph 0236 page 2-31- HOSTAC Crossdeck Ship Helicopter Operating Limits as follows: Reservations (1) USA H-60s shall utilize the SHOLs in 0236 when conducting multinational HOSTAC crossdecks. Until the required engineering analysis is performed, all other USA aircraft types shall continue to employ the more restrictive USA General Envelope (modified for HOSTAC Operations) as contained in the MPP-02.2 USA National Data Section. (2) Based on engineering analysis, the CG-52 and LPD-17 classes shall employ a modified HOSTAC SHOL IAW 0236 as per MPP-02.1 USA National Data Section, when conducting HOSTAC crossdecks with non-USA aircraft. (3) With the exception of USA CG-52 and LPD-17 classes, all other USA ship classes shall employ the more restrictive USA General Envelope (modified for HOSTAC Operations) until the required engineering analysis is performed. These more restrictive envelopes are contained in MPP-02.1 USA National Data Section. (4) All SHOLs and USA General Envelopes (modified for HOSTAC Operations) contained in the MPP-02.1 USA National Data Section shall contain the following pilot Warning: THE PILOT SHALL DETERMINE THE OPERATING LIMITS REQUIRED TO PROVIDE ADEQUATE THRUST MARGINS (AS DIRECTED BY NATIONAL PROCEDURES) FOR THE LAUNCH AND RECOVERY TAKING INTO ACCOUNT RELATIVE WIND, TURBULENCE, SHIP MOTION, AND ENVIRONMENTAL CONDITIONS. c. Figure 2-12 page 2-51: Nonstandard outbound leg from USA procedures. USA outbound leg is 180° REL from BRC.
LTU	The Lithuanian Naval Forces doesn’t have ships with helipads and can conduct only VERTREP type operations.

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 DATABASE FOR THE COMPLETE LIST OF EXISTING RESERVATIONS.

RECORD OF OBSERVATIONS

NATION	SPECIFIC OBSERVATIONS
BRA	1. Chapter 2, Article 0204—Deck Markings: Brazilian Navy reserves the right to use two types of marks. 2. Chapter 2, Article 0204—Deck Markings, and Article 0241—Helicopter In-Flight Refueling Procedures: Brazilian Navy does not implement HIFR marks and lighting. Night fueling is performed only in emergency. 3. Chapter 2, Article 0206—Flight Deck Clothing: Maintenance crews use brown surcoat and headgear.
JPN	Chapter 2, Article 0236 page 2-31: HOSTAC Crossdeck Ship Helicopter Operating Limits, to: 1. Until the Japan Maritime Self Defense Force completes the engineering/dynamic interface testing to generate Ship Helicopter Operating Limits (SHOLs) for each of its ship classes, the JMSDF shall use the launch and recovery envelopes contained within the JPN national section of the MPP-02.1 and MPP-02.2 for all cross-deck helicopter operations that involve JMSDF ships or aircraft. These day and night envelopes (including pitch and roll limits) are derived directly from the instruction of Chief of Staff, Commander Fleet Air Force, JMSDF. These envelopes, for purposes of HOSTAC operations, will be referred to as the JPN generic HOSTAC SHOL (day/night). For cross-deck operations involving JMSDF ships, the SHOL used for these cross-deck operations shall never be greater than the JPN Generic HOSTAC SHOL, but may be more restrictive due to the visiting non-JPN helicopter's low speed factors, and power/weight limitations. 2. JMSDF has established Ship Helicopter Operating Limits (SHOLs) for each JMSDF helicopter operating with each air capable ship class. SHOLs are contained within the flight deck rules specific to each ship. EH-101, MH-53, or H-60 aircrews shall use the appropriate SHOL specific to the ship they are operating with when conducting cross-deck operations. Specific SHOLs will be provided to aircrews from the host ship prior to flight operations. Chapter 2, Article 0251 HOSTAC Deck Standard for Pilots Cross-Operating in the Maritime Environment: 1. INITIAL QUALIFICATION paragraph 4, 2nd sentence, delete "or suitably experienced"; must be a qualified instructor only. 2. CURRENCY paragraph 6. Initial qualification is valid for a period of 1 year for "HOSTAC Deck Day," and 90 days for "HOSTAC Deck Night." Table 2-5 minimum landings are 2 Day, 2 Night, and N/A NVD. 3. REVALIDATION paragraph 7, 2nd sentence, delete "or suitably experienced"; must be a qualified instructor only.

NOTE

THE OBSERVATIONS LISTED ON THIS PAGE INCLUDE ONLY THOSE THAT WERE RECORDED AT TIME OF PROMULGATION AND MAY NOT BE COMPLETE.

RECORD OF COMMENTS

NATION	SPECIFIC COMMENTS
EST	Estonian naval vessels do not have helicopter landing areas.
FRA	Chapter 2, figure 2-1. Face-to-Face Brief: in the sentence « In order to familiarize aircrews/deck crews with the aviation facilities/helicopter of the ship being visited, a face-to-face briefing shall be conducted before pre-planned crossdeck operations », France recommends replacing the verb « shall » by the verb « should » in the next version of MPP-02, because this briefing cannot be done in particular conditions (ship at sea without stopovers, limited communications with the outside world, etc.).
HRV	Reaching of the initial capabilities and maintaining of the same require significant resources and intensive cooperation with allied countries whose navies have adequate ships. The Republic of Croatia will implement this standardization document after fulfilling necessary organizational, material and financial requirements for its adoption.
HUN	Hungarian Defence Forces does not have the skills and tools contained in the standard.
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.

NOTE

THE OBSERVATIONS LISTED ON THIS PAGE INCLUDE ONLY THOSE THAT WERE RECORDED AT TIME OF PROMULGATION AND MAY NOT BE COMPLETE.

NATO NATIONS
EACH NATION SHOULD SUBSTITUTE ITS OWN
NATIONAL LETTER OF PROMULGATION IF REQUIRED

INTENTIONALLY BLANK

TABLE OF CONTENTS

Page No.

CHAPTER 2—COMMON SHIPS' AVIATION FACILITIES AND OPERATING PROCEDURES FOR CROSS OPERATIONS

SECTION I—STANDARDS FOR SHIP/AIRCRAFT INTEROPERABILITY

SECTION II—GENERAL OPERATIONAL INFORMATION

SECTION III—AIR TRAFFIC CONTROL PROCEDURES

SECTION IV—HELICOPTER CROSS OPERATIONS TO AIR-CAPABLE SHIPS

Page No.

SECTION V—HOSTAC CROSS-OPERATING STANDARDS AND TRAINING

SECTION VI—SAFETY PRACTICES, PROCEDURES, AND STANDARDS

SECTION VII—AIRCRAFT EMERGENCY PROCEDURES

SECTION VIII—ON-DECK SECURING, SERVICING, AND SUPPORT INFORMATION

IAN ANNEX 2A—INTER-AMERICAN NAVIES COMMON AVIATION FACILITIES AND OPERATING PROCEDURES FOR CROSS OPERATIONS UNDER HOSTAC GUIDELINES

ANNEX 2B—STANDARD SCA PROCEDURE

CHAPTER 3—MISCELLANEOUS AND REFERENCE DATA

Page No.

IAN ANNEX 3A—INTER-AMERICAN NAVIES REFERENCE DATA

ANNEX A—STANDARDS FOR HOST SHIP'S AVIATION FACILITIES

LEXICON

LIST OF ILLUSTRATIONS

Page No.

LIST OF TABLES

Page No.

CONVENTIONS USED IN THIS PUBLICATION

CHANGE SYMBOLS

Revised text in changes is indicated by a black vertical line in either 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 the chapter number and title indicates a new or completely revised chapter.

WARNINGS, CAUTIONS, AND NOTES

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

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.

INTENTIONALLY BLANK

CHAPTER 1 General Information

SECTION I—BASIC HOSTAC GUIDELINES

0101 HOSTAC Operations

1. For a wide range of reasons, it can become necessary for a shipborne helicopter of one nation to operate (or, to use the term employed in these manuals, to cross operate) with a ship of another nation.

2. Routine day-to-day, short-term requirements frequently make helicopter cross operations necessary. The requirements are sometimes humanitarian, as in the transfer of a sick or injured person to more suitable facilities. Often, operational requirements arise, typically for purposes of refueling or emergency repair, for delivery of critically needed materials by VERTREP, or for landing to pick up transiting personnel. In short, wherever one finds it necessary or convenient to operate helicopters to and from the decks of one's own ships, similar situations may make it necessary at some time to operate to and from the decks of ships of other nations.

0102 HOSTAC Program

1. The HOSTAC program is made up of four regional working groups that use the same standards and publications to facilitate crossdeck operations. The multinational HOSTAC publication, MPP-02, Volume I, is produced by NATO and non-NATO international working groups: NATO, Inter-American Navies (IAN), Middle East, and Pacific (PAC). MPP-02, Volume I, is supported by technical supplements, MPP-02.1, Volume I, MPP-02.1.1, and MPP-02.2, that contain national technical data supplied by nations. These publications are gathered in the HOSTAC Electronic Supplement.

2. To cross operate safely and efficiently, standardization of as many procedures and as much hardware as possible is highly desirable. However, two other items are mandatory for any cross operation. They are:

   a. Detailed knowledge of the receiving ship's landing areas, support facilities, deck markings, location of obstructions, and other physical details that affect the helicopter landing environment.

   b. Detailed knowledge of the helicopter that will be coming aboard, including rotor diameter, gross weight, fuselage length, landing gear specifications, and service requirements, where appropriate.

3. This information must be made available to all parties involved in a cross operation before the actual cross operation can take place. No operation can begin until the receiving ship is satisfied that the helicopter will indeed fit its landing facilities without striking an obstacle or that its helicopter deck can withstand the weight of the arriving helicopter. And no helicopter pilot can be expected to attempt a landing or VERTREP until he is familiar with the deck markings of the host ship, its navigational aids, and the landing area and VERTREP operating area clearances he can expect to find.

4. To aid a participating nation in assembling and maintaining the relevant data on its ships and helicopters for inclusion in the multinational HOSTAC publications, data collection forms (Figures 1-2 and 1-3) and methods of submission are provided in the last section of this chapter. Figure 1-2 details all of the information required about the host ship. Figure 1-3 details all of the information required about the guest helicopter. The completed data sheets are exchanged between nations so that the basis for ship/helicopter interoperability can be technically established. This information is then compiled within the Ship/Aircraft Interoperability Matrix, located in MPP-02.1.1.

5. Because the data supplied in the completed Figures 1-2 and 1-3 is relatively complex, approval of safety and suitability of the particular combination of ship and helicopter requires detailed technical analysis, often by technically oriented organizations, and cannot be determined on the spot. Therefore,

long-term advance planning before any cross operation is essential. However, once the ship and helicopter combination is approved for interoperations by any two nations, authority to cross operate can be granted by each agreeing nation's national authority.

6. The basic principle in HOSTAC operations is that the guest helicopter always uses the approach, landing, and deck handling procedures of the host ship. Thus, a successful cross operation requires the exchange of this information between the guest helicopter and the host ship. This information is in general national information and isn't ship and aircraft specific, as is the information required in Figures 1-2 and 1-3. A participating nation provides either all relevant information concerning its own unique operating procedures or a combination of references to agreed-upon operating procedures and its own unique operating procedures for inclusion in the technical supplements.

0103 Information Exchange

1. The HOSTAC Program provides a forum for standardizing procedures and hardware for helicopter and ship cross operations among different nations. Once national ship, helicopter, and procedural data is gathered and compiled, the HOSTAC Program makes it available to nations through the multinational HOSTAC publications. Since these publications are intended to provide all the technical and operational data necessary for safe helicopter cross operations, periodic face-to-face meetings of representatives from participating nations is desirable, so that items of mutual interest can be discussed and any problem resolved.

2. To make the multinational HOSTAC publications more useful and reflective of cross-operating practices, both helicopter and shipboard users of these publications are urged to complete a cross-operating report form upon completion of any helicopter cross operation. These forms provide a valuable input to participating nations that are making an effort to standardize and optimize shipboard and helicopter procedures. Figure 1-5 shows an example form. An electronic form is provided in this publication and should be submitted by the cross-operating ship and helicopter. Reports should be forwarded through the national chain of command and then forwarded to the NSO HOSTACWG Secretary. To help with the collation of crossdeck reporting, the recommended document file naming convention is:

YYYYMMDD-N1-AC/SH-N2-AC/SH-XDECK

Example: 20120320-CHL-COCHRANE-GBR-LYNX8-XDECK

1. YYYY=year—MM=month—DD=day
2. N1=nation reporting crossdeck (3-letter code)
3. N2=other nation taking part
4. AC=aircraft—SH=ship

0104 Organization of Multinational HOSTAC Publications

The multinational HOSTAC consists of four parts: the basic publication, MPP-02, Volume I; three technical supplements: MPP-02.1, Crossdeck Operations Technical Supplement: National Procedures and Ship Data; MPP-02.1.1, Ship/Aircraft Interoperability Matrix and Advance National Information; MPP-02.2, Crossdeck Operations Technical Supplement: National Aircraft Data; and an addendum: MPP-02.3, Crossdeck Addendum.

1. Basic Publication. The basic publication provides descriptive and procedural information required for ships and helicopters of two or more nations to cross operate safely and efficiently together. It includes agreed-upon standardized ship configurations and operating procedures.

2. Technical Supplements. The technical supplements provide specific information on each nation's helicopters and ships.

Note. *Multinational HOSTAC publications are not intended to support a capability for long-term helicopter deployment. The operations envisaged would be limited to less than 24 hours or overnight. Operations beyond 24 hours are considered to be a deployment and would require more extensive logistic and personnel support planning.*

3. Crossdeck Addendum. The crossdeck addendum provides additional supporting standards to the basic publication.

4. Organization of Basic Publication

a. The basic publication contains information relative to all areas of helicopter and ship cross operations. It is the guiding procedural document for all cross operations involving helicopters.

b. Chapter 1 contains general information including guidelines and standards, and cross operations procedures and forms.

c. Chapter 2 covers common information on ships' aviation facilities and operating procedures.

(1) The commonalties provided in the HOSTAC Program developed over time through the use of Standardization Agreements (STANAGs). STANAGs are unique because they are the only consistent set of documents to resolve problems of helicopter cross operations beyond the national level.

(2) Many of the STANAGs have been adopted by nations other than those in NATO as a basis for their own cross operations. Nations participating in the HOSTAC Program may voluntarily adopt the STANAGs as their own standards for ship construction and operation when and as they see fit.

d. Chapter 3 is a compilation of data that is helpful to mission planners, including a preflight briefing checklist, metric to non-metric conversion tables, marshaling signals, and other information.

e. Annex A provides information on standardization of aviation equipment and facilities aboard host ships and the requirements for inspection.

5. Organization of Technical Supplements. The technical supplements provide all the ship and helicopter technical data that have been compiled from information submitted by nations using Figures 1-2 and 1-3.

a. MPP-02.1 includes national procedures and ship data. Data on ship decks, aviation facilities and operating procedures, and procedures for operations with aircraft carriers from MPP-02.1 may be carried on board the guest helicopter for in-flight reference.

b. MPP-02.1.1 includes the ship/aircraft matrix, as well as advance national data. As specific ship and helicopter combinations are approved for use and agreed upon by nations, they are listed in the Ship/Aircraft Interoperability Matrix in MPP-02.1.1. Once listed there, cross operations between ships and helicopters can be approved by national authorities on that basis.

c. MPP-02.2 includes national aircraft data. Ships use MPP-02.2 to determine the details of the helicopter that will be landing on their decks.

6. Organization of Crossdeck Addendum. The crossdeck addendum provides additional ship and aircraft standards under the MPP-02.3.X series of publications.

7. HOSTAC Electronic Supplement. The HOSTAC Electronic Supplement contains the basic publication, MPP-02, Volume I; its technical supplements, MPP-02.1, MPP-02.1.1, and MPP-02.2; and the MPP-02.3 crossdeck addendum. In addition, the Electronic Supplement provides marshaling signals videos, national videos, blank forms for ship/aircraft data and crossdeck operations, and HOSTAC-related STANAGs and associated publications. It is produced as an interactive DVD that displays each nation's national capabilities and procedures as they relate to HOSTAC.

0105 Approval to Operate and Cross Operation Mitigation of Risk

1. Cross operations covered in multinational HOSTAC publications require initial international technical agreement and subsequent national authority approval. It is the nation's responsibility to assign the appropriate level of authorization to properly address the operational risks for these planned multinational cross operations.

NOTE

THE INCLUSION OF A PARTICULAR SHIP AND HELICOPTER COMBINATION INTO THE SHIP/AIRCRAFT INTEROPERABILITY MATRIX DOES NOT AUTOMATICALLY AUTHORIZE ITS USE.

2. Operational Risk Management. The following principles of Operational Risk Management shall be applied by each nation during the approval process, prior to commencing a cross operation:

a. Obtaining the following information is recommended when considering approval to conduct a cross operation.

(1) Expected local time and date of operation.

(2) Expected local weather conditions, VMC/IMC, Day/Night. If night, will operations be unaided or aided with Night Vision Devices?

(3) Purpose of the cross operation, i.e., exercise or operation. Will the cross operation include shutting down or remaining embarked for an extended period?

(4) A face-to-face briefing shall be conducted (see Figure 2-1) to include a flight deck familiarization between the aircrew and receiving ship's personnel.

(a) If not, due to operational reasons, how will the face-to-face briefing information in Figure 2-1 be reviewed?

(b) Is their additional training specific to the type of aircraft intended to be received that needs to be covered (e.g., securing the aircraft to the deck, battery locations, cartridge-activated devices, refueling, stores or ordnance considerations)?

(5) Are there any degradations to ship's aviation facilities and equipment? If so, what is the impact to the ship's certification and/or aviation capabilities?

(6) Are MPP-02.1, MPP-02.1.1, and MPP-02.2 up to date with the latest ship, aircraft, and national procedures information applicable to the cross operation?

(7) What language will the cross operation communications be conducted in?

b. For aircrew:

(1) Aircraft type, nationality and maximum gross weight.

(2) Are the pilots military or civilian qualified (If military, what service)?

(3) Are the pilots Deck Landing Qualified (DLQ) and current in accordance with Section V, paragraph 0251.2?

(4) When did the cross operation aircrew conduct its last deck landing, day or night, and to what type of ship?

(5) Will the aircraft have hazardous stores or ordnance onboard (Electro Magnetic Interference (EMI) or Hazardous Emission Radiation Ordnance (HERO) considerations)?

(6) Is the aircrew familiar with the ship's national procedures?

c. For Ship Personnel:

(1) Ship type and nationality.

(2) Is the deck certified to conduct aviation operations in accordance with national standards? Are there any existing operational defects that will affect cross operations?

(3) Are flight deck personnel qualified and current in conducting aviation operations in accordance with national standards?

(a) Have they been briefed on the aircraft specific procedures, hazards, fire fighting, and crash and salvage considerations (composite or other hazardous parts or assemblies)?

(b) When did the ship last conduct aviation operations?

(4) What type of aircraft dotes the ship normally operate?

3. Cross Operations Within NATO. All NATO nations that have ratified STANAG 1194 HOS have agreed to use the Ship/Aircraft Interoperability Matrix, the national helicopter data, and the individual ship pages of the technical supplement as the basis for their cross operations. The NATO agreement is expressed as follows:

Nations have approved in principle and bilaterally their own ship/maritime helicopter combinations. Upon completion of the Operational Risk Management (see 0105.2), officers conducting and scheduling exercises, officers in tactical command (OCEs, OSEs, and OTCs), as well as commanding officers (COs) of ships need request no further approval, unless otherwise noted by the nation. Once ordered, the decision to cross operate is entirely a matter between the CO of the ship, the commander of the aircraft, and the officer authorizing the flight, provided clearance is given in the MPP-02 technical supplements.

4. Cross Operations With or Among Participating Non-NATO HOSTAC Nations. Participating HOSTAC partner nations conduct cross operations with both NATO nations and other partner nations. These nations have agreed to provide and keep current their national operational information and technical data within the multinational HOSTAC publications. Operations with or among nations, other than those in NATO, require both an Operational Risk Management assessment (see 0105.2) and separate specific national authority approval on each occasion of a cross operation.

NOTE

NEITHER THE CONDUCT OF A CROSS OPERATION NOR THE USE OF THE MULTINATIONAL HOSTAC PUBLICATIONS BY A NATION INDICATES THE EXISTENCE OF A TREATY OR ALLIANCE BETWEEN THAT NATION AND NATO, A NATO NATION, OR ANY OTHER NATION.

5. Crossdeck Procedures—Assurance Questions. Before conducting crossdeck operations, each participating nation should complete the assurance questions form (see Figure 1-1) and send it to the other nation(s) to ensure all questions have been answered and to allow the appropriate clearances to be generated.

Srl	QUESTIONS	RESPONSES
	EVENT	
1.	What is the date and local time of the intended crossdeck procedures?	
2.	What is the purpose of the crossdeck procedure (in support of an exercise or other activity)?	
3.	What is the type of activity intended day/night/VMC/IMC/NVD/VERTREP?	
4.	A face-to-face brief (see Article 201, MPP-02 Volume I) including deck familiarization between the aircrew and receiving ship's personnel should be the primary method of conveying all the necessary crossdeck procedure information. If this is not possible, how will the information be passed/transmitted between participants (email/radio brief)?	
5.	In what language will communications be conducted? (They may not always be in English.)	
	AIRCRAFT INFORMATION:	
6.	What is the call sign?	
7.	What is the type/nationality/mark and maximum AUW?	
8.	Are the pilots military or civilian qualified (if military, what service)?	
9.	Are pilots deck qualified and current IAW MPP-02 Volume I, Article 0251?	
10.	When did the aircrew (visiting helicopter) conduct their last deck landing and to what type of ship by day/night/NVD?	
11.	What is the crew concept LHS and/or RHS pilot?	
12.	What type of approaches are to be used?	
13.	Will the aircraft have hazardous stores or ordnance onboard (electromagnetic interference (EMI) or hazardous emission radiation ordnance (HERO) considerations)?	

Figure 1-1. Crossdeck Procedures: Assurance Questions (Sheet 1 of 2)

PDF Form

Srl	QUESTIONS	RESPONSES
	AIRCRAFT INFORMATION (continued):	
14.	Is there a need for the aircraft to shut down for refuel/ pax transfer/other reason?	
15.	Does the helicopter have lashing capabilities? *Note: Green Deck Procedures may be appropriate if no lashing capability; decision to go ahead to be made either by national authority or on scene commander.*	
16.	Is the receiving ship to be provided with/briefed on the aircraft specific procedures, hazards, firefighting, and crash and salvage considerations (composite or other hazardous parts or assemblies)?	
17.	Is there any other pertinent information which may affect recovery?	
	SHIP INFORMATION	
18.	What is the type/nationality?	
19.	Is deck certified for and current to conduct aviation IAW national standards and/or HOSTAC?	
20.	When did the ship last conduct helicopter operations by day/night/NVD?	
21.	What is the ship's primary/normal operating aircraft type?	
22.	Are there any extant ship defects that affect aviation?	
23.	Are the ship details up to date in MPP-02.1?	

Figure 1-1. Crossdeck Procedures: Assurance Questions (Sheet 2 of 2)

0106 Use of Standardization Agreements

PDF Form

1. Many HOSTAC cross operations are based on procedures used by NATO nations as agreed to by STANAGs. In conjunction with this publication, agreed standards for procedures and equipment are now widely used by nations participating in the HOSTAC Program and therefore form a common base for all helicopter cross operations. STANAGs cover two broad areas:

a. Physical and engineering details of ships and helicopters, and

b. Rules governing flight operations.

2. STANAGs are not a binding directive to a nation but are a convenient and economical method of achieving operational and hardware standardization with another nation. To ensure maximum effectiveness and safety of cross operations, nations participating in the HOSTAC Program should agree to abide by the STANAGs. Until a nation agrees to implement a STANAG, it is not required to abide by its terms. Even after implementation, a nation may, if necessary, initiate a reservation (NATO) observation or condition (non-NATO) that states its inability or unwillingness to conform completely with the STANAG.

3. The HOSTAC Electronic Supplement provides a list of NATO STANAGs on which the procedural and doctrinal information in HOSTAC publications is based. All the STANAGs listed are applicable to HOSTAC operations and reflect the agreements on which HOSTAC operations are grounded. STANAGs will be reviewed at the NATO HOSTAC Working Group meeting.

0107 Standardized Vocabulary Usage

Refer to the section entitled Conventions Used in This Publication located before Chapter 1 in the front matter pages.

0108 Change Symbols

Refer to the section entitled Conventions Used in This Publication located before Chapter 1 in the front matter pages.

0109 Timeliness of Data in HOSTAC Publications

The value of the information in the HOSTAC publications depends upon national authorities and operating ships reporting any alterations or additions to information that affects helicopter and ship cross operations.

0110 Obtaining HOSTAC Publications

1. NATO HOSTAC National Authorities. Ships and activities are to request the number of copies required of the HOSTAC publications in accordance with national procedures for procuring documents.

2. Non-NATO HOSTAC National Authorities. The USA custodian provides nations with electronic files of the HOSTAC publications. New or altered requirements for HOSTAC publications are to be submitted to the custodian so that the distribution may be updated accordingly.

SECTION II—DATA SUBMISSION

0111 General Requirements

1. All users are encouraged to submit, via their chain of command, proposed changes for MPP-02, Volume I, MPP-02.1, MPP-02.1.1, and MPP-02.2 to their HOSTAC representatives for either presentation at the next HOSTAC Working Group meeting or submission by mail directly to the U.S. custodian.

2. HOSTAC publications are issued as a result of both national inputs and direction provided by the HOSTAC Working Group. National representatives should be prepared to submit changes at the Working Group meeting. A short cut-off date for further changes is normally established at the meeting. Data received after that time may be held for release at a later date. Information on data submission is provided below.

0112 Making Routine Changes

1. Changes that affect other nations (e.g., a ship's capability to operate with certain helicopters of another nation or an agreed HOSTAC procedure or practice) must have the concurrence of affected nations. The HOSTAC representative of the requesting nation may either obtain the official concurrence of each of the affected nations and forward the results (together with all official correspondence) to the U.S. custodian or forward his proposed change to the U.S. custodian for coordinating action.

2. Depending on the time sensitivity or the magnitude of the change, the U.S. custodian can elect to either obtain national concurrences (or exceptions) by correspondence or ask the requesting nation to present the change proposal at the next HOSTAC Working Group meeting. Upon receipt of all national concurrences, the change will be included in the next update of the publication.

0113 Making Interim Updates

Changes that urgently affect matters of safety are to be forwarded by message directly to the affected operating units and commands with copies to the U.S. custodian. The U.S. custodian will issue an interim update to the affected publication. Such changes will be reviewed at the next HOSTAC Working Group meeting.

0114 Changing National Information

A nation may add to, delete, or modify purely national information (i.e., information related to their own ships, aircraft, and operating procedures) at any time without approval of other nations participating in the HOSTAC program. Changes of this nature are to be submitted to the U.S. custodian via the nation's HOSTAC representative and will be incorporated into the next update of the publication.

0115 Submitting Technical Data

1. Ship and Helicopter Data Forms. The ship and helicopter data forms in Figures 1-2 and 1-3 permit easy and comprehensive submission of national data required in HOSTAC publications. The forms may be reproduced locally. Nations are requested to provide the originals of typed or neatly hand-lettered information to ensure accurate transfer of data. For ease of reference, each item in the forms is numbered.

2. Ships. Details of national ship information are provided in Chapter 2 of MPP-02.1 on individual ship/class pages through information provided using the ship data form, Figure 1-2. This form, when filled in, provides the U.S. custodian with the necessary data for the individual ship's page. In addition:

a. The ship profile, item 5 on the form, should show the starboard side of the ship and be fully blackened in silhouette form.

b. The helicopter landing area diagram, item 6 on the form, must be a scaled drawing of suitable quality to allow the U.S. custodian to produce artwork for printing. All dimensions should be given using both English and metric values.

3. Helicopters. Details of national helicopter information are provided in Chapter 1 of the MPP-02.2 through information provided using the helicopter data form, Figure 1-3. Included are helicopter performance and capabilities data, tiedown diagrams, dimensional diagrams, physical characteristics, service requirements, and danger area, firefighting, and rescue diagrams.

a. The helicopter dimensional drawing must be a scaled drawing showing the helicopter in both the spread and folded configurations. Locate only the most essential helicopter dimensions. All dimensions should be given using both English and metric values on both the dimensional drawing and Figure 1-3.

b. Stylized illustrations rather than scaled drawings are acceptable for the helicopter tiedown, danger area, firefighting, and rescue data diagrams. Whether stylized or scale, all drawings must be of suitable quality to allow the U.S. custodian to produce artwork for printing.

4. MTACCOPS National Procedures. Nations should use the format provided in Figure 1-4 to submit national procedures for Multinational Through-Deck and Aircraft Carrier Crossdesk Operations (MTACCOPS).

0116 Submitting Data By Mail

1. Nations participating in the HOSTAC program should submit all changes to both publications via their chain of command. Material that was not submitted to the U.S. custodian at the HOSTAC Working Group meeting should be forwarded as follows:

A copy of the requested change including ***originals*** of all photoprints and artwork to the U.S. custodian:

Commander
Navy Warfare Development Command
Attn: HOSTAC Custodian
1528 Piersey St., Bldg O-27
Norfolk VA 23511-2723 USA

0117 Crossdeck Operations Report

Upon the completion of crossdeck operations, units involved are to submit a crossdeck operations report to their national HOSTAC representative, using the most appropriate means (message, e-mail, or hardcopy). Figure 1-5 provides an example of the report, and the electronic file is available via the link below the figure. Units are encouraged to submit all relevant details.

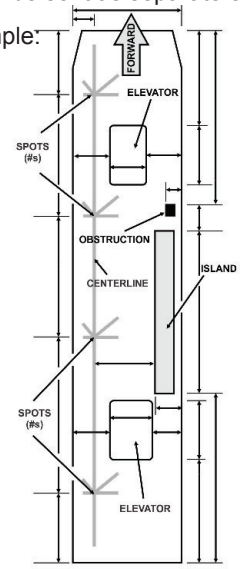
Item No.	Item Status	Item Description	Instructions
1		Ship Class _____ Ships in Class _____ _____	Specify the ship's class, name, and hull number, or if the data is the same for an entire class, specify only ship class.
2		Nationality _____	Specify the nationality of the ship.
3		Average Class Helo Deck Height Above Waterline _____	Specify the average class helicopter deck height above the waterline.
4		Average Class Mast Height _____	Specify the average class mast height.
5	❑ ❑ ❑	Profile Silhouette of Ship (Stern Left) Illustration attached Illustration not presently available Illustration to be sent as separate enclosure	Provide a profile silhouette of the ship and indicate by an arrow the location(s) of the helicopter facility(ies). Note Profile submitted must be suitable for use as an original for photo reduction.
6	❑ ❑ ❑	Scaled Drawing Locating Flight Deck Area Markings and Lighting (Stern Down—Portrait Orientation) Illustration attached Illustration not presently available Illustration to be sent as separate enclosure Figure example:  	Provide scale drawing locating the following: • Markings • Lighting • Deck edge power • Fueling locations • Elevator location and markings • Measurements • Specify location of equipment, superstructure, antennae, etc., in the vicinity of the aircraft operating area. Indicate by a large dot (●) or square (■) the items considered to be major flight caution items (obstructions). Note: Profile submitted must be suitable for use as an original for photo reduction. Vectored graphics file format is encouraged; otherwise a high-definition bitmap format such as gif, png, jpg, or tiff will suffice. The figure at left includes required flight deck dimensions and information for diagram.
7	❑ ❑ ❑	Color photograph of flight deck from helicopter's perspective with all pilot visual aids, flight deck markings, and lighting annotated for each spot as required. Photograph attached/forwarded Photograph not presently available Photograph to be sent as separate enclosure or email	Provide a full color detailed (200 dpi minimum) full page (minimum size 10 X 10 cm) photograph of the ship's flight deck or VERTREP areas. Include one photograph without text. This non-annotated photograph will be used by the custodian to generate the HOSTAC electronic file. Also include a photograph with all visual aids, flight deck markings, and lighting clearly annotated (a scan with items clearly written by hand will suffice).
8		Date _____	Diagram verification date.

Figure 1-2. Ship Data Form (Sheet 1 of 5)

PDF Form

Item No.	Item Status	Item Description	Instructions
9		Control Area: Radius (NM)_____ Altitude (FT)_____ Control Zone: Radius (NM)_____ Altitude (FT)_____	Control area and zone dimensions.
10		SRAD/TRAD Codes	Provide SRAD/TRAD information IAW AECP-02/MECP-02.
11		Type of Approach for each spot.	Type of helicopter approach (port/starboard) for each spot (straight-in, lateral, oblique, 45 approach, or athwartships).
12		Approach Procedures Day and Night/VFR/NVD	Provide approach plates for Day and Night/VFR/NVD recoveries.
13	 ❑	OPERATING CAPABILITY Landing _____ _____ VERTREP _____ _____ HIFR _____ _____ Passenger Transfer _____ Mark-up of Ship/Helicopter Matrix included	Specify environmental conditions (i.e., day/night and VMC/IMC) under which each type of aircraft operation can be conducted. Also include aircraft gross weight limitations as applicable. Next specify the aircraft with which the ship is capable of conducting each type of operation. Include all aircraft, regardless of nationality. Include any updates to Ship/Helicopter Matrix. Break down capabilities by spot where applicable. Identify clearance criteria used.
14	 ❑ ❑ ❑ ❑ ❑ ❑ ❑ ❑	LIGHTING NVD Stage Lighting Homing Beacon Deck Edge Floodlights Lineup Waveoff Deck Status, Stop/Go, Trafficators Other _____ _____	Indicate the lighting systems provided.
15	 ❑ ❑ ❑ ❑	LANDING AIDS Glideslope Indicator Precision Approach Radar Horizon Bar Other	Provide details of landing aids provided for fixed and rotary wing aircraft.

Figure 1-2. Ship Data Form (Sheet 2 of 5)

PDF Form

Item No.	Item Status	Item Description	Instructions
16	 ❑ ❑ ❑ ❑ ❑ ❑	CRASH FIRE AND RESCUE Agents Dispersing Systems Sprinkling Systems Portable Fire Extinguishers Description of flight deck escape routes Crash Fire Rescue vehicle(s)	Indicate capabilities on both flight deck and hangar. Indicate applicable standard compliance.
17	 ❑ ❑	Flight Deck Safety Net Type Nylon Corrosion Resistant Steel (CRES)	Indicate type of netting around flight deck edge.
18		DECK HANDLING _____ _____ _____	Specify method of moving the aircraft while on the flight deck (e.g., manual, spotting dolly, tow bar (type), tow tractor, mechanical handlers, etc.).
19	 ❑ ❑ ❑ ❑	MOORING AIDS Sets of Wheel Chocks _____ Types and Numbers of Tiedowns With Safe Working Load _____ Types of securing Points, Rating in kN/lbs, and Diameter _____ _____ Description of Tiedown grid_____ _____ Other Securing (Specify) _____ _____	Indicate the availability and quantity of mooring aids. Example: 64 x Chains, 128 x Straps , etc., include safe working load information Example: Cruciform, 32000 kN/142.34 lbs, 17.5–22.2mm Example: (1.5m x 1.5m grid)
20		Elevator(s) Number_____ Dimensions_____ Maximum Aircraft Dimensions _____ Capacity (weight)_____ Tie Downs_____ Dimensions of Hangar Bay Door _____ C_g Limitations_____	Elevator dimensions and capabilities, including any operating restrictions.

Figure 1-2. Ship Data Form (Sheet 3 of 5)

PDF Form

21	❑ ❑	Hangar Height_____ Weight Limitations_____ Tie Downs_____ Obstructions_____ Overhead Crane Weight_____ Clearance_____ Max Hook Height_____ Traversing_____	Hangar dimensions and capabilities. List aircraft(s) for which hangar facilities are available.
22		❑ STABILIZED ❑ NOT STABILIZED	Indicate whether ship has stabilization.
23		COMMUNICATIONS ❑ UHF/AM ❑ UHF/FM ❑ UHF/SATCOM ❑ VHF/AM ❑ VHF/FM ❑ HF/AM ❑ HF/SSB ❑ HF/FM ❑ Other _____ _____	Indicate ship-to-aircraft communications available.
24	 ❑ ❑ ❑ ❑	NAVIGATION LF Homer TACAN Approach Radar Other _____ _____	Indicate navigation systems available
25		SERVICES	Indicate types of aircraft services available.
26	❑	Fuel (Type) Capacity: gal or m^3	Specify by NATO code number the type(s) and capacity of aircraft fuel provided. Indicate defuel capability if applicable.
27	❑	Pump: gpm _____ psi _____ m^3/h _____ bar _____ mPa _____	Specify aircraft service refueling pump capacity and pressure rating. Also include HIFR details if applicable.
28	❑	Nozzle Supply method: ❑ Gravity ❑ Pressure	Specify by NATO STANAG number the type(s) of aircraft fueling nozzle(s) provided.
29	❑	Fuel Purity Check	Indicate the availability of an apparatus for determining fuel purity for aircraft use. Indicate compliance to standard for fuel quality.

Figure 1-2. Ship Data Form (Sheet 4 of 5)

PDF Form

30	❑	Oil (Type) _____	Specify by NATO code number the type(s) of aircraft engine oil provided.
31	❑	Hydraulic Fluid (Type) _____	Specify by NATO code number the type(s) of aircraft hydraulic fluid provided.
32	❑	Pneumatic Service Air (Range) _____ Nitrogen (Range) _____	Specify the type (i.e., air or nitrogen) and the pressure of each pneumatic system available to the aircraft facility.
33	 ❑ ❑	Starting/Servicing Power Vdc _____ Amperage_____ Vac _____ kVA_____ H_z _____	Specify ac/dc power supplies available for aircraft starting and/or servicing on the f ight deck and hangar bay.
34	❑	Plug Type(s) _____	Type of aircraft starting plug available. Indicate compliance with standard.
35	 ❑ ❑	Water Availability Fresh Water Demineralized Water	Indicate the availability of fresh/demineralized water for aircraft washing and servicing.
36	❑	NOTES, CAUTIONS, AND WARNINGS _____ _____ _____	Notes, cautions, and warnings about ship facilities that may be relevant to crossdeck operations.
37		NATIONAL INFORMATION	Indicate certifications for national aircraft. Specify ship motion restrictions for helicopters normally carried in degrees of roll and pitch. Provide any other information on a separate sheet.

Figure 1-2. Ship Data Form (Sheet 5 of 5)

PDF Form

NATIONALITY:

TYPE OF AIRCRAFT

MODELS:

PHYSICAL CHARACTERISTICS		MODEL/APPLICATIONS
CAPABILITIES		
CREW PASSENGER CARGO SPACE CARGO HOOK RESCUE HOIST HIFR RADIO/NAVAIDS		
PERFORMANCE		
MAXIMUM RANGE (nm) MAXIMUM RANGE with Air-to-Air Refueling (AAR) (nm) MAXIMUM SPEED (kts) ENDURANCE (hrs) Launch/Recovery Capability (STO/ROL, VTOL) WEIGHT lbs (kg): Basic Maximum Typical		

Figure 1-3. Aircraft Data Form (Sheet 1 of 7)

PDF Form

PHYSICAL CHARACTERISTICS			MODEL/ APPLICATIONS
LANDING GEAR			
1	Landing Gear Conf guration (Tricycle [nosewheel or tailwheel], Quad, skids):		
2	Distance between Fwd Landing Gear Center and Aft Landing Gear Center (max)		
FORWARD LANDING GEAR			
3	Number of Tires		
4	Tread Width (Single wheel—tread width; twin wheels—from outside to outside of wheels)		
5	Longitudinal distance from center of forward landing gear to main rotor center (MRC)		
6	Distance from outside of forward landing gear to aircraft centerline		
7	Footprint (area of tire in contact with deck) (in^2/mm^2)		
8	Tire pressure (psi/$kgcm^2$/bar)		
9	Oleo collapse load (lb/kg)		
10	Area of tire at oleo collapse (in^2/mm^2)		
AFT LANDING GEAR			
11	Number of Tires		
12	Aft landing gear tread width (Single wheel—tread width; twin wheels— from outside to outside of wheels)		
13	Longitudinal distance from center of aft landing gear to main rotor center (MRC)		
14	Distance from outside of aft landing gear to aircraft centerline		
15	Footprint (area of tire in contact with deck) (in^2/mm^2)		
16	Tire pressure (psi/$kgcm^2$/bar)		
17	Oleo collapse load (lb/kg)		

Figure 1-3. Aircraft Data Form (Sheet 2 of 7) **PDF Form**

PHYSICAL CHARACTERISTICS			MODEL/ APPLICATIONS
AFT LANDING GEAR (Continued)			
18	Area of tire at oleo collapse (in^2/mm^2)		
OVERALL DIMENSIONS			
19	Operating length		
20	Operating width		
21	Operating width with external stores		
22	Operating height		
23	Folded length		
24	Folded width		
25	Folded height		
26	Folding Clearance Envelope (area)		
27	Ground Clearance		
28	Minimum Turning Radius - towed		
FUSELAGE DIMENSIONS			
29	Length		
30	Width		
31	Height		
32	Fuselage to Ground (normal minimum)		
33	Fuselage width to widest point on port side from aircraft centerline		
34	Fuselage width to widest point on starboard side from aircraft centerline		

Figure 1-3. Aircraft Data Form (Sheet 3 of 7) PDF Form

PHYSICAL REQUIREMENTS			MODEL/ APPLICATIONS
MAIN ROTOR			
35	Diameter		
36	Static ground clearance		
37	Dynamic ground clearance		
38	Distance between MRCs (twin rotor aircraft)		
TAIL ROTOR			
39	Diameter		
40	Distance from Tail Rotor Center (TRC) to MRC		
41	Distance from Tail Rotor hub to aircraft ceterline		
42	Static ground clearance		
DISTANCE FROM			
43	Nose to MRC		
44	Most fwd end of aircraft or refueling probe to MRC		
45	Pilot's eye to MRC		
46	Aft most point of stabilizer to MRC		
47	Aft most point of aircraft to MRC		
48	Tip of [left/right] stabilizers to centerline		

Figure 1-3. Aircraft Data Form (Sheet 4 of 7) **PDF Form**

PHYSICAL REQUIREMENTS			MODEL/ APPLICATIONS
	DISTANCE FROM (Continued)		
49	Harpoon/probe to MRC (Specify Fwd or Aft of MRC)		
50	Distance between hoist and MRC		
51	Distance between cargo hook(s) and MRC		
SERVICE REQUIREMENTS			**MODEL/ APPLICATIONS**
1	**ENGINE MODEL**		
2	**ENGINE STARTING POWER** dc volts/amperage		
3	ac volts/kVA/Hz		
4	Receptacle Type standard		
5	Secondary Self-Starting Capability (Yes/No)		
6	**FUEL SYSTEM** Preferred Fuel NATO CODE		
7	Alternative Fuels NATO CODE		
8	Capacity		
9	Filling Methods/Connectors NATO Standard.		
10	In-Flight Refueling Capability (Yes/No)		
11	Connector standard		
12	**ENGINE OIL** Type NATO CODE		
13	Filling Methods/Connectors NATO Standard.		
14	**GEAR BOX OILS** Type NATO CODE		

Figure 1-3. Aircraft Data Form (Sheet 5 of 7) **PDF Form**

	SERVICE REQUIREMENTS		MODEL/ APPLICATIONS
15	Filling Methods/Connectors NATO Standard.		
16	**HYDRAULIC SYSTEM** Type NATO CODE		
17	Filling Methods/Connectors NATO Standard		
18	Accumulators (Air/Nitrogen)		
19	Pressure (psi/kgcm^2/bar)		
20	**WINDSCREEN DE-ICING** Type Fluid NATO CODE		
	EMERGENCY CONSIDERATIONS		**DATA**
1	Aircraft emergency shutoff		
2	Master Armament Safety Switch (MASS) location		
3	Internal weapon pin stowage locations (storage location during flight)		
4	Rotor Brake system, lever or switch location		
5	Electrical Isolations		
6	Brakes application		
7	Fuel Isolations		
8	Fuel type		
9	Harness type and removal instructions		
10	Egress systems		
11	'Cut here' areas to facilitate forced access		
12	Ejection and Miniature Detonating Cord (MDC) location and operating procedure (Some aircraft have an explosive canopy jettison system)		

Figure 1-3. Aircraft Data Form (Sheet 6 of 7) **PDF Form**

EMERGENCY CONSIDERATIONS (Continued)		DATA
13	Hazardous materials	
14	Radioactive materials (thorium-232 alloys; thorium-232 lenses; Gaseous Trintium Light Source (GTLS)	
15	Asbestos and vitreous fibres	
16	Batteries – aircraft, locator beacons and ancillary systems	
17	Stored energy – compressed gasses, hydraulic fluid systems	
18	Airframe material / Man (Machine) Made Fibers (MMMF)	
19	Ordnance, chaff/flare, cartridge initiated	
20	Laser designators	
21	Combustion by-products	
22	Other hazards	
ADDITIONAL ITEMS		**DATA**
1	Special Firefighting Requirements	
2	Notes, Cautions, and Warnings	
3	TRAD/SRAD Codes	
4	Aircraft Hazards (escape areas, danger zones, materials, ordnance)	
5	Egress procedures (diagrams or photographs)	
6	Emergency shutdown (diagrams or photographs)	
7	Lashing Pattern Diagram (or photographs)	
8	Meteorological Conditions (VMC/IMC)	
9	Special Operating Conditions (e.g., NVD)	

Figure 1-3. Aircraft Data Form (Sheet 7 of 7) **PDF Form**

MTACCOPS NATIONAL PROCEDURES	
1.	**NATIONAL GLOSSARY**
	a. National specific glossary of acronyms, terms, and brevity words used during flight operations
2.	**APPROACH**
	a. Marshalling Procedures
	b. Holding Pattern for Helicopter and Fixed Wing (Figure(s)/Drawing(s))
	c. Approach Procedures (VMC, IMC, and NVD)
	d. Approach Plan for Helicopter and Fixed Wing (Figure(s)/Drawing(s))
3.	**LANDING**
	a. Landing Procedures for Helicopter and Fixed Wing including NVD
	b. Diagrams of Visual Landing Aids
	c. Approach Lighting Configuration (color drawings)
	d. SHOL and Fixed Wing Envelopes for applicable spots
	e. Potential Turbulence and Deck Motion Issues
4.	**DECK PROCEDURES**
	a. Flight Deck Clothing Colors
	b. Securing Procedures
	c. Deck Movement
	d. Flight Deck Servicing Stations (Figure)
	e. Fueling
	f. Preparation for Flight

Figure 1-4. MTACCOPS National Procedures Format (Sheet 1 of 2)

MTACCOPS NATIONAL PROCEDURES (CONTINUED)	
5.	**LAUNCH**
	a. Takeoff Procedures for Helicopter and Fixed Wing (1) VMC (2) IMC (3) NVD
6.	**DEPARTURE**
	a. Procedures including NVD
	b. Rendezvous
7.	**EMERGENCY**
	a. Procedures
8.	**SECONDARY ROLES**
	a. VERTREP
	b. Hoist
	c. FRR
	d. MEDEVAC
9.	**VIDEOS**
	a. Video, from pilot's perspective, of a multi-aircraft Case I recovery. Preferably from aircraft number 3 or 4 position.

Figure 1-4. MTACCOPS National Procedures Format (Sheet 2 of 2)

Instructions					
1. The crossdeck report correlates the actual activity undertaken, identifies any issues/ discrepancies/differences experienced during the activity and against the information provided from the crossdeck assurance questions and during the face-to-face brief processes. Accurate completion of the form is essential to make it a useful product for analysis. 2. Both the receiving ship and the visiting aircraft are required to complete this form on completion of the activity. 3. Once completed, the form should be saved in the following format and sent to the relevant national authority. • YYYYMMDD-N1-AC/SH-N2-AC/SH-XDECK 20120320-CHL-COCHRANE-GBR-LYNX8-XDECK • YYYY = year – MM = month – DD = day • N1 = nation reporting crossdeck (3-letter code) • N2 = other nation taking part • AC = aircraft – SH = ship 4. Post national analysis the form will be sent to the GBR NA delegate for correlation and the identification of trends and issues experienced during crossdeck procedures. This information is used to support procedural reviews and to ensure that the highest levels of flight safety are maintained during crossdeck procedures.					
Srl	GENERAL				
1.	Ship (Name/Type/Class/Nationality)				
2.	Aircraft (Type/Nationality/Parent Unit)				
3.	Date/Time/Year (DTG Format) (Z)/Day/Night/NVD				
4.	Purpose of the Crossdeck Procedure (in support of an exercise or other activity)				
5.	Type of Activity: DLP/VERTREP/HIFR/ Winching/Boarding/Other	If other, please specify.			
6.	Flight Meteorological Conditions: VMC/IMC				
7.	Weather Conditions: Sea State/Wind/Ceiling/Visibility	Sea State	Wind Direction/Spd	Cloud Cover/Ceiling	Visibility
8.	Deck Conditions: Rel Wind/Speed/Pitch/Roll	Rel Wind	Rel Speed	Pitch	Roll
	APPROVAL				
9.	Approval from National Authorities to Operate if Required or Not a Cleared Combination				
10.	Face-to-Face Brief Conducted				
11.	Any Warnings and Cautions and Other Pertinent Information Not in MPP-02.1 and MPP-02.2				
12.	Are the ship/aircraft details up to date in MPP-02.1 and MPP-02.2?	Ship: Aircraft:			

Figure 1-5. Crossdeck Operations Report Form (Sheet 1 of 2) **PDF Form**

	COMMAND AND CONTROL		
13.	Communications		
14.	SHIPHAZ/RADHAZ (SRAD/TRAD codes)		
15.	Other Pertinent Command and Control Issues		
	FLIGHT PROFILE		
16.	Joining Instructions/Message		
17.	HOSTAC SHOL Used/Approach/Landing Spot	SHOL	Landing Spot
			If multiple, please detail.
18.	Type of Approach (Visual/Instrument/NVD/ Direction)		
19.	Helicopter Control—Approach Type SCA/ ELVA/Other, direction and quality of control		
20.	Landing Aids Used—GSI/Other		
21.	Other Pertinent Flight Profile Information		
	DECK OPERATIONS		
22.	Did the deck markings match those in the diagram in MPP-02.1?	If NO, please explain/comment.	
23.	Compatibility of Lashings and Lashing Points		
24.	Servicing: Fuel Type/Connection/Side of Refuel		
25.	Manned or Unmanned Deck: FDO Control (Lighting and Marshalling Signals)	FD =	
26.	Other Pertinent Deck Operations and Safety Issues, i.e., FOD/Other		
	FREE TEXT COMMENT		
27.	(In the event of an emergency, include details here.)		

Figure 1-5. Crossdeck Operations Report Form (Sheet 2 of 2) **PDF Form**

IAN ANNEX 1A Inter-American Navies Basic Operating Agreements

1A01 Inter-American Navies HOSTAC Operations

1. The Inter-American Navies HOSTAC Supplements were developed to permit integration of western hemisphere nations into the HOSTAC program, as a first step in building an international data base, dedicated to helicopter cross operations. They were designed to provide national operational and helicopter and ship data for nations participating in the Inter-American Navies program in the same format as the HOSTAC publications. For Inter-American Navies users of HOSTAC publications, this change in scope of MPP-02, Volume I, accomplishes the second step in building the international data base—full integration.

2. Inter-American Navies users of HOSTAC publications must familiarize themselves with the content of Chapter 2 of this publication. It contains general and common information pertinent to any helicopter cross operation, regardless of national affiliation. MPP-02.1, MPP-02.1.1, and MPP-02.2 give national information on the aviation facilities of ships as well as other data that may be at variance with the accepted practices described in Chapter 2. They also provide national operating procedures that must be observed by helicopter pilots intending to visit ships of another nation.

NOTES

1. **THE RULES OF THE RECEIVING SHIP GOVERN AT ALL TIMES—BOTH STANDARDIZED AND UNIQUE NATIONAL RULES.**

2. **PRIOR TO ANY AIRCRAFT OPERATIONS, AN ADEQUATE BRIEFING ON SHIP AND AIRCRAFT REQUIREMENTS AND PROCEDURES SHOULD BE CONDUCTED TO ENSURE SAFE OPERATIONS.**

3. **PILOTS SHALL FAMILIARIZE THEMSELVES WITH THE ACCEPTED OPERATING DOCTRINE IN CHAPTER 2 AND THE NATIONAL DOCTRINE IN MPP-02.1, MPP-02.1.1, AND MPP-02.2 PRIOR TO PLANNING ANY CROSS OPERATION WITH A SHIP BELONGING TO ANOTHER NATION.**

1A02 Basis for Inter-American Navies HOSTAC Operations

1. To further military and naval cooperation, Chiefs of Naval Operations from nations in the western hemisphere convened their ninth annual meeting in Lima, Peru, on 21 to 25 August 1978. As a part of the decisions coming from that conference, it was decided that American navies would adopt a system similar to that used by NATO to facilitate helicopter interoperability from the decks of ships of member nations. This decision was formalized in paragraphs 19, 20, and 21 of the sponsor's minutes, U.S. CNO memo 613/94-79 of 15 March 1979. Participating nations in the conference were Argentine Republic, Brazil, Chile, Colombia, Dominican Republic, Ecuador, Paraguay, Peru, United States, Uruguay, and Venezuela. Nations having observer status were Canada, El Salvador, Mexico, and Panama. As a result of IANC decision, Canada was granted full participating and voting status in IAN activities in 1992.

2. As a consequence of initial decisions, the NATO publications MPP-02, Volume I, Helicopter Operations from Ships Other Than Aircraft Carriers (HOSTAC), and the technical supplements were taken as models upon which unique Inter-American Navies operating documents (initially IAN 1 and its supplement, IAN 1-1) would be constructed. A special working conference of the IAN conference

(SIANC HOSTAC) was chartered to develop and maintain this publication. Operating agreements among member nations were to be based in general on those STANAGs developed and ratified by NATO nations. Nevertheless, IAN nations retained the authority to modify and add to text to meet their own unique operational requirements.

3. Chiefs of Naval Operations of IAN nations are responsible for calling meetings of special IAN conferences. Because of the operational and safety impact of HOSTAC, SIANC HOSTAC working groups are recommended annually. The nation hosting the venue traditionally chairs these meetings with technical and administrative representatives from participating and observing nations in attendance.

1A03 Approval to Operate

1. MPP-02.1, Chapter 1, provides the nations and national authorities that use the International HOSTAC to support helicopter cross operations between and among their helicopters and ships.

Note: *Only the national authorities listed in MPP-02.1 have the authority and responsibility to authorize cross operations unless pre-existing agreements are in effect. No random or unscheduled cross operation is permitted without such clearance.*

2. Feasible IAN ship/aircraft combinations are provided in the Ship/Aircraft Interoperability Matrix in MPP-02.1.1 and on individual ship pages contained in MPP-02.1. ***Ship/aircraft operational capabilities are for guidance on physical feasibility only.*** Approval for international cross operations must be obtained from each respective national authority listed in MPP-02.1 before commencing the operation.

1A04 Use of Bilateral Agreements

1. Under the NATO multinational publication program, STANAG 1194 (covering STANAG for MPP-02, Volume I) requires separate and specific adoption by nations. Once adopted by two or more nations within the framework of IAN agreements, bilateral agreements then exist between them to allow use of the Ship/Aircraft Interoperability Matrix in MPP-02.1.1 and the individual ship and helicopter pages in MPP-02.1 and MPP-02.2 as the basis for day-to-day helicopter cross operations. The Ship/Aircraft Interoperability Matrix provides data on physical compatibility of specific ship/aircraft combinations.

2. The list of nations adopting (and ratifying) STANAG 1194 is contained within MPP-02.1.1.

3. The bilateral agreement is stated in italicized text in paragraph 0113.1. Although such bilateral agreements are currently in force among NATO nations, to date none have been implemented between IAN nations. Therefore, the requirements for prior permission by national authorities (MPP-02.1) remain in force.

1A05 Cross Operation Enhancement Through Standardization

1. Interoperations among IAN participants can be made safer, easier, and more effective if national procedures and equipment are standardized to the maximum degree possible. In many instances it will cost nothing or little more to adopt international operating procedures or to build or modify a ship according to international standards than it does to build or modify one according to national standards. But by adopting international standards and procedures when possible, pilots of other nations will be familiar with approach and landing procedures, thus reducing the possibility of an aircraft mishap to a minimum.

2. IAN nations are requested to review the agreed-upon equipment standards and operating procedures (Chapter 2 of this publication) and HOSTAC-related publications and STANAGs and be prepared to provide the U.S. custodian updates on the status of national ratification/implementation as changes occur. Such information, when published in future editions of the multinational HOSTAC, will provide a convenient way of determining national conformance to international standards.

3. IAN nations that have not adopted STANAG 1194 should describe any portion of this publication that cannot be implemented and/or any portion that can only be implemented with limitations as a "condition." These conditions are recorded in Table IAN-1A-1 and annotated with the nation's three-letter country code within the margin of the appropriate section.

Table IAN-1A-1. Record of Conditions

Nation	Chapter/STANAG	Specific Conditions
Chile	0204 Deck Markings	Chilean Navy uses own deck markings (see MPP-02.1).
	0204 Deck Markings 0241 Helicopter In-Flight Refueling Procedures	Chilean Navy does not use HIFR marks and lighting.

INTENTIONALLY BLANK

PAC ANNEX 1B Pacific Rim Operating Agreements

1B01 Pacific HOSTAC Operations

To facilitate aviation crossdeck operations, Pacific NATO Partner Nations and Global HOSTAC Partner Nations have joined together, via the AAP-03 Partner Nation Adoption of STANAGs, in a series of international meetings, conducted per the PAC HOSTAC Terms of Reference (TOR), to exchange operational and technical information relative to this objective, and to foster, where practicable, a level of technical and operational standards. The PAC HOSTAC working group is chaired and administered by a U.S. Pacific Fleet (COMPACFLT) command representative (who is the Pacific region's HOSTAC representative to the NATO HOSTAC working group), and consists of the HOSTAC delegates of Pacific NATO Partner nations and non-NATO participating nations.

1. NATO Partner Nations. Adoption and agreement to use MPP-02, Volume I, by Pacific NATO Partner nations, is officially recorded via the Partner Nation Adoption of Standardization Agreement (STANAG) 1194 form (see section 0126) submitted to the NATO Standardization Office (NSO) with a copy to the PAC HOSTAC chair. Current Pacific NATO Partner nations are: Australia, Japan, Republic of Korea, and New Zealand.

2. Non-NATO Participating Nations. Non-NATO participating nations may participate in the PAC HOSTAC working group (as coordinated by the chair), and will record their adoption and agreement to use MPP-02, Volume I, via the Global HOSTAC Participating Nation Adoption of STANAG 1194 (see section 0127) submitted to the PAC HOSTAC chair.

3. Pacific NATO Nations. Canada, United Kingdom, and United States are members of PAC HOSTAC. Other NATO HOSTAC nations may participate in the PAC HOSTAC working group and attend the annual meeting as observers. Their attendance is coordinated by the PAC HOSTAC chair.

1B02 Authorization of Cross Operations

The authority responsible for approval of Pacific (PAC) HOSTAC crossdeck operations will be identified by each participant. MPP-02.1 lists the nations and national authorities that have agreed to establish a means to develop and maintain an information exchange of standards and procedures for conducting international maritime helicopter crossdeck operations. The principal means used to convey this information to support helicopter crossdeck operations between and among their helicopters and ships are the HOSTAC publications. National authorities listed in MPP-02.1 have the authority and responsibility to authorize crossdeck operations unless a pre-existing agreement is in effect. ***No random or unscheduled crossdeck operations are permitted without such clearances.***

1B03 Approval to Operate

Feasible ship helicopter combinations are provided in the ship/aircraft matrix and on individual ship pages in the technical supplement. ***Ship/aircraft operational capabilities are for guidance on physical feasibility only.*** Approval for international crossdeck operations must be obtained from each respective national authority listed in the MPP-02.1, and the principles of operational risk management shall be applied by each nation before commencing the operation.

1B04 Green Deck/Green Light Procedures Definition.

Until such time that the HOSTAC program defines green deck/green light procedures, the Pacific HOSTAC shall use the following definition and additional face-to-face briefing requirement when conducting crossdeck operations:

Green deck/green light. When the ship is steady on the designated flying course and speed with SHOL (wind, pitch, and roll) limitations, with appropriate SHIPHAZ/RADHAZ applied such that permission has been given by the officer of the watch/deck officer to launch or recover an aircraft.

WARNING

NATIONAL GREEN DECK/GREEN LIGHT PRODEDURES MAY VARY AND SHALL BE DISCUSSED DURING THE FACE-TO-FACE BRIEF.

1B05 Use of HOSTAC Publications

Implementation of NATO standards by Pacific NATO Partner or Global HOSTAC participating nations will be in accordance with AAP-03 and will require submission of signed AAP-03/ANNEX G Partner Nation Adoption of STANAG 1194 or Global HOSTAC Participating Nation Adoption of STANAG 1194 forms. National "observations" (those portions of the publication that nations cannot implement and/or portions that can only by implemented with limitations) shall be recorded alongside NATO national reservations in the front of this publication. These "observations" shall be annotated with the nation's 3 letter country code within the margin of the appropriate section.

1B06 Partner Nation Adoption of STANAG 1194 Form

PARTNER NATION ADOPTION OF STANAG 1194

Originator: PARTNER NATION (National reference and date)

To: NATO STANDARDIZATION OFFICE
Cc: MARITIME STANDARDIZATION BOARD (MCMSB)
REGIONAL HOSTAC CHAIR
USA HOSTAC WG PROGRAM MANAGER

Subject: **STANAG 1194 (Current Edition) ADOPTION**

Reference: Cover letter under which subject STANAG's partner adoption is submitted

1. THE FOLLOWING INFORMATION IS SUBMITTED CONCERNING STANAG 1194 - MPP-02, Volume I, Helicopter Operations from Ships Other Than Aircraft Carriers (HOSTAC)

a. Adoption Information

ADOPTING		ADOPTING, FUTURE IMPLEMENTATION		NOT PARTICIPATING
	WITH OBSERVATIONS		WITH OBSERVATIONS	
(A)	(B)	(C)	(D)	(E)

b. Intended Date of Implementation

Partner nations should indicate which service(s) are implementing by placing either "Upon Receipt" or a specific date in month and year, as appropriate.

2. OBSERVATIONS

NAVY	ARMY	AIR	COAST GUARD
(Schedule)	(Schedule)	(Schedule)	(Schedule)

To be only used with positions (B) & (D), Observations state any limitations associated with implementation of the NATO standardization agreement and may contain proposals for its improvement. Partner nations stating observations are invited to provide change proposals during the publication's normal review process.

Partner Nation Authority's SIGNATURE BLOCK

1B07 Global HOSTAC Participating Nation Adoption of STANAG 1194 Form

GLOBAL HOSTAC PARTICIPATING NATION ADOPTION OF STANAG 1194

Originator: GLOBAL HOSTAC PARTICIPATING NATION (National reference and date)

To: PACIFIC HOSTAC CHAIR
Cc: USA HOSTAC WG PROGRAM MANAGER

Subject: **STANAG 1194 (Current Edition) ADOPTION**

Reference: Cover letter under which subject STANAG's global HOSTAC participating adoption is submitted

1. THE FOLLOWING INFORMATION IS SUBMITTED CONCERNING STANAG 1194 - MPP-02, Volume I, Helicopter Operations from Ships Other Than Aircraft Carriers (HOSTAC)

a. Adoption Information

ADOPTING		ADOPTING, FUTURE IMPLEMENTATION		NOT PARTICIPATING
	WITH OBSERVATIONS		WITH OBSERVATIONS	
(A)	(B)	(C)	(D)	(E)

b. Intended Date of Implementation

Global HOSTAC participating nations should indicate which service(s) are implementing by placing either "Upon Receipt" or a specific date in month and year, as appropriate.

2. OBSERVATIONS

NAVY	ARMY	AIR	COAST GUARD
(Schedule)	(Schedule)	(Schedule)	(Schedule)

To be only used with positions (B) & (D); Observations state any limitations associated with implementation of the NATO standardization agreement and may contain proposals for its improvement. Global HOSTAC participating nations stating observations are invited to provide change proposals during the publication's normal review process.

Global HOSTAC Participating Nation Authority's SIGNATURE BLOCK

INTENTIONALLY BLANK

ME ANNEX 1C Middle East HOSTAC Operating Group Agreements

1C01 Middle East HOSTAC Operations

1. The Middle East (ME) HOSTAC Working Group is established to permit integration of Middle-Eastern, African, and Southwest Asian nations into the HOSTAC program. The purpose of the ME HOSTAC Working Group is to develop and standardize procedures and to disseminate information that will permit aircraft and air-capable ships of participating ME HOSTAC Working Group nations to safely operate with one another and with those of other nations within the HOSTAC program. The participants agree to establish an acceptable means by which they can develop and maintain an information exchange concerning national standards and procedures and establish common procedures for operations.

2. Operators using HOSTAC procedures must be familiar with the content of this publication. The technical supplement provides national information concerning the aviation facilities onboard ships as well as other nation-specific data and procedures that may be at variance with the accepted common practices described in MPP-02, Volume I. National operating procedures must be observed by helicopter pilots intending to visit ships of another nation.

NOTE

THE PROCEDURES OF THE RECEIVING SHIP GOVERN OPERATIONS AT ALL TIMES, INCLUDING BOTH STANDARD AND UNIQUE NATIONAL RULES. PRIOR TO ANY CROSS OPERATIONS, AN ADEQUATE PRE-OPERATIONAL BRIEFING ON SHIP AND AIRCRAFT REQUIREMENTS AND PROCEDURES SHOULD BE CONDUCTED.

1C02 Basis for Operations

1. To further cooperative efforts and to improve efficiency of operations among militaries and governmental agencies, the Middle East HOSTAC Working Group was established. Participating nations and national authority contact data include those listed in Table ME-1C-1.

2. Nations of the Middle East HOSTAC Working Group have agreed to meet on a regular basis to facilitate information sharing and forward standardization of procedures and operations. Nations participating in the working group agree to ensure national data concerning air-capable ships, aircraft operating in the maritime environment, and national operating procedures are kept up to date within MPP-02, Volume I, and further agree to use MPP-02, Volume I, procedures for all cross operations except as noted within the sections provided for nation-specific data and procedures or as specifically agreed to during pre-operational planning. While primarily using MPP-02, Volume I, procedures and associated STANAGs to guide operations, ME HOSTAC Working Group participants retain the authority to modify or add text to existing procedures or Standardization Agreements to meet working group operational requirements.

1C03 Approval to Operate

1. Feasible ship/aircraft combinations are provided in Ship/Aircraft Matrix of MPP-02.1.1 in order to provide decision-making guidance concerning operational capabilities. Ship/aircraft operational capabilities as listed are for guidance and physical feasibility only. Approval for international cross operations must be obtained from each nation's respective national authority.

2. Only the national authorities listed in Table ME-1C-1, or as delegated, have the authority and responsibility to authorize cross operations unless pre-existing arrangements or operational agreements are in effect. Bilateral or other operational agreements among nations within the working group are required to allow use of Ship/Aircraft Matrix data or the MPP-02.1 and MPP-02.2 technical data as the basis for routine cross operations, so long as authority to approve operations is addressed or delegated in such agreements.

Table ME-1C-1. List of Middle East HOSTAC National Authorities by Nation (Sheet 1 of 2)

Nation	National Authority
Bahrain	OMC-BAH Mail to: BDF PO Box 254 Manama, Bahrain Telephone: 973 1766 4347 Fax: 973 1766 3768
Jordan	Royal Jordanian Air Force Commander Telephone: 00 962 64896351 ext 22000
Kuwait	Off ce of the Ministry of Interior, Kuwait Assistant Manager Floutilah Department Training Section, Kuwait Police Wing Telephone: 00 965 6766630 00 965 6677779 Fax: 00 965 3906375 00 965 434 5686 Off ce of the Ministry of Defense KAF Director of Operation-Planning Branch Mail to: State of Kuwait KAF Directory of Ops Planning Branch Telephone: 00 965 4734513 Fax: 00 965 434 2219
Pakistan	Directorate of Naval Aviation Mail to: Director Naval Aviation Naval Headquarters, Islamabad Telephone: 00 92 51 20062290 Fax: 00 92 51 9261551/3
Qatar	Qatar General Headquarters Mail to: Arabian Gulf Doha, Qatar PO Box 37 Telephone: 974 461 4111 Fax: 974 461 4495

Table ME-1C-1. List of Middle East HOSTAC National Authorities by Nation (Sheet 2 of 2)

Nation	National Authority
United States	Crossdeck Approval Authority: Commander, U.S. Naval Forces Central Command Attn: Code N32 FPO AE 09501-6008 USA Telephone: 00-973-1785-8923 Fax: 00-973-1785-9931 Message: COMUSNAVCENT or COMFIFTHFLT United States Head of Delegation: Commander, Naval Air Forces Attn: Code N3C3 Sauf ey St Bldg 319 NAS North Island San Diego, CA 92135-7051 USA Telephone: (619) 545-1418 Fax: (619) 545-2818 Message: COMNAVAIRFOR SAN DIEGO CA//N3// United States Custodian: Commander, Navy Warfare Development Command Attn: HOSTAC Custodian 1528 Piersey St Bldg O-27 Norfolk, VA 23511-2723 USA Telephone: (757) 341-4341 Fax: (757) 341-4178

INTENTIONALLY BLANK

CHAPTER 2 Common Ships' Aviation Facilities and Operating Procedures for Cross Operations

SECTION I—STANDARDS FOR SHIP/AIRCRAFT INTEROPERABILITY

0201 Introduction

1. This section contains information pertinent to ship/aircraft interoperability—shipboard helicopter facility marking and lighting standards, common visual landing aids, flight deck clothing standards, and aircraft marshaling signals. Remaining sections cover general operational information, air traffic control procedures, the standard cross-operating procedures for helicopters and ships, safety practices and procedures, aircraft emergency procedures, and on-deck securing, servicing, and support information.

WARNING

EACH SHIP'S AVIATION FACILITY HAS BEEN CLEARED TO OPERATE ONLY WITH SPECIFIC AIRCRAFT. THIS OPERATIONAL CLEARANCE IS BASED STRICTLY UPON THE ASSUMPTION THAT THE AIRCRAFT WILL OPERATE IN FULL ACCORD WITH THE NATIONAL PROCEDURES AND CRITERIA OF THE HOST SHIP. OPERATION OF OTHER AIRCRAFT WITH A GIVEN SHIP OR FAILURE TO OBSERVE THE HOST SHIP'S NATIONAL PROCEDURES AND OPERATING CRITERIA IS POTENTIALLY DANGEROUS AND MAY RESULT IN AN ACCIDENT. HOSTAC PUBLICATIONS LIST APPROVED SHIP/AIRCRAFT COMBINATIONS THAT ARE PHYSICALLY FEASIBLE WHEN AIRCRAFT OPERATE IN ACCORDANCE WITH THE PROCEDURES AND CRITERIA OF THE HOST SHIP.

NOTE

EACH NATION EMPLOYS VARIOUS COMBINATIONS OF STANDARDIZED AVIATION FACILITIES AS WELL AS THOSE THAT ARE UNIQUE TO SHIPS OF THAT NATION. IN ADDITION TO THE GENERAL CROSSDECK GUIDANCE IN ARTICLE 0105, THIS SECTION CONTAINS INFORMATION ON COMMON SHIPS' AVIATION FACILITIES. MPP-02.2 CONTAINS EACH NATION'S UNIQUE AVIATION FACILITY INFORMATION AND PASSENGER BRIEFS. WHEN PLANNING ANY CROSS OPERATION, IT IS ABSOLUTELY NECESSARY TO CONSULT ALL INFORMATION ON SHIPS' AVIATION FACILITIES—THE COMMON FACILITIES INFORMATION IN THIS SECTION, THE NATIONAL INFORMATION AND INDIVIDUAL SHIP PAGES IN MPP-02.1 AND ADDITIONAL VIDEOS IN THE HOSTAC ELECTRONIC SUPPLEMENT.

2. In order to familiarize aircrews/deck crews with the aviation facilities/helicopter of the ship being visited, a face-to-face briefing shall be conducted before pre-planned crossdeck operations. (See Figure 2-1.)

Instructions				
1. In order to familiarize aircrew/deck crews with the aviation facilities/helicopter of the ship being visited, a FULL face-to-face briefing shall be conducted before pre-planned crossdeck procedures are conducted. This will ensure that all the necessary information for both participants to successfully complete the procedure has been covered and allows for subsequent clarif cation questions to be posed. 2. If for operational reasons, a physical or electronic FULL face-to-face brief cannot be conducted before the crossdeck procedure, the information is to be passed by alternate means. The points marked with an M (mandatory information) must be covered and relayed between the crossdeck procedure participants. 3. Where a FULL face-to-face brief has been conducted and both participants are content that all information has been shared and questions answered, the form should be signed in the relevant box (either physically or confirmation sent by email) to indicate the participants have received and understood the information provided. The signed form/email should be presented to the authorizing officer and kept until completion of the activity. 4. In the event of an incident or accident, the form is to be retained for the subsequent investigation.				
FACE-TO-FACE BRIEFING TOPICS			Completed	
Srl	Event Description	M?	Ship	Helo
GENERAL				
1.	Ship	M		
2.	Aircraft	M		
3.	Intended Time of Event	M		
4.	Purpose	M		
5.	Type of Activities	M		
APPROVAL				
6.	Approval from National Authorities to Operate			
7.	Any Warnings, Cautions, and Other Pertinent Information	M		
COMMAND AND CONTROL				
8.	Communications	M		
9.	SHIPHAZ/RADHAZ (SRAD/TRAD Codes)	M		
10.	Other Aircraft Operations	M		
11.	Other Pertinent Command and Control Information			
FLIGHT PROFILE				
12.	Joining Instructions/Message	M		
13.	HOSTAC SHOL to Be Used/Landing Position/Approach	M		
14.	Type of Approach (Visual/Instrument/Direction)	M		
15.	Helicopter Control—GSI, Approaches, and Approach Direction	M		
16.	Landing Aids-GSI/Other	M		
17.	Night Operations	M		
18.	Other Pertinent Flight Profile Information	M		

Figure 2-1. Face-to-Face Brief (Sheet 1 of 2)

PDF Form

FACE-TO-FACE BRIEFING TOPICS Continued						Completed	
Srl	Event Description				M?	Ship	Helo
DECK OPERATIONS							
19.	Size of Flight Deck and Calculated Landing Position for Main/Tail Wheel; and That the Flight Deck Is Capable of Taking the Aircraft's Weight				M		
20.	Landing Spots and Control—Type of Approach (Oblique, Lateral, or Straight In)				M		
21.	Compatibility of Lashings and Lashing Points and Any Specif c Requirements				M		
22.	Servicing Requirements: Fuel Type/Connection/Side of Refuel				M		
23.	Manned or Unmanned Deck: Lighting and Signals				M		
24.	Other Pertinent Deck Operations Information						
EMERGENCIES							
25.	Ship and Aircraft Responses to Potential Aircraft Emergencies				M		
26.	Emergency Landing SHOL/Landing Permissions/Authorization in the Case of a Helicopter Emergency				M		
27.	Ship and Aircraft Emergency Responses to a Crash on Deck or Ditched Helicopter to Cover Man Made Mineral Fibre (MMMF) Hazardous Materials						
SPECIAL REQUIREMENTS							
28.	Points Not Covered Above						
FINAL SIGNATURES							
29.	Receiving Ship	Name		Sig		Date	
30.	Aircraft Cdr	Name		Sig		Date	

PDF Form

Figure 2-1. Face-to-Face Brief (Sheet 2 of 2)

0202 National Reservations

National reservations are listed in the front matter of this publication and provide brief statements of the scope or effect of the national exception to a HOSTAC standard.

0203 Shipboard Helicopter Facility Level and Class Designations

1. Definitions of Level and Class. Many nations have identified a ship's basic aviation capability using the terms "level" and "class."

level. The level of a helicopter facility identifies the environmental condition (i.e., day/night, day only, or VMC/IMC) that prevails.

class. The class of a helicopter facility identifies the authorized operation (i.e., landing, VERTREP, HIFR, or hoist transfer), the types of services available (e.g., fuel, starting power), and the availability of maintenance facilities (e.g., routine inspection, minor repairs, and replacement of parts that do not require special tools).

2. Standard Definitions of Level and Class Designations.

a. Levels (Environmental Operating Standards).

(1) Level I. Ship's facilities are capable of supporting both day and night helicopter operations under both IMC and VMC for those helicopters so designated.

(2) Level II. Ship's facilities are capable of supporting both day and night helicopter operations under VMC only.

(3) Level III. Ship's facilities are capable of supporting only day helicopter operations and only under VMC.

b. Classes (Helicopter Operational and Support Capabilities).

(1) Class 1. The host ship has (1) a landing area, (2) service facilities, and (3) maintenance facilities.

NOTE

BECAUSE MAINTENANCE FACILITIES ARE DESIGNED TO SERVICE ONLY CERTAIN HELICOPTERS, CLASS 1 CERTIFICATION IS GENERALLY APPLICABLE ONLY TO NATIONAL HELICOPTERS ON BOARD THE HOST SHIP.

(2) Class 2. The host ship has (1) a landing area and (2) service facilities that apply to helicopters so designated.

(3) Class 2A. The host ship has limited service facilities that apply to helicopters so designated.

(4) Class 3. The host ship is able to provide only a certified landing area. Service and maintenance are not available.

Note. *Classes 4 and 5 apply to vertical replenishment (VERTREP) capabilities and clearance.*

(5) Class 4. The host ship has a VERTREP area with a maximum obstruction height of 5 feet (1.52 meters) within the helicopter's fuselage and landing gear clearance zone and 15 feet (4.57 meters) within the rotor clearance zone.

(6) Class 5. The host ship has a VERTREP area with a maximum obstruction height of 15 feet (4.57 meters) within the fuselage and landing gear clearance zone and 25 feet (7.6 meters) within the rotor clearance zone.

(7) Class 6. The host ship has a helicopter in-flight refueling (HIFR) facility.

(8) Class 7. The host ship has a facility for transferring personnel and light cargo (e.g., mail bags) by means of the aircraft's hoist.

Note. *Shipboard facilities for support of these standard designations shall be in accordance with the ship's national standards. (Nations may publish this information on the ship's data page for the benefit of the guest helicopter aircrew.)*

0204 Deck Markings

1. Deck markings for the helicopter landing area are either white or yellow with a minimum width of 0.2 meters and have been adopted to ensure adequate physical clearance for those helicopters approved to land, VERTREP, HIFR, or perform hoist transfers with the host ship.

2. Alpha-numeric ship designators, painted on the flight deck to identify the ship by hull number or other designation, provide the pilot with positive identification of the host ship.

3. To prevent the aircraft and cargo from sliding in adverse weather or sea conditions, helicopter decks are coated with a non-skid surface having a minimum dry-deck coefficient of friction of 0.6.

Note. *Maintenance of this surface and measurement of the friction coefficient is in accordance with national standards.*

4. MPP-02.1 provides diagrams of the deck markings on ships. It includes the hull designators for ships, keyed to the ship's name, in the index for each nation's ships.

WARNING

EACH NATION EMPLOYS VARIOUS COMBINATIONS OF THE STANDARD DECK MARKINGS DESCRIBED BELOW AND MARKINGS THAT ARE UNIQUE TO ITS SHIPS. BEFORE CONDUCTING CROSS OPERATIONS, CONSULT THE NATIONAL INFORMATION IN MPP-02.1.

5. Landing Area Markings. Although national markings may differ in detail, the following descriptive terms for ships having a landing area, illustrated in Figure 2-2, apply to all.

WARNING

CLEARANCE LIMITS INDICATED BY THE MARKINGS DESCRIBED BELOW ARE FOR THE LARGEST HELICOPTER FOR WHICH THE FACILITY IS DESIGNED OR FOR THE HELICOPTER NORMALLY DEPLOYED. ROTOR TIP AND FUSELAGE CLEARANCES ARE IN ACCORDANCE WITH NATIONAL CRITERIA AS DESCRIBED IN MPP-02.1 AND MPP-02.2.

WARNING

THE USE OF THE TOUCHDOWN CIRCLE TO DETERMINE HELICOPTER OPERATING CLEARANCES VARIES AMONG NATIONS.

a. Touchdown Circle (Non-Wire-Recovery Ships). A circle indicates the desired touchdown location. It is positioned to ensure sufficient clearance for the largest helicopter for which the facility is designed.

b. Landing Lineup Line. A line used to indicate the path to be followed by the helicopter's fore-and-aft axis during approach to achieve the correct landing position.

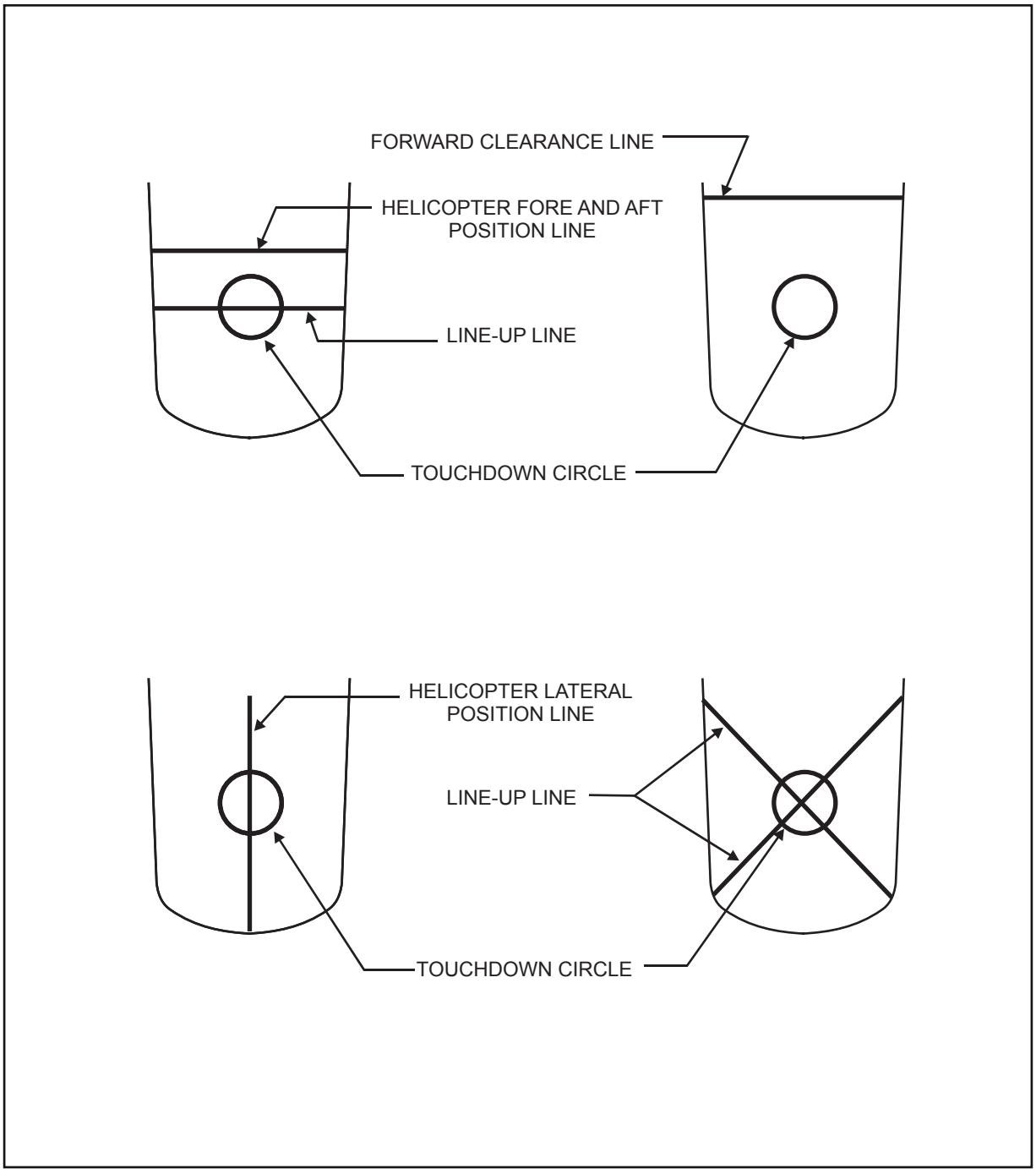
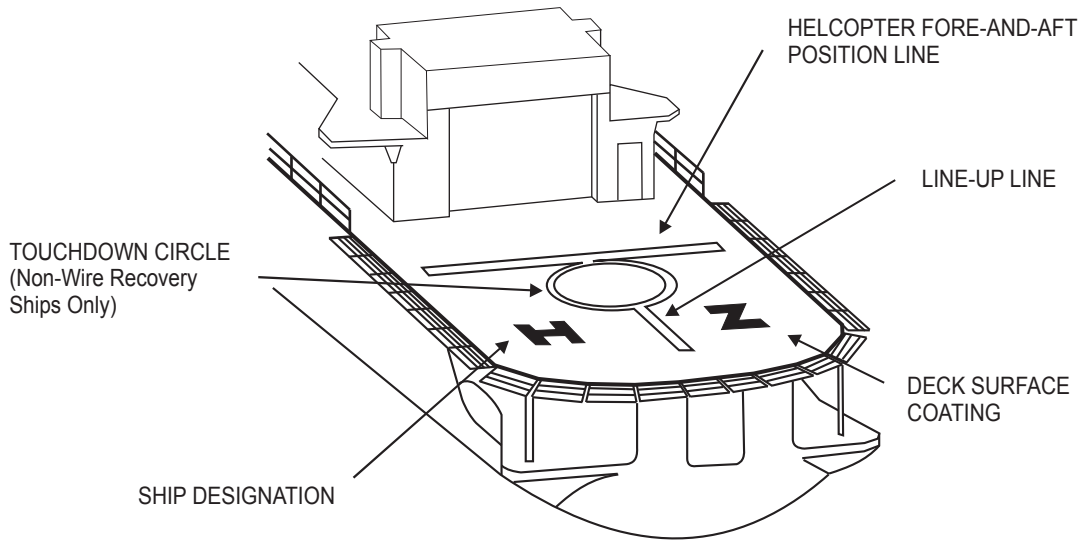
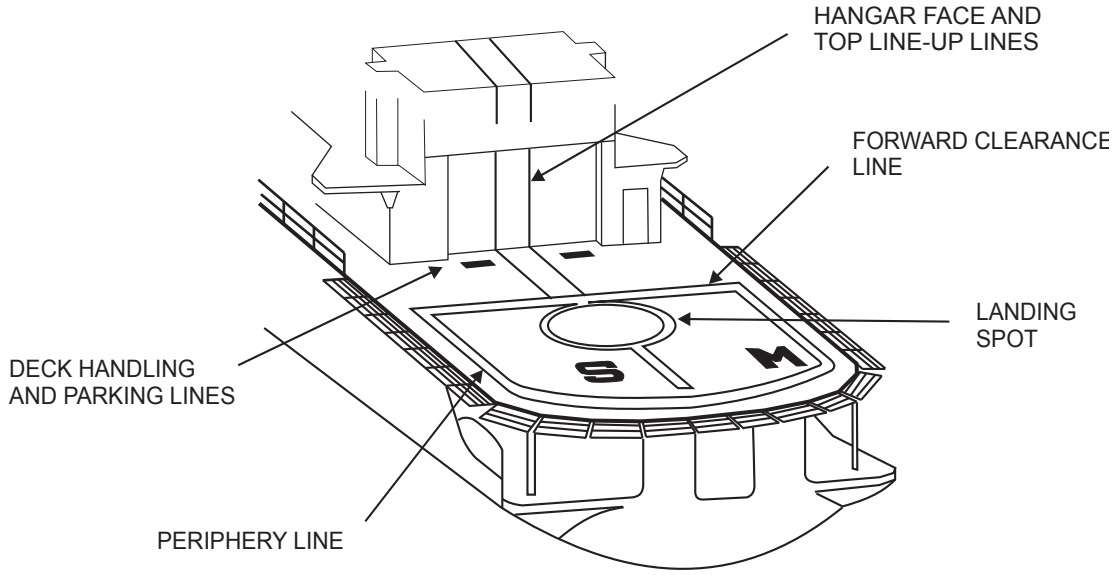


Figure 2-2. Standard Flight Deck Markings (Sheet 1 of 2)



a. TYPICAL LANDING AREA MARKINGS



b. ADDITIONAL TYPICAL LANDING AREA MARKING

Figure 2-2. Standard Flight Deck Markings (Sheet 2 of 2)

c. Helicopter Lateral Position Line. A fore-and-aft line from which the helicopter's lateral (port/starboard) displacement can be determined.

d. Fore-and-Aft Position Line. An athwartship line from which the helicopter's fore-and-aft position can be determined.

e. Forward Clearance Line. An athwartship line that indicates the limit of the helicopter's forward positioning, used in conjunction with the periphery lines.

f. Periphery Line. A line that indicates the obstruction-free area on the helicopter deck. The forward periphery line is generally called the forward clearance line.

g. Landing Spot. A circle with a maximum diameter of 6 feet 6 inches (2 meters) indicates the precise area over which the helicopter is to land.

h. Deck Handling or Parking Line. A yellow line indicates the precise area where the helicopter is to be parked or maneuvered.

i. Ship Designator. A number or letter designator with a minimum length of 1.2 meters to provide hull identification.

GBR **6. Vertical Replenishment Markings.** Ship decks are provided with markings to give helicopter aircrews a visual aid for both day and night VERTREP operations. Ships employ two general types of VERTREP markings.

a. On the Helicopter Landing Area. Ships do not require additional VERTREP markings if the helicopter is cleared for landing as indicated in the Ship/Aircraft Interoperability Matrix. In this case, the landing spot shall be used for the pickup and delivery zone. Additionally, the approach path for the VERTREP helicopter shall be the same as that used for landing. If the helicopter cleared for VERTREP is larger than the category of the largest helicopter cleared for landing, a rotor-center limit line is used to designate the safe operating boundary past which the main and tail rotor hubs shall not pass.

NOTE

WHEN A ROTOR-CENTER LIMIT LINE IS PROVIDED, ALL HELICOPTERS CLEARED TO VERTREP THE HOST SHIP ARE TO USE THIS LINE OR LINES IN LIEU OF THE LANDING SPOT. WHEN USED, THE ROTOR-CENTER LIMIT LINE PROVIDES CLEARANCE FOR ALL HELICOPTERS CLEARED TO USE THE VERTREP AREA.

b. On VERTREP-Only Areas. When a deck area other than the normal landing area is designated for VERTREP operations, the periphery of that area is marked to identify the clear-deck area and a rotor-center limit line is provided. (See Figure 2-3.)

c. Rotor-Center Limit-Line Markings. This line provides clearance for the largest category of helicopter cleared for VERTREP operations. Four types of rotor-center limit-line markings are authorized, depending on the physical clearances available in the VERTREP operating area (VOA).

(1) Type 1. (See Figure 2-3.) The Type 1 marking is a dashed line through a VOA that identifies it as a facility providing adequate helicopter and load clearance only when a helicopter remains centered on and parallel to the rotor-center limit line.

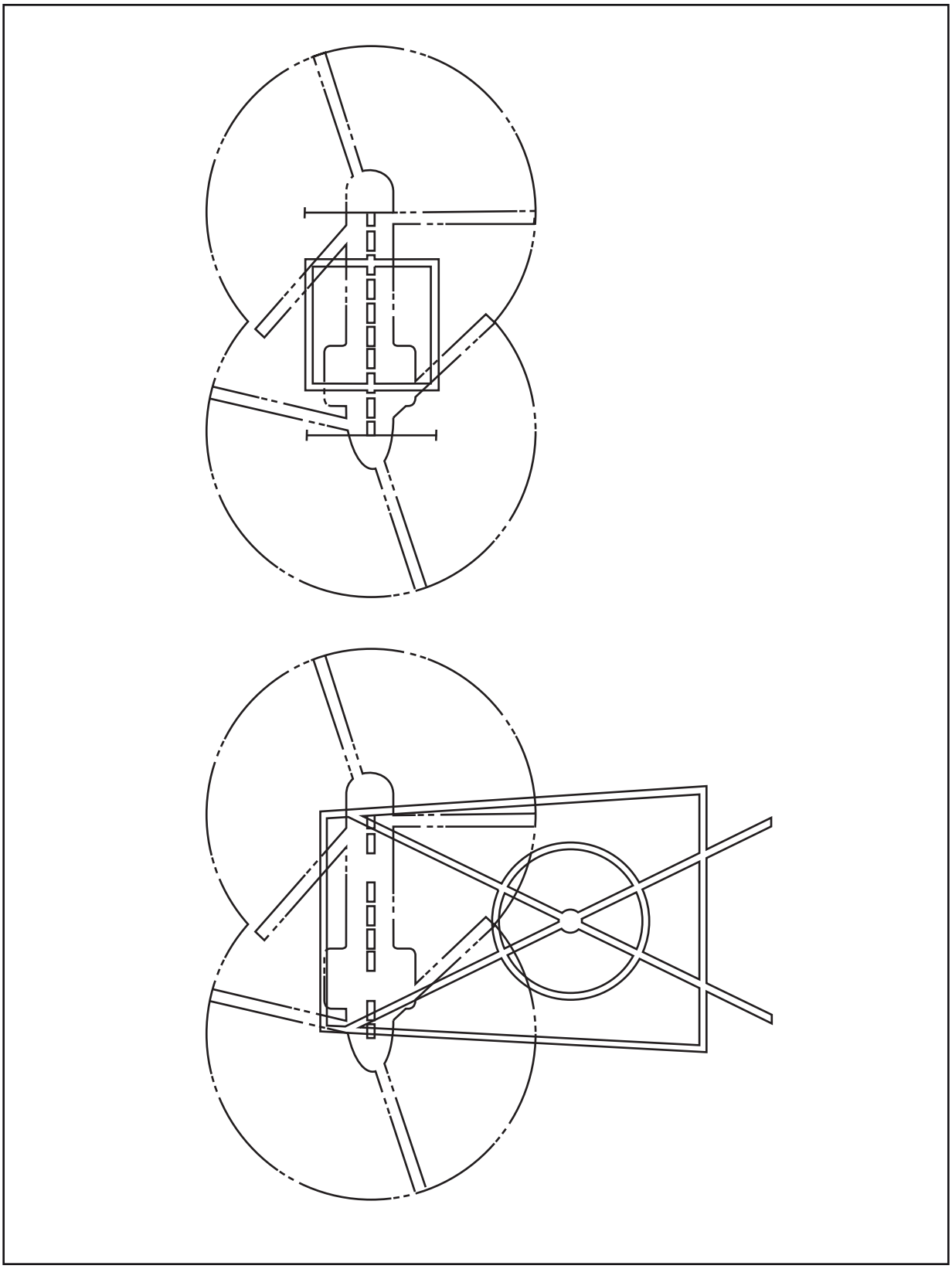


Figure 2-3. VERTREP Area Marking—Type 1

(2) Type 2. (See Figure 2-4.) The Type 2 marking is an athwartship line through a VOA consisting of a series of Tees, the legs of which identify the side on which no danger exists. It identifies a facility providing adequate helicopter and load clearance only when a helicopter remains with its main and tail rotor hubs on or aft (forward on bow VERTREP areas) of the Tee marking line.

(3) Type 2A. (See Figure 2-5.) The Type 2A marking has an additional athwartship line through a VOA consisting of a series of alternating Tees and Balls. The legs of the Tees identify the side on which no danger exists. It is used only to provide additional VERTREP capabilities for use by helicopters larger than can be safely operated using the Type 2 marking. As with the Type 2 facility, adequate helicopter and external load clearances are provided only when the helicopter remains with its main and tail rotor hubs on or aft (forward on bow VERTREP areas) of the Tee-Ball marking line.

(4) Type 3. (See Figure 2-6.) The Type 3 marking has two athwartship Tee lines through a VOA, the legs of which indicate the sides on which no danger exists. They identify a facility providing adequate helicopter and load clearance only when a helicopter remains with its main and tail rotor hubs between the two Tee marking lines.

7. Hoist Pickup and Delivery Point Markings.

WARNING

THE USE OF THE HOIST PICKUP AND DELIVERY DECK MARKING DOES NOT INDICATE THAT ADEQUATE PHYSICAL CLEARANCE IS NECESSARILY AVAILABLE TO CONDUCT HOIST PICKUP AND DELIVERY SAFELY. PREPLANNING BETWEEN THE SHIP AND VISITING HELICOPTER IS NECESSARY PRIOR TO COMMENCING OPERATIONS.

a. On Ships Cleared for VERTREP, Landing, or HIFR. No unique deck markings are required for hoist pickup of personnel or cargo when the largest type of helicopter anticipated to conduct hoist transfer is approved to land, VERTREP, or HIFR. In this case, the hoist operation is conducted in the areas normally designated for landing, VERTREP, or HIFR. The helicopter approach path for the hoist spot shall be the same as that used for landing, VERTREP, or HIFR operations.

b. On All Other Ships. On ships not cleared for VERTREP, HIFR, or landing operations, the hoist marking shown in Figure 2-7 may be used to mark the best shipboard location for hoist pickup and delivery of cargo or personnel. This mark indicates only the best area for conducting hoist operations aboard that ship and is not based on any predetermined clearance criteria. Therefore, its safe use is entirely a matter for agreement between the captain of the ship and the helicopter pilot. Approach requirements for each hoist operation must be discussed and mutually agreed upon before commencing operations.

8. Helicopter In-Flight Refueling Deck Marking. The block letter "H" is painted on the deck to designate the spot over which the helicopter must lower its hoist hook in order to pick up the refueling hose. The HIFR spot "H" is normally located on the port side of the designated helicopter deck area. (See Figure 2-8.)

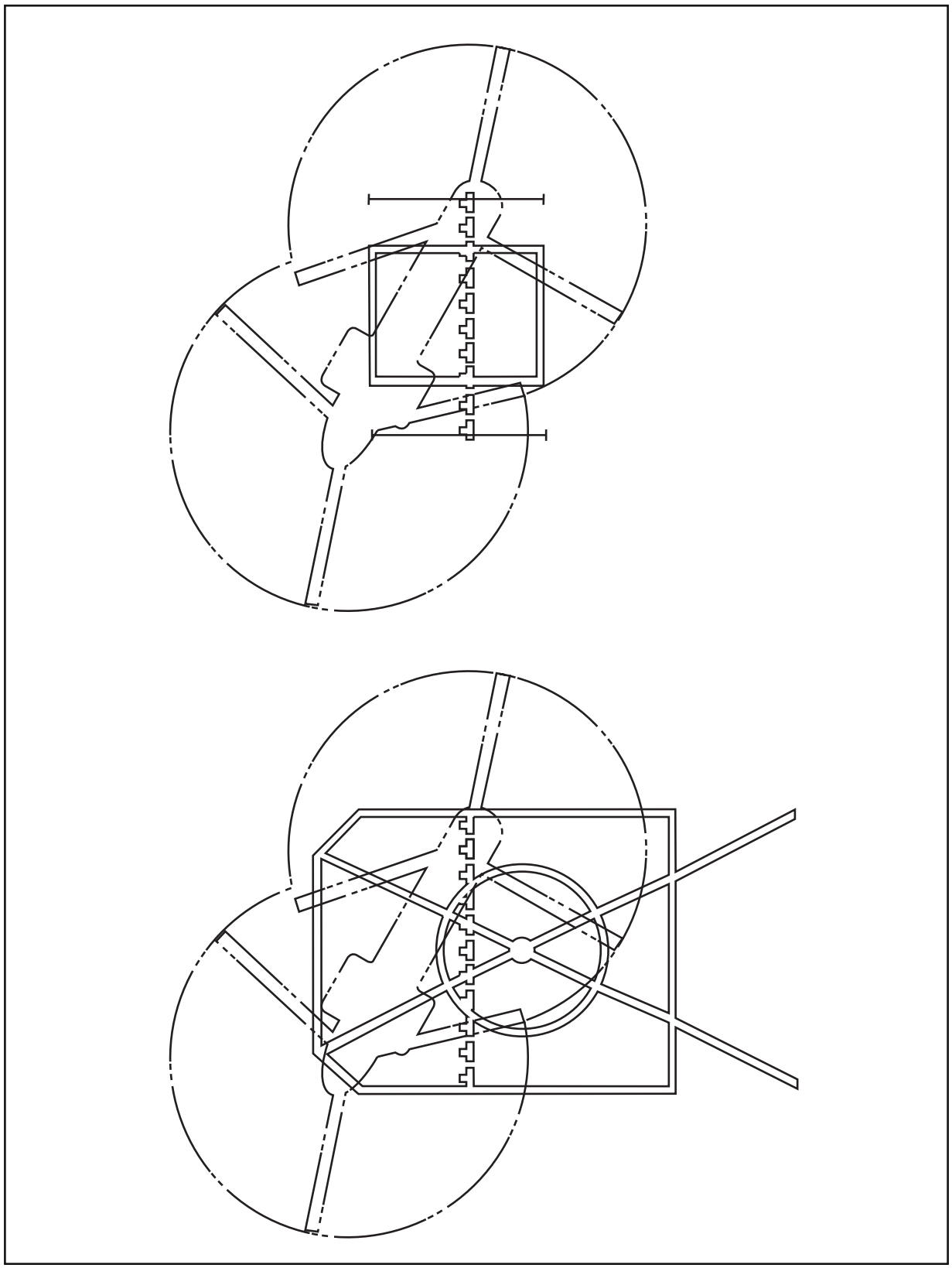


Figure 2-4. VERTREP Area Marking—Type 2

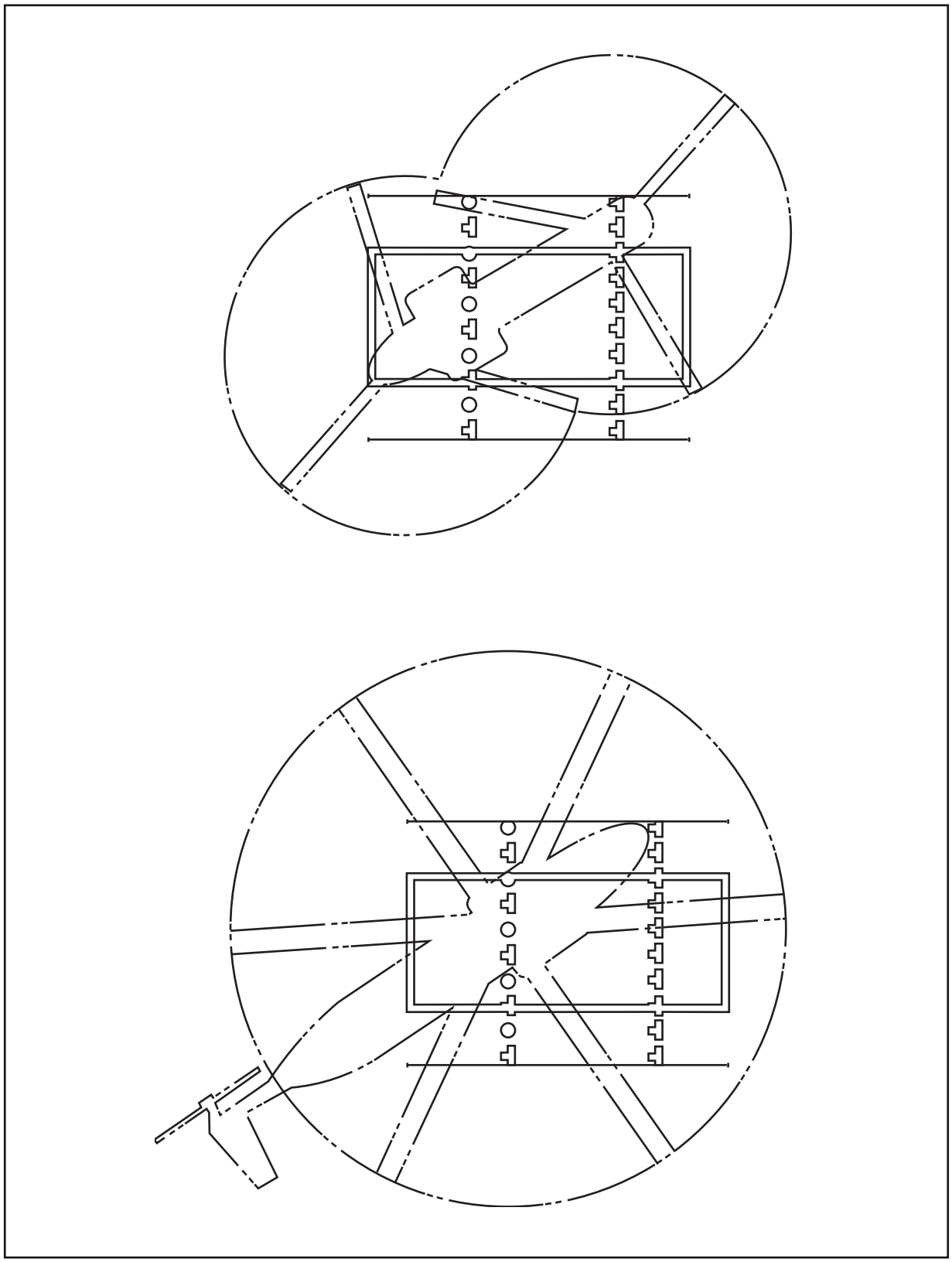


Figure 2-5. VERTREP Area Marking—Type 2A

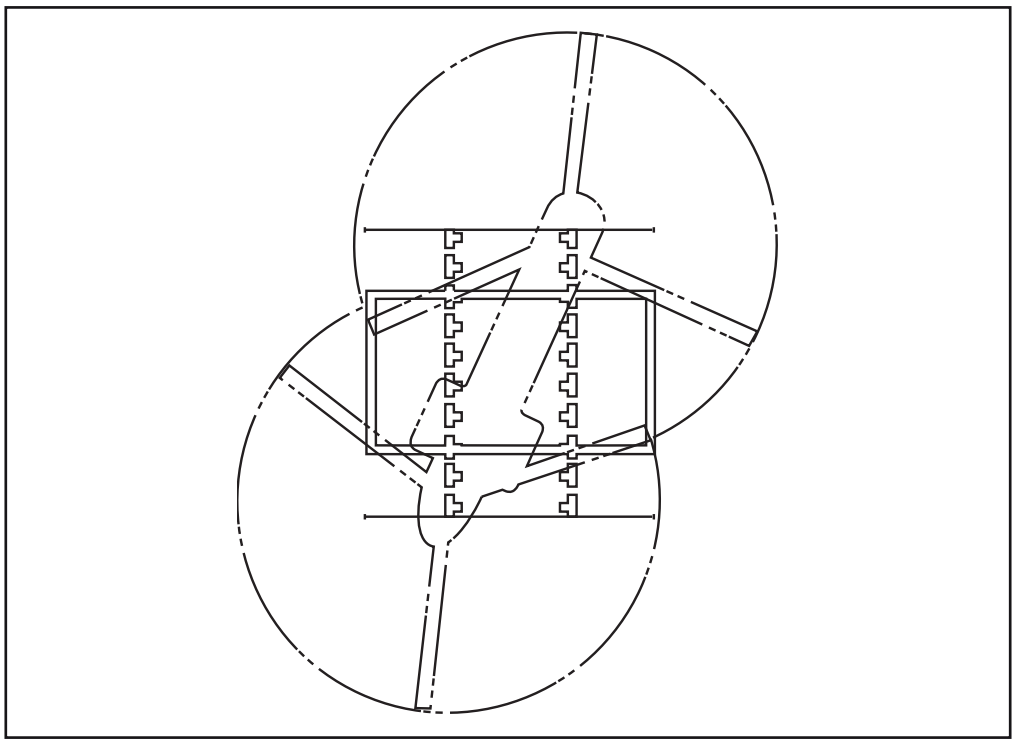
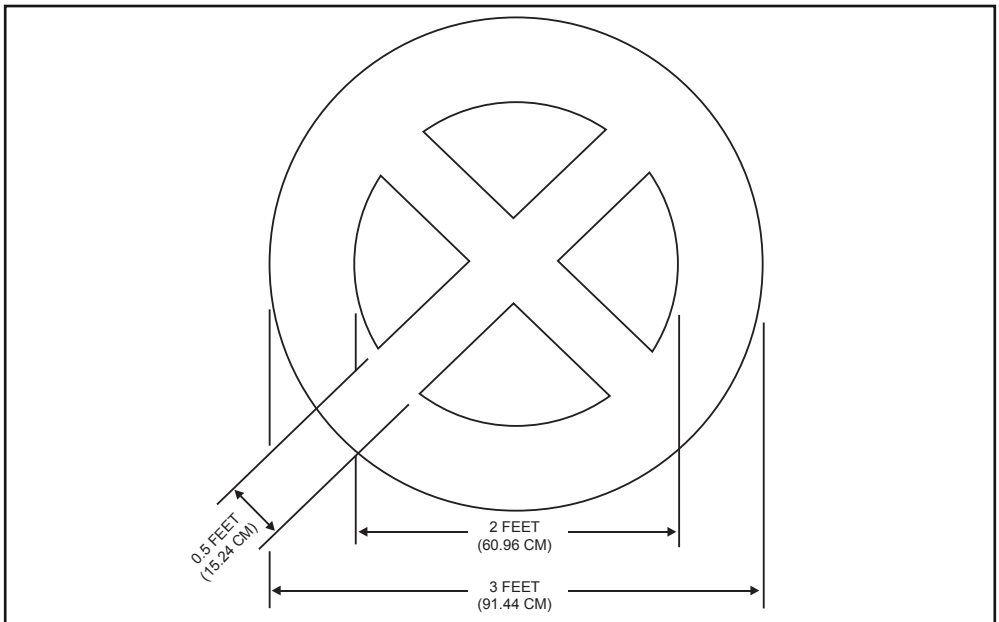


Figure 2-6. VERTREP Area Marking—Type 3



Notes:
1. This marking may be used on ships with no landing or VERTREP facilities to mark the best place for pickup or delivery by means of hoisting.
2. The position marked is not established on any clearance criteria; therefore, safety is entirely between the pilot of the aircraft and the captain of the ship.
3. Line up lights should be inset along the entire length of the landing line up lines.

Figure 2-7. Optional Helicopter Pickup Point Marking

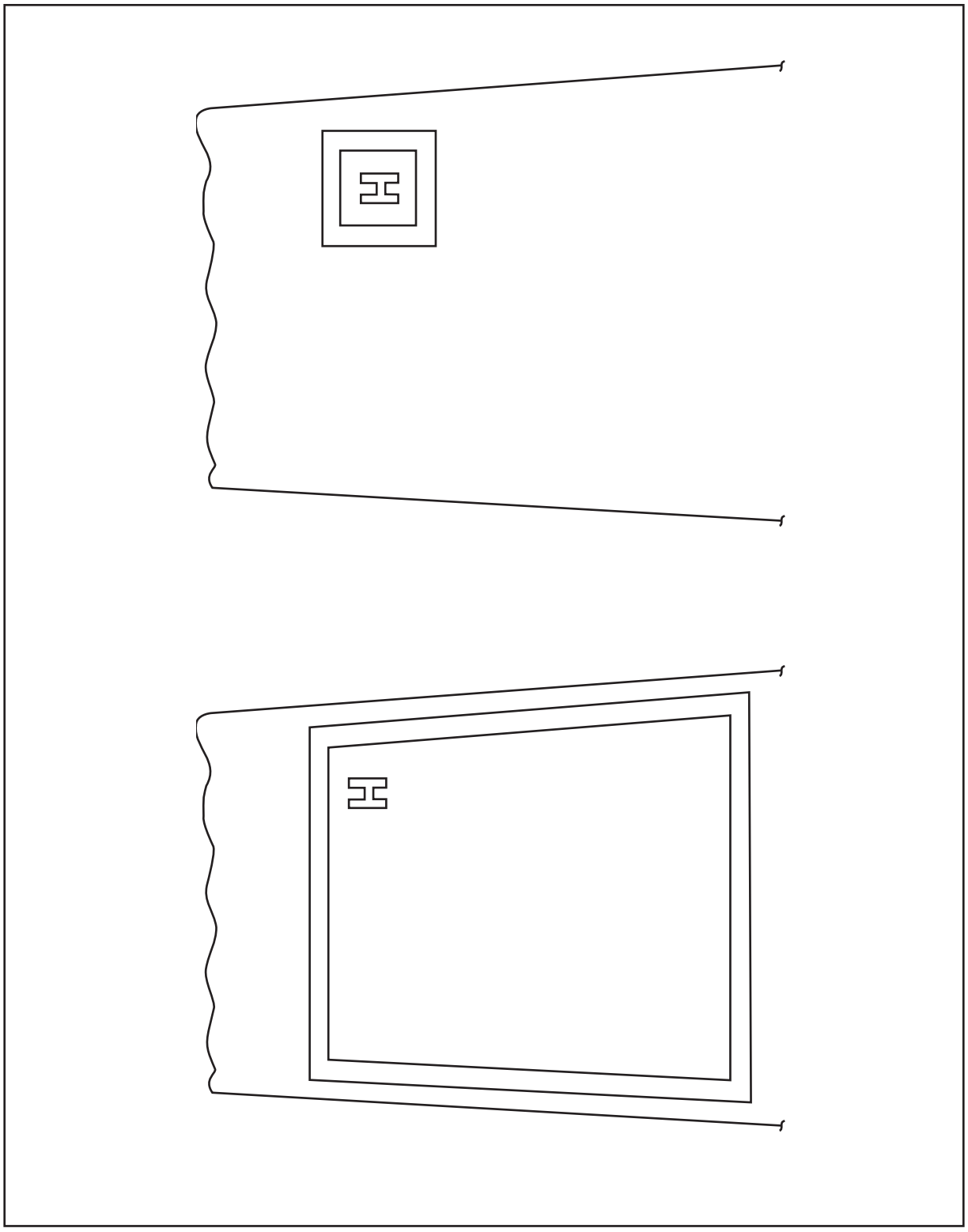


Figure 2-8. HIFR Area Marking

0205 Deck Lighting

1. Deck Lighting for General Illumination. Deck lighting accentuates deck markings to provide visual references for night helicopter operations. Figure 2-9 shows typical lighting locations, including both mandatory and optional lights. The intensity of all deck lighting is controllable at the request of the guest helicopter. The types and functions of the lights shown in the illustration are as follows:

a. Deck edge and lineup lights are inset into the deck on the markings and provide visual reference for night helicopter flights.

b. Forward structure floodlights illuminate the face of the superstructure immediately forward of the helicopter deck hangar and provide the pilot with increased depth perception and a view of obstructions. At least two lights (which may be red, yellow, or white) are used.

c. Overhead floodlights (either red, yellow, or white) are aimed to provide uniform illumination of the helicopter deck.

d. Hangar-top floodlights (either red or white) illuminate the top of the hangar and provide the pilot with additional horizon cues when the pilot is over the flight deck.

e. Deck surface floodlights (either red or white) are mounted on the deck edge to illuminate the deck surface.

f. Maintenance floodlights (either red, yellow, or white) illuminate the helicopter for on-deck maintenance.

2. Deck Status and Flight Reference Lighting. The following paragraphs give general information on ship's lighting used in direct support of night operations. Additional national details are provided in MPP-02.1 for ships of each nation.

a. Deck Status Lighting. The landing area is equipped with deck status lights to provide a green (clear deck) or red (fouled deck) indication that is visible to approaching helicopters. A yellow (sometimes referred to as amber) intermediate status light may also be provided. Red wave-off lights may also be used in conjunction with the glideslope indicator (GSI).

b. Horizon and Pitch Bars. Both horizon and pitch bars are a series of lights mounted athwartship on the superstructure forward of the helicopter deck. They may be either stabilized or unstabilized.

(1) Ships with a wire-recovery system require a stabilized horizon bar to provide the pilot with a precise horizontal reference cue. The horizon bar is stabilized in at least 10° of roll with up to 30° preferred. A pitch bar may also be installed that is stabilized within 5° of pitch. The bars are installed in an area that allows a view of both simultaneously.

(2) Ships without a wire-recovery system may be equipped with a stabilized or an unstabilized horizon bar or stabilized horizon lights installed on the structure forward of the helicopter deck.

1. LINEUP APPROACH LIGHTS (PERMISSIBLE)
2. a. HANGAR TOP FLOODLIGHTS (PERMISSIBLE)
   b. HANGAR FRONT FLOODLIGHTS (PERMISSIBLE)
   c. OVERHEAD FLOODLIGHTS—MANDATORY
3. a. MAINTENANCE FLOODLIGHTS—FORWARD (PERMISSIBLE)
   b. MAINTENANCE FLOODLIGHTS—AFT (PERMISSIBLE)
4. DECK STATUS LIGHTS (MANDATORY)
5. HIGH INTENSITY LINEUP LIGHTS (PERMISSIBLE)
6. DECK EDGE LIGHTS (PERMISSIBLE)
7. HORIZON BAR—FORWARD (PERMISSIBLE)
8. PITCH BAR (PERMISSIBLE)
9. HORIZON BAR—AFT (MANDATORY ON WIRE-RECOVERY SHIPS)
10. DECK SURFACE LIGHTS (PERMISSIBLE)
11. FLIGHT DECK LINEUP LIGHTS (PERMISSIBLE)
12. FLIGHT DECK DROP LINE LIGHTS (PERMISSIBLE)
13. FLIGHT DECK EXTENDED LINEUP LIGHTS (PERMISSIBLE)
14. TOUCHDOWN SPOT LIGHT (PERMISSIBLE)
15. HOMING BEACON//VESSEL HEIGHT INDICATOR LIGHT (MANDATORY)
16. GLIDESLOPE INDICATOR AND WAVE-OFF LIGHTS (MANDATORY)

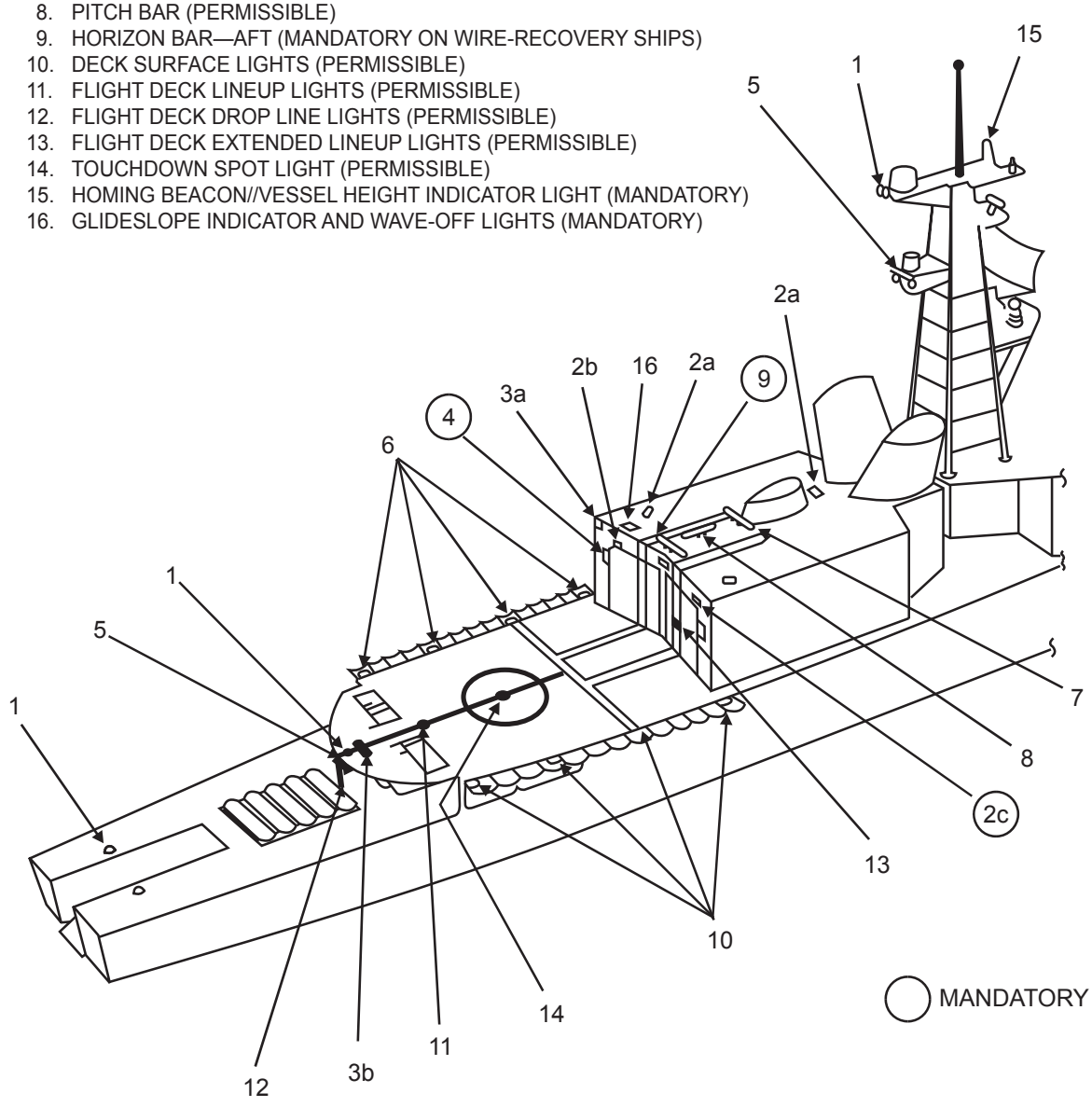


Figure 2-9. Standard Flight Deck Lighting

c. Glideslope Indicator Standards. The nomenclature of helicopter GSIs and certain other characteristics of the GSI used by the host ship have been standardized. However, because shipboard GSI systems vary, the guest helicopter's aircrew must familiarize themselves with the GSI characteristics of the host ship before making an approach. National GSI details are provided in MPP-02.1.

(1) A GSI is a light-emitting landing aid designed to indicate the desired angle of descent to the ship to an approaching helicopter. Figure 2-10 shows the standard vertical and horizontal beam dispersal.

(2) On tricolored GSIs (either the YGR or the GYR type), the beam consists of three stacked vertical sectors that use the colors green, red, and yellow (sometimes referred to as amber).

(a) On the YGR type the yellow sector is high, green is the command path (on the glideslope), and red is low.

(b) On the GYR type the green sector is high, yellow is the command path, and red is low.

(3) On the type of GSI known as the FGR, a flashing green light indicates high, a steady green is the command path, a steady red is low, and a flashing red indicates a very low approach.

(4) On both the GYR and YGR systems, the upper and command sectors are steady-burning and part or all of the low (red) sector may be strobed to flash approximately 90 times per minute. On FGR systems, parts of the flashing red and flashing green sectors are set to strobe at approximately 90 to 120 flashes per minute.

(5) A GSI is either stabilized or unstabilized. If stabilized, it maintains a fixed orientation with respect to earth that is independent of the pitch and roll of the ship. Design limits of tricolored GSIs are ±10° roll and ±6° pitch. The FGR system is stabilized within 5 minutes of minimum arc for the same 10° and 6° angles of roll and pitch.

d. Homing Beacon//Vessel Height Indicator Light. This light is located high in the superstructure to identify the ship conducting helicopter operations.

0206 Flight Deck Clothing

1. Mandatory Color Codes for Clothing. Standard colors have been adopted for headgear and the jacket, surcoat (or outer coat), or pullover sweater worn by ship's personnel. These colors enable the guest helicopter's aircrew to identify host ship's personnel functions once the helicopter has landed. For ships other than aircraft carriers, only the following clothing identification color is mandatory:

FDO/FDD/LSE—YELLOW

2. Optional Color Codes for Clothing. The following clothing identification colors may also be used by flight deck personnel on host ships. For national exceptions, consult the technical supplements.

a. Aircraft handling crew and chockmen—BLUE.

b. Maintenance crew—GREEN.

c. Medical—WHITE.

d. Messengers and telephone talkers—WHITE headgear and BLUE jacket.

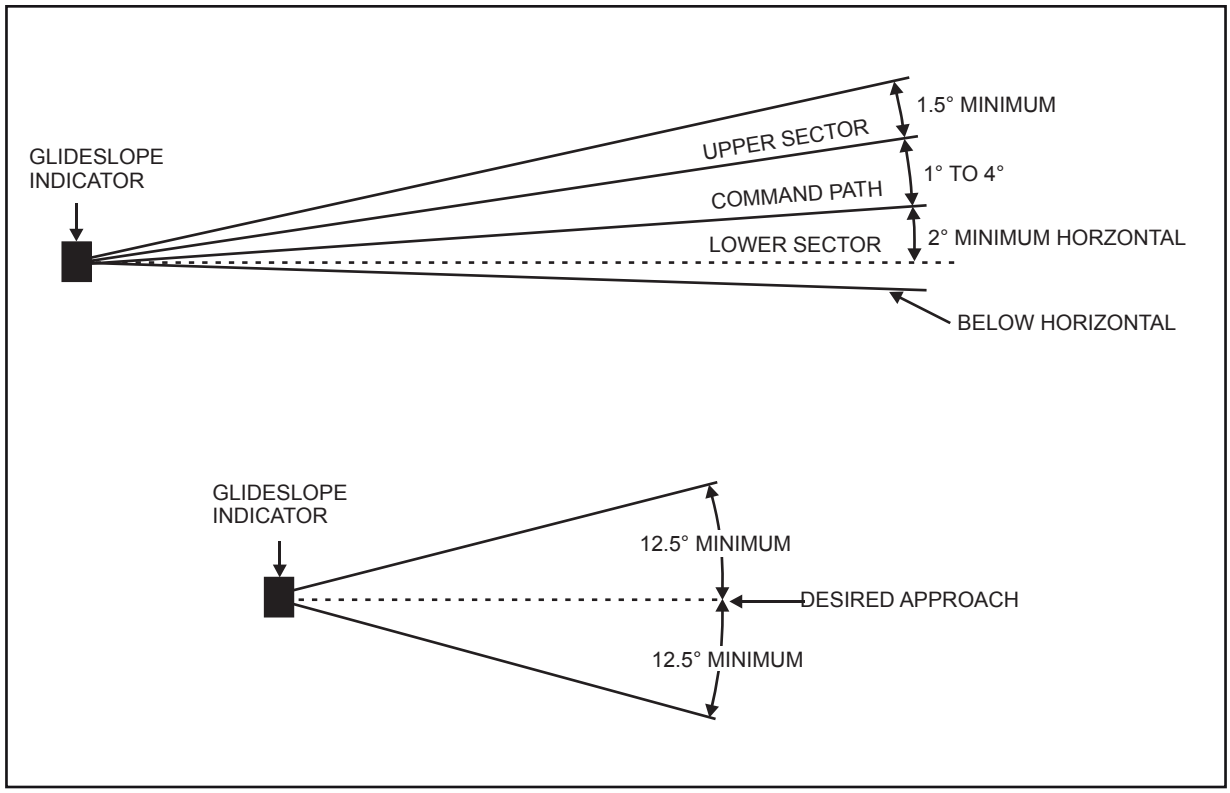


Figure 2-10. Glideslope Indicator (Typical)

e. Ordnance—RED.

f. Photographers—GREEN.

g. Firefighting and crash crews—RED.

h. Aviation fuel crew—PURPLE.

3. Color Codes for Flight Deck Clothing on Aircraft Carriers Only. For aircraft carriers, the color-coding of flight deck clothing listed in paragraph 0206.2 is mandatory along with the following additional standards:

a. Aircraft handling officers and plane directors—YELLOW.

b. Catapult and arresting gear officers, FDO, FDD, LSO, and LSO's talker—YELLOW.

c. Officers and senior ratings other than FDO and FDD normally employed on the flight deck—WHITE jacket with billet or function title.

d. Aircraft handling crew (chockmen, tractor drivers, elevator operators, etc.)—BLUE.

e. Maintenance crew (hook runners, catapult and arresting gear crews, etc.)—GREEN.

f. Air electrical and radio ratings—GREEN.

g. Plane captains and line CPO—BROWN.

h. Ordnancemen (EOD, weapons handlers)—RED, with black stripe.

i. Medical—WHITE, with red cross.

0207 Aircraft Marshaling Signals

Chapter 3 provides the day and night hand signals that are used for communication between the helicopter's aircrew and the host ship's personnel. Lighted signal wands of matching colors must be used for night operations. On aircraft carriers, plane directors use amber wands, and the launching officer uses red or green wands.

0208—0210 Spare

SECTION II—GENERAL OPERATIONAL INFORMATION

0211 Liaison Between Guest Helicopter and Host Ship

WARNING

SAFE AND PROPER CROSS OPERATIONS BY HELICOPTERS REQUIRE A DETAILED KNOWLEDGE OF THE HOST SHIP'S FACILITIES AND ITS NATIONAL OPERATING PROCEDURES. EACH NATION EMPLOYS VARIOUS COMBINATIONS OF STANDARD SHIPS' AVIATION FACILITIES GENERALLY AGREED TO BY ALL PARTICIPATING NATIONS AS WELL AS THOSE THAT ARE UNIQUE TO SHIPS OF THAT NATION.

NOTES

1. **IF STANDARDIZED PROCEDURES DO NOT EXIST OR IF THEY ARE CONSIDERED UNNECESSARY, THE NATIONAL OPERATING PROCEDURES OF THE HOST SHIP RECEIVING THE HELICOPTER SHALL APPLY. REFER TO MPP-02.1 FOR NATIONAL OPERATING PROCEDURES.**

2. **A FACE-TO-FACE BRIEFING SHALL BE CONDUCTED BEFORE PRE-PLANNED CROSSDECK OPERATIONS TAKE PLACE (SEE ARTICLE 0201).**

A certain amount of liaison is necessary for both the guest helicopter and the host ship to ensure safe and efficient cross operations and to minimize conditions that may jeopardize both the mission and the aircraft. The need for liaison applies equally to both the host ship's personnel and the visiting aircrew. Planning for cross operations should begin as far in advance as possible with the maximum feasible amount of coordination between guest and host to confirm the procedures that are to be used. Adequate planning is necessary for safety and efficiency and to minimize conditions that could jeopardize the mission, helicopter, or aircrew.

0212 Pre-Operational Planning

1. In addition to Article 0105, the following paragraphs in this section contain guidance for ship and aircraft personnel in the planning of any helicopter cross operation.

2. Helicopter Preflight Briefing Checklist. Article 0304 contains the standard helicopter preflight briefing checklist, which should be completed prior to commencing operations.

3. Helicopter Passenger Briefing Checklist. Personnel embarking on a helicopter as passengers for any operation must be briefed. To ensure that critical safety information is provided, minimum requirements for a briefing checklist are provided in Article 0263.

0213 Aircraft-Specific Information

1. Required Reference Materials.

a. Refer to the most recent copies of MPP-02.1, MPP-02.1.1, and MPP-02.2 and check the following information pertinent to the host ship:

(1) Capability of accommodating the aircraft and its mission.

(2) Required shipboard services that can be made available.

(3) Physical details of the ship, including silhouette, location of obstructions, specific deck marking, retractable hangar hazards, hull number, and so on.

Note. *Some ships within a class may vary in certain details from the national standards discussed in MPP-02.1, MPP-02.1.1, and MPP-02.2.*

b. Read this chapter, MPP-02.1, MPP-02.1.1, and MPP-02.2 for the following:

(1) Details of flight deck lighting and marking, visual landing aids, flight deck clothing, and aircraft marshaling signals.

(2) The host ship's standards of flight deck marking and lighting.

c. Read and become familiar with the common procedures in this chapter as well as the national procedures in MPP-02.1, MPP-02.1.1, and MPP-02.2.

2. Sea State, Weather, and Deck Motion Conditions. Where possible, check that the sea state and weather conditions are compatible with the host ship's ability to perform cross operations. Some nations provide acceptable levels of deck pitch and roll for each ship in MPP-02.1. Determine if deck motion limits are compatible for the helicopter and the ship for the proposed operation.

3. Lift Factors. Lift capability is a limiting factor in any helicopter operation and is most critical when hovering. Determine the load factors to be encountered, particularly in a VERTREP or internal cargo transfer. Lift capability is influenced substantially by the following factors:

a. Ambient temperature—Lift capability decreases as temperature increases.

b. Relative humidity—Lift capability decreases as relative humidity increases.

c. Pressure altitude—Lift capability decreases as pressure altitude increases.

d. Density altitude, a combination of pressure altitude, ambient temperature, and relative humidity—Lift capability decreases as density altitude increases.

e. Relative wind—Lift capability decreases as relative wind decreases.

f. Ground effect—Lift derived from ground effect is increased if the deck is stable. It is decreased as height above deck is increased. Lift from ground effect is lost when the helicopter passes over the deck edge.

4. Day/Night Considerations. Determine whether the expected time of arrival is day or night, inasmuch as all ships are not equally day-night capable.

5. Maintenance Considerations. Although the host ship's capability to support the guest helicopter's maintenance requirements is given in MPP-02.1, the ship may not necessarily stock all expendable stores required for extended helicopter operations. A pack-up kit containing specialized O-rings, gaskets, and other items that are normally expended regularly should be prepared and stowed aboard the helicopter.

6. HIFR Considerations. Because many ships do not carry the necessary adapters to mate the ship's fuel hose to the aircraft, ensure that these adapters are available if a HIFR operation is anticipated.

7. Briefing. Ensure that all passengers have read the helicopter passenger briefing checklist.

0214 Ship-Specific Information

WARNING

ALL OPERATING CAPABILITIES, CERTIFICATIONS, AND OPERATING CLEARANCES GIVEN IN MPP-02.1 ARE BASED UPON THE PREMISE THAT RETRACTABLE HANGARS ON SHIPS SO FITTED ARE RETRACTED DURING CROSS OPERATIONS. UNRETRACTED HANGARS MAY PROVIDE OBSTRUCTIONS THAT ARE NOT INDICATED IN MPP-02.1.

1. Guest Helicopter Compatibility. Check the physical and operational details of the guest helicopter in MPP-02.2 to ensure that helicopter operating clearances and deck support services, including tiedown points, special fuel requirements, etc., are adequate. Ensure that the deck crew and officers fully understand these requirements.

2. Weather Brief. An aerographer, experienced quartermaster (QM), or other qualified member of the host ship's company shall prepare a weather brief to be relayed to the guest helicopter. This brief shall include, at the least, the following information:

a. Air and sea surface temperature.

b. Dew point.

c. Barometric pressure.

d. Density altitude.

e. Surface wind direction and speed.

f. Altimeter setting.

g. Ceiling and cloud cover.

h. Visibility.

i. If available, a forecast of weather en route and at the estimated time of arrival.

NOTE

DURING AN EXTENDED FLIGHT, THE SHIP SHALL NOTIFY THE HELICOPTER OF ANY WEATHER CHANGES THAT DEVELOP.

WARNING

WHEN CONDUCTING CROSS OPERATIONS, CONSIDERATION MUST BE GIVEN TO THE POTENTIAL EFFECTS OF RADIATION HAZARDS (RADHAZ), ELECTROMAGNETIC INTERFERENCE (EMI), AND ELECTROMAGNETIC VULNERABILITY (EMV). THE HOST SHIP MUST TAKE APPROPRIATE MEASURES TO MINIMIZE THE EFFECTS OF THE SHIP'S EMITTERS ON THE AIRCRAFT AND ITS COMPONENT SUBSYSTEMS AND ONBOARD ORDNANCE OR STORES. FAILURE TO OBSERVE THESE PRECAUTIONS CAN CAUSE DAMAGE TO AIRCRAFT ELECTRONIC EQUIPMENT OR, UNDER CERTAIN CIRCUMSTANCES, ACTUATION OF ORDNANCE CARRIED ABOARD THE AIRCRAFT. STANAG 1380/ AECP-2 PROVIDES INFORMATION REGARDING PROCEDURES TO BE TAKEN TO AVOID THE HAZARDS THAT CAN ARISE WHEN PERSONNEL, MUNITIONS AND WEAPON SYSTEMS EMBODYING ELECTRO-EXPLOSIVE DEVICES (EED), FUELS AND FLAMMABLE MATERIEL, AND SAFETY CRITICAL ELECTRONIC SYSTEMS (SCES) ARE EXPOSED TO EMR IN RADIO AND RADAR FREQUENCY ENVIRONMENTS DURING NATO NAVAL OPERATIONS. GENERAL GUIDANCE AND PROCEDURES, AND METHODS FOR CALCULATING SAFETY DISTANCES, BY WHICH THESE HAZARDS CAN BE AVOIDED ARE DESCRIBED, OR REFERENCED, FOR THOSE WITH RESPONSIBILITIES FOR DIRECTING SUCH OPERATIONS.

3. Electromagnetic Radiation Considerations. Not all combinations of aircraft and explosive stores have been tested for safety in a shipboard electromagnetic environment. Some aircraft or their controls, ordnance, launchers, and cartridge activated devices (CADs) may not meet the host ship's standards for operating in the presence of electromagnetic radiation (EMR).

4. Radio Communications.

a. Except in an emergency or when under emission control (EMCON), radio contact should be established between the launching and receiving ships and the helicopter before beginning helicopter operations. While airborne, the helicopter should be kept informed of any deterioration of weather at the receiving ship.

b. The host ship should have a spare UHF radio available to assume communications if the primary radio fails. This is especially critical during periods of reduced visibility, night operations, or when positive radar control must be maintained.

c. During the initial and final phases of departure and approach, and at other times when intense pilot concentration is required, two-way radio contact should be deferred, except in an emergency, until the aircraft is on deck.

NOTE

IT IS MANDATORY THAT THE HOST SHIP MONITOR THE MILITARY AIR DISTRESS FREQUENCY (243.0 MHZ) AT ALL TIMES THAT THE HELICOPTER IS AIRBORNE. THIS IS OF PARTICULAR IMPORTANCE WHEN THE HELICOPTER IS OPERATING INDEPENDENTLY, AS THE PILOT MAY ATTEMPT TO COMMUNICATE USING HIS SURVIVAL RADIO DURING A COMMUNICATION FAILURE.

0215 National Search and Rescue Swimmer Data

See Chapter 2 of MPP-02.2 for information on national search and rescue swimmer capabilities.

0216—0220 Spare

SECTION III—AIR TRAFFIC CONTROL PROCEDURES

0221 Control Zone

1. The airspace that surrounds each air-capable ship equipped for approved approaches by fixed-wing aircraft and helicopter under instrument flight rules (IFR) is defined as a circle starting at a minimum of 2 nautical miles in radius out to a maximum of 5 nautical miles depending on the national origin of the ship. The control zone extends from the surface to a height between 500 and 2,500 feet above mean sea level (MSL), also dependent upon the national origin of the ship.

2. During periods when ceiling and/or visibility is below IFR minima, electronic air traffic control techniques shall be used to provide separation for maximum safety.

0222 Operational Factors

1. In addition to weather conditions at the host ship, other operational factors that bear on the degree of helicopter control required include:

a. Mission, range, and emission policy.

b. Tactical considerations.

c. Mutual interference.

d. Capabilities of air control units and controllers.

e. Equipment status and condition of aircraft involved.

2. The type of control to be employed during departure and recovery is determined by the senior naval aviator, unless otherwise specified by higher authority.

0223 Types of Operational Control During Approach

1. Normally, the pilot is responsible for determining if weather conditions allow him to operate under visual meteorological conditions (VMC). However, if the ship's commanding officer determines that the close control associated with flight under instrument meteorological conditions (IMC) is operationally preferable, then IMC shall prevail during the aircraft/ship operation.

2. During departure and recovery, the guest helicopter is always subject to some form of air control by the host ship. Pilots shall not shift frequencies unless they notify and/or obtain permission from the controlling agency.

3. Control Methods. The following level-of-control criteria are provided as guidance.

a. During approach, the guest helicopter may operate under either:

(1) Close control.

(2) Loose control.

(3) Broadcast control.

(4) Positive control.

(5) Advisory control.

b. Under certain circumstances the above terms may be employed individually. However, in most operations, they are combined as follows:

(1) Close positive control.

(2) Close advisory control.

(3) Loose positive control.

(4) Loose advisory control.

(5) Broadcast control.

c. In simplest terms, "close" and "loose" apply to control of aircraft, while "positive" and "advisory" apply to in-flight collision avoidance and safe separation.

4. Definitions of Control Terms.

close control. A form of aircraft mission control in which the aircraft is continuously controlled for altitude, speed, and heading to a position from which the mission can be accomplished.

loose control. A form of aircraft mission control in which the aircraft commander selects his own speed, altitude, heading, and appropriate tactics to accomplish the assigned task. The controlling unit (host ship) will advise the aircraft of the current tactical picture and will provide further advice if and when available.

broadcast control. In the absence of full capability or if the tactical situation precludes close or loose control, aircraft may be operated under broadcast control. Tactical or target information is passed to enable the aircraft to accomplish its task. The controlling unit, when possible, provides adequate warnings of hazards but the aircraft commander is responsible for aircraft navigation and collision avoidance.

positive control. The controlling unit is responsible for taking actions for collision avoidance such as ordering necessary alterations to heading, speed, and altitude to maintain separation criteria.

advisory control. The controlling unit will provide adequate warnings of hazards affecting aircraft safety. The aircraft commander is responsible for the aircraft's navigation and collision avoidance.

0224 Positive Control

1. Positive control may be used under the following conditions:

a. Less than 500-foot ceiling.

b. Forward visibility of less than 1 mile.

c. During operations at night, unless modified by the officer in tactical command (OTC).

2. Positive control is executed only after being firmly established between pilots and controllers in plain language. Under these conditions, the host ship must maintain two-way radio communications and have radar contact with the helicopter. It is generally employed under conditions of poor visibility because of the benefit of a radar environment under centralized control.

3. Under positive control, the ship (1) has radar and radio contact with the helicopter and published approach or departure procedures are complied with, or (2) specific assignments for heading and altitude are issued by the ship's air controller. Pilots shall not shift frequencies unless they notify and/or obtain permission from the controlling agency.

4. During an extended flight, frequent radio checks shall be made. The ship must inform the pilot of any change in weather, loss of radar contact, or alteration of ship's course and/or speed.

0225 Advisory Control

Advisory control consists of the ship's monitoring of radar and radio channels in order to advise the pilot of the hazards of other aircraft traffic and ongoing operations. Advisory control shall be used whenever traffic density in any operational area requires use of a higher degree of control for flight safety reasons than that which is normally associated with VMC. Advisory control is normally limited to VMC operations and is recommended whenever positive control is not required.

0226 Broadcast Control

In the absence of a full aircraft control unit (ACU) capability, or if the tactical situation precludes positive or advisory control, an aircraft may be operated under tactical direction of the ship. Tactical information is passed from the ship to enable the aircraft to accomplish its mission. The ship, where possible, shall provide warnings of hazards but the pilot is responsible for the safety and proper navigation of his aircraft.

0227 Separation Criteria

1. While altitude separation is generally provided by pilots maintaining assigned altitude, lateral and time separation is the responsibility of the air controller. Speed changes may also be directed by the air controller.

2. Under instrument conditions, either lateral or vertical separation should be provided. These restrictions do not apply to launch and recovery operations or tactical maneuvers such as air intercepts, rendezvous, or close ASW action. USA

a. Low Altitude, Close-In. (less than 400 feet and closer than 10 nautical miles). Unless the guest helicopter is otherwise ordered by the receiving ship, minimum lateral separation is 1,500 yards. Minimum vertical separation is 300 feet.

b. Medium and High Altitudes. (above 400 feet).

(1) Lateral Separation.

(a) At least 3 nautical miles within 40 nautical miles of the radar antenna.

(b) At least 5 nautical miles beyond 40 nautical miles of the radar antenna.

(2) Vertical Separation.

(a) 500-foot minimum for helicopters.

(b) 1,000-foot minimum between helicopters and fixed-wing aircraft.

0228 Qualifications of Helicopter Controllers at Sea

STANAG 1154 provides standard qualifications for certification of helicopter air controllers in a multinational force operating at sea. Such standard qualifications enhance operational safety, particularly under IFR approaches and landings.

0229—0230 Spare

SECTION IV—HELICOPTER CROSS OPERATIONS TO AIR-CAPABLE SHIPS

0231 Pre-Arrival Procedures

1. Shipboard Preparations to Receive Helicopter. The host ship is responsible for the following preparations:

a. Conduct a walk-down of all decks, particularly those in the helicopter area, to inspect these areas for materials that may cause foreign object damage (FOD) (rags, paper, small metal objects, chocks, etc.). Large helicopters with proportionately larger downwash can generate sufficient wind velocity to cause large objects and some ground support equipment to become airborne. Ensure that all FOD-causing material is disposed of or secured.

b. Ensure that no garbage is jettisoned over the side or incinerated during the period of flight operations. Dumping or burning of trash constitutes a major FOD hazard.

c. Set the firefighting/rescue detail as specified in Article 0267.

d. Set a rescue boat detail with crew ready to launch if required.

e. Secure smoking and use of open flame on the helicopter deck.

f. Clear all nonessential personnel from the helicopter deck when flight quarters are set. Ensure that those remaining on duty are wearing the color-coded clothing required by Article 0206.

g. When possible, maneuver the ship to obtain optimum wind across the deck; minimal roll, pitch, yaw, and heave; and maintain a steady speed.

WARNING

EXCEPT IN AN EXTREME EMERGENCY, THE HOST SHIP SHALL NOT CHANGE COURSE WHILE THE HELICOPTER IS BEING LAUNCHED OR RECOVERED.

2. Night Operations. In addition to the requirements of paragraph 0231.1, the following apply to night operations:

a. Be prepared to adjust the intensity of any and all deck lighting at any time at the request of the guest helicopter's aircrew.

b. The LSO shall use lighted signal wands or paddles.

c. The rescue boat shall have appropriate night signaling equipment.

d. Restrict use of cameras equipped with flash units. Such flashes can temporarily blind an aircrew during takeoff or landing.

0232 Communications

1. Except in emergency or when under emission control (EMCON), radio contact should be established between the launching and receiving ships and the helicopter before beginning helicopter operations.

2. The host ship shall monitor the military distress frequency (243.0 MHz) at all times that the helicopter is airborne.

3. The ship will keep the helicopter informed of possible changes in weather, course, or speed; mission requirements; and other factors that could affect the scheduled operation.

0233 Approach Under Emission Control Conditions

Under EMCON, when radio communications are normally not permitted, visual signals may be used to support routine helicopter operations. The receiving ship should guard the helicopter common circuit in the event of a flight emergency.

0234 Information To Be Passed From Helicopter to Ship

When approaching the recovery ship, upon release from the previous control agency, and prior to initiating approach, an inbound helicopter shall establish radio contact and provide the following minimum information to the ship:

a. Identification, type of helicopter, and helicopter total weight/mass.

b. Operation intended (e.g., landing, VERTREP, HIFR, hoist transfer).

c. Position relative to the ship.

d. Heading and altitude.

e. In-flight refueling equipment availability, if applicable.

f. Fuel remaining expressed in hours and minutes to mandatory commencement of approach.

g. Aircraft status.

h. Pilot's estimate of weather conditions.

i. Number of persons on board.

j. Type of approach (VMC or IMC) and landing (straight-in, oblique one o'clock/eleven o'clock, or lateral port/starboard) requested, required deck motion limit (if known) by reporting maximum degree of pitch and roll and intentions. (See Article 0239 and Figures 2-14 thru 2-18.)

k. Any other pertinent information which may affect recovery.

0235 Information To Be Passed From Ship to Helicopter

After granting permission to approach and come aboard, the host ship shall provide the following minimum information to the guest helicopter.

a. Type of approach, VMC or IMC, approved.

b. Recovery course.

c. Estimated distance to ship, estimated time of recovery, and time check.

d. Surface wind.

e. Cloud base and visibility.

f. Wind direction relative to the ship's centerline and the wind velocity across the deck. Maximum deck motion expected, given in degrees pitch and roll.

g. Altimeter setting.

h. Missed approach instructions, if required.

i. Information that could affect landing (e.g., pitch and roll, yaw).

j. Safety distances and operational procedures to address all RADHAZ considerations (e.g., Susceptability RADHAZ Designator (SRAD), Transmitter RADHAZ Designator (TRAD) and Personnel RADHAZ Designator codes) to ensure the safety of all material and personnel.

k. Other factors that could affect safety of flight (e.g., unanticipated traffic, operational changes).

WARNING

ENSURE THAT SHIP'S PERSONNEL UNDERSTAND THAT UNDER NO CIRCUMSTANCES SHALL THEY ATTEMPT TO PHOTOGRAPH THE ARRIVING HELICOPTER AT NIGHT USING SPEED LIGHTS OR OTHER PHOTOGRAPHIC FLASH EQUIPMENT. THE FLASHES CAN CAUSE TEMPORARY BLINDING OF THE HELICOPTER'S AIRCREW.

0236 HOSTAC Crossdeck Ship Helicopter Operating Limits

USA

1. A requirement exists for nations to be able to safely interoperate to complete operational tasking. Prior to conducting crossdeck procedures participants are to consult Articles 0105(NATO), 1A03 (IAN Annex 1A, 1B03 (PAC Annex 1B), and 1C03 (ME Annex 1C), as necessary, to ensure the appropriate permissions exist for the planned or intended activity to take place.

2. Once the articles listed in paragraph 0236.1 have been checked, the crossdeck procedure assurance questions at paragraph 0105.5, Figure 1-1, should be completed as necessary to provide either:

a. The participating nations national commands with the necessary information to issue a clearance, OR

b. The participating nations on scene commanders with the necessary information to authorize the crossdeck procedure.

3. In addition to the requirements stated in the previous subparagraphs, the following articles, as an absolute minimum, should be consulted and understood prior to commencing the planning and conduct process; those listed are not exhaustive:

a. MPP-02, Volume I, Articles 0101–0104 and 0212.

b. MPP-02.1.1, ship/aircraft matrix: This table provides the initial information to confirm if the ship/aircraft combination has been assessed. If there is an entry, complete the requirements at paragraph 0236.1 and any national guidance on crossdeck procedures. If there is no entry, then specific

permissions will be required from both participating operating authorities to allow the activity. (This may take several weeks or longer so early planning is recommended.)

c. MPP-02, Volume I, Article 0201, Figure 2-1, face-to-face brief: This brief shall be completed by the receiving platform and the participating helicopter.

d. MPP-02, Volume I, Article 0147, crossdeck operations report: This report should be completed by both the ship and aircraft to provide feedback, especially where difficulties or issues arose during the operation. Information from these reports is used to look for flight safety issues or trends that may indicate changes are required to procedures in MPP-02, Volume I.

e. MPP-02, Volume I, Chapter 2, Common Ships' Aviation Facilities and Operating Procedures for Cross Operations: In particular the following articles:

(1) 0201: Aircrew are to be aware of the contents contained in the WARNING.

(2) 0204: Aircrew are to be familiar with the types of deck markings to which they will be flying; in addition they are to consult MPP-02.1 to source the exact information for the platform to which the crossdeck operation is taking place.

(3) 0239: The pilot is responsible for the implementation of proper landing procedures. The pilot shall use the visual aids and land in accordance with the national procedures of the host ship. Any deviation from the national procedure must be approved by the national authority.

f. MPP-02.2 Chapter 2 which covers national search and rescue swimmer data, NVD ship capabilities, and national non-maritime pilot standards.

4. Types of Crossdeck Procedures.

a. Routine Operations. Operations between aircraft and aviation capable ships of two or more participating nations, not requiring engineering support and are of limited duration (less than 24 hours or overnight). This includes, but is not limited to (see Article 0101):

- Refuels.
- Transfers of cargo and passengers (includes winch/VERTREP/HIFR).
- Casualty/Medical Evacuation (CASEVAC/MEDEVAC).
- Conduct of deck landing practice (see notes).

(1) For these activities the HOSTAC crossdeck ship helicopter operating limits (SHOLs) at paragraphs 0236.5.a to e shall be used. National reservations and additional information can be found in the preliminary pages of MPP-02, Volume I; MPP-02.2, Article 0203, should also be consulted.

(2) Once the intended SHOL to be used has been selected, all other limitations and considerations (see paragraphs 0236.6 to 16) shall be assessed/implemented/applied and understood before the activity can take place.

Note. *The conduct of deck landing ab initio training, to be awarded the HOSTAC deck landing qualification (Article 0251), shall be carried out using a host (own) nation platform in the first instance. Ab initio deck landing qualification/training and requalification post a currency lapse to a foreign platform is* ***PROHIBITED*** *unless this deviation is specifically authorized between the relevant national authorities by signal/email.*

b. Extended Operations. Operations between aircraft and aviation capable ships of two or more participating nations that are of a duration, greater than 24 hours, that results in the embarkation of one nation's aircraft in another nation's platform together with stores and engineering support (see paragraph 0104.2 (Note—Deployment)).

Note. *Activities of this nature require nation-to-nation dialogue and agreement, they should be planned well in advance of the start date of the extended operation; if language training is also required, a timeline of 18 months to deliver an aircraft to the platform is realistic. Shorter planning windows may be possible (not usually less than 6 months) but will limit the amount of capability that can be delivered.*

(1) Instructions and guidance on extended crossdeck procedures can be found in Articles 0305 and 0306.

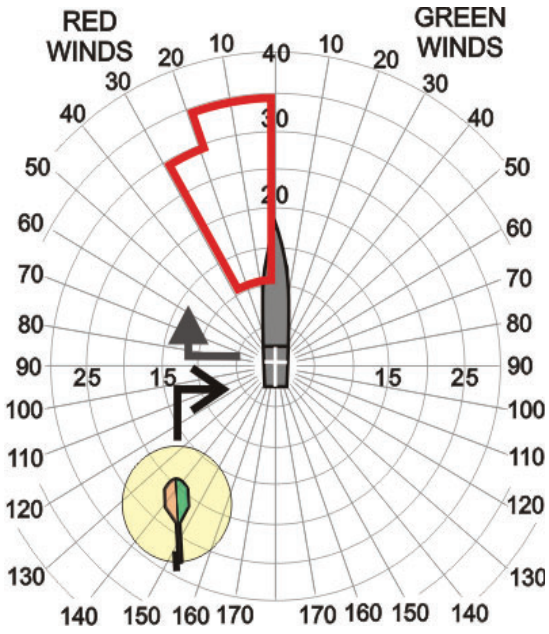
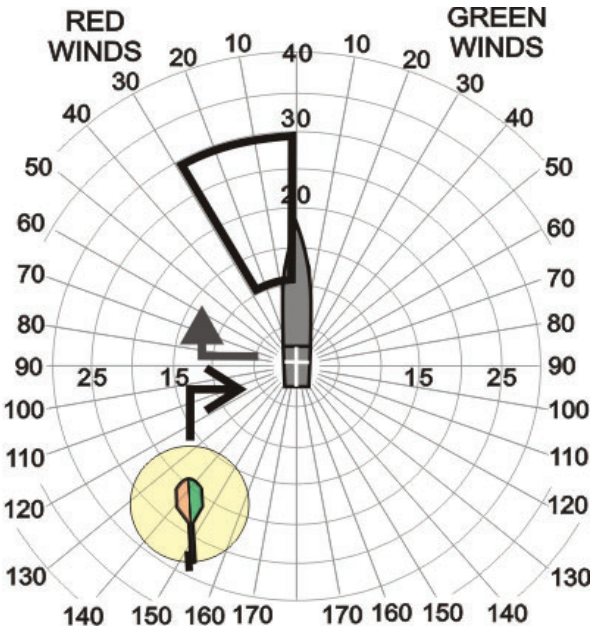
5. HOSTAC Crossdeck SHOLs. The SHOL to be used is to be **briefed and agreed** (see note) at the face-to-face briefing; if airborne and required to conduct a short notice crossdeck procedure, the SHOL to be used and wind required is to be passed in the joining call along with the mandatory items (M) as per Figure 2-1.

Note. *Both the nation that operates the helicopter and the nation that operates the ship should verify whether the helicopter type is able to operate within the recommended envelope, as the recommended envelopes do not guarantee that all helicopters can operate to all ship types.*

a. HOSTAC SHOL—Port Lateral & 45-Degree.

An approach conducted from abeam the ship to port having lined up with the pilot eye line or other appropriate references before transitioning laterally at 90 degrees to land on facing fore and aft.

Note. *This SHOL is also to be used with the 45-degree approach as shown in Article 0239.*

Day	Night
35 kts Ships Head to Red 20° 30 kts Red 20° to Red 30° Minimum Relative Wind Speed 10 kts from Ships Head to Red 30°	30 kts Ships Head to Red 30° Minimum Relative Wind Speed 10 kts from Ships Head to Red 30°
	

Deck Motion Limits (see Table 2-1 for notes)

	Day		Night (Conventional)		NVD	
Configuration	**Pitch**	**Roll**	**Pitch**	**Roll**	**Pitch**	**Roll**
Skidded/Narrow Wheel Base/High CofG /Tail Wheel (at end of tail boom)	**±1°**	**±3°**	**±1°**	**±2°**	**±1°**	**±2°**
Wheeled (without compatible deck securing system)	±2°	±4°	±1°	±3°	±1°	±3°
Wheeled (with compatible deck securing system)	±2°	±6°	±1	±4°	±1°	±4°

(1) The port lateral and 45-degree procedure is valid for both port take-off and landings.

(2) **The pilot shall determine the operating limits required to provide adequate thrust margins (as directed by national procedures) for the launch and recovery taking into account relative wind, turbulence, ship motion, and environmental conditions.**

(3) The helicopter shall not operate at more than 95% of the calculated maximum all up mass (MAUM)/maximum take-off weight (MTOW). Consideration should be given to operating at a lower mass/weight for the first crossdeck procedure to the host ship.

(4) If the HOSTAC deck motion limits are higher than the limits published for the same operations to the helicopter's parent ship, the lesser limits are to apply.

(5) The HOSTAC relative wind envelope (SHOL) must never include areas not valid for the visiting aircraft at the relevant operating mass/weight based on either:

(a) MPP-02.2 own national data for aircraft specific relative wind limitations, OR

(b) Must not include areas that would be omitted/excluded within national SHOLs on a similar type/class of vessel.

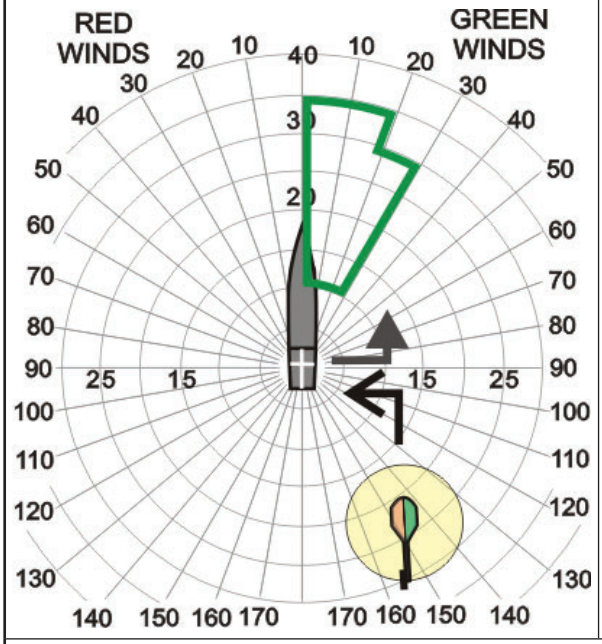
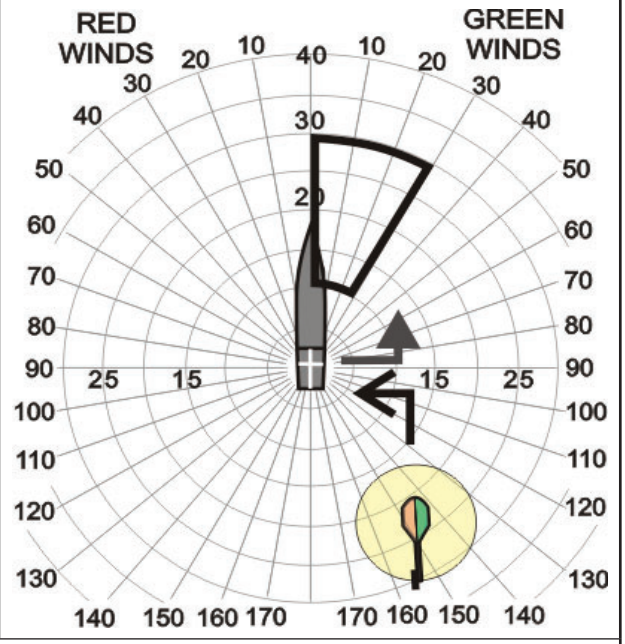
(6) If the HOSTAC relative wind envelope includes areas which are not part of the host ship SHOL, then those areas are to be excluded and only the areas common to both shall apply.

(7) Single pilot aircraft see paragraph 0236.14 reference for flying pilot position.

b. HOSTAC SHOL—Starboard Lateral & 45-Degree.

An approach conducted from abeam the ship to starboard having lined up with the pilot eye line or other appropriate references before transitioning laterally at 90 degrees to land on facing fore and aft.

Note. *This SHOL is also to be used with the 45-degree approach as shown in Article 0239.*

Day	Night
35 kts Ships Head to Green 20° 30 kts Green 20° to Green 30° Minimum Relative Wind Speed 10 kts from Ships Head to Green 30	30 kts Ships Head to Green 30° Minimum Relative Wind Speed 10 kts from Ships Head to Green 30°
	

Deck Motion Limits (see Table 2-1 for notes)

	Day		Night (Conventional)		NVD	
Configuration	**Pitch**	**Roll**	**Pitch**	**Roll**	**Pitch**	**Roll**
Skidded/Narrow Wheel Base/High CofG /Tail Wheel (at end of tail boom)	**±1°**	**±3°**	**±1°**	**±2°**	**±1°**	**±2°**
Wheeled (without compatible deck securing system)	±2°	±4°	±1°	±3°	±1°	±3°
Wheeled (with compatible deck securing system)	±2	±6°	±1°	±4°	±1°	±4°

(1) The starboard lateral and 45-degree procedure is valid for both starboard take-off and landings.

(2) **The pilot shall determine the operating limits required to provide adequate thrust margins (as directed by national procedures) for the launch and recovery taking into account relative wind, turbulence, ship motion, and environmental conditions.**

(3) The helicopter shall not operate at more than 95% of the calculated MAUM/MTOW. Consideration should be given to operating at a lower mass/weight for the first crossdeck procedure to the host ship.

(4) If the HOSTAC deck motion limits are higher than the limits published for the same operations to the helicopter's parent ship, the lesser limits are to apply.

(5) The HOSTAC relative wind envelope (SHOL) must never include areas not valid for the visiting aircraft at the relevant operating mass/weight based on either:

(a) MPP-02.2 own national data for aircraft specific relative wind limitations, OR

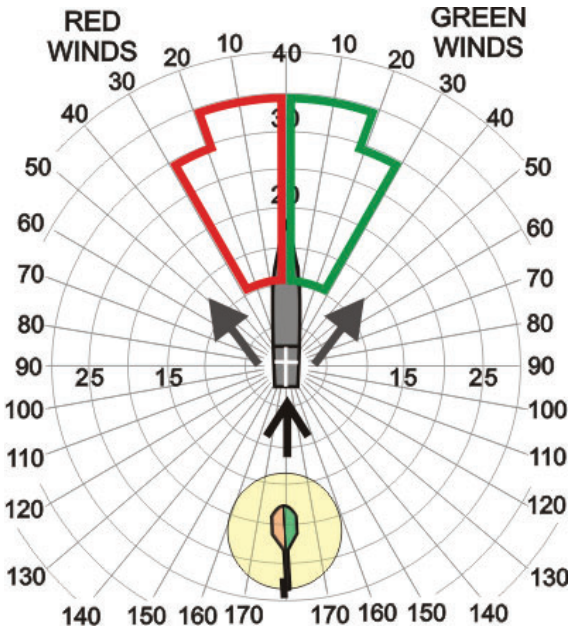
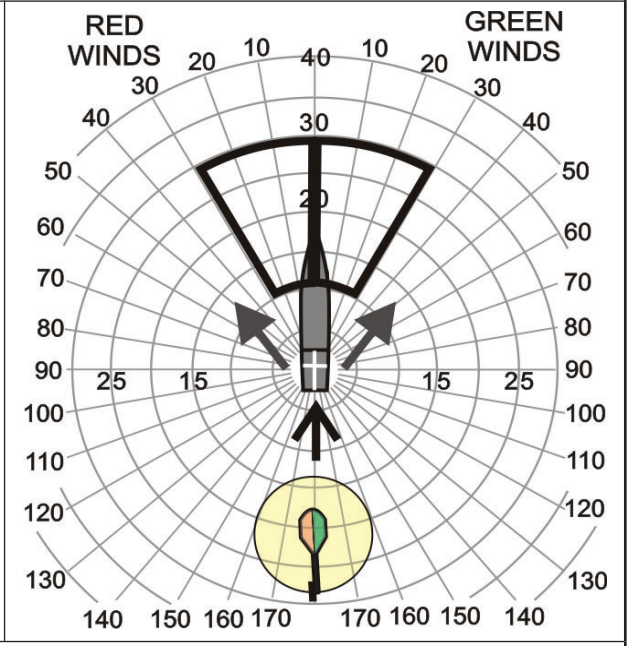
(b) Must not include areas that would be omitted/excluded within national SHOLs on a similar type/class of vessel.

(6) If the HOSTAC relative wind envelope includes areas which are not part of the host ship SHOL, then those areas are to be excluded and only the areas common to both shall apply.

(7) Single pilot aircraft see paragraph 0236.14 reference for flying pilot position.

c. HOSTAC SHOL—Straight-In.

An approach conducted from directly astern landing facing fore and aft.

Day	Night
35 kts Red 20° through Ships Head to Green 20° 30 kts Red 20° to Red 30° and from Green 20° to Green 30° Minimum Relative Wind Speed 10 kts Red 30° through Ships Head to Green 30°	30 kts Red 30° through Ships Head to Green 30° Minimum Relative Wind Speed 10 kts Red 30° through Ships Head to Green 30°
	

Deck Motion Limits (see Table 2-1 for notes)

	Day		Night (Conventional)		NVD	
Configuration	**Pitch**	**Roll**	**Pitch**	**Roll**	**Pitch**	**Roll**
Skidded/Narrow Wheel Base/High CofG /Tail Wheel (at end of tail boom)	**±1°**	**±3°**	**±1°**	**±2°**	**±1°**	**±2°**
Wheeled (without compatible deck securing system)	±2°	±4°	±1°	±3°	±1°	±3°
Wheeled (with compatible deck securing system)	±2	±6°	±1°	±4°	±1°	±4°

(1) Straight-in approaches facing fore and aft may be conducted with Red or Green winds.

(2) Take-off:

(a) To port, into the prevailing relative wind—with winds from ahead to port.

(b) To starboard, into the prevailing relative wind—with winds from ahead to starboard.

(3) **The pilot shall determine the operating limits required to provide adequate thrust margins (as directed by national procedures) for the launch and recovery taking into account relative wind, turbulence, ship motion, and environmental conditions.**

(4) The helicopter shall not operate at more than 95% of the calculated MAUM/MTOW. Consideration should be given to operating at a lower mass/weight for the first crossdeck procedure to the host ship.

(5) If the HOSTAC deck motion limits are higher than the limits published for the same operations to the helicopter's parent ship, the lesser limits are to apply.

(6) The HOSTAC relative wind envelope (SHOL) must never include areas not valid for the visiting aircraft at the relevant operating mass/weight based on either:

(a) MPP-02.2 own national data for aircraft specific relative wind limitations, OR

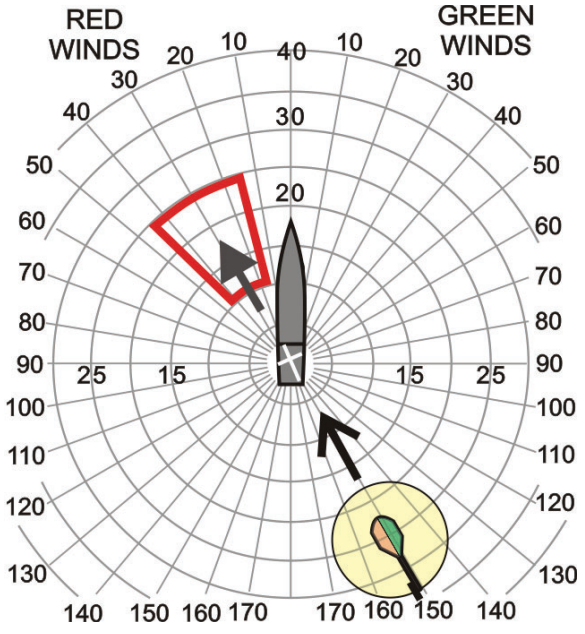
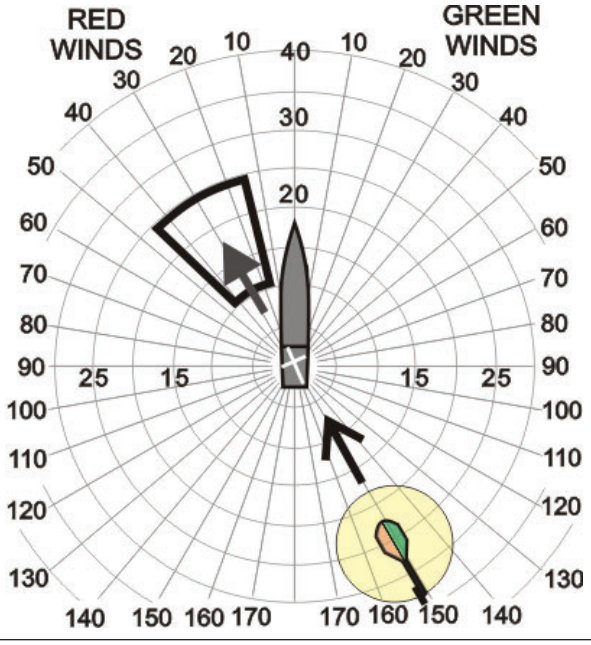
(b) Must not include areas that would be omitted/excluded within national SHOLs on a similar type/class of vessel.

(7) If the HOSTAC relative wind envelope includes areas which are not part of the host ship SHOL, then those areas are to be excluded and only the areas common to both shall apply.

(8) Single pilot aircraft see paragraph 0236.14 reference for flying pilot position.

d. HOSTAC SHOL—Starboard to Port Oblique.

An approach conducted from the starboard quarter of the ship with the helicopter landing on the relative Red wind heading that equates to the direction of the national line up line painted on the flight deck). The SHOL is to be aligned to this directional heading. (Note: This example is based on a 30-degree line up line.)

Day	Night
25 kts 15° to the Left and Right of the Line Up Line Minimum Relative Wind Speed 10 kts 15° to the Left and Right of the Line Up Line	25 kts 15° to the Left and Right of the Line Up Line Minimum Relative Wind Speed 10 kts 15° to the Left and Right of the Line Up Line
	

Deck Motion Limits (see Table 2-1 for notes)

	Day		Night (Conventional)		NVD	
Configuration	**Pitch**	**Roll**	**Pitch**	**Roll**	**Pitch**	**Roll**
Skidded/Narrow Wheel Base/High CofG /Tail Wheel (at end of tail boom)	**±1°**	**±3°**	**±1°**	**±2°**	**±1°**	**±2°**
Wheeled (without compatible deck securing system)	±2°	±4°	±1°	±3°	±1°	±3°
Wheeled (with compatible deck securing system)	±2	±6°	±1°	±4°	±1°	±4°

(1) The starboard to port oblique procedure is valid for both take-off and landings. Take-off is to be to port only.

(2) **The pilot shall determine the operating limits required to provide adequate thrust margins (as directed by national procedures) for the launch and recovery taking into account relative wind, turbulence, ship motion, and environmental conditions.**

(3) The helicopter shall not operate at more than 95% of the calculated MAUM/MTOW. Consideration should be given to operating at a lower mass/weight for the first crossdeck procedure to the host ship.

(4) If the HOSTAC deck motion limits are higher than the limits published for the same operations to the helicopter's parent ship, the lesser limits are to apply.

(5) The HOSTAC relative wind envelope (SHOL) must never include areas not valid for the visiting aircraft at the relevant operating mass/weight based on either:

(a) MPP-02.2 own national data for aircraft specific relative wind limitations, OR

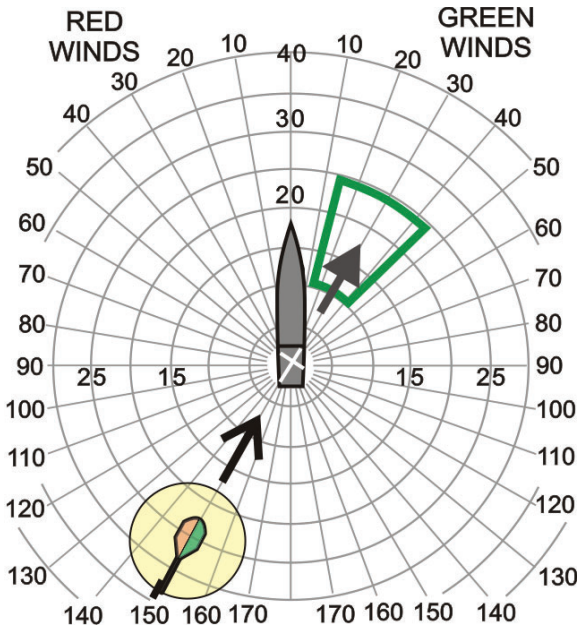
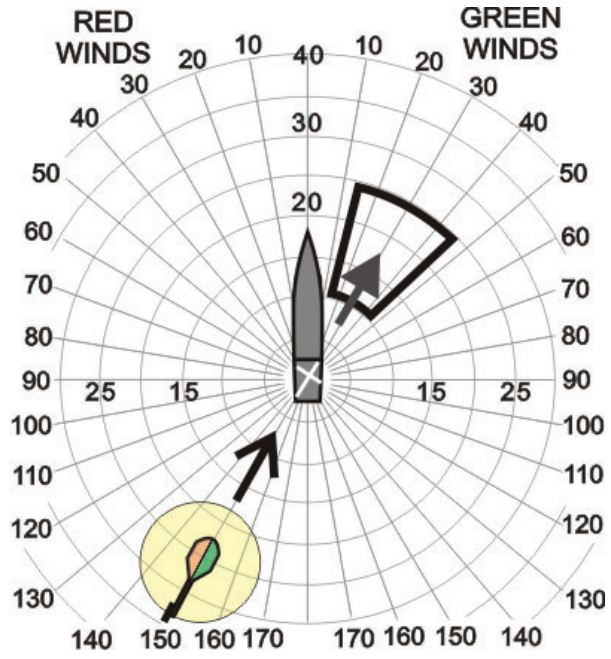
(b) Must not include areas that would be omitted/excluded within national SHOLs on a similar type/class of vessel.

(6) If the HOSTAC relative wind envelope includes areas which are not part of the host ship SHOL, then those areas are to be excluded and only the areas common to both shall apply.

(7) Single pilot aircraft see paragraph 0236.14 reference for flying pilot position.

e. HOSTAC SHOL—Port to Starboard Oblique.

An approach conducted from port quarter of the ship with the helicopter landing on the relative Green wind heading that equates to the direction of the national line up line painted on the flight deck). The SHOL is to be aligned to this directional heading. (Note: This example is based on a 30 degree line up line.)

Day	Night
25 kts 15° to the Left and Right of the Line Up Line Minimum Relative Wind Speed 10 kts 15° to the Left and Right of the Line Up Line	25 kts 15° to the Left and Right of the Line Up Line Minimum Relative Wind Speed 10 kts 15° to the Left and Right of the Line Up Line
	

Deck Motion Limits (see Table 2-1 for notes)

	Day		Night (Conventional)		NVD	
Configuration	**Pitch**	**Roll**	**Pitch**	**Roll**	**Pitch**	**Roll**
Skidded/Narrow Wheel Base/High CofG /Tail Wheel (at end of tail boom)	**±1°**	**±3°**	**±1°**	**±2°**	**±1°**	**±2°**
Wheeled (without compatible deck securing system)	±2°	±4°	±1°	±3°	±1°	±3°
Wheeled (with compatible deck securing system)	±2	±6°	±1°	±4°	±1°	±4°

(1) The port to starboard oblique procedure is valid for both take-off and landings. Take-off is to be to starboard only.

(2) **The pilot shall determine the operating limits required to provide adequate thrust margins (as directed by national procedures) for the launch and recovery taking into account relative wind, turbulence, ship motion, and environmental conditions.**

(3) The helicopter shall not operate at more than 95% of the calculated MAUM/MTOW. Consideration should be given to operating at a lower mass/weight for the first crossdeck procedure to the host ship.

(4) If the HOSTAC deck motion limits are higher than the limits published for the same operations to the helicopter's parent ship, the lesser limits are to apply.

(5) The HOSTAC relative wind envelope (SHOL) must never include areas not valid for the visiting aircraft at the relevant operating mass/weight based on either:

(a) MPP-02.2 own national data for aircraft specific relative wind limitations, OR

(b) Must not include areas that would be omitted/excluded within national SHOLs on a similar type/class of vessel.

(6) If the HOSTAC relative wind envelope includes areas which are not part of the host ship SHOL, then those areas are to be excluded and only the areas common to both shall apply.

(7) Single pilot aircraft see paragraph 0236.14 reference for flying pilot position.

6. Deck Motion Limits/Reporting.

a. Determine the maximum allowable deck motion limits based on the operating helicopter configuration from Table 2-1 and apply them to the SHOL selected for the crossdeck procedure. Where these figures are higher than the deck motion limits published by the helicopter national authority for operations to the parent ship, the lesser of the limits are to be applied for the crossdeck operation.

b. Ship motions are defined in terms of absolute pitch and roll angle. Deck motion should be reported as the maximum pitch and maximum roll indicated on the ship's inclinometers over a minimum of the preceding 3 minutes with the ship steady on aircraft recovery course. If deck motion exceeds limits, a new ship's course and/or speed should be selected.

c. The limits are the maximum permitted dynamic deck motion limits permissible with the ship maintaining a steady aircraft recovery course (ARC). The pilot should attempt to touch down when the ship is in a quiescent state with negligible deck motion. See Table 2-1 for notes on deck motion limits.

Table 2-1. Crossdeck Operations Deck Motion Limits

Helicopter Configuration	Deck Motion Limits (see Notes 1 & 2)					
	Day		Night		NVD	
	Pitch	Roll	Pitch	Roll	Pitch	Roll
Skidded/Narrow Wheel Base/High CofG /Tail Wheel (at end of tail boom) (see Note 3)	±1°	±3°	±1°	±2°	±1°	±2°
Wheeled (without compatible deck securing system)	±2°	±4°	±1°	±3°	±1°	±3°
Wheeled (with compatible deck securing system) (see Note 4)	±2°	±6°	±1°	±4°	±1°	±4°

Notes:

1. The deck motion limits are necessarily conservative as they apply to all ship/aircraft combinations in the ship/aircraft matrix (MPP-02.1.1). The actual values at which particular helicopters reach a limiting condition will differ from one ship class to another due to varying ship motion characteristics.

2. If there is ambiguity as to which conf guration applies to a given helicopter, use the more restrictive set of deck motion limits.

3. Skidded and narrow wheelbase helicopters in particular may slide and/or topple at relatively low pitch and roll angles when unrestrained.

4. Compatible deck securing systems such as RAST, Harpoon, etc., which has been approved for use by the ship and aircraft national authorities.

7. Lashings/Ship Maneuvering.

a. Once an aircraft has been recovered, unless conducting green deck operations (see paragraph 0236.7.f), it shall be secured to the flight deck.

b. The method of securing the aircraft is to be established at the face-to-face brief along with the compatibility of the lashings and the aircraft (chains/nylons, etc.) and the compatibility of the lashings with the deck fittings. Aircrew should carry a set of their own nation's lashings in their aircraft.

c. If it is not possible to secure the aircraft after landing due to incompatibility issues or where green deck operations are in force, then the ship **SHALL REMAIN ON THE AIRCRAFT RECOVERY COURSE** and maintain the required pitch and roll limits for launch/recovery.

d. If there is a requirement to change course, the aircraft must either be secured or launched; **NO ALTERATIONS OF COURSE SHALL BE MADE WITH AN UNSECURED AIRCRAFT ON DECK.**

e. With an aircraft secured on deck the maximum pitch and roll limits allowed are +/-3 degrees pitch and +/- 10 degrees of roll; when altering course rudder angle should be kept to a minimum and not more than 15 degrees.

Note. *The ship motion limitations in use shall never be larger than the equivalent pitch and roll limits allowed from a similar type/class of ship from the national fleet that equates (approximately) to the class of ship to which the cross-operation is to be conducted.*

f. Green Deck Operations. A specific agreement by the command, the FDO, and the aircraft commander for the ship to remain **steady** on the flying course and speed within SHOL (wind, pitch, and roll) limitations to facilitate the aircraft not requiring to be lashed down between land-on and take-off. (Nations should apply national procedures as required when conducting green deck operations.)

The following evolutions are **not** permitted during green deck operations unless national regulations dictate otherwise:

- Weapon loads
- Refueling
- Defect rectification
- Re-role
- Rotors running crew changes
- Any other activity that may prejudice the ability of the aircraft to launch immediately or that requires the aircraft to remain running on deck for an extended period where the relaxation of the normal rules serves no useful purpose.

The following evolutions are permitted during green deck operations unless national regulations dictate otherwise:

- PAX moves
- Helicopter delivery service (HDS)
- DLPs
- Emplaning boarding teams

8. Operating Risk Mitigation Considerations.

a. Crossdeck operations involve additional risks which must be recognized and appropriately managed through operating risk mitigation (ORM). Ship commanding officers and aircraft commanders should establish ship/helicopter operating limits that are suitable for the intended cross operations and, where possible, constrain the limits to within those determined as the maximum in the interests of increased flight safety. Additional cross-operating risks are due to a range of factors, including:

(1) Different visual perspective of ship due to size/shape differences and approach profiles.

(2) Different visual references due to flight deck layout and markings.

(3) Unfamiliar deck motion frequency and characteristics.

(4) Unknown superstructure turbulence effects.

(5) Different lighting configuration.

(6) Procedural differences which increase pilot's overall workload.

(7) Language barriers.

b. Risk mitigation strategies for reducing exposure to the risks associated with crossdeck operations are contained in Tables 2-2a and 2-2b. Ship commanding officers and aircraft commanders should communicate any special requirements, limitations, and/or mitigation prior to the conduct of the cross operations as part of the face-to-face brief. (See Table 2-1.)

c. For night/NVD operations the ORM considerations in Table 2-2b should be applied.

Table 2-2a. Crossdeck Operating Risks and Mitigation—Day/Night

Risk	Mitigation Strategies
Exceed aircraft power limit	• Reduce operating weight • Increase minimum acceptable relative wind speed • Reduce pitch and roll limits • Monitor engine for salt accretion at regular intervals
Reach tail rotor control limit	• Reduce operating weight • Increase minimum acceptable relative wind speed • Restrict relative wind direction to side that assists in minimizing tail rotor requirements
Reach cyclic control limit	• Reduce operating weight • Restrict maximum wind azimuth • Decrease maximum acceptable relative wind speed • Limit extremes of CG
Hard landing due to high pilot workload	• Reduce landing weight so as not so close to limits • Decrease maximum acceptable relative wind speed to reduce turbulence • Reduce pitch and roll limits for landing
Exceeding deck motion limits due to extended time taken to secure aircraft on deck	• Reduce pitch and roll limits for landing until deck crew are familiar with aircraft lashing points and tie down procedures

Table 2-2b. Crossdeck Operating Risks and Mitigation—Night

Risk	Mitigation Strategies
Unintentionally exceeding helicopter limitations	• Conduct day operations before night operations
Disorientation due to unfamiliar deck environment	• Conduct day operations before night operations
Disorientation due to unfamiliar ship lighting	• Conduct night operations with a visible natural horizon

9. Aircraft Operating Mass/Weight.

Aircraft mass/weight should be corrected for temperature and pressure in accordance with national standards. The maximum aircraft mass/weight permitted must ensure that adequate power margins are available for a safe launch and recovery and should allow the aircraft to hover out of ground effect (OGE).

10. Sufficient Power and Control Margins Check.

If at any time during the recovery limitations are reached, or pilot workload is found to be too high to permit a safe, controlled touchdown, then an overshoot must be initiated and a more suitable ship course/speed selected.

WARNING

THE PILOT SHALL DETERMINE THE OPERATING LIMITS REQUIRED TO PROVIDE ADEQUATE THRUST MARGINS (AS DIRECTED BY NATIONAL PROCEDURES) FOR THE LAUNCH AND RECOVERY TAKING INTO ACCOUNT RELATIVE WIND, TURBULENCE, SHIP MOTION, AND ENVIRONMENTAL CONDITIONS.

Notes:

1. When using the maximum hover mass/weight charts as published in aircraft flight manuals aircrew are to be aware that they generally do not take into account turbulence or downdrafts resulting from airflow around a ship's superstructure, recirculation of rotor wash, or the power required to compensate for ship motion. Check that sufficient power and control margins exist prior to attempting a recovery.

2. Aiming to use the center of the crossdeck SHOL relative wind envelope while minimizing aircraft mass/weight and ship motion for initial operations with a new ship/helicopter combination will maximize the safety margins.

11. Measurement of Wind Speed and Direction.

Considerable differences exist between the flight deck winds and those measured by bridge-level anemometers. Because of the direct influence of the ship superstructure and the vertical side of the ship, winds at the flight deck or VERTREP platform may be slightly less but are usually far more gusty and turbulent than those at the bridge. Wind limits for crossdeck SHOL are based on winds measured by installed ships' anemometers.

12. True Wind Direction.

In high sea conditions, a downwind heading may be used to provide a more stable deck motion condition during day operations only. The pilot must be made aware if true winds are from abaft the beam prior to commencing an approach as national procedures may not allow a landing. **For night operations, true winds from abaft the beam are not permissible at any time during crossdeck operations.**

13. Red and Green Winds.

The HOSTAC crossdeck SHOLs have been developed around known results from various ship flying trials. When conducting port/starboard lateral and oblique approaches, it has been found that opposite Green/Red winds introduce excessive turbulence and downdraughts that make it unsafe, therefore approaches must be conducted as follows:

- Port Lateral and Starboard to Port Oblique—Red winds only.
- Starboard Lateral and Port to Starboard Oblique—Green winds only.
- Straight-In—Red or Green winds.

Note. *Anemometer indications can vary significantly from one ship to another. Aircraft captains must be aware that relative winds reported by the host ship may be quite different from those reported by their parent ship under similar conditions.*

14. Flying Pilot Position.

The flying pilot position will dictate the type of approach and departure being flown. In aircraft with two pilot positions all five HOSTAC SHOL approaches and take-offs may be conducted provided that they are flown by the pilot (if more than one) closest to the superstructure/obstructions. Straight-in approaches may be flown from either seat.

Note. *Cross cockpit landings should not be conducted unless in an emergency situation when it is not possible for the flying pilot to make an approach appropriate to their seat position as described in paragraph 0236.14.*

15. Rotor Engage/Disengage and Engine Start Limits.

Wind limitations for rotor engagement and disengagement vary between aircraft types but the probability of damage increases sharply when wind gusts exceed 10 knots. If the aircraft shuts down/engages/starts the rotor blades and/or engines, then the ship is to verify with the aircraft the required wind and pitch and roll limits used on their own national platform for the evolution.

Note. ***Rotors are not to be shut down unless the aircraft is fitted with a rotor brake except in an emergency.*** *If clarification is required contact the relevant national authority.*

16. Ships with Multiple Spots (not aircraft carriers/ships with clear main decks).

On ships with more than one sequential spot on the same flight deck, preference should be given to using the furthest spot from the ship's superstructure (ships with flight decks aft of the bridge), provided it can accommodate the aircraft type in question, as it is likely there will be considerably less turbulence.

0237 Standard Helicopter Approach Procedures

NOTES

1. **THIS PARAGRAPH CONTAINS ALL STANDARDIZED APPROACH PROCEDURES. THE APPROACHING HELICOPTER SHALL USE THE NATIONAL PROCEDURES OF THE HOST SHIP AS SPECIFIED IN MPP-02.1, THE PROCEDURES AGREED BETWEEN PILOT AND SHIP, OR THE STANDARD SCA PROCEDURE.**

2. **THERE SHALL BE AT LEAST ONE PERSON WHO IS IN DIRECT VISUAL CONTACT WITH THE HELICOPTER DURING THE LANDING/TAKEOFF SEQUENCE WHO CAN COMMUNICATE VERBALLY WITH THE HELICOPTER AT ALL TIMES (UNLESS NOT TECHNICALLY FEASIBLE).**

1. Visual Approach in VMC.

NOTE

A MINIMUM OF A 500-FOOT CEILING AND 1 MILE OF VISIBILITY IS REQUIRED FOR VMC OPERATIONS.

If a visual recovery is selected, the helicopter controller will vector the inbound helicopter to the ship. When the pilot confirms that he is in visual contact with the ship, the ship's radar officer shall pass control of the helicopter to the appropriate flight deck authority to complete the recovery. Even if the ship is not prepared to receive the helicopter, the flight deck authority shall retain control. When the ship is ready for recovery, the flight deck authority shall pass essential information to the pilot, if not already passed.

2. Instrument Approaches in IMC.

a. If an instrument recovery is selected, it shall be one of the following:

(1) Tacan approach.

(2) Non-directional beacon (NDB) approach.

(3) Ship-controlled approach (SCA).

(4) Helicopter-controlled approach for radar-fitted helicopters.

b. The instrument approach path should allow the helicopter to use the visual approach aids available on the ship. During an instrument approach, the helicopter shall not change communication channel frequency until the operation is completed. The ship shall hold a steady course before the helicopter commences the final approach.

c. Tacan Approach. In this approach, the helicopter shall be directed to an approach fix and, upon clearance from the controller, carry out the approach, using the national procedures of the host ship. However, the tacan approach shown in Figure 2-11 shall be used if:

(1) National procedures are not available, or

(2) Communication failure is experienced before the aircraft agrees to use national procedures.

d. Non-Directional Beacon Approach. After identifying the beacon, the helicopter shall proceed to the ship at the assigned altitude. When overhead of the ship, the pilot shall report, "Commencing approach," and carry out the approach using the national procedures of the host ship. However, the NDB approach shown in Figure 2-12 shall be used if:

(1) National procedures are not available, or

(2) Communication failure is experienced before the aircraft agrees to use national procedures.

e. Ship-Controlled Approach. This approach requires the availability of the ship's radar and radio. A primary consideration for determining the best approach path is the capabilities and limitations of the radar being used. The helicopter shall be vectored to a position at least 2 nautical miles from the ship on the final approach path. The helicopter shall commence descent on instruction from the controller, who shall provide lineup instructions and range information. If the helicopter is lost by radar and is not visual with the ship by that time, the controller shall order missed approach action. The pilot shall be advised when he reaches missed approach range and will then either carry out a visual approach or commence missed approach procedures.

f. Emergency Low-Visibility Approach. If low visibility prevents visual contact at the missed approach point (MAP), and no suitable alternate recovery base is available within residual range, an emergency may be declared by the pilot to call for specific assistance by the ship for an emergency low-visibility approach (ELVA). (See Figure 2-13 for approach procedures.)

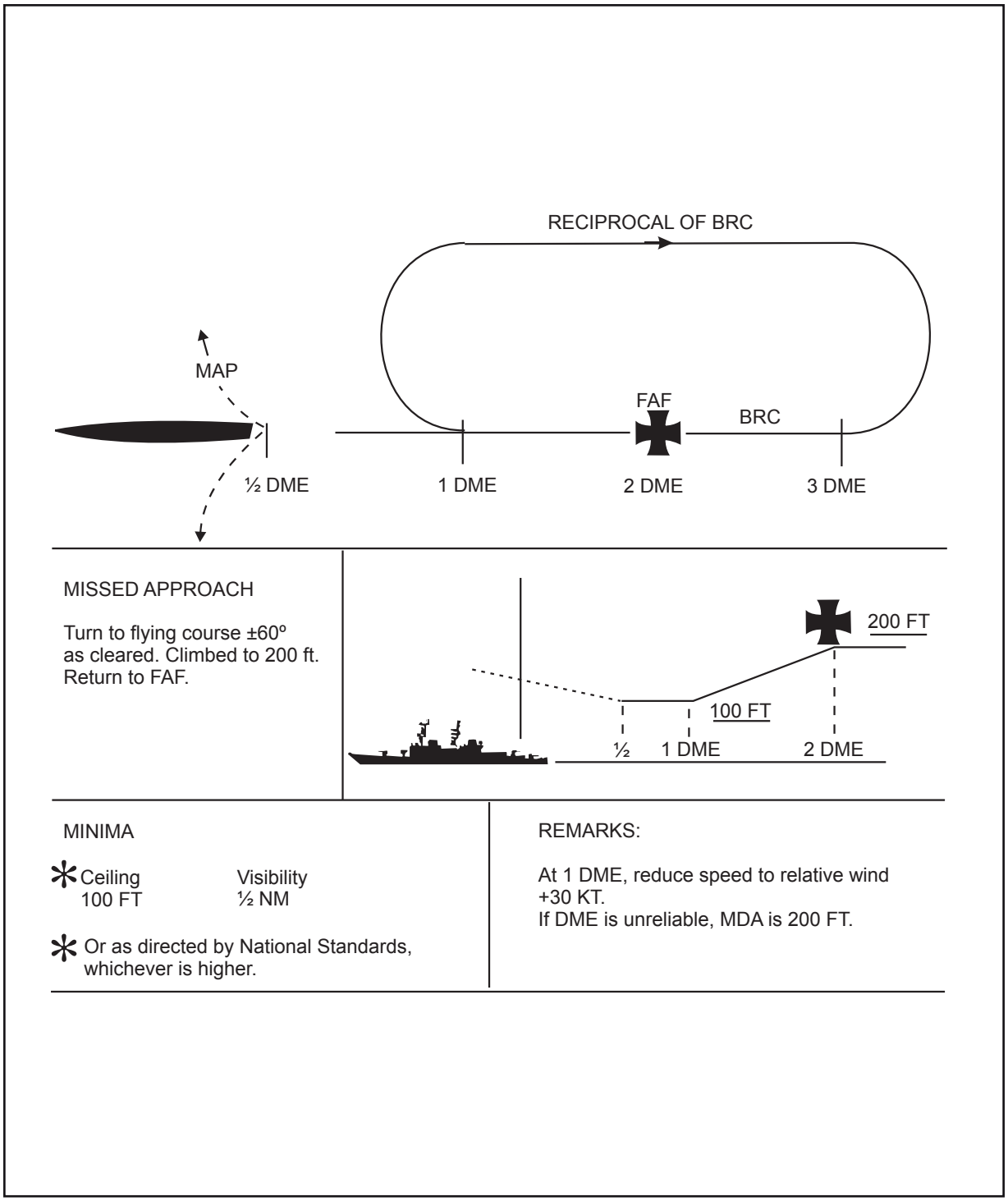


Figure 2-11. Approach Chart—Tacan

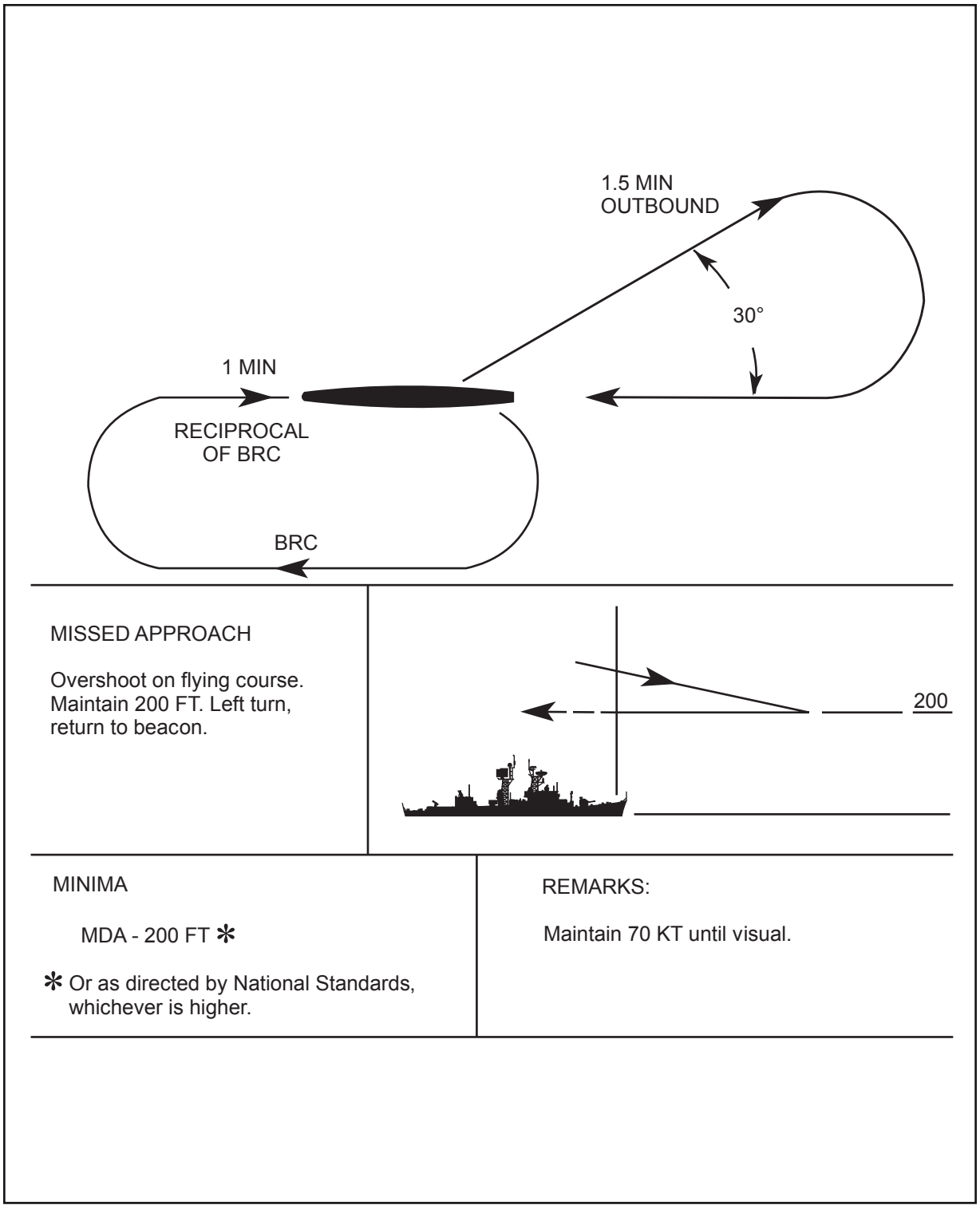


Figure 2-12. Approach Chart—Non-Directional Beacon (NDB) USA

Ship	Adjust course and speed to attain best relative wind and to produce a visible wake.
Helicopter	Fly a normal IFR approach up the ship's wake on the same heading as the ship.
Ship	Turn lights on the stern of the ship up to maximum brilliance and drop smokelights at the limiting visibility intervals. Attempt to locate the helicopter by sound.
Helicopter	Descend to gain visual contact with the water. Fly up wake and close on ship at slow relative speed.

Figure 2-13. Emergency Low-Visibility Approach Procedure

3. Missed Approach Procedure. A missed approach procedure shall be carried out, if by approach minimum, the pilot fails to establish the position of the ship visually.

4. Holding.

a. Visual. If the ship is not prepared to recover the helicopter, holding instructions will be issued by the controlling authority until such time as the ship is ready for recovery.

b. Instrument.

(1) Tacan Approach. Holding will be in a 1-mile, right-hand, racetrack pattern between the 3- and 4-nm DME fixes, inbound along the primary marshal radial, and turning outbound on crossing the marshal point. (See Figure 2-11.) The alternate holding pattern will be a right-hand racetrack pattern between the 3- and 4-nm DME fixes, inbound along the alternate marshal radial (normally the 180° relative radial). When the ship is prepared to recover the helicopter, CIC shall clear the aircraft for the approach.

(2) Non-Directional Beacon (NDB) Approach. Holding shall be oriented over the ship. (See Figure 2-12.) When the ship is prepared to recover the helicopter, CIC shall clear the aircraft for the approach.

(3) Radar Approach. Approach shall be oriented from 150° to 210° relative to the ship, as shown in Figure 2-14.

5. Lost Communications. The pilot shall proceed to the last known position of the ship, displaying the appropriate identification friend or foe (IFF) code, if fitted. If the ship is in sight, make a visual approach and land. If no visual contact is made, the helicopter shall carry out lost communications procedures in accordance with the host ship's national doctrine.

6. Visual Aids.

a. Glideslope Indicator. The GSI is a visual-reference lighting system that provides the incoming helicopter's pilot with a means of judging and correcting the approach angle to the ship. Details are provided in paragraph 0205.2c.

b. Landing Signalman. The landing signalman (LSE) visually signals the helicopter to assist the pilot in making a safe takeoff and/or approach and landing, VERTREP, HIFR, or hoist-transfer operation on board the host ship. The signals are advisory in nature, with the exception of the wave-off and hold signals, which are mandatory.

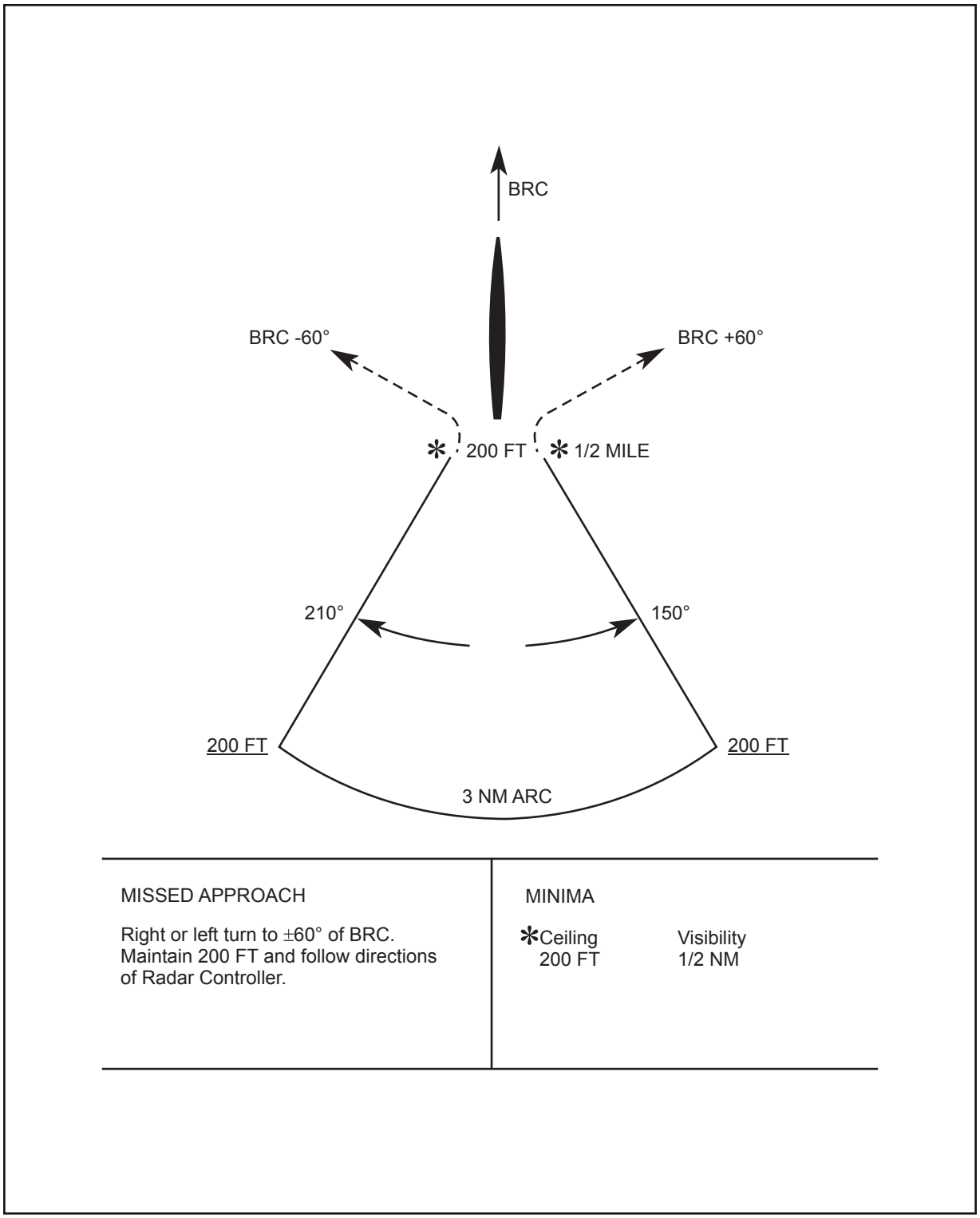


Figure 2-14. Approach Chart—Standard SCA/HCA

0238 VMC and IMC Helicopter Approach Voice Procedures

1. Visual Recovery.

Aircraft: "(C/S) this is (C/S), (position), closing for visual recovery."

Controller: "Roger, call visual with (C/S)." Once visual call is made "Pogo L/L. Call (C/S)."

OR

Both automatically check in on L/L.

When on L/L Frequency

Aircraft: "(C/S) this is (C/S), over."

Controller: "This is (C/S), roger, flying course (____), relative wind (____), call Paddles for control."

Aircraft: "Paddles this is (c/s), fuel (____) SOB (____)."

If Holding is Required

LSO: "Signal Delta (port, starboard, overhead, astern, or hover astern as applicable). Flying course (____), relative wind (____). Expect Signal Charlie at (____)."

Delta patterns are used to hold the aircraft in proximity to the ship while awaiting landing clearance.

Aircraft: "Roger."

Aircraft assumes assigned holding pattern and waits for further instructions.

LSO: "Signal Charlie for hauldown (or free deck), flying course (____), relative wind (____), altimeter setting (____)."

Hauldown will only be used for aircraft/ships fitted for/with RAST.

Aircraft: "Roger."

Aircraft moves over ship's flight deck, lowering messenger cable if so fitted.

For Rapid Assist Secure Traverse (RAST) Landing Utilizing the Bell Mouth

LSO: "Stop lowering."

LSO: "Raise the messenger."

Aircraft: When appropriate, "Hover tension."

LSO: "Roger. Hover tension/____ lb is on."

Aircraft: "Ready to land."

LSO: (Gives corrections if required.)

LSO: "Land now, down, down, down. On the deck maximum tension."

Cable release will be achieved from the hover immediately after takeoff.

For Free Deck Landing

Aircraft: "Ready to Land."

LSO: (Gives corrections if required.) "Land now, down, down, down. On the deck. Do you wish lashings?"

2. Tacan Approach.

a. When cleared for a tacan approach, the pilot shall fly the aircraft to the FAF. The flying course and relative wind shall be included in the approach instructions. The final approach course shall be at the aircraft captain's discretion and should normally be flown on the 180° relative radial.

b. Voice Procedures.

Aircraft: "(C/S) this is (C/S). Request clearance for a tacan approach on the (____) relative radial."

Controller: "(C/S) is cleared for a tacan approach to (C/S). Flying course (____), relative wind (____). Report the FAF."

Aircraft: "Roger" ... "FAF."

Controller: "Call visual."

Aircraft: "Visual." OR "Carrying out missed approach left/right."

Controller: "Call Paddles for control." OR "Roger, standing by."

3. Standard Ship-Controlled Approach Procedures.

a. Centerline of approach shall be oriented from 150° to 210° relative to the ship, in accordance with the equipment specifications on receiving ship. Controller will pass direction in relative radial.

b. Controller will bring aircraft to a position at a range of 3 nm in the sector described above and speed at own convenience. Aircraft has to be at initial height at this point.

c. Descend starts at the gate (2 nm). Rate of descend will be at pilot's discretion, preferably in accordance with receiving ship's equipment specifications (GSI, etc.).

d. Missed approach point will be at 0.5 nm/200 feet.

e. Missed approach vector is at least 60° away from the receiving ship's flying course.

f. Aircraft will be continuously controlled for heading during the approach.

g. Prior to finals:

(1) Two-way communications and identification are established.

(2) Controller provides, in accordance with HOSTAC publication, surface wind, cloud base, visibility, QNH, pigeons (or ship position), FLYCO, relative wind, pitch and roll.

(3) Aircraft provides, in accordance with HOSTAC publication, POB, endurance and other relevant information to the ship, including alternate approach radial requirements if different from receiving ship's national procedures.

h. Prior to finals.

Aircraft: Request standard SCA, out of… height, initial speed of…

OR

Controller: Intention is standard SCA, approach will be on the … relative radial, report your initial height for approach.

Aircraft: Roger, standard SCA … relative radial, initial height …

Controller: Hold you on my gadget, STBY standard SCA, close advisory control, height … (initial height), speed at own convenience.

Aircraft: Roger, close advisory control for standard SCA, height …, speed at own convenience, heading …

Controller: Pigeons …

Aircraft: Roger.

Controller: Set QNH … for deck height … feet, confirm landing checks complete, report endurance.

Aircraft: Roger, cockpit checked, endurance …

Controller: Missed approach point 200 ft 1/2 nm, if not in sight at missed approach point, execute missed approach vector …, height … (initial height), speed at own convenience.

Aircraft: Roger, missed approach vector …

i. Aircraft approaching finals.

(3 nm out)	Contr:	1 mile to the gate, relative wind ... speed ..., flying course ... speed ..., request your approach speed.
	Aircraft:	Roger, flying course … speed …
(2 nm)	Contr:	At the gate, reduce speed … (to approach speed). Cleared to minimum height 200, Green deck.
	Aircraft:	Roger, reducing and descending.

(1.5 nm) Contr: At 1.5.

Aircraft: Roger.

(1.2 nm) Contr: At 1.2.

Aircraft: Roger.

(1.0 nm) Contr: At 1 mile, check height and speed.

Aircraft: Roger, height … speed ….

(0.75 nm) Contr: At three-quarters.

Aircraft: Roger.

(0.5 nm) Contr: At missed approach point, call visual.

Aircraft: Visual (or)

Carrying out missed approach ….

Contr: Roger, continue, visual deck control (or)

Roger, stop descent, execute missed approach vector …, height …, speed ….

Aircraft: Roger (or)

Roger, missed approach vector ….

4. Non-Directional Beacon (NDB) Approach.

Controller: "(C/S) is cleared for NDB approach to (C/S), flying course (____), relative wind (____), approach on the (____) relative radial. Call the beacon outbound."

Aircraft: "Roger."

Aircraft: When on top the beacon for teardrop or abeam the beacon for race track. "(C/S) is the beacon outbound."

Controller: "Roger, call established on the relative radial inbound."

Aircraft: "Roger."

Aircraft: "C/S is on the relative radial inbound."

Controller: "Roger, call visual."

Aircraft: "Visual." OR "Carrying out missed approach left/right."

Controller: "Roger, call Paddles for control." OR "Roger, standing by."

5. Emergency Low-Visibility Approach (ELVA).

Controller: "(C/S) is cleared for an Emergency Low-Visibility Approach to (C/S), flying course (____), relative wind (____), approach on the (____) relative radial. Vector (____)."

Aircraft: "Roger."

Controller: "You are at the FAF (on left/right) of the on course."

Aircraft: "Roger."

Controller: "You are 1,000 yards back, confirm at creep speed, call visual."

"You are (____) yards back (on/left/right) of the on course."

Aircraft: "Roger, confirmed visual." OR "Carrying out missed approach left/right."

0239 Approach, Landing, and Departure

1. This paragraph provides visual representation of the procedures for the final approach, landing, and departure aboard the host ship (see Article 0236 for SHOL requirements); the pilot is responsible for implementation of the correct procedures. The pilot shall use the visual aids and land/launch in accordance with the national procedures of the host ship that are given in MPP-02.1 or as agreed between pilot and ship.

2. Types of Shipboard Landings. There are five types of approach that can be made to ship flight decks. The approaches are governed by the host nation's flight deck layout and landing aids.

a. Straight-in. (See Figure 2-15.)
b. Oblique (port to starboard or starboard to port). (See Figure 2-16.)
c. Lateral (port or starboard). (See Figure 2-17.)
d. 45° Approach (port or starboard). (See Figure 2-18.)
e. Athwartships (port to starboard or starboard to port). (See Figure 2-19.)

3. Departure. The type of departure shall be in accordance with the host nation's procedures and will normally be into the relative wind to maintain the aircraft within safe flight parameters.

4. Assisted-Landing/Deck Lock Systems. Before initiating operations using haul down, trap, or deck lock systems, the host ship and guest helicopter shall confirm compatibility as part of the face-to-face briefing process.

5. Restrictions During Ship Formation Maneuvering. Formation steaming courses and the requirements for safe landing and launching of a helicopter are frequently incompatible. Therefore, allowances must be made for helicopter operations and the formation turned to a proper course or, at a minimum, the recovery ship must be given authorization to maneuver independently. The following items also apply:

a. The signal flag Hotel/Hotel One displayed close up by the recovery ship signals that it will refrain from maneuvering until helicopter operations are secured.

b. Ships undergoing VERTREP must notify the pilot before making a maneuver.

c. No ship shall pass within 500 yards upwind of a hovering helicopter.

d. The requirements of Article 0236.7 should be adhered to.

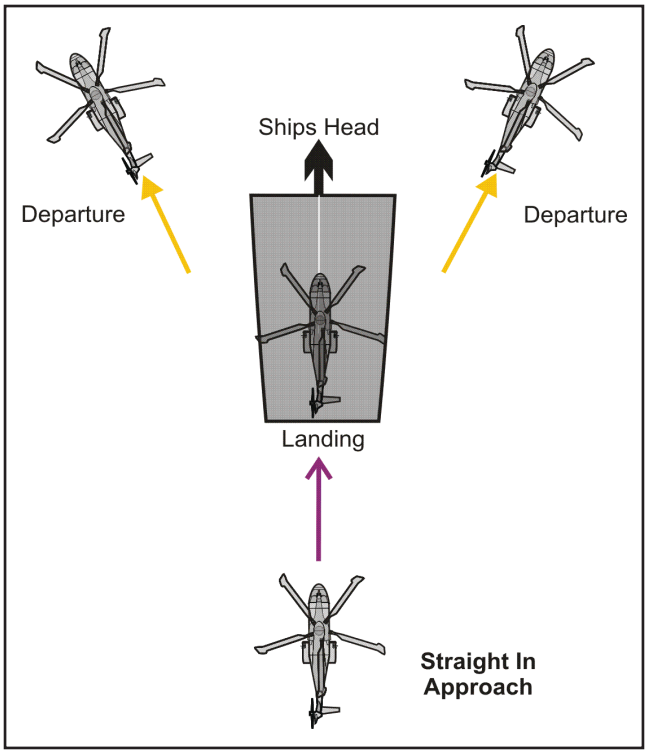


Figure 2-15. Straight-in Approach

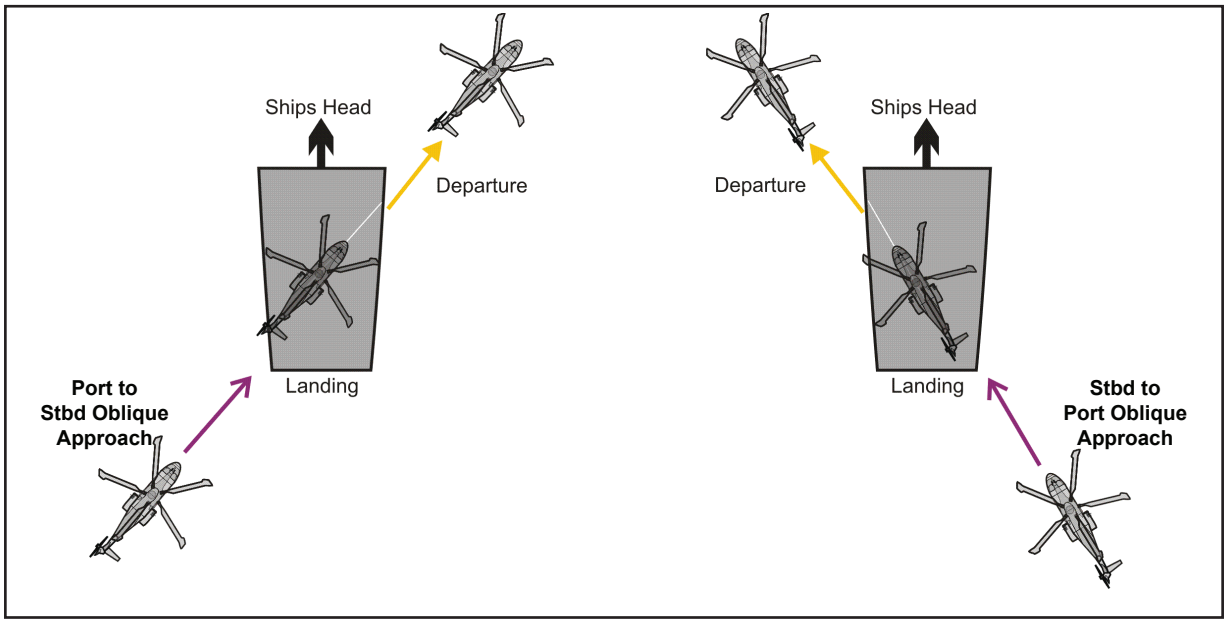


Figure 2-16. Oblique Approach

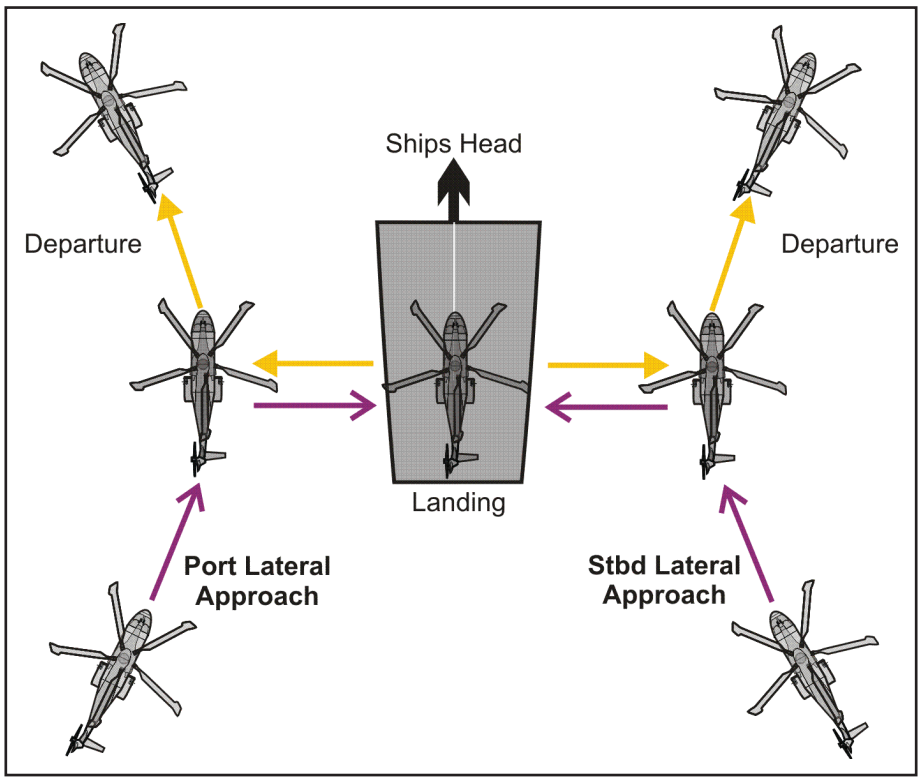


Figure 2-17. Lateral Approach

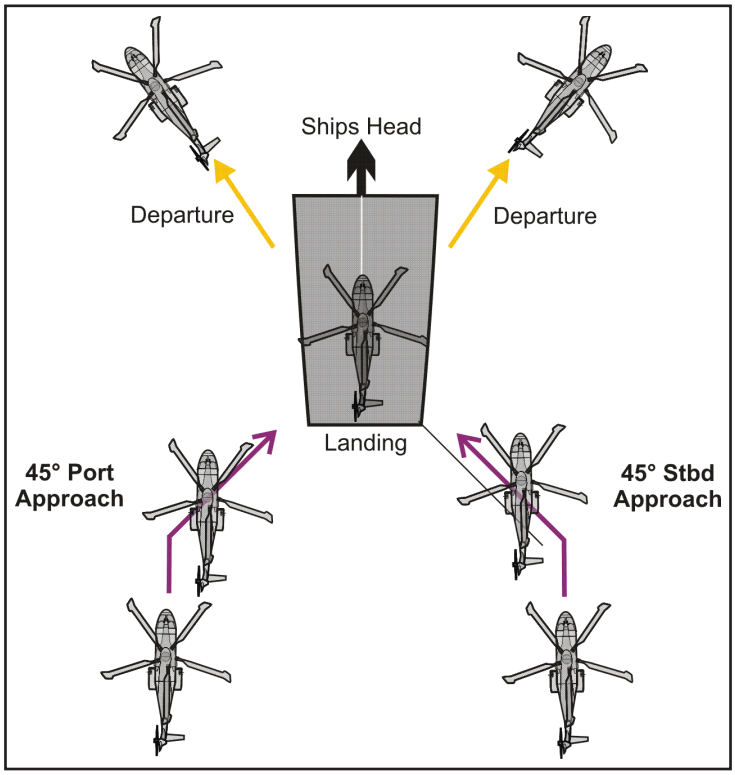


Figure 2-18. 45-Degree Approach

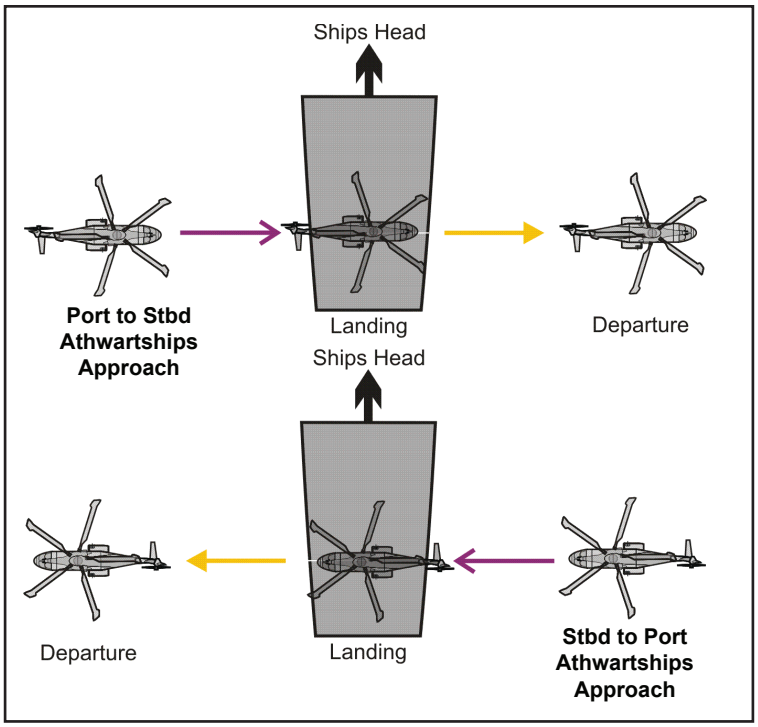


Figure 2-19. Athwartships Approach

0240 Vertical Replenishment Procedures

WARNING

- **WHEN PLANNING A VERTREP OPERATION, ENSURE THAT THE INTENDED CARGO WEIGHT IS WITHIN THE LIFTING LIMITS OF THE HELICOPTER AS LISTED IN MPP-02.2. FACTORS THAT ADVERSELY AFFECT LIFTING AND HOVERING CAPABILITY THAT ARE DISCUSSED IN THIS CHAPTER SHOULD ALSO BE TAKEN INTO ACCOUNT.**
- **THE PILOT SHALL ALWAYS BE CONSULTED AS TO THE FEASIBILITY OF TRANSFERRING NONSTANDARD LOADS.**
- **WHEN APPROACHING AND HOVERING OVER THE DECK, THE PILOT MUST OBSERVE THE VERTREP PROCEDURES AND HOVER-HEIGHT RESTRICTIONS OF THE HOST SHIP TO ENSURE ADEQUATE ROTOR, FUSELAGE, AND LOAD CLEARANCES.**

1. VERTREP is the external transfer of cargo between a helicopter in flight and a ship. In a VERTREP operation, the pilot delivers cargo to the ship's VERTREP operating area (VOA) by means of a hook. The pickup and delivery zone is that general, unobstructed area within the VOA where loads are picked up and delivered.

2. Pilot's Responsibility. The pilot is responsible for the transfer and delivery of cargo to the host ship and shall conduct the VERTREP operation in accordance with the national procedures of the host ship and the general procedures of ATP/MTP-16, Chapter 9. It is also the pilot's responsibility to determine the maximum capacity of the sling system and associated gear before commencing VERTREP operations.

3. VERTREP Warnings and Safety Requirements. Safe VERTREP operations require constant attention to detail and proper operating procedures. General warnings, taken from ATP/MTP-16, Chapter 9, and listed in Figure 2-20, apply to all VERTREP procedures and operations.

4. VERTREP Operating Area and Deck Markings. VOA standards are provided in Chapter 3 and also in ATP/MTP-16, Chapter 9. Operational requirements are determined by the class of facility and the deck marking of the host ship's VOA.

a. Class of VERTREP Operating Area.

(1) Class 4 VERTREP Area (Low Hover Operations). An area in which maximum obstruction height of 1.52 m (5 ft) within fuselage and landing gear clearance zone and 4.6 m (15 ft) within rotor clearance zone is permitted.

(2) Class 5 VERTREP Area (High Hover Operations). An area in which maximum obstruction height of 4.6 m (15 ft) within fuselage and landing gear clearance zone and 7.62 m (25 ft) within rotor clearance zone is permitted.

b. VERTREP Deck Markings. Within VERTREP Classes 4 and 5, there are four types of facilities.

(1) Type 1. To ensure adequate helicopter and load clearance when hovering over the ship, the helicopter must be centered over and parallel to the rotor-center limit line.

(2) Type 2. To ensure adequate helicopter and load clearance when hovering over the ship, the helicopter must be positioned with its main and tail rotor hubs on or aft (forward on bow VERTREP areas) of the Tee marking line. The legs of the Tees identify the side on which no danger exists.

(3) Type 2A. To ensure adequate helicopter and load clearance when hovering over the ship, the helicopter must be positioned with its main and tail rotor hubs on or aft (forward on bow VERTREP areas) of the Tee-Ball marking line. The legs of the Tees identify the side on which no danger exists.

(4) Type 3. To ensure adequate helicopter and load clearance when hovering over the ship, the helicopter must be positioned with its main and tail rotor hubs between the two Tee marking lines.

5. Advisory Environmental Factors. Experience in VERTREP has shown that the following factors bear strongly on successful operations.

a. Winds.

(1) A relative wind of 15 to 30 knots from Red 30° or Green 30° is considered ideal for VERTREP operations. The helicopter should take off, make approaches, and hover into the relative wind.

(2) High winds usually cause excessive pitch and roll of the host ship. In these conditions, it is better if the ship steams down-sea to provide a steadier deck. Although the course will be downwind for the helicopter, the relative wind may still be sufficient for VERTREP. However, increased rotor downwash caused by the downwind hover will create additional hazards for both the helicopter and flight deck personnel. Before a downwind and down-sea VERTREP is considered, the helicopter pilot should be consulted.

WARNING

- **WHEN PLANNING A VERTREP OPERATION, ENSURE THAT THE INTENDED CARGO WEIGHT IS WITHIN THE HELICOPTER'S LIFTING LIMITS. FACTORS THAT ADVERSELY AFFECT LIFTING AND HOVERING CAPABILITY DISCUSSED IN THIS CHAPTER SHOULD BE TAKEN INTO ACCOUNT.**
- **THE PILOT SHALL ALWAYS BE CONSULTED AS TO THE FEASIBILITY OF TRANSFERRING NONSTANDARD LOADS.**
- **ON APPROACHING AND WHEN HOVERING OVER THE DECK, THE PILOT MUST OBSERVE THE VERTREP PROCEDURES AND HOVER-HEIGHT RESTRICTIONS OF THE HOST SHIP TO ENSURE ADEQUATE ROTOR, FUSELAGE, AND LOAD CLEARANCES.**
- **THE FDO SHALL ENSURE THAT THE AREA IS CLEAR OF PERSONNEL WITH THE EXCEPTION OF THE LSE/LSO WHEN THE HELICOPTER IS OVER THE VERTREP AREA.**
- **UNDER NO CIRCUMSTANCES SHALL SHIP'S CREW TAKE FLASH PICTURES AT NIGHT OF THE HELICOPTER BECAUSE THE FLASH CAN CAUSE TEMPORARY BLINDNESS OF THE AIRCREW.**
- **ALL FOD MATERIAL SHALL BE REMOVED FROM THE VERTREP AREA PRIOR TO FLIGHT OPERATIONS.**
- **PERSONNEL CLEARING STORES MUST TAKE EXTRA PRECAUTIONS TO REMOVE BANDING STRIPS, PAPER, AND OTHER DEBRIS FROM THE RECEIVING AREA PRIOR TO THE NEXT HELICOPTER APPROACH TO PRECLUDE INJURY TO PERSONNEL OR DAMAGE TO HELICOPTER ENGINES AND ROTOR BLADES.**
- **DANGER TO THE HELICOPTER OR LOSS OF PART OR ALL OF THE LOAD CAN RESULT IF THE CARGO IS NOT PROPERLY SECURED OR IF PRESCRIBED METHODS ARE NOT FOLLOWED. WHEN EXTERNALLY TRANSFERRING HOISTING SLINGS AS RETROGRADE, THE SAFETY HOOKS AT THE ENDS OF THE SLINGS/LEGS MAY ENGAGE THE SHIP'S LIFELINES OR PADEYES, CAUSING A HAZARD TO PERSONNEL AND AIRCRAFT.**
- **PERSONNEL SHALL NOT ENTER THE DROP ZONE NOR ATTEMPT TO STEADY THE LOAD WHILE THE HELICOPTER IS OVER THE SHIP. THE LOAD SPOTTER SHALL BE CLEARED OF THE DROP ZONE BEFORE THE LOAD PASSES OVER THE DECK EDGE.**

Figure 2-20. Summary of Warnings for Vertical Replenishment Operations (Sheet 1 of 2)

WARNING

- **THE HOOKUP MAN SHALL NEVER STAND ON THE LOAD OR BETWEEN THE LOAD BEING PICKED UP AND ANOTHER LOAD, EXCEPT WHEN THE SIZE AND SHAPE OF AN EXTERNAL LOAD TO BE TRANSPORTED PRECLUDE ADHERENCE.**
- **THE CH-53E HAS THE POTENTIAL FOR GENERATING IN EXCESS OF 200,000 VOLTS. BUILDUP OF THIS SHOCK POTENTIAL IS ESSENTIALLY INSTANTANEOUS ONCE GROUNDING IS REMOVED. A HAND-HELD STATIC DISCHARGE DEVICE (STATIC DISCHARGE WAND) AND 20,000-TO-30,000-VOLT INSULATED GLOVES SHALL BE USED IN ORDER TO PREVENT PERSONNEL INJURY. CONTACT BETWEEN THE CARGO HOOK AND THE GROUNDING HOOK SHALL BE CONTINUOUSLY MAINTAINED.**
- **WHEN ATTACHING A SPECIAL LOAD RIGGING, CAREFULLY INSPECT THE SELECTED ATTACHMENT POINTS ON THE LOAD TO ENSURE THEY WILL WITHSTAND THE LOADS APPLIED WHEN THE OBJECT IS LIFTED. WHAT APPEARS TO BE A CONVENIENT LIFTING EYE OR LIFTING POINT MAY BE THERE FOR ANOTHER PURPOSE AND NOT INTENDED TO LIFT THE ENTIRE WEIGHT OF THE LOAD.**
- **DO NOT HOOK AN EMPTY NET TO THE HELICOPTER WITHOUT AT LEAST FOUR WOOD OR SIX METAL PALLETS OR AN EQUIVALENT WEIGHT IN THE NET. TO DO SO WOULD ENDANGER THE HELICOPTER BY ALLOWING THE NET TO BLOW INTO THE HELICOPTER'S ROTORS. IN QUESTIONABLE CASES CONSULT THE PILOT.**

Figure 2-20. Summary of Warnings for Vertical Replenishment Operations (Sheet 2 of 2)

(3) Turbulence adversely affects VERTREP and can be caused by hot stack gas over the VOA, either from the host ship or from another ship at close quarters. Another ship can also obstruct the relative wind in the pickup or drop zone of the VOA.

b. Relative Positions of Ships. Generally, VERTREP is employed between two ships close aboard, with a separation of 300 to 1,000 yards for night operations and 300 to 500 yards for day operations. Intership distances of more than 35 miles are not recommended and should be undertaken only for high-priority cargo where time is a critical factor.

NOTE

WHEN CONDUCTING NIGHT VERTREP, SHIPS SHOULD BE POSITIONED ABREAST, THUS PROVIDING THE PILOT WITH THE BEST VISUAL APPROXIMATION OF AN ARTIFICIAL HORIZON.

c. Temperature and Atmosphere. High ambient temperatures and low barometric pressures adversely affect the lifting capability of any helicopter. Thus, a cold, dry day with high barometric pressure is, all else being equal, optimum for good VERTREP operations.

0241 Helicopter In-Flight Refueling Procedures

WARNING

DURING HIFR OPERATIONS, THE AIRCREW MUST BE AWARE OF OTHER AIR TRAFFIC ON SHIPS WITH MULTIPLE-SPOT DECKS. OTHER AIRCRAFT MAY BE CLEARED FOR TAKEOFF AND LANDING TO STARBOARD WHILE HIFR IS IN PROGRESS.

1. HIFR Hardware Compatibility. A ship's HIFR capability as shown in MPP-02.1 indicates only that the ship is capable of conducting HIFR operations. It does not necessarily mean that all helicopters can conduct HIFR with that ship. This is because many ships do not carry all adapters needed to mate the aircraft fueling system to the ship's HIFR equipment. Therefore, before beginning any operation requiring in-flight refueling, the aircraft commander must ensure that any required HIFR adapters can be made available.

2. Helicopter Procedures. Current standardization of HIFR procedures allows day or night in-flight refueling of helicopters. The following procedures apply to the helicopter during in-flight refueling. General warnings listed in Figure 2-21 apply to all HIFR operations.

a. Communications. Under normal circumstances, two-way radio contact between the supporting ship and the aircraft should be established. This contact is essential when it is likely that concurrent deck operations could take place. Hand signals shall be as specified in Chapter 3.

b. Pilot's Responsibility. The pilot is responsible for the safety of his aircraft during HIFR operations. He shall conduct HIFR operations in accordance with the national procedures of the host ship.

c. Fuel Sample. If the pilot wants to see a fuel sample, he should request it prior to HIFR hookup and shall furnish a bag for pickup.

d. Approach. The helicopter shall approach the ship's port quarter in accordance with the national procedures for the host ship, as described in MPP-02.1. The ship's FDO will indicate the desired hover position.

e. Hose Pickup.

(1) The helicopter shall come to a hover over the HIFR spot "H" at a height over the deck of no lower than 15 feet (4.57 meters) and lower its rescue hoist cable. Before attaching it to the hoist cable, the ship will depressurize the hose. The ship's crewman shall electrically ground the hoist hook as soon as it is lowered to the flight deck and then attach the HIFR hose rig.

(2) The helicopter shall move clear of the deck to port and descend slightly. The helicopter shall then move outboard to a maximum lateral distance from the port side of the ship of 60 feet (approximately 20 meters) and maintain a hover at 60 feet (20 meters) above the water. On signal from the helicopter crewman, the ship shall commence pumping fuel.

f. Emergency Breakaway. Emergency breakaway may be executed by the helicopter at any time. To initiate an emergency breakaway, the pilot need not signal but merely pull away.

NOTE

THE AIRCREW MUST BE MADE AWARE OF THE POSSIBILITY AND DANGER OF AN EMERGENCY BREAKAWAY AND TAKE ALL APPROPRIATE SAFETY PROCEDURES.

g. Fuel Flow Rates. Fuel is provided under positive pressure to the aircraft at a minimum flow rate of 114 liters, 25 Imperial gallons, or 30 U.S. gallons per minute. Fuel pressure is limited to a maximum of 3.44 BAR (50 psi) and a minimum of 1.38 BAR (20 psi) at the maximum distances stated in Annex A.

h. Completion of Fuel Transfer. When fueling is completed, a helicopter crewman shall signal the ship to cease pumping fuel. The helicopter shall reverse the hose pickup procedures and shall move back over the deck to return the hose.

i. Departure. The helicopter shall request permission to depart the ship. Departure shall be as concurred with by the ship.

3. Ship Procedures. The following procedures apply to the ship. General warnings listed in Figure 2-21 apply to all HIFR operations.

a. Helicopter Approach.

CAUTION

DURING HIFR OPERATIONS, SHIP MOTION SHOULD NOT EXCEED 5° PITCH AND 10° ROLL.

(1) The ship shall establish radio contact with the helicopter and pass heading, speed, relative wind, and roll, pitch, and heave information to the pilot.

(2) After radio or other contact has been established with the helicopter, flight deck personnel shall depressurize the hose or drain excess fuel from it and ensure that it is at the port quarter of the deck. They will then stand by to receive the hoisting hook from the approaching helicopter.

b. Maneuvering Limits. Prior to hose pickup, the ship should turn to place the wind 30° off the port bow at 15 knots or more. During pickup and return of the hose, the ship must maintain a steady course. Once the helicopter has moved outboard during HIFR, limited maneuvering may take place. However, the ship must notify the pilot of any intended maneuvering whenever possible.

c. Receipt of Hook. A ship's crewman shall immediately ground the hook electrically before connecting the hose. When the hose is connected to the hoist hook, two men, each wearing a protective helmet and a life jacket, pay out the hose and prevent it from entering the water or being snatched by a wave.

WARNING

- **FUEL DELIVERED TO THE HELICOPTER SHALL HAVE NO DETECTABLE FREE WATER OR SEDIMENT. A FUEL SAMPLE SHALL BE DRAWN AND EXAMINED BY THE SHIP BEFORE EACH HIFR OPERATION, EVEN IF IT IS NOT REQUESTED BY THE HELICOPTER.**
- **A SEVERE STATIC SHOCK HAZARD CAN EXIST BETWEEN THE HELICOPTER HOOK AND THE SHIP DECK. PERSONNEL MUST NOT TOUCH THE HOOK AS IT IS LOWERED FROM THE HELICOPTER AND MUST WEAR INSULATED GLOVES AND BOOTS. A GROUNDING WAND SHALL BE USED TO RELIEVE THE STATIC CHARGE BY ESTABLISHING A GROUND TO THE SHIP. GROUNDING MUST BE CONTINUOUS DURING THE ENTIRE HIFR OPERATION. ONCE A GROUND IS BROKEN, THE STATIC CHARGE CAN REBUILD WITHIN 1 SECOND.**
- **UNDER NO CIRCUMSTANCES SHALL THE HOIST CABLE BE ATTACHED TO THE SHIP'S STRUCTURE.**
- **ALL PERSONNEL SHALL STAND CLEAR OF THE DECK AREA BETWEEN THE HOSE AND THE PORT DECK EDGE WHILE THE HIFR OPERATION IS UNDERWAY. IF FOR ANY REASON THE HOSE IS PULLED TAUT, PERSONNEL COULD BE STRUCK BY THE HOSE AND KNOCKED OVER THE SIDE.**
- **DURING PUMPING OPERATIONS WITH THE HELICOPTER HOVERING CLEAR OF THE SHIP, THE FUELING HOSE SHALL BE TENDED BY AT LEAST TWO MEN TO PREVENT EXCESS SLACK FROM DEVELOPING IN THE HOSE. IT IS ABSOLUTELY ESSENTIAL THAT NO EXCESS STRAIN IS PLACED UPON THE HOSE. SHOULD THIS HAPPEN, THE HOSE COULD PART AND WHIP INTO THE HELICOPTER ROTORS.**
- **SHIP'S PERSONNEL SHALL NOT PRESSURIZE THE HIFR HOSE PRIOR TO RECEIVING A COMMENCE SIGNAL FROM THE HELICOPTER AIRCREW. A PRESSURIZED HOSE PREVENTS HOOKUP BETWEEN THE NOZZLE AND THE PRESSURE FUELING PORT AND CAN RESULT IN A FUEL SPILL INSIDE THE HELICOPTER'S CABIN.**

Figure 2-21. Summary of Warnings for Helicopter In-Flight Refueling Operations

d. Transfer and Pumping Operations.

(1) Hose transfer and fueling can be hazardous to both ship's personnel and the helicopter's aircrew if procedures are not followed exactly. (See the warnings in Figure 2-21.)

(2) When "Commence pumping" is received, the ship's crew shall begin pumping.

e. Emergency Breakaway. Emergency breakaway may be executed by the helicopter at any time. If the pilot wishes to initiate an emergency breakaway, he need not signal but merely pull away.

NOTE

THE SHIP'S FLIGHT DECK CREW MUST BE MADE AWARE OF THE POSSIBILITY AND DANGER OF AN EMERGENCY BREAKAWAY AND TAKE ALL APPROPRIATE SAFETY PROCEDURES.

f. Hose Return. When refueling is completed, the helicopter will move inboard to return the hose.

g. Departure. The ship shall grant permission for departure of the helicopter.

0242 Personnel and Internal Cargo Transfer Procedures

CAUTION

WHEN PLANNING ANY TYPE OF HOIST TRANSFER, ENSURE THAT THE INTENDED CARGO WEIGHT IS WITHIN THE HOISTING LIMITS OF THE HELICOPTER AS LISTED IN MPP-02.2.

1. Passenger Briefing. Before transferring a passenger via helicopter, the passenger shall be briefed using the helicopter passenger briefing checklist in Article 0263. This briefing should be conducted in a quiet area of the ship so that the passenger will have no problem in hearing or in asking questions.

2. Passenger Manifest. Prior to any passenger transfer, the ship shall develop a passenger manifest of those personnel embarking from that ship with the exception of mass troop transfers. The manifest shall contain, at a minimum, the following information:

a. Last name and initials of passenger(s).

b. Rank.

c. Organization.

d. Destination.

e. Priority.

f. Date and time of departure.

NOTE

THE SHIP SHALL MAINTAIN THE MANIFEST UNTIL THE TRANSFER IS COMPLETED.

3. Helicopter-to-Ship Hoist Transfer. Helicopter hoist transfer of personnel and internal cargo may be conducted at any designated helicopter landing spot, VERTREP line, or HIFR area, provided that the helicopter conducting the transfer is cleared to land, VERTREP, or HIFR from the designated area.

a. Pilot's Responsibility. The helicopter pilot is responsible for the safe conduct of the hoist transfer and must use the national procedures and visual cues of the host ship during the hoist operation.

b. Approach. When cleared by the receiving ship, the helicopter should make an approach into the relative wind and establish a hover height of approximately 15 feet (4.6 meters) over the pickup mark.

4. Procedure for Hoist Transfer of Passengers From Helicopter to Ship.

CAUTION

IN COLD WEATHER THE PASSENGER MUST BE PROVIDED WITH HYPOTHERMIA GEAR.

a. The passenger to be transferred shall be wearing a rescue strop and cranial protection and shall be positioned at the open helicopter door by an assisting air crewman.

WARNING

SHIP'S PERSONNEL SHALL ENSURE THAT THE HOIST CABLE IS CONTINUOUSLY GROUNDED TO THE SHIP BY A GROUNDING WAND OR OTHER SIMILAR DEVICE BEFORE THE PASSENGER'S FEET TOUCH THE SHIP'S DECK. IT IS CRITICAL THAT CONTACT BE MADE WITH THE HOIST CABLE RATHER THAN THE PASSENGER'S BODY DURING THE GROUNDING PROCEDURE. TOUCHING THE PASSENGER WITH THE WAND OR OTHER GROUNDING DEVICE CAN RESULT IN SEVERE STATIC SHOCK. GROUND CONTINUITY MUST BE MAINTAINED UNTIL AFTER THE PASSENGER'S FEET HAVE MADE CONTACT WITH THE DECK. IF THE GROUND IS BROKEN, A POTENTIALLY DANGEROUS CHARGE CAN REBUILD WITHIN 1 SECOND.

WARNING

UNDER NO CIRCUMSTANCES SHALL THE HOIST CABLE BE ATTACHED TO THE SHIP'S STRUCTURE.

b. The air crewman shall first raise the transfer hoist slightly to take the weight of the passenger and then lower away sufficiently to allow the passenger to be suspended above the deck until the hoist cable is grounded.

c. After the hoist cable has been properly grounded, ship's personnel shall signal the helicopter to complete payout of the cable so that the passenger is fully lowered to the deck.

d. The air crewman shall adjust the payout of the hoist cable so that the passenger is not dragged across the deck as he is being assisted in freeing himself of the strop harness.

e. The protective clothing and headgear shall be removed from the passenger and returned by hoist to the helicopter.

5. Ship-to-Helicopter Hoist Transfer. Normally, cargo to be hoisted aboard a helicopter should not exceed 200 pounds (90 kilograms) because of crewman limitations. Material weighing less than 30 pounds (13.6 kilograms) must be transferred in a weighted bag.

6. Procedure for Hoist Transfer of Passengers From Ship to Helicopter.

a. The air crewman shall lower the hoist cable with the rescue strop, cranial protection, and the necessary protective clothing to the deck of the ship.

WARNING

UNDER NO CIRCUMSTANCES SHALL THE HOIST CABLE BE ATTACHED TO THE SHIP'S STRUCTURE.

b. Ship's personnel shall ground the hoist cable as soon as it is near the deck, remove the protective clothing, and assist the passenger in putting it on.

c. After the passenger has put on the required protective clothing, a ship's crewman shall ensure that the grounding device is in continuous contact with the hoist cable before the passenger is connected to the hoist cable. The crewman shall then signal the helicopter to begin hoisting. The hoist cable shall remain grounded until the passenger is sufficiently clear of the deck.

WARNING

THE PASSENGER MUST REMAIN PASSIVE AND NOT ATTEMPT TO ASSIST THE AIR CREWMAN IN RETRIEVING HIM. SUCH AN ATTEMPT CAN RESULT IN CONFUSION AND A POTENTIALLY MORE HAZARDOUS SITUATION FOR THE PASSENGER.

d. The air crewman controls the hoisting cable and coordinates the entire lifting procedure with the pilot.

0243 Conduct of Maritime NVD Cross Operations

WARNING

SHIP STAFF AND AIRCREW MUST BE AWARE THAT THERE IS A FUNDAMENTAL DIFFERENCE BETWEEN WHAT THE AIRCREW CAN SEE WHEN WEARING NVDS AND WHAT CAN BE SEEN BY THE DECK CREW OR PERSONNEL IN PRI-FLY/FLYCO. THE AIRCREW WILL BE ABLE TO CARRY OUT A NORMAL APPROACH, LANDING, AND TAKEOFF USING NVDS. HOWEVER, IN MOST CASES, THE DECK CREW WILL NOT BE ABLE TO SEE THE HELICOPTER AND, THEREFORE, WILL NOT BE ABLE TO EITHER OFFER APPROACH/ LANDING GUIDANCE OR CONDUCT BASIC DECK OPERATIONS.

This paragraph establishes the minimum standards and operational methodology for the conduct of night vision device (NVD) cross operations to maritime platforms. It lays down the minimum requirements to allow NVD operations to be carried out between ships and aircraft of different countries. NVD operations are those operations limited to approaches, launches, and recoveries. NVD cross operations are restricted to approach, landing, and takeoff using NVDs as the primary visual cueing tool. Once on deck, normal evolutions may continue with due consideration to the additional safety requirements necessitated by the use of NVDs. Ships and crew are considered NVD capable when the bridge, CIC operations, LSO, and flight deck crews are trained in NVD flight operations and the ship is in compliance with the appropriate lighting state definition which applies to all lights that can be seen from the aircraft during its approach, landing, or takeoff. See MPP-02.2 for those ships capable of conducting NVD operations.

1. Stages of NVD Operations.

a. Stage 1. No modifications to existing lights. Ship's lights secured or dimmed to support NVD operations.

b. Stage 2. NVD friendly. Ship's lights will cause a controlled degree of interference to night vision devices, but must be able to be clearly seen both through goggles and by the naked eye.

c. Stage 3. NVD compatible. Ship's lights will adhere to the specifications discussed in Table 2-3, MIL-L-85762A, and STANAG 3224. This lighting will cause minimal interference with night vision devices providing uninterrupted vision through goggles while retaining full visibility to the naked eye.

2. NVD Restrictions.

a. Mixed Operations. Mixed operations (i.e., NVD and non-NVD-configured aircraft conducting simultaneous flight operations from the same ship) are not authorized.

b. Hours of Operation. NVD operations shall be restricted to 4 hours of continuous use per aircrew over a 24-hour period.

c. Multi-spot Ships. For multi-spot ships, NVD recoveries will not be conducted with turning aircraft aft or abeam on adjacent spots.

d. Wind Envelope. HOSTAC SHOL or national relative wind envelope (whichever is more conservative) will be used.

e. Pitch and Roll. To commence an approach the ship shall be steady on its flight recovery course and a pitch ± 2° and roll ± 4°.

Table 2-3. Class NVD Radiance Requirements

LIGHTING FUNCTION		MAXIMUM CLASS NVD RADIANCE (@ 0.1 fL)[1]
Flight deck f ood lighting (exit window shrouded from direct view)		1.6E-8
Flight deck f ood lighting (exit window in direct view)		5.0E-9
Visual landing aids		1.4E-7 max (red)
Flight deck close-in signaling lights	Red	1.4E-7
	White	1.6E-8
Well dock/hangar/lift area f oodlights		5.0E-9
Navigation lights	Red	1.4E-7
	White	1.6E-8
Obstruction lights		1.4E-7
Miscellaneous support equipment		1.6E-8

Internal instruments, control panels display (FLYCO/PRI-FLY)
Use MIL-L-85762A/STANAG 3224.

These figures represent lighting at maximum brilliance.
All lighting shall have 100% dimming capability.

Lighting components shall be seen by both aided and unaided personnel.

Note:

1. fL = footlambert. A unit of luminance equal to one lumen per square foot.

NOTE

PITCH AND ROLL INFORMATION PASSED DOES NOT INDICATE DECK MOTION AT MOMENT OF TOUCH DOWN, WHICH SHOULD BE MINIMIZED.

3. NVD Minimum Pilot Qualifications.

a. Deck Qualifications. Pilots must be deck qualified, as defined by national procedures, by day and night without NVD. NVD qualifications will be in accordance with national procedures and shall include shipboard takeoff and landings using night vision devices as a primary visual sensor.

b. Currency. Three hours on NVDs in the past 30 days to include at least two shipboard takeoffs and landings are required to maintain currency.

4. Weather Minimums.

a. Ceiling/Visibility. NVD cross operations are only to be conducted in visual meteorological conditions (VMC) as defined by national authorities, with the horizon visible on the approach and takeoff axis.

b. Light Levels. A minimum ambient light level of 2.2 mLUX is required for NVD operations.

5. Prerequisites Prior to Conducting NVD Operations.

a. Preparations. A thorough briefing for all personnel involved in the evolution should take place. The following points are to be covered and should form the basis of an NVD Operations Checklist:

(1) Ship lighting: what, when, at what level.

(2) Aircraft approach, landing, takeoff.

(3) Marshalers/FDO/LSO actions.

(4) Flight deck personnel equipment.

(5) Emergencies.

(6) Wave-off procedures.

(7) Hazards of aircraft on deck.

(8) Flight deck hazards caused by inability to see obstructions and deck edge.

(9) Communications.

(10) Light pollution.

b. Site Survey/Prior Day Landing. A site survey and/or day landing shall be conducted prior to night NVD operations.

c. Stage 1 Operations. All NVD-capable ships should be capable of conducting Stage 1 operations should the requirement arise at short notice.

d. Joining Message. A standard joining message is to be passed and should include whether using NVD or not.

e. Preflight Planning. The following points should be considered during preflight planning:

(1) Moon elevation and angle.

(2) Max time on NVD allowed for mission planning purposes.

(3) Flight deck procedures refer to national procedures.

6. Recommended Equipment. The use of the following equipment is recommended:

a. NVD-Compatible Wands.

b. Blue/Green Chemlites/Cyalumes. Blue/Green Chemlites/Cyalumes attached to personnel to indicate their whereabouts on the flight deck.

c. NVDs. NVDs should be provided to all key personnel involved in NVD flight operations.

7. Deck Operations.

WARNING

DURING STAGE 2 OR 3 OPERATIONS, IF NVD PERFORMANCE BECOMES DEGRADED TO AN UNACCEPTABLE LEVEL DUE TO SHIP'S LIGHTING, REVERT TO STAGE 1 DECK OPERATIONS.

a. Access. Access to the upper deck should be strictly controlled to avoid NVD-incompatible light spilling on to the upper deck. The ship's company is to be made aware of these conditions and the flight safety hazard that is caused by non-NVD-compatible light sources.

b. Stage 1. When the aircraft lands on an NVD-capable Stage 1 ship, in most cases the ground crew including FDO/LSO/LSE will not be able to see the aircraft. As a result they will not be able to carry out normal duties of refueling, lashing, rearming, or escorting personnel to and from the aircraft. It will also be hazardous for ground crew to operate without flight deck lighting. Once on deck, aircrew are to give clearance to shipboard personnel to modify lighting configurations commensurate with safety. All lighting should be returned to its NVD configuration immediately prior to takeoff after all lashings have been removed and all personnel are clear of the area. The GSI, stop-go, and deck status lights are not to be used. Clearance to land/launch is to be passed verbally between the bridge/PRI-FLY and the FDO/LSO.

c. Stage 2/3. Some interference with NVD performance is anticipated during Stage 2 operations.

8. Training. All shipboard personnel involved in NVD operations shall be familiar with the following:

a. Standard NVD lighting configurations (including reversion to Stage 1).

b. Emergency procedures.

c. Safety precautions.

d. Marshaling signals.

e. Aircraft approach procedures.

f. Light discipline.

0244—0250 Spare

SECTION V—HOSTAC CROSS-OPERATING STANDARDS AND TRAINING

0251 HOSTAC DECK Standard for Pilots Cross-Operating in the Maritime Environment

1. Introduction. The requirement exists for nations to be able to cross-operate aircraft in the maritime environment safely. However, the pilots involved may not necessarily be trained in all aspects of maritime operations. This HOSTAC DECK standard specifies a minimum standard of deck landing training required for pilots cross-operating in the maritime environment.

2. Agreement. Nations agree to adhere to the minimum requirements and procedures for the award and validation of this qualification. The award of the HOSTAC DECK qualification does not automatically grant authority for a pilot to operate to a ship. This remains the prerogative of the individual nation. Prior to granting such authority, due consideration should be given to the inherent risks of deck landing operations particularly when operating to single spot ships in high sea states or during poor meteorological conditions.

3. National Qualifications. Where national training exceeds the minima laid down in this agreement, pilots are considered to be HOSTAC DECK qualified.

4. Initial Qualification. Prior to commencing airborne training a deck-operating brief is required that shall include ship helicopter operating limits (SHOLs); deck operating and approach procedures as specified in this publication; and relevant STANAGs, emergencies, ATC and marshalling. Minimum airborne training requirements, under the supervision of a qualified instructor or suitably experienced maritime pilot, are shown in Table 2-4.

5. Categories. Pilots who achieve the minima specified in Table 2-4 are categorised as HOSTAC DECK DAY; HOSTAC DECK NIGHT; HOSTAC DECK NVD in accordance with the training completed. A pilot shall be HOSTAC DECK DAY qualified prior to conducting night or NVD landings.

6. Currency. The initial qualification is valid for a period of 180 days. This qualification will remain current provided that the minima specified in Table 2-5 is achieved. The currency period runs from the date of the last qualifying deck landing whether conducted as an initial qualification or as a normal operation in accordance with Table 2-5.

7. Revalidation. Pilots' HOSTAC DECK qualification automatically expires after 180 days unless the minima specified in Table 2-5 has been achieved. In order to revalidate an expired HOSTAC DECK qualification, pilots must conduct a period of dedicated refresher training under the supervision of a qualified instructor or suitably experienced pilot as specified in Table 2-6.

Table 2-4. Initial Training for HOSTAC DECK Qualification

Category	Day	Night	NVD
Minimum Approaches and Landings	8	8	4
Note: Approaches and landing are to be conducted while the ship is underway.			

Table 2-5. Minimum Deck Landings Required to Maintain HOSTAC DECK Currency

Category	Day	Night	NVD
Minimum Approaches and Landings	4	4	4
Note: Approaches and landing are to be conducted while the ship is underway.			

Table 2-6. Minimum Deck Landings Required to Revalidate an Expired HOSTAC DECK Qualification

Category	Day	Night	NVD
Minimum Approaches and Landings	4	4	4
Note: Approaches and landing are to be conducted while the ship is underway.			

0252 National Non-Maritime Pilot Standards

Article 0212 provides general guidance for ship and aircraft personnel in the planning of helicopter cross operations. Chapter 2 of MPP-02.2 summarizes national standards for shipboard operations for non-maritime pilots.

0253-0260 Spare

SECTION VI—SAFETY PRACTICES, PROCEDURES, AND STANDARDS

0261 Goggles and Headgear

All personnel on the flight deck during flight operations shall wear goggles and either flight helmet or cranial with ear protection. Eye protection provides personnel protection against FOD and rotor wash, the head gear provides impact protection, and ear protection provides protection against permanent hearing degradation.

0262 Passenger Safety

1. Because of potentially lethal conditions during flight operations, passengers being transferred by helicopter shall be thoroughly briefed and provided with survival gear.

2. Helicopter Passenger Clothing—Minimum Acceptable Standards. Passengers are to be dressed in clothing that will afford suitable protection in the event of an aircraft fire or ditching. As a minimum standard, passengers should be dressed in overalls or long-sleeved shirts with open collar, trousers, socks and shoes. Nylon clothing of any form shall not be worn, and caps or hats shall be carried or packed away. Goggles and cranials with hearing protection (or flight helmet) shall be worn. Immersion suits will be provided if required (see Article 0242).

3. Helicopter Passenger Considerations and Briefing.

a. The following minimum personnel safety equipment for personnel transfers shall be supplied by the helicopter. Transferring flight personnel may use personal flight and survival gear.

(1) Life vests (not to be water actuated).

(2) Flight helmet or cranial, hearing, and goggle protection.

(3) Immersion suits are to be worn in accordance with the national regulations of the helicopter.

b. The briefing and putting on (donning) of safety equipment should take place in a relatively quiet area of the ship. Passengers shall be escorted to and from the helicopter by a member of the flight crew or by other designated personnel. No person shall approach or depart the helicopter until permission has been given by the LSO.

c. If the transfer is to be by hoist, the briefing should be conducted by a crewman of the helicopter, who will be lowered to the deck of the host ship. If this is not feasible, it is the responsibility of the ship to provide a brief on the hoist procedures (paragraphs 0263.a through c). Once the passenger is hoisted and embarked, the aircrew shall brief the passenger on subsequent aircraft-related matters (paragraphs 0263.d through h).

d. Upon completion of the transfer, passenger safety equipment shall be removed only upon leaving the flight deck in a location away from rotor downwash hazards. Safety equipment provided by the helicopter will be returned to the flight crew.

0263 Helicopter Passenger Briefing Checklist

This checklist is to be made up locally using waterproof plastic or card stock. It shall provide as a minimum the following information, amplified by graphic or pictorial views where possible.

a. Required flight helmet or cranial, hearing, and goggle protection.

b. Required flight deck clothing. See the national standards for details of protective clothing that will be provided to the passenger.

c. Required method of putting on rescue strop and other protective and safety gear for hoist transfer.

d. Proper method of approaching aircraft and procedures for entering.

e. Specific seating plans and escape routes for the helicopter to be used.

f. Seat belts or harness and their methods of closure and release.

g. Action to be taken during in-flight emergency, including crash and ditching procedures, crew personnel in charge of crash and ditching operation, and normal methods of notification of emergency.

h. Specific locations and means of operating release fasteners, hatches, latches, and emergency exit systems for the helicopter to be used.

i. Proper method of putting on and using life vests and jackets.

j. When and where safety equipment will be removed and returned to the flight crew upon completion of the evolution.

0264 Passenger Carrying Rules and Regulations

1. All passengers, regardless of rank, are subordinate to the captain of the aircraft for the duration of the flight. They must only embark/disembark when cleared to do so by the aircraft captain. In addition to the passenger preflight briefing, nations have agreed to minimum operational standards for carrying passengers to and from the decks of air-capable ships.

2. Limitations.

a. Air-Capable Ships (i.e., ships holding a current air certification for night helicopter operations). Night transfer of non-aircrew passengers is permitted if they have been trained and are current on helicopter emergency escape training (i.e., Dunker training). Other cases should be limited to operational necessity, with authorization from the appropriate national (or nationally delegated) authority (for the helicopter). Movement of personnel at night during exercises does not normally constitute operational necessity. This does not preclude troop movements in support of amphibious exercises.

b. Non-Air-Capable Ships (i.e., ships not holding a current air certification for night helicopter operations). Transfer of passengers at night to/from non-air-capable ships is not normally conducted except in emergency situations.

c. Any passenger baggage is to be handled by the load party and is to be hoisted separately from the passenger.

d. Smoking is prohibited inside the aircraft.

e. The following articles are not to be carried by the passenger:

(1) Matches other than safety matches.

(2) All types of liquid or gas-filled lighters (butane, petrol, etc.).

(3) Containers or refill capsules or cylinders for lighters.

(4) Aerosol containers.

0265 Hazards

WARNING

BECAUSE OF THE FLEXIBILITY OF THE ROTOR BLADES, THE LSE SHALL DIRECT THE HELICOPTER FROM A POSITION OUTSIDE THE ROTOR DIAMETER. PERSONNEL SHOULD NEVER WALK BENEATH THE ROTORS UNTIL THEY HAVE COME TO A STOP OR HAVE BEEN BROUGHT UP TO FULL SPEED. STAND WELL CLEAR OF THE ROTOR DIAMETER WHEN ROTORS ARE BEING ENGAGED OR DISENGAGED. WHEN ENTERING THE HELICOPTER ON DECK, KEEP LOW AND ENTER ONLY WHEN AND AS DIRECTED BY THE LSE OR FDD AND HELICOPTER CREWMAN.

1. Main Rotor Blades. Turning main rotor blades are inherently dangerous. Although blade flapping can occur at any time, it normally occurs when blades are rotating at low RPMs or are stopped. When stopped, flight deck personnel shall ensure that the blades are properly secured during wind conditions that may cause damage as a result of blade flapping.

WARNING

ROTOR DOWNWASH CREATED BY THE CH-53E HELICOPTER IS STRONGER THAN THAT PRODUCED BY ANY OTHER HELICOPTER. DOWNWASH HAZARDS CAN EXIST AS FAR AS 300 FEET (91 METERS) FROM THE HELICOPTER. UNDER ZERO-WIND CONDITIONS, MAXIMUM AVERAGE VELOCITIES OCCUR AT 49 FEET (15 METERS) FROM THE ROTOR CENTERS (1.25 TIMES THE ROTOR RADIUS) AND CAN VARY FROM 50 TO 95 KNOTS, DEPENDING ON THE HELICOPTER'S GROSS WEIGHT. THIS IS A HAZARDOUS AMOUNT OF WIND THAT CAN BLOW UNSECURED CHAINS OR TOWBARS AROUND THE DECK, CAUSING INJURY OR FATALITIES. THE PRESENCE OF HIGH RELATIVE WIND CAN INCREASE TURBULENCE EVEN MORE. THE NEED TO SECURE ALL LOOSE OBJECTS AND TO HAVE PERSONNEL TAKE APPROPRIATE ACTION TO ENSURE THEIR SAFETY IS ESPECIALLY CRITICAL UNDER THESE CONDITIONS.

2. Downwash. Downwash from main rotor blades can create significant wind velocities in the vicinity of the helicopter. Personnel shall take special care to avoid injuries or damage to equipment, particularly when operating in the vicinity of large helicopters that have a strong downwash.

WARNING

PERSONNEL MUST NEVER ATTEMPT TO PASS UNDER AN OPERATING TAIL ROTOR OF A HELICOPTER WITH A SINGLE MAIN ROTOR.

3. Tail Rotor Blades. Helicopters with a single main rotor use a vertical antitorque tail rotor. This rotor is very close to the flight deck.

0266 Helicopter Safety Practices

NOTE

BECAUSE THE FOLLOWING PARAGRAPHS COVER GENERAL OPERATIONAL SAFETY, BOTH AIRCREW AND SHIP'S PERSONNEL SHOULD READ AND BE FAMILIAR WITH THEIR CONTENTS IN ADDITION TO THE SPECIALIZED PROCEDURES AND REQUIREMENTS PROVIDED ELSEWHERE.

1. Ship Course Changes. Except in extreme emergencies, the host ship shall not change course while a helicopter is being launched or recovered, is engaging or disengaging rotors, or is being towed or pushed about the deck. Under these conditions, any unanticipated ship movement makes the helicopter particularly susceptible to overturning or sliding.

2. Weapon Hazards. Helicopters parked or operating in the vicinity of weapons are subject to damage by gunfire concussion and rocket blast and from FOD damage when weapons are fired. Except under combat conditions, normal flight deck operations should be suspended during weapons or gunnery training. If a helicopter must remain exposed during weapon firing, it should be positioned as far away aft of the firing units as possible with its doors and hatches open to minimize the possibility of concussion damage.

3. Sonic Boom Concussion Damage. High-performance aircraft should not be cleared for close-in supersonic passes over or near a ship when helicopters are embarked. Sonic boom concussion has the same damaging effects on structures and hatches as weapons fire.

0267 Firefighting and Rescue

1. Specific multinational aircraft rescue information is available in STANAG 3896 CFR, Information and procedures Aerospace Emergency Rescue and Mishap Response Information (Emergency Services). STANAG 3896 CFR is available online at: http://cryptome.org/aero-rescue.htm.

2. Firefighting Team.

a. The firefighting team must consist of:

(1) A leader.

(2) Two rescue persons wearing protective clothing that is flame-retardant and heat-reflective.

(3) The number of persons who are needed to operate the ship's firefighting systems.

b. Personnel shall have the following material and equipment available to them:

(1) Fire axe.

(2) Cable cutter.

(3) Rescue knife.

(4) Metal piercing and cutting tool.

c. Firefighting personnel shall be trained and frequently drilled in the following basic areas:

(1) Fundamentals of fire combustion, extinguishing, and control.

(2) Firefighting operations and tactics with varying worst-case scenarios.

(3) Aircraft familiarization.

(4) Specific fire hazards of aviation fuels and lubricants and on board ordnance hazards.

(5) Rescue and first aid.

3. Firefighting Equipment and Systems. The host ship shall have the following firefighting equipment and systems.

a. Saltwater Hydrant. Saltwater in a straight stream or fog pattern is used to extinguish class A fires (burning wood, paper, cloth, fibrous materials, and paper products) and class D fires (combustible metals). Saltwater in quantity as a high-velocity fog is the recommended agent for class D fires in the absence of special agents.

WARNING

DO NOT MIX WATER WITH AQUEOUS FILM-FORMING FOAM (AFFF) TO FIGHT FIRES. COMBINED USE OF SALTWATER WITH AFFF OR EQUIVALENT WILL DEGRADE THE EFFECTIVENESS OF AFFF.

b. Aqueous Film-Forming Foam. AFFF or equivalent is used to combat class A fires and class B fires (POL and other volatile liquids). If an aircraft fire involves live ordnance, the firefighting team leader shall ensure that AFFF is continuously applied to all exposed ordnance. Water is not used to cool ordnance until after the fire is extinguished.

c. Portable Fire Extinguishers. Two of each of the following types of fire extinguishers will be available at the helicopter areas:

(1) Smothering agent, for use against class B fires, and

(2) Carbon dioxide, inert gas, or Halon, for use against class B fires and class C fires (electrical).

0268 Helicopter Engine Fire on Deck

1. Internal Engine Fire. Given evidence of an internal engine fire, the LSO or firefighting crew shall notify the pilot by an appropriate hand signal. In the case of an internal fire, the pilot should, at his judgment, continue to motor the system or take action to extinguish the fire using onboard fire-extinguishing systems as available. If unsuccessful, he shall attempt to secure the engine and shall exit the helicopter.

2. External Fire. If the fire is external and/or clearly beyond the capacity of onboard fire-extinguishing systems, the pilot shall attempt to secure the engine and exit the helicopter immediately. The LSO then directs the firefighting party to fight the fire using CO2. Dry chemicals or foam may be required for larger fires.

0269 Jettison Procedures

Jettison of the helicopter over the side is prudent if the fire is so far advanced that it endangers the ship or if on board ordnance creates an unacceptable hazard. To jettison a burning or damaged helicopter over the side, the following procedures are recommended insofar as safety and the hazards of the particular situation allow:

a. Sound general alarm.

b. Check for passengers or crew remaining in the helicopter and assist them insofar as possible to abandon the helicopter.

c. Clear all unnecessary personnel from the flight deck area.

d. On orders from the LSO or other authority, all chocks and tiedowns shall be removed.

e. If the ship is equipped with fin stabilizers, the stabilization system should be secured and the ship should attain maximum speed.

f. The firefighting team should lay a blanket of foam across the jettison path to the edge of the deck before attempting to jettison the helicopter over the side. This foam blanket will minimize the possibility of reflash of the fire from hot debris or exposed oil, fuel, or other materials as the helicopter is dragged or moved across the deck.

g. When the LSO reports the chocks and tiedowns clear, the ship should make a maximum-rate port or starboard turn to cause the ship to heel and the helicopter to topple over the side.

h. If the procedure above is not feasible, as in a confined or restricted waterway, a 3/4-inch (19 mm) cable may be laid around three sides of the periphery of the flight deck with the bitter end secured to the deck and the other end attached to a capstan. When slack is taken up by the capstan, the helicopter should become fouled in the cable and pushed to the side and overboard.

0270 Maritime, Rotary Wing Aircraft, Immediate Accident/Mishap Response Procedures

1. This section establishes guidelines for an immediate accident/mishap response (A/MR) plan for aircraft operating in the maritime environment. Effective A/MR can only be achieved if all parties have a clear understanding of the priorities and aims of A/MR. The initial response (first 24 hours) and the preservation of available evidence will be crucial to the success of a subsequent investigation.

2. Crash Scenarios.

a. Commanding officers of ships and maritime platforms are to apply A/MR principles for all aircraft operations. They can utilize ship/platform staff as appropriate to provide technical expertise and manpower support as required, commensurate with the operational situation. The three occasions that may be required to implement A/MR procedures are:

(1) Aircraft ditching.

(2) Aircraft crash on deck.

(3) Organic aircraft crash ashore.

b. Individual aircraft scenarios are seldom identical and the wide range of factors and dynamics preclude reliance on fixed plans. The A/MR organization has to be flexible enough to deal with any eventuality whilst remaining focused on the main operational priority. The immediate command priorities are:

(1) Put out the fires and rescue aircrew.

(2) Provide first aid.

(3) Prevent further injury and damage.

(4) Preserve evidence. (Restricting any access to the site until investigative bodies arrive is an alternative.)

c. Subsequently, report the incident to appropriate national accident investigation centers/authorities as required by the nations involved. Include numbers and the nature of casualties and an initial damage assessment.

3. Key Activities. The key activities required to allay concerns and facilitate subsequent investigation are listed in the following paragraphs. Personnel assigned to A/MR duties should not have been involved in the actual incident.

a. Coordinate. A senior officer should have overall charge of A/MR activities and he should be responsible for ensuring that the command priorities (4 Ps) have been carried out, the incident has been reported and relevant investigative bodies informed. He must also ensure that uninvolved personnel are kept away from the crash site/flight deck.

b. Incident Control. The following activities would best be conducted by an aviator or other designated aviation officer, if available, who should act as the initial point of contact.

(1) Arrange direct communication between the ship and the crash site/flight deck. Obtain an immediate situation report for high level briefing purposes.

(2) Decide on and coordinate if assistance from external agencies is required, i.e., salvage, jungle, or mountain rescue teams, etc.

(3) Coordinate security of the crash site/flight deck.

c. Crash Site/Flight Deck Control.

(1) Secure the crash site/flight deck and establish whether any hazardous materials, ordnance, stores, or cargo are involved.

(2) Maintain a detailed narrative log recording all occurrences.

(3) Preserve the crash site/flight deck ensuring evidence is not disturbed.

(4) Entry to the crash site/flight deck should be controlled until completion of the A/MR process. For a crash ashore, communication equipment should be provided and clear communication with the host ship/platform maintained.

d. Impound Relevant Documents and Material.

(1) Flight authorization sheets.

(2) Meteorological forecast/actual.

(3) Relevant camera/voice/mission recordings.

(4) Ship's bridge and OPS room recordings.

(5) Aircraft maintenance documents.

(6) Aircraft fluid samples.

NOTE

WITNESSES SHOULD BE ADVISED THAT STATEMENTS WILL NEED TO BE TAKEN IN DUE COURSE. NATIONAL ACCIDENT INVESTIGATION CENTERS/AUTHORITIES WILL ADVISE ON THE SPECIFIC REQUIREMENTS FOR WITNESS STATEMENTS. IF A DELAY IN THE HANDOVER OF THE SCENE TO THE APPROPRIATE INVESTIGATIVE AUTHORITY IS EXPECTED, CONSIDERATION SHOULD BE GIVEN TO A MEMBER OF THE A/MR TEAM TO TAKE WITNESS STATEMENTS.

e. Medical Considerations. A medical doctor or qualified practitioner, preferably with aero medical specialist training, may initiate the gathering of any medical evidence that may be required for a subsequent investigation. After-care for those involved in an accident should be considered.

4. Command and Control. Individual incident officers may be relieved during the course of A/MR operations, but only after following formal handovers and notifying command of the change. The initial chain of command covers the period up to and including the completion of firefighting and rescue. The senior officer on scene is to carry out the crash site/flight deck control duties in addition to being responsible for fire and rescue. On completion of all firefighting and rescue activities the Senior Officer may hand over his duties if required to another nominated officer. The handover should detail hazards present on site, positioning of the cordon, casualties and any other relevant information. Once this officer has assumed control he assumes full responsibility for the site and personnel, (including fire and crash crews). He will only relinquish these responsibilities when a site clearance certificate, or similar, is signed by the appropriate authorities and the site is handed back to its owner in a safe condition. (Not relevant aboard ships).

5. Safety. The principal concern at any accident site must always be the safety of personnel working in and around the wreckage of the aircraft. Crashed aircraft present a significant number of safety hazards; examples are listed as follows:

a. Weapons and explosive hazards, including flotation bottles, hoist cartridges, accumulators (pneumatic and hydraulic), and fire extinguishers.

b. Fire hazard from ruptured fuel tanks.

c. Stored potential hazard energy from damaged composite main rotor blades.

d. Acid contamination from damaged or leaking aircraft batteries.

e. Electric shock hazard from damaged/exposed high energy igniter units.

f. Minor radiation hazard from damaged beta lights.

g. Any additional hazard from internal and external loads.

h. Aircraft of man-made mineral fibre (MMMF) construction pose special hazards if the structure has been damaged in the crash impact or if fire has ensued, as follows:

(1) Damaged MMMF structure will expose or release many shards of sharp material which will easily penetrate unprotected skin.

(2) A by-product of a fire involving MMMF is the release of varying amounts of toxic gas and dust.

i. The possibility of blood-borne pathogens should be considered when injuries are present. The wearing of personal protective equipment (PPE) such as gloves, coveralls, and respirators may be required and a decontamination area, to exit the crash site, should be considered.

Respecting these hazards, the senior aircraft engineer present will need to continually assess the hazards posed in and around the crash site/flight deck and direct the PPE dress levels accordingly.

6. Preservation of Evidence. Aside from the over-arching responsibility for personnel safety, the principal objective of the A/MR organization is the preservation of evidence for subsequent investigation of the cause of the accident. Accident investigation is a specialized and demanding task, normally undertaken by appropriate Accident Investigation Centers. Other personnel may only investigate the cause of the accident if there is a pressing operational requirement. A crash site/flight deck should ideally be maintained in the condition found following the accident; however, this is not always possible. A command may have an operational or flight safety requirement to clear the crash site/flight deck, but must consider the option of preserving evidence against the possibility that vital clues may be lost. See AFSP-1.3. The use of any video, digital imagery, or a plan view sketch can help to preserve evidence, should safety dictate that the crash scene and associated debris need to be moved or disturbed prior to the arrival of any formal investigative body or team.

7. Issues relating to jurisdiction, safety investigation, and the convening of boards of inquiry are dealt with in AFSP-1.3.

SECTION VII—AIRCRAFT EMERGENCY PROCEDURES

0271 Helicopter Landing Emergencies

1. There are three classes of landing emergency: those that require an immediate landing; those that require a precautionary landing; and those that cause a helicopter to ditch or crash. There are also variations and special problems peculiar to specific landing emergencies. The decision to proceed to the |nearest land or airfield or to request a shipboard landing rests with the helicopter captain and will be dependent on the nature of the emergency. However, the final responsibility of any ship to receive the aircraft remains with the ship's commanding officer.

2. During any emergency in which recovery of the helicopter is to be attempted, the first considerations of the ship should be to (1) close the distance to the helicopter and (2) prepare for immediate recovery. If the emergency is caused by power loss, the ship shall attempt to get the most favorable relative wind across the deck. If flight control malfunction has caused the emergency, a condition that results in a stable deck is the most important.

3. Immediate Emergency Shipboard Landing. If the helicopter must get on the deck with no delay, the ship shall execute the following emergency landing procedures:

a. Maintain radar contact. If the helicopter is lost, proceed as in paragraph 0271.5.

b. Close on the helicopter at best speed.

c. Obtain as much clarifying information from the pilot as possible concerning the nature and extent of malfunction, his intentions, etc.

d. Set emergency flight quarters over ship's general announcing system. Emergency flight quarters requires increasing the alert condition and shall, at a minimum, direct all hands not engaged in recovery to stand clear of landing area, to extinguish all open flame and secure dumping of trash and garbage, to station fire and crash teams, and to man crash and rescue boat.

e. Inform accompanying units and request assistance.

f. Turn to base recovery course (BRC) and adjust speed to provide a compromise of best wind and steady deck 3 nm prior to arrival at the helicopter intercept point (4 nm at night or under IMC).

g. Clear all unnecessary personnel from the flight deck and hangar area prior to declaring a green deck. Fire and rescue personnel should stand far back from the flight deck but be prepared to move in rapidly if needed.

h. Once on deck, place chocks and tiedowns as in a normal recovery.

4. Precautionary Emergency Shipboard Landing. Landings of this type are declared as a result of minor malfunctions where the pilot, in the interest of safety, decides to terminate the flight. A precautionary landing is an emergency when declared although it does not have the urgency of an immediate emergency landing. Ship's personnel should be aware, however, that the precautionary landing could be upgraded in urgency at any time. The ship should execute the following procedures during any precautionary landing:

a. Maintain radar contact if possible.

b. Set normal flight quarters, including firefighting and rescue party, as soon as possible, without interfering with urgent ship evolutions.

c. Turn to BRC and adjust speed to recover the helicopter as soon as possible.

5. Crashed or Ditched Aircraft.

a. Plot position of crashed or ditched aircraft.

b. Close to this position as rapidly as possible.

c. Call away rescue boat or rescue helicopter as appropriate.

d. Station and brief lookouts.

e. Notify and request assistance from accompanying units.

f. Recover personnel and then recover aircraft or debris.

6. Single-Engine Landings. Because a twin-engine helicopter's ability to hover on a single engine is possible only under very limited conditions, a single-engine landing should be classified as an immediate emergency. Precision in all phases of the landing is necessary because a wave-off is generally not possible. In the event of a single-engine landing emergency, the ship should execute the following procedures:

a. Take a course that will provide the best wind across the deck.

b. When possible, provide the maximum amount of deck space for a no-hover, run-on landing.

c. Take all action to land the helicopter with no delay.

d. Once the helicopter is inbound, the LSE/LSO should make timely advisory correction signals to facilitate a safe approach and landing.

7. Recovering Helicopter With Damaged or Malfunctioning Landing Gear. When possible, it is desirable for the helicopter to establish a low hover so that deck personnel can observe the helicopter firsthand and inspect the damage. Ideally, personnel who are familiar with the guest helicopter should be on site at the flight deck to communicate details of the damage or malfunction directly to the pilot. If the malfunction cannot be cleared, padded pallets or mattresses may be used to support the aircraft on touchdown. Personnel should stand well clear during the actual touchdown.

8. Hung Droop Stops. As rotor speed decreases during disengagement, a mechanical stop in the rotor head prevents the blades from drooping downward to the deck. If a droop stop fails, one or more blades may strike the deck or portions of the helicopter. This will result in damage to the helicopter and possible injury to personnel close at hand. Should a droop stop fail on shutdown, the following procedures should be executed:

a. The LSO shall immediately give the signal to re-engage as shown in Chapter 3.

b. The pilot shall attempt another shutdown.

c. If the second shutdown is unsuccessful, the ship should change course and speed for minimum wind and turbulence over the deck.

d. The LSE/LSO shall clear all personnel from the flight deck, including himself, and the pilot shall proceed with the shutdown.

0272—0280 Spare

SECTION VIII—ON-DECK SECURING, SERVICING, AND SUPPORT INFORMATION

0281 Tiedown Requirements

Helicopters aboard the host ship must be tied down immediately upon landing. Prevailing environmental conditions of wind and sea state govern the specific tiedown procedures that are used. Tiedown requirements for specific helicopters are provided in MPP-02.2.

0282 Refueling Requirements

1. National Standards of Liquid Measure. When determining the volume of fuel to be transferred, it is absolutely necessary that operators understand whether the quantity is expressed in U.S. gallons, Imperial gallons, or in liters, kilograms, or cubic meters.

Note. *The U.S. Gallon is smaller than the imperial gallon.*

2. Communications. The marshaling signals provided in Chapter 3 or nonradio face-to-face communications shall be used between the helicopter aircrew and ship's personnel during the entire fueling or defueling sequence. All of the measures prescribed for the quality control of fuel shall be complied with prior to fuel delivery.

3. Refueling Methods.

WARNING

AIRCRAFT SHALL NOT BE REFUELED AND REARMED SIMULTANEOUSLY. ARMING IS AUTHORIZED ONLY AFTER REFUELING IS COMPLETED.

a. Hot Refueling (Engines Running). Helicopters equipped for pressure refueling may be hot refueled during training, operational, and combat situations. The ship's commanding officer or his representative must be notified before hot refueling commences. Embarked passengers shall leave the helicopter prior to a hot refueling operation.

b. Pressure Refueling With Engines Shut Down. Pressure refueling with aircraft engines secured is the normal procedure for refueling an aircraft. The aircraft will be completely shut down and only the refueling party, aircrew, and fire party need remain on station.

WARNING

GRAVITY REFUELING IS NOT PERMITTED WHEN AIRCRAFT ENGINES ARE RUNNING.

c. Gravity Refueling. The supervisor of the ship's refueling party must check with the pilot on the amount of fuel required. The aircrew monitors the fueling operation and determines the fuel cut-off quantity if less than a full load is required.

0283 On-deck Refueling Procedures

1. General. The on-deck refueling procedures in paragraphs 2 through 7 below are for refueling either with (1) engines secured or (2) engines running with rotors secured or turning. The following warnings apply to all refueling and defueling operations.

WARNING

• DURING REFUELING AND DEFUELING OPERATIONS, RADIO FREQUENCY EMISSIONS REPRESENT A POTENTIAL SAFETY HAZARD. ALL AIRCRAFT TRANSMITTING EQUIPMENT, INCLUDING RADIO ALTIMETER, DOPPLER RADAR, TACAN, AND IFF WILL BE IN OFF OR STANDBY CONDITIONS. SHIP'S RADAR AND RADIO ANTENNAS NEAR THE REFUELING AREAS SHOULD NOT BE USED.

• IN COLD WEATHER, REFUELING CREWS SHOULD TAKE ADDITIONAL PRECAUTIONS BECAUSE OBJECTS CAN BECOME MORE EASILY CHARGED WITH STATIC ELECTRICITY AND FUEL SPILLED ON THE SKIN CAN CAUSE SEVERE AND IMMEDIATE FROSTBITE.

• REFUELING OPERATIONS SHOULD BE SUSPENDED DURING THUNDERSTORMS.

• WHEN REFUELING AIRCRAFT, SMOKING OR USE OF OTHER OPEN FLAME IN THE REFUELING AREA SHALL BE SECURED.

2. Fuel Pressure and Flow Rate. The fuel pressure delivered at the aircraft shall be as stated in paragraph 0241.2g.

3. Refueling Party. The host ship's refueling party must, at a minimum, consist of the following:

a. FDO or FDD—The refueling operation is under the supervision of the FDO or FDD.

b. Firefighting personnel—At least one qualified firefighter must be present during refueling operations to man a fire bottle.

c. Fuel controller—A qualified member of the host ship's crew must be present to monitor and control fuel flow to the helicopter.

4. Aircrew Responsibility. The helicopter crew is responsible for supplying a qualified member to ground the aircraft and to connect the fuel nozzle to the aircraft.

5. Fuel Sample. A 500 milliliter fuel sample shall be furnished upon request to the helicopter as soon as practicable. The quality of the fuel shall conform to STANAG 3149 POL.

6. Tiedown Requirement. Prior to refueling, the helicopter must be safely secured to the deck by the appropriate procedures specific to the helicopter, as provided in the technical supplement.

7. Grounding Requirements. During refueling operations, the helicopter must be electrically grounded to the ship following the procedures below as appropriate:

a. Connect the fueling system bonding cable to an uncoated metal part of the aircraft. For closed-circuit refueling, this requirement will be satisfied where the hose and equipment have a continuous conducting path from ship to aircraft.

b. For open-line refueling, the nozzle shall be electrically connected to the structure of the aircraft before the tank to be filled is opened and the connection shall be removed only after the tank is closed. This connection shall utilize the grounding plug described in STANAG 3632.

c. After refueling, disconnect the refueling hose before disconnecting the bonding cable.

0284 Defueling Requirements

The helicopter must be electrically grounded during defueling as described in paragraph 0283.7. Ships equipped with an on-deck refueling capacity also have the capability to defuel an aircraft. Defueling is accomplished either by connecting a defueling hose to the aircraft refueling connection or, if this is not possible, by connection to an accessible aperture on the aircraft. When suction equipment is used for defueling, it must be regulated so as not to exceed 5 psi of vacuum.

0285 Engine Turn-up

Some preflight and turn-around inspections require that engines or rotors be turned up. Prior to any engine turn-up, host ship's personnel must perform an FOD walkdown of the maintenance area. The ship must ensure that work details secure the dumping of garbage over the side. Guest helicopter personnel must obtain the host ship's permission to start up engines.

0286 Washdown and Corrosion Control

1. Although specific requirements may vary, all helicopters operating in a saltwater environment require some measure of corrosion control to prevent airframe or engine damage due to corrosion or salt encrustation. Washdown requirements can generally be less demanding if the helicopter can be stowed in a sheltered hangar.

2. Although a daily freshwater washdown creates an additional demand on the water distilling and storage facilities, it is the most effective way of preventing saltwater corrosion buildup and resulting premature equipment failures. A helicopter in unsheltered deck storage requires approximately 50 gallons (190 liters) of fresh water per day for minimal corrosion control.

0287—0290 Spare

INTENTIONALLY BLANK

IAN ANNEX 2A Inter-American Navies Common Aviation Facilities and Operating Procedures for Cross Operations Under HOSTAC Guidelines

2A01 Inter-American Navies Agreements

1. Inter-American Navies nations have agreed to adopt the standardized hardware and operating procedures based on STANAGs and other agreements used throughout NATO. These are provided elsewhere and are not repeated here.

2. Inter-American Navies nations have also agreed to adopt the following search and rescue (SAR) procedures.

2A02 Downed Airman Search and Rescue Procedures

1. SAR procedures must be tailored to the specific situation. For example, the planning involved in the rescue of a downed airman within visual sighting range of the deck of an air-capable ship will be considerably less complex than the search for the survivors of a helicopter that is down at sea while making an emergency low-visibility approach (ELVA). Nevertheless, there are common elements in both emergencies. The following paragraphs provide minimal standards for equipment and procedures used in search and rescue, using either helicopters or the ship's rescue boat. While most pertinent to the rescue of helicopter air crewmen, they are also appropriate to recovery of survivors from a fixed-wing aircraft downing.

2. Use of Rescue Boat or SAR Helicopter. If the survivor is close aboard and within visual range, the rescue boat may be launched to retrieve him. Under most other circumstances, particularly where location is not absolutely known or where distance makes quick recovery impossible, the ship-launched helicopter is preferred.

NOTE

DETAILS OF MOST COMMAND AND CONTROL, SWIMMER DEPLOYMENT, BOAT HANDLING, AND RECOVERY PROCEDURES SHALL CONFORM TO NATIONAL STANDARDS OF THE SHIP EFFECTING THE RESCUE.

3. Required Water Rescue Equipment for Qualified Swimmer and SAR Helicopter. A qualified swimmer ready for immediate water entry should be assigned to the helicopter rescue team.

a. Minimum Swimmer's Equipment. The swimmer shall be equipped with the following survival/SAR equipment:

(1) Rescue harness with the following equipment attached:

(a) Strobe light.

(b) Two flares.

(c) One pocket shroud cutter.

(d) One diver's knife.

(e) Four chemical lights—two high intensity, two general purpose.

(2) SAR flotation vest, protective gloves, wet suit, swim fins, and mask and snorkel or underwater breathing apparatus.

(3) Waterproof, short-range two-way radio for communication with helicopter.

b. Onboard Helicopter Equipment. The minimum equipment to be maintained in the SAR helicopter is as follows:

(1) Rescue strop.

(2) Double rescue hook.

(3) One quick splice.

(4) One cable grip with crewman safety belt.

(5) Pneumatic webbing/cable cutter.

(6) Two wool blankets for hypothermia treatment.

(7) One rescue litter sling assembly and litter.

(8) Dedicated medical kit apart from that normally carried in aircraft.

(9) Six month flare markers.

(10) Three droppable electric sea marker lights for use in fuel spills.

(11) High-intensity, 28-volt hand-held Aldis lamp or equivalent.

(12) Radio for communication with swimmer when required.

4. Required Water Rescue Equipment for Qualified Swimmer and Rescue Boat.

a. A qualified swimmer ready for immediate water entry should be assigned to the boat rescue team. The swimmer's personal equipment shall consist of the materials listed in paragraph 2A02.3a.

b. The following minimum equipment should be available to SAR boat personnel:

(1) J-bar davits with safety harness for davit operators.

(2) Heaving lines, 115 feet (35 meters) or more in length.

(3) Heavy-duty shears.

(4) V-bladed rescue knife with Dzus-fastener attachment.

(5) Rescue strop with recovery line.

(6) High-output waterproof electric lantern.

(7) Grapnel hooks and lines.

(8) 24-inch (60-centimeter) life rings.

(9) Megaphone, battery-powered if possible.

(10) Boat hook for parachute snagging and retrieval.

(11) Hatchet for gaining entry into still floating helicopter or aircraft.

(12) Battery-operated radio set.

(13) Six smoke flare markers.

(14) Six electric sea markers.

(15) Semaphore flags and signaling lights.

(16) VERY pistol and VERY lights.

(17) First aid kit and two wool blankets for hypothermia treatment.

(18) Litter.

5. Search and Rescue Initiation.

a. Under almost any operating condition, rescue of personnel lost at sea in an aircraft emergency takes precedence over other ongoing operations.

b. The responsibility for reporting the need for a shipboard SAR condition lies primarily with the HCO on the intended host ship, although any ship in direct radio or radar contact may set its own SAR condition, depending upon distance, knowledge of the probable site of the downed aircraft, visual sighting, and so forth.

NOTE

THE MILITARY AIR DISTRESS FREQUENCY (243.0 MHZ) SHALL BE MONITORED AT ALL TIMES THAT THE HELICOPTER IS AIRBORNE. SPECIAL ATTENTION SHOULD BE PAID TO TRANSMISSIONS ON THIS FREQUENCY DURING ANY OF THE CONDITIONS DESCRIBED BELOW.

c. Condition Yellow. The HCO should report an initial Condition Yellow SAR watch (aircraft in distress with possibility of going down) under the following conditions:

(1) During an emergency approach (i.e., ELVA, smokelight).

(2) Whenever the helicopter reports mechanical trouble such that normal landing is in question.

(3) When indicated by the pilot for any reason, including physical disability or apparent illness.

(4) When helicopter fuel is below allowable minimums.

(5) When three or more approaches have resulted in wave-off for any reason.

(6) When radar or radio contact with the helicopter is intermittent or unreliable.

(7) When environmental conditions either aloft or on the surface make a safe landing questionable.

When a Condition Yellow SAR appears likely, the HCO should immediately notify and brief the commanding officer of the ship. Depending upon circumstances, the commanding officer may elect to go immediately to a full SAR alert, including:

(1) Suiting up of the swimmer and rescue team and placing them in standby alert.

(2) Making ready of own helicopter(s) and/or rescue boat for immediate launch when ordered.

(3) Notifying accompanying units.

(4) Making for the crash site at best possible speed, if appropriate.

NOTE

WHETHER RESCUE IS ATTEMPTED WITH THE SHIP'S HELICOPTER OR RESCUE BOAT IS LARGELY A COMMAND DECISION BASED ON FACTORS OF WATER SURVIVAL TIME, DISTANCE FROM THE DITCHING SCENE, AND SAFETY OF BOTH THE SURVIVOR AND RESCUE PERSONNEL. WHICHEVER ONE IS SELECTED, THE OTHER SHOULD STAND CLEAR SO AS NOT TO HAMPER RESCUE OPERATIONS. IT SHOULD, HOWEVER, REMAIN AT A HIGH READINESS CONDITION TO RENDER ASSISTANCE IF CALLED UPON.

d. Condition Red. A full Condition Red SAR bill (aircraft in water) should be set under the following conditions:

(1) When watch lookouts report seeing helicopter go down or seeing evidence of burning, debris, etc.

(2) When radar and/or radio contact with the helicopter is lost and cannot be regained.

(3) When the aircrew indicates in any manner that ditching is imminent or unavoidable.

(4) When an inbound helicopter is past his last reported expected time of arrival (ETA) and no radio or radar contact can be established.

(5) When downing is likely due to calculated fuel exhaustion.

(6) When, after active contact with a target or when operating in a hostile environment, a report of disengagement is not received.

(7) When reports from accompanying units indicate apparent loss of aircraft.

(8) If sonar reports sound of impact at sea, particularly along the inbound axis or on a bearing to the operating area.

6. Helicopter Swimmer Deployment.

a. VFR/VMC Conditions. The swimmer shall normally jump from the helicopter from a low hover (approximately 15 feet or 5 meters) into the water and assist the survivor. However, the aircraft commander should determine that direct water entry will not unnecessarily endanger the rescue swimmer because of sea state, debris in the water, sharks or other predators, or fire on the water.

b. Low-Visibility Retrieval. At night or under poor visibility, the swimmer should be lowered into the water by the hoist. Upon entry, the swimmer should remove the hoist cable so as to have the necessary mobility in the water and to avoid injury resulting from unexpected movement of the aircraft or wave motion. If a parachute is sighted in the rescue area, the rescue pilot should approach it no closer than one rotor diameter outside of the rotor wash area. A closer approach can result in injury to the survivor or possible damage to own aircraft. The pilot should establish a hover into the wind at approximately the 3-o'clock position during the time that the rescue is underway.

NOTE

IF THE SWIMMER CANNOT CLEAR THE SURVIVOR OF HIS PARACHUTE BEFORE ATTEMPTING A HOIST AND A SURFACE UNIT IS STANDING BY, HE SHOULD CONSIDER ABANDONING THE RESCUE ATTEMPT AND TURNING THE EFFORT OVER TO A RESCUE BOAT.

7. Surface Ship SAR Procedures.

a. When helicopter retrieval of the survivor is not practical or possible, the ship should turn toward the scene of downing and make for the site at best possible speed. Upon arrival, the small boat or motor whaleboat should be launched to retrieve the survivor. Retrieval can be effected according to the man overboard bill if appropriate.

NOTE

IF HELICOPTERS ARE ALREADY ON THE SCENE UPON ARRIVAL, SURFACE SHIPS SHOULD STAND CLEAR SO AS NOT TO BLANKET THE WIND OR CREATE TURBULENCE FOR THE HELICOPTERS.

b. The rescue boat shall approach the survivor upwind if possible and proceed at slow speed because of the danger of snaring partially submerged parachute shrouds.

c. Parachutes are not always obvious. When bringing a survivor alongside, ensure first that his parachute has been removed and is not dragging in the water. If for any reason he can't be freed, position someone to ensure that the parachute is not being drawn into the propeller of the rescue boat.

d. A swimmer is deployed when directed by the officer in charge of the rescue boat. Swimmers from the boat are normally used to retrieve survivors because of the need for hands-on contact, particularly in the case of rescue of injured personnel. The swimmer determines the need for a litter to retrieve the survivor if needed.

e. When hoisting a survivor from the rescue boat to the ship, the boat should approach the forecastle rather than amidships or astern. Lines and harness still inadvertently attached to the survivor or streaming from the boat can be sucked into the ship's screws or seawater induction valve.

INTENTIONALLY BLANK

ANNEX 2B Standard SCA Procedure

1. Centerline of approach shall be oriented from 150º to 210º relative to the ship, in accordance with the equipment specifications on receiving ship. Controller will pass direction in relative radial.

2. Controller will bring aircraft to a position at a range of 3 nm in the sector described above and speed at own convenience. Aircraft has to be at initial height at this point.

3. Descend starts at the gate (2 nm). Rate of descend will be at pilot's discretion, preferably in accordance with receiving ship's equipment specifications (GSI, etc.).

4. Missed approach point will be at 0.5 nm/200 feet.

5. Missed approach vector is at least 60º away from the receiving ship's flying course.

6. Aircraft will be continuously controlled for heading during the approach.

7. Prior to finals:

   a. Two-way communications and identification is established.

   b. Controller provides, in accordance with HOSTAC publication, surface wind, cloud base, visibility, QNH, pigeons (or ship position), FLYCO, relative wind, pitch and roll.

   c. Aircraft provides, in accordance with HOSTAC publication, POB, endurance and other relevant information to the ship, including alternate approach radial requirements if different from receiving ship's national procedures.

8. Prior to finals:

A/C: Request Standard SCA, out of ... height, initial speed of ...

OR

Controller: Intention is Standard SCA, approach will be on the … relative radial, report your initial height for approach.

A/C: Roger, standard SCA, ... relative radial, initial height ...

Controller: Hold you on my gadget, STBY Standard SCA, close advisory control, height … (initial height), speed at own convenience.

A/C: Roger, close advisory control for Standard SCA, height …, speed at own convenience, heading …

Controller: Pigeons…

A/C: Roger.

Controller: Set QNH … for deck height … feet, confirm landing checks complete, report endurance.

A/C: Roger, cockpit checked, endurance …

Controller: Missed Approach Point 200 ft/ 1/2 nm, if not in sight at Missed Approach Point, execute missed approach vector … , height … (initial height), speed at own convenience.

A/C: Roger, missed approach vector …

9. Aircraft approaching finals:

(3 nm out)	Contr:	1 mile to the gate, relative wind ... speed ... , flying course ... speed ..., request your approach speed.
	A/C:	Roger, flying course … speed …
(2 nm)	Contr:	At the gate, reduce speed ... (to approach speed). Cleared to minimum height 200, Green deck.
	A/C:	Roger, reducing and descending.
(1.5 nm)	Contr:	At 1.5.
	A/C:	Roger.
(1.2 nm)	Contr:	At 1.2.
	A/C:	Roger.
(1.0 nm)	Contr:	At 1 mile, check height and speed.
	A/C:	Roger, height … speed ...
(0.75 nm)	Contr:	At three-quarters.
	A/C:	Roger.
(0.5 nm)	Contr:	At Missed Approach Point, call visual.
	A/C:	Visual (or)
		Carrying out missed approach ...
	Contr:	Roger, continue, visual deck control (or)
		Roger, stop descent, execute missed approach vector ... , height ... , speed ...
	A/C:	Roger (or)
		Roger, missed approach vector ...

CHAPTER 3 Miscellaneous and Reference Data

0301 Introduction

This chapter contains supporting data to supplement the standardized and national operating data in Chapter 2, MPP-02.1, MPP-02.1.1, and MPP-02.2. Flight deck marshaling signals, conversion references, and ship's facilities requirements are provided. A lexicon containing glossary terms and a list of acronyms and abbreviations is located after the annexes at the end of the publication.

0302 Spare

0303 Marshaling Signals

1. The following pages illustrate the hand signals for on-deck handling of guest helicopters. These may be supplemented by radio voice communications where feasible.

2. Marshalers should wear a distinctive garment (preferably of fluorescent international orange or yellow), except when operations dictate otherwise.

NOTE

SPECIALIZED SIGNALS OR A COMPLETE LIST OF SIGNALS THAT APPLY TO A PARTICULAR AIRCRAFT OR OPERATIONAL ROLE ARE NOT INCLUDED. THEY SHOULD CONTINUE TO BE INCLUDED IN THE UNIT OPERATING INSTRUCTIONS AND OTHER SPECIALIZED PUBLICATIONS OF THE APPROPRIATE SERVICE.

3. The signals to an aircraft in movement areas are designed for use by the marshaler facing the helicopter in a position where the marshaler can best be seen by the pilot.

4. For night operations, the wands will be used in pairs of the same color and should not be too bright. During surface taxiing and parking, the pilot will stop when one or both of the marshaler's wands fail.

NOTE

MARSHALERS SHOULD USE NIGHT MARSHALING SIGNALS WITH NVD-COMPATIBLE WANDS DURING NVD OPERATIONS.

5. The signals may be used by the pilot, as appropriate, in a similar way to that indicated for the marshaler. They are:

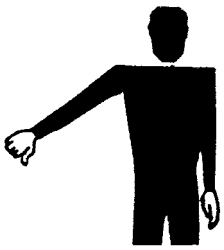
a. General marshaling signals are signals 1 thru 28.

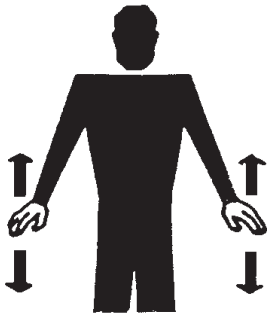
b. Hovering aircraft signals are signals 29 thru 55.

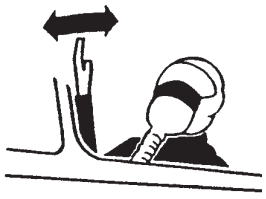
c. Helicopter in-flight refueling signals are signals 56 thru 59.

6. List of Signals.

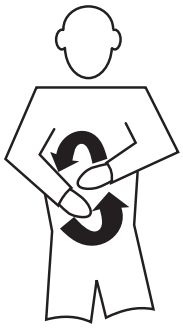
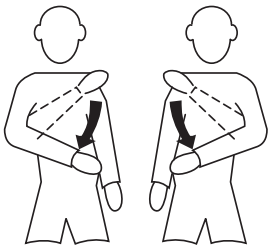
No.	Description	No.	Description
1.	Aff rmative (all clear)	31.	Hover
2.	Negative (not clear)	32.	Move downward
3.	Proceed to next marshaler	33.	Take off
4.	This way	34.	Move to left
5.	Slow down	35.	Move to right
6.	Turn to left	36.	Engage nosewheel steering or swivel left/right
7.	Turn to right	37.	Swivel left/right
8.	Move ahead	38.	Clear
9.	Stop	39.	Lower wheels
10.	Brakes	40.	Wave off
11.	Move back	41.	Land
12.	Clearance for personnel to approach aircraft	42.	Harpoon up
13.	Request by marshaler to approach aircraft	43.	Harpoon down
14.	Personnel approach aircraft	44.	Droop stops out
15.	Insert chocks	45.	Droop stops in
16.	Remove chocks	46.	Remove blade tiedowns **(TBD)**
17.	Lashings on	47.	Engage rotor(s)
18.	Lashings off **(TBD)**	48.	Hook up load
19.	Install down locks/undercarriage pins	49.	Release load
20.	Remove down locks/undercarriage pins	50.	Load has not been released
21.	Connect ground electrical power supply	51.	Winch up
22.	Disconnect ground electrical power supply	52.	Winch down
23.	Start engine(s)	53.	Cut cable
24.	Cut engine(s)	54.	Spread pylon
25.	Fire	55.	Fold pylon **(TBD)**
26.	Fold wings/helicopter blades	56.	I desire HIFR
27.	Spread wings/helicopter blades	57.	Commence fueling/clear to commence fueling/pressure on
28.	Lock wings/helicopter blades	58.	Ready to disconnect and return hose (aircrew), return hose (ground crew)
29.	Landing direction	59.	Cease fueling
30.	Vertical movements/move upward		

SIGNAL	DAY	NIGHT	REMARKS
1.  AFFIRMATIVE (ALL CLEAR)	Hand raised, thumb up.	Same as day signal with wands held as extension of arms. Aircrew: One flash.	ICAO Compliant
2.  NEGATIVE (NOT CLEAR)	Arm held out, hand below waist level, thumb turned downwards.	Same as day signal with wands held pointing down Aircrew: Steady light.	ICAO Compliant
3.  PROCEED TO NEXT MARSHALER	Right or left arm down, other arm moved across the body and extended to indicate direction to next marshaler.	Same as day signal with wands held as extension of arms.	ICAO Non-Compliant
4.  THIS WAY	Arms above head in vertical position with palms facing inward.	Same as day signal with wands held as extension of arms.	ICAO Compliant

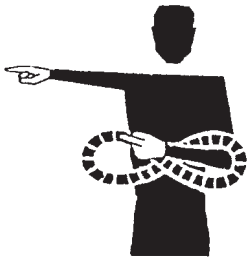
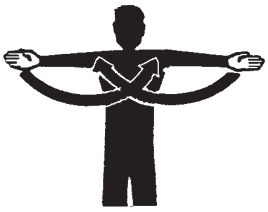
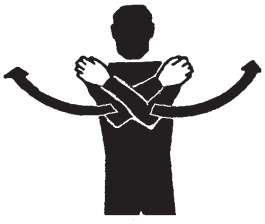
SIGNAL	DAY	NIGHT	REMARKS
5.  SLOW DOWN	Arms down with palms towards ground, then moved up and down several times.	Same as day signal with wands held horizontally.	ICAO Compliant
6.  TURN TO LEFT	Point right arm downward, left hand is repeatedly moved upward and backward. Speed of arm movement indicates rate of turn.	Same as day signal with wands held as extension of arms.	Also used for spot turns for hovering aircraft. ICAO Compliant
7.  TURN TO RIGHT	Point left arm downward, right hand is repeatedly moved upward and backward. Speed of arm movement indicates rate of turn.	Same as day signal with wands held as extension of arms.	Also used for spot turns for hovering aircraft. ICAO Compliant
8.  MOVE AHEAD	Arms a little apart, palms facing backwards and repeatedly moved upward-backward from shoulder height.	Same as day signal with wands held as extension of arms.	ICAO Compliant

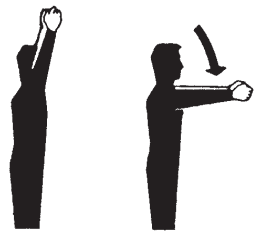
SIGNAL	DAY	NIGHT	REMARKS
9.  STOP	Arms crossed above the head, palms facing forward.	Same as day signal with addition of wands.	ICAO Compliant
10.  BRAKES	"ON"—Arms above head, open palms and f ngers raised with palms toward aircraft, then f st closed. "OFF"—Reverse of above.	"ON"—Arms above head, then wands crossed. "OFF"—Crossed wands, then uncrossed.	ICAO Compliant
11.  MOVE BACK (Also used to pull back aircraft utilizing arresting wire)	Arms by sides, palms facing forward, swept forward and upward repeatedly to shoulder height.	Same as day signal with wands held as extension of arms.	ICAO Compliant
12.  CLEARANCE FOR PERSONNEL TO APPROACH AIRCRAFT	A beckoning motion with either hand at eye level.	Continuously flashing light.	

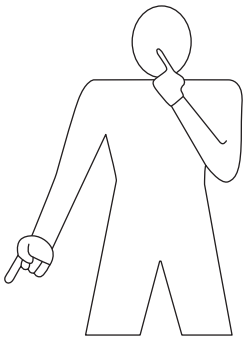
SIGNAL	DAY	NIGHT	REMARKS
13.  REQUEST BY MARSHALER FOR PERSONNEL TO APPROACH AIRCRAFT	Left hand raised vertically overhead, palm toward aircraft; other hand lowered, palm facing inwards.	Same as day signal but the raised wand is illuminated and f ashing.	
14.  PERSONNEL APPROACH AIRCRAFT	Either hand raised vertically overhead, palm towards aircraft. The other hand indicates to personnel concerned and gestures towards aircraft.	Same as day signal with wands held as extension of arms.	
15.  INSERT CHOCKS	Arms down, fists closed, thumbs extended inwards, swing arms from extended position inwards.	Same as day signal with wands held as extension of arms.	ICAO Non-Compliant
16.  REMOVE CHOCKS	Arms down, fists closed, thumbs extended outwards, swing arms outwards.	Same as day signal with wands held as extension of arms.	ICAO Non-Compliant

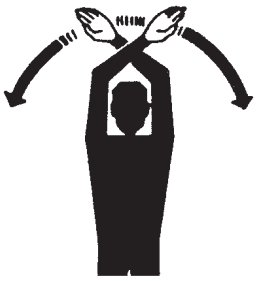
SIGNAL	DAY	NIGHT	REMARKS
17.  LASHINGS ON	Hands in front at waist level, rotate in circular motion.	Same as day signal with wands held as extension of arms.	
18.  1. 2. LASHINGS OFF	Left arm down. Sweeping motion of right hand from shoulder to wrist. Repeat on right side.	Same as day signal with wands held as extension of arms.	
19.  INSTALL DOWN LOCKS/ UNDERCARRIAGE PINS	Left arm bent vertically in front with fist clenched, right arm bent horizontally in front with f st clenched and held motionless at left elbow.	Same as day signal with addition of wands.	.
20.  REMOVE DOWN LOCKS/ UNDERCARRIAGE PINS	Left arm bent vertically in front with fist clenched, right arm bent horizontally in front with fist clenched at left elbow. Right fist moves horizontally away from left elbow.	Same as day signal with addition of wands.	

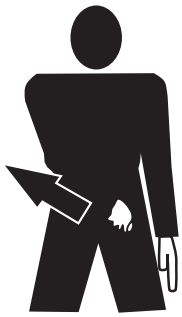
SIGNAL	DAY	NIGHT	REMARKS
21.  CONNECT GROUND ELECTRICAL POWER SUPPLY	Hands above head, left fist partially clenched, right hand moved in direction of left hand with first two fingers extended and inserted into circle made by fingers of the left hand.	Same as day signal with left wand held vertical and right wand held horizonal.	ICAO Non-Compliant
22.  DISCONNECT GROUND ELECTRICAL POWER SUPPLY	Hands above head, left f st partially clenched, right hand moved away from left hand, withdrawing first two fingers from circle made by fingers of the left hand.	Same as day signal with left wand held vertical and right wand held horizontal.	ICAO Non-Compliant
23.  START ENGINE(S)	Left hand overhead with appropriate number of fingers extended to indicate the number of the engine to be started, and circular motion of right hand at waist level.	Similar to day signal except that the wand in the left hand will be flashed to indicate the engine to be started.	ICAO Compliant
24.  CUT ENGINES	Either arm and hand level with shoulder, with hand moving across throat, palm downward.	Same as day signal with wands held as extension of arms.	ICAO Compliant

SIGNAL	DAY	NIGHT	REMARKS
25.  FIRE	Make rapid horizontal figure of eight motion at waist level with either arm, pointing at source of fire with the other.	Same as day signal with wands as extension of arms.	ICAO Compliant
26.  FOLD WINGS/ HELICOPTER BLADES	Arms straight out at sides, then swept forward and hugged around shoulders.	Same as day signal with wands held as extension of arms.	
27.  SPREAD WINGS/ HELICOPTER BLADES	Arms hugged aound shoulders, then swept straight out to the sides. Hold signal until wings/ blades are locked, then give affirmative signal.	Same as day signal with wands held as extension of arms.	
28.  LOCK WINGS/ HELICOPTER BLADES	Hit right elbow with palm of left hand.	Same as day signal with addition of wands.	

SIGNAL	DAY	NIGHT	REMARKS
29.  LANDING DIRECTION	Marshaler stands with arms raised vertically above head and facing toward the point where the aircraft is to land. The arms are lowered repeatedly from a vertical to a horizontal position, stopping finally in the horizontal position.	Same as day signal with wands held as extension of hands.	ICAO Non-Compliant
30.  VERTICAL MOVEMENT/ MOVE UPWARD	Arms extended horizontally sideways beckoning upwards, with palms turned up. Speed of movement indicates rate of ascent.	Same as day signal with wands held as extension of arms.	ICAO Compliant
31.  HOVER	Arms extended horizontally sideways, palms downward.	Same as day signal with wands held as extension of arms.	ICAO Compliant
32.  MOVE DOWNWARD	Arms extended horizontally sideway, beckoning downwards, with palms turned down. Speed of movement indicates rate of descent.	Same as day signal with wands held as extension of arms.	ICAO Compliant

SIGNAL	DAY	NIGHT	REMARKS
33.  TAKEOFF	Arms extended horizontally sideways beckoning upwards.	Same as day signal with wands held as extension of arms.	
34.  MOVE TO LEFT	Right arm extended horizontally sideways in direction of movement, and other arm swung over the head in the same direction, in a repeating motion.	Same as day signal with wands held as extension of arms.	ICAO Non-Compliant
35.  MOVE TO RIGHT	Left arm extended horizontally sideways in direction of movement, and other arm swung over the head in the same direction, in a repeating motion.	Same as day signal with wands held as extension of arms.	ICAO Non-Compliant
36.  ENGAGE NOSEWHEEL STEERING OR SWIVEL LEFT/RIGHT	Point to nose with index finger while indicating direction of turn with other index finger.	Same as day signal with wands held as extension of arms.	

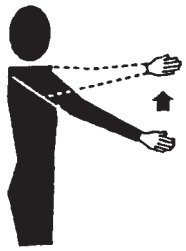
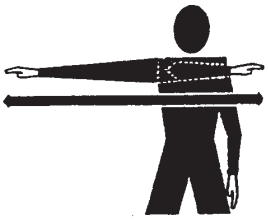
SIGNAL	DAY	NIGHT	REMARKS
37.  SWIVEL LEFT/RIGHT	Pilot points to nose, then indicates direction of swivel.	Radio or in accordance with national procedures.	
38.  CLEAR	Both arms extended on same side above shoulder level in direction clear to fly off.	Same as day signal with wands held as extension of arms.	
39.  LOWER WHEELS	When the aircraft approaches director with landing gear retracted, marshaler gives signal by side view of a cranking motion of the hands.	Same as day signal with wands held as extension of arms.	
40.  WAVE OFF	Waving of arms over the head.	Same as day signal with wands held as extension of arms.	

SIGNAL	DAY	NIGHT	REMARKS
41.  LAND	Arms crossed and extended downwards in front of body.	Same as day signal with wands held as extension of arms.	ICAO Compliant
42.  HARPOON UP	Right hand moving up and across the body from left thigh (as if drawing a sword).	Same as day signal with wand held as extension of arm.	
43.  HARPOON DOWN	Right hand moving down towards left thigh (as if sheathing a sword).	Same as day signal with wand as extension of arms.	
44.  DROOP STOPS OUT	When rotor starts to “run down” marshaler stands with both hands raised above head, fists closed, thumbs pointing out.	Same as day signal with wands held as extension of arms.	Caution: Same as ICAO Remove Chocks.

SIGNAL	DAY	NIGHT	REMARKS
45.  DROOP STOPS IN	When droop stops go in, marshaler turns thumbs inwards.	Same as day signal with wands as extension of arm.	Caution: Same as ICAO Insert Chocks.
46.  REMOVE BLADE TIEDOWNS	Left hand above head, right hand pointing to individual boots for removal.	Same as day signal with wands as extension of hands.	
47.  ENGAGE ROTORS	Circular motion in horizontal plane with right hand above head.	Same as day signal with wands held as extension of hands.	
48.  HOOK UP LOAD	Bend left arm horizontally across chest with fist clenched, palm downward; open right hand pointed up vertically to center of left fist.	Same as day signal with wands held as extension of hands.	

SIGNAL	DAY	NIGHT	REMARKS
49.  RELEASE LOAD	Left arm horizontal in front of body with fist clenched; right hand with palm turned upwards making upward motion.	Same as day signal with wands held horizontally, perpendicular to aircraft.	
50.  LOAD HAS NOT BEEN RELEASED	Bend left arm horizontally across chest with fist clenched, palm downward; open right hand pointed up vertically to center of left fist.	Same as day signal with wands held as extension of hands.	
51.  WINCH UP	Left arm horizontal in front of body with fist clenched; right hand with palm turned downward making a downward motion.	Same as day signal with wands held horizontally, perpendicular to aircraft.	
52.  WINCH DOWN	Left arm horizontal in front of body with fist clenched; right hand with palm turned downward making a downward motion.	Same as day signal with wands held horizontally, perpendicular to aircraft.	

SIGNAL	DAY	NIGHT	REMARKS
53.  CUT CABLE	Right arm extended forward horizontally with fist clenched; left arm making horizontal slicing movements below the right fist with palm downward.	Same as day signal with wands held as extension of arms.	
54.  SPREAD PYLON	Bend elbow across chest with palm downward. Extend arm outward to horizontal position, keeping palm open and facing down.	Same as day signal with wands held as extension of arms.	
55.  FOLD PYLON	Extend right arm horizontally, palm downward. Bend arm across chest, keeping palm down.	Same as day signal with wands held as extension of arms.	
56.  I DESIRE HIFR	Helicopter crewmember brings thumb to mouth as if drinking from a glass.	Same as day using f ashlight in hand.	

SIGNAL	DAY	NIGHT	REMARKS
57.  COMMENCE FUELING/ CLEAR TO COMMENCE FUELING/PRESSURE ON	Helicopter or ground crewmember makes circular motion with right hand.	Helicopter crewmember makes circular motion with f ashlight; ground crewmember uses wand.	
58.  READY TO DISCONNECT AND RETURN HOSE (When made by aircrew)/ RETURN HOSE (When made by groundcrew)	Helicopter or ground crewmember makes vertical motion of hand.	Helicopter crewmember makes vertical motion with f ashlight.	
59.  CEASE FUELING	Helicopter or ground crewmember makes horizontal motion of right arm across body at shoulder height.	Same motion with f ashlight or wand.	

0304 HOSTAC Preflight Briefing Checklist

The preflight briefing checklist should be completed prior to commencing operations. It may be reproduced locally.

1. Environmental factors.

   a. Sunrise/sunset.

   b. Moonrise/moonset.

   c. Winds.

   d. Air/sea temperature.

   e. Dew point.

   f. Density altitude.

   g. Pressure altitude.

   h. Relative humidity.

   i. Freezing level.

   j. Altimeter setting (barometric pressure).

   k. Icing conditions.

   l. Sea state and swell.

   m. Ceiling and cloud cover.

   n. Visibility.

   o. Water depth.

   p. Bathythermograph.

   q. Predicted sonar range/tactical sonar range.

2. Present position.

   a. Force disposition.

   b. Airspace structure and separation.

   c. Helicopter reference point.

   d. Reference position (within 30 nm along PIM) and displacement from (bearing and range).

   e. Force MLA and PIM.

   f. Safe altitudes 25 nm/100 nm.

g. Local variation.

h. Displacement from center of force (ZZ).

i. Nearest land and airfield.

j. Spare decks available.

k. Notams.

l. Diversion.

(1) Navaids.

(2) Communications.

3. Communications/emission control policy.

a. COMPLAN and button numbers.

b. EMCON policy.

c. Sonar frequencies of other air/surface units.

4. Friendly forces.

a. Surface and subsurface call signs.

b. Aircraft.

(1) Call signs.

(2) On/off task times.

(3) Weapon loads.

(4) Endurance.

(5) GO/NO GO items.

c. Helicopter controlling unit.

d. Aircraft-helicopter controller grade.

0305 Checklist for Cross Operations Lasting More Than 24 Hours

This checklist is designed to provide a guideline for detachment for commanders and ship's staff faced with the prospect of operating helicopters from another nation's vessel for periods longer than 24 hours. It is not exhaustive, nor will all points be relevant to all detachments, but is intended to highlight topics that may be considered.

1. Engineering.

a. Petroleum, Oil, Lubricants (POL).

(1) Correct types and sufficient quantities.

(2) Alternate fuels/lubricants and source of replenishment.

(3) What checks are carried out on status of fuel?

(4) What fueling/defueling facilities are available?

(5) HIFR equipment.

(6) ALP-1 ALPIO — Payment for POL.

b. Stores.

(1) Does the ship carry the appropriate spares? If so, is there a bilateral agreement to use them?

(2) Will a "flyaway" stores pack be required and, if so, will there be adequate shipborne storage?

(3) Take own stores reference catalogue/microfiche to enable demands to be placed on own system.

(4) Warn own organization of flight movements to enable possible prearranged stores transfers.

(5) Role equipment.

c. Servicing.

(1) Ensure no major servicing item will fall due during the period of the detachment.

(2) What engineering facilities does the ship have; i.e., lathes, overhead winches, jacks, and tool outfits?

(3) Supply of appropriate national forms.

(4) Compressor wash facilities. Electrical, hydraulic, and pneumatic supplies.

(5) Freshwater wash facilities for aircraft.

2. Administration.

a. Define authority of ship's commanding officer over detachment personnel (discipline).

b. Liaison officer/interpreter.

c. Establish which national publications should be embarked.

d. Laptop computer with word processing facility. Which word processing system does the ship use? Is it compatible?

e. Supply of appropriate national forms.

f. Integration of detachment personnel with ship's company, duties.

g. Briefing on ship's routines.

h. Allocation of flight work areas; i.e., briefing room, technical spaces.

i. Cleaning routines/spaces for detachment personnel.

j. What is the requirement for duty personnel?

3. Personnel.

a. Medical/dental facilities. All in date for medical checks.

b. Pay/supply of cash/cheque cashing.

c. Medical/dental records.

d. Accommodations (male/female), food, cost, out-of-hours meals.

e. Standards of dress, including provision of flight deck equipment.

f. Laundry facilities.

g. Availability and range of shopping facilities.

h. Does ship provide bedding?

i. Ship's sports facilities.

j. Rerouting of detachment's mail.

k. Availability of radiophone calls.

l. Customs clearance.

4. Communications.

a. Compatibility of ship/aircraft equipment.

b. Availability and supply of cryptographic material.

c. Distribution of messages to include detachment commander.

d. Routing of national messages to ensure detachment does not miss any safety-of-flight messages.

e. Ability to release own messages.

5. Security.

a. Stowages for classified material.

b. Do personnel require security clearances?

c. Awareness of national security vetoes.

d. Any compartments out of bounds to detachment personnel?

e. Any items of sensitive aircraft equipment?

6. Safety of Aircraft.

a. Will aircraft fit inside hangar? If not, are covers available to protect aircraft on deck?

b. Are lashing points in suitable positions in hangar and on flight deck?

c. What equipment is available to move the aircraft from flight deck to hangar?

d. Are there sufficient lashings (chain/nylon) to ensure the security of the aircraft in rough weather?

7. Armaments.

a. Supply of appropriate weapons and flight-in-air material.

b. Sonobuoy stocks, Honeypot, mission support equipment.

c. Bilateral agreements.

d. Storage of own national weapons.

e. Assistance with loading weapons, if required.

f. Correct weapon trolleys.

8. Operations.

a. Who conducts the preflight briefing?

b. Authorization of flight.

c. Detachment's input into ship's program.

d. Organization for Notams and air navigational warning messages.

e. Sufficient maps/flight planning documents to cover area of operations and timescale.

f. Ensure aircrew are, will remain indate for flight checks throughout the detachment.

g. Will the ship provide a full flight deck crew to meet the flight's maximum operational deck cycle or must the flight provide some personnel to work the deck?

h. Does the ship have sufficient ACs to provide maximum coverage? What are their briefings?

i. Weather minima/instrument ratings/SHOL.

j. SAR/duty crew requirements.

k. Ship/aircraft emergencies.

l. Salvage routines.

m. Flying operations/aircraft availability/expectations.

0306 Extended Operations of One Nation's Helicopter from a Second Nation's Ship

1. This section establishes guidelines for the preparation, execution, and follow-up reporting of extended operations on another nation's ship. It is designed to supplement the planning processes of individual nations to ensure a smooth embarkation. When an aircraft from one nation embarks for an extended period of time there should be a common planning process whereby both embarking nation and host nation work to a common procedure to plan, execute, and report on the embarkation. For ease of use the process and procedures are based on a checklist.

2. Pre-Embarkation Checklist. The checks listed in Figure 3-1 are designed to assist the detachment commander and hosting nation's ship to prepare for extended operations. This checklist should be utilized in conjunction with the specific operation orders issued by both embarking unit and hosting nation. The pre-embarkation checklist in Figure 3-1 contains the following parts:

a. Part A—General Command Pre-Planning Issues (Nation to Nation).

b. Part B—Embarkation Specific Logistic Planning (Operating Authority to Operating Authority).

c. Part C—Host Ship/Embarking Squadron Specific Issues (Ship/Squadron).

d. Part D—Host Ship/Embarking Squadron Execution Issues.

e. Part E—Host Ship/Embarking Squadron Final Briefings.

f. Part F—Host Ship/Squadron Disembarkation (Post-Embarkation Lessons Learned/Identified).

Part A—General Command Pre-Planning Issues			
Requirement (Nation to Nation) Completed 6 Months before Embarkation			Complete
1.	General:		
	a.	Determine concept of joint multinational operations and mission requirements. Include outline dates, areas of operation, and embarkation/disembarkation ports.	
	b.	Determine aircraft type and number to be embarked has been formalised and ship allocated.	
	c.	Munitions requirements (types/amounts).	
2.	Legal Frameworks:		
	a.	Rules of engagement have been scoped and agreed.	
	b.	Memorandum of understanding between nations drafted and agreed on.	
	c.	Command authority (OPCON/OPCOM, etc.).	
	d.	All legal agreements have been reached to operate from ship.	
	e.	Ensure agreement is reached between nations on correct qualifications needed for aircrew to operate from host nation's ship.	
	f.	Appropriate security clearances obtained and documented.	
	g.	Ensure all customs clearance and immigration restrictions addressed particularly if foreign port visits are planned.	

Figure 3-1. Pre-Embarkation Checklist (Sheet 1 of 4)

Part A—General Command Pre-Planning Issues (continued)			Complete
3.	Operating Capabilities of Ship and Aircraft:		
	a.	Ship requirements (data links/approach radars-aids).	
	b.	Helicopter operating limitations. Ensure the aircraft SHOL has been agreed. For extended operations, the crossdeck SHOL should not be relied upon. If the operating ship has no specific SHOL for aircraft, further work should be completed to give both aircraft and ship the best SHOL for operating the aircraft in all conditions and weights.	
	c.	EMC (RADHAZ) issues identified.	
4.	Safety Case:		
	a.	Ensure all personnel are trained and current to operate from sea including sea survival training.	
	b.	Verify technical compatibility of aircraft and ship (power supplies/ground support equipment, etc.).	
	c.	Ensure training objectives are clear and set by operating authority.	
	d.	Munitions clearances.	
Part B—Embarkation Specific Logistic Planning			
Three Months (Operating Authority to Operating Authority)			**Complete**
5.	Stores Equipment Planning:		
	a.	Plan and coordinate equipment move onboard. Ensure all relevant bids have been submitted 3 months prior to the embarkation.	
	b.	Plan and coordinate disembarkation requirements.	
6.	Manpower/Domestics Requirements:		
	a.	Manpower requirement (Including augmentees (chefs, stewards, suppliers, and armourers) dependent on the size and length of embarkation).	
	b.	Appropriate/sufficient accommodation.	
	c.	Provision of sufficient special dietary requirements.	
	d.	Administration (money (cash/cheques/exchange currency)/mail/discipline).	
	e.	Aircrew currency (qualifications/deck/simulator).	
	f.	Points of contact (ship/squadron).	

Figure 3-1. Pre-Embarkation Checklist (Sheet 2 of 4)

Part C—Host Ship/Embarking Squadron Planning Issues			
Two Months (Ship/Squadron)			**Complete**
7.	Shipboard Integration:		
	a.	Face-to-face briefings including aircraft/ship familiarisation.	
	b.	Pilots/engineers/deck crews initial briefings. (senior level)	
	c.	Planning meeting for equipment and manpower move onboard.	
	d.	Ensure flight safety procedures have been established.	
	e.	Ensure the aircraft hazards and out of area response procedures are fed in to the host vessels post crash management plan	
	f.	Ensure the detachment has sufficient ground support equipment/SME/tools/ spares/test equipment and other equipment required for the duration of the embarkation.	
	g.	Ensure the squadron embarks with sufficient role equipment to meet the requirements of the tasked mission and any secondary roles envisaged.	
	h.	Ensure personnel are medically (dental/vaccinations) fit for sea service.	
Part D—Host Ship/Embarking Squadron Execution Issues			
One Month			**Complete**
8.	a.	Orders/Procedures:	
	b.	Embarkation order issued by ship/squadron to operating authorities.	
	c.	Conduct a pre-embarkation meeting onboard host ship to f nalise procedures for the embarkation of the squadron.	
9.	Final Embarkation Arrangements:		
	a.	Make arrangements for embarkation of equipment. This is to include cranage requirements and any RADHAZ/HERO restrictions on equipment where applicable.	
	b.	Finalize final embarkation/disembarkation dates.	
	c.	Compile an outline f ying programme.	
	d.	Ensure all pilots have completed all pre-embarkation currency requirements.	
	e.	Ensure aircraft are prepared to operate from the host ship IAW squadron orders.	
	f.	Ensure aircraft have sufficient flying hours and calendar clearance from any scheduled or out of phase maintenance that cannot be carried out whilst embarked for the planned duration of the deployment.	
	g.	Ensure all pre-embarkation checks are carried out IAW unit orders.	

Figure 3-1. Pre-Embarkation Checklist (Sheet 3 of 4)

Part E—Host Ship/Embarking Squadron Final Briefings				
One Week				Complete
10.	Final Embarkation Conference and Briefings: a.			
	Pre-Join Conference (onboard host ship).			
	b.	Brief ngs:	Deck crews.	
			Aircrew.	
			ATC.	
			Ship's safety briefings.	
			Ships company.	
	c.	Plan the embarkation FLYPRO and subsequent FLYPRO requirements to take account of pilot deck qualification (day/night) and deck crew training/familiarization.		
Part F—Host Ship/Squadron Disembarkation (Post-Embarkation Lessons Learned/Identified)				
Disembarkation				Complete
11.	Disembarkation:			
	a.	Coordinate equipment move off ship. Ensure all relevant bids/requirements have been submitted 3 months prior to the disembarkation date.		
	b.	Draft post embarkation reports (lessons learned) for both operating authorities.		

Figure 3-1. Pre-Embarkation Checklist (Sheet 4 of 4)

0307 Conversion Tables

Table 3-1. Distance (Sheet 1 of 2)

KILOMETERS TO			STATUTE MILES TO			NAUTICAL MILES TO		
SM	KM	NM	KM	SM	NM	KM	NM	SM
0.62	1	0.54	1.61	1	0.87	1.85	1	1.15
1.24	2	1.08	3.22	2	1.74	3.71	2	2.30
1.86	3	1.62	4.83	3	2.61	5.56	3	3.46
2.49	4	2.16	6.44	4	3.47	7.41	4	4.61
3.11	5	2.70	8.05	5	4.34	9.27	5	5.76
3.73	6	3.24	9.66	6	5.21	11.12	6	6.91
4.35	7	3.78	11.27	7	6.08	12.97	7	8.06
4.97	8	4.32	12.88	8	6.95	14.83	8	9.21
5.59	9	4.86	14.49	9	7.82	16.68	9	10.36
6.21	10	5.40	16.09	10	8.68	18.53	10	11.52
12.43	20	10.79	32.19	20	17.37	37.06	20	23.03
18.64	30	16.19	48.28	30	26.05	55.60	30	34.55
24.86	40	21.58	64.38	40	34.74	74.13	40	46.06
31.07	50	26.98	80.47	50	43.42	92.66	50	57.58
37.28	60	32.38	96.56	60	52.10	111.19	60	69.10
43.50	70	37.77	112.66	70	60.79	129.72	70	80.61
49.71	80	43.17	128.75	80	69.47	148.26	80	92.13
55.93	90	48.56	144.85	90	78.16	166.79	90	103.64
62.14	100	53.96	160.94	100	86.84	185.32	100	115.2
124.28	200	107.92	321.88	200	173.7	370.64	200	230.3
186.42	300	161.88	482.82	300	260.5	555.96	300	345.5
248.56	400	215.84	643.76	400	347.4	741.28	400	460.6
310.70	500	269.80	804.70	500	432.2	926.60	500	575.8
372.84	600	323.76	965.64	600	521.0	1,111.92	600	691.0
434.98	700	377.72	1,126.6	700	607.9	1,297.24	700	806.1
497.12	800	431.68	1,287.5	800	694.7	1,482.56	800	921.3
559.26	900	485.64	1,448.5	900	781.6	1,667.88	900	1,036.4
621.4	1,000	539.6	1,609.4	1,000	868.4	1,853.20	1,000	1,151.6

Table 3-1. Distance (Sheet 2 of 2)

METERS—FEET			METERS—YARDS			NM—METERS	
M	M or FT	FT	M	M or YD	YD	NM	M
0.305	1	3.281	91	100	109	1/10	185
0.610	2	6.562	183	200	219	2/10	370
0.914	3	9.842	274	300	328	1/4	463
1.219	4	13.123	366	400	437	3/10	556
1.524	5	16.404	457	500	547	4/10	741
1.829	6	19.685	549	600	656	1/2	926
2.134	7	22.966	640	700	766		
2.438	8	26.247	732	800	875	6/10	1,111
2.743	9	29.528	823	900	984	7/10	1,296
						3/4	1,389
3.048	10	32.809	914	1,000	1,094	8/10	1,482
6.096	20	65.617	1,006	1,100	1,203	9/10	1,667
9.144	30	98.426	1,097	1,200	1,312		
12.192	40	131.234	1,189	1,300	1,422	1	1,852
15.24	50	164.043	1,280	1,400	1,531	1-1/4	2,315
18.29	60	196.852	1,372	1,500	1,640	1-1/2	2,778
21.34	70	229.660	1,463	1,600	1,750	1-3/4	3,241
24.38	80	262.469	1,554	1,700	1,860		
27.43	90	295.278	1,646	1,800	1,969	2	3,704
			1,737	1,900	2,078	2-1/4	4,167
30.48	100	328.087				2-1/2	4,630
60.96	200	656.1	1,828	2,000	2,188	2-3/4	5,093
91.44	300	984.3	2,742	3,000	3,282		
121.92	400	1,312.3	3,656	4,000	4,376	3	5,556
152.4	500	1,640.4	4,570	5,000	5,470	3-1/4	6,019
			5,484	6,000	6,564	3-1/2	6,482
304.8	1,000	3,280.9	6,398	7,000	7,658	3-3/4	6,945
609.6	2,000	6,561.7	7,312	8,000	8,752		
914.4	3,000	9,842.6	8,226	9,000	9,846	4	7,408
1,219.2	4,000	13,123.5					
1,524.0	5,000	16,404.3	9,140	10,000	10,940	5	9,260

Table 3-2. Crosswind Components

Wind Speed Knots	Angle Between Wind Direction and Runway Heading								
	10°	20°	30°	40°	50°	60°	70°	80°	90°
5	1	2	2	3	4	4	4	5	5
10	2	3	5	6	7	8	8	9	10
15	3	5	7	9	11	13	14	14	15
20	3	7	10	13	15	17	18	19	20
25	4	8	12	16	19	22	23	24	25
30	5	10	15	19	23	26	28	29	30
35	6	12	17	22	26	30	32	34	35
40	7	14	20	25	30	35	37	39	40
45	8	15	22	29	34	39	42	44	45
50	9	17	25	32	38	43	47	49	50
55	10	19	27	35	42	48	52	54	
60	10	20	30	38	46	52	56		
65	11	22	32	42	50	56			
70	12	24	35	45	54				
75	13	26	37	48					
80	14	27	40						
85	15	29							
90	16								

Table 3-3. Barometric Readings from Inches to Millibars

Mercury Inches	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
	Millibars									
28.0	948.2	948.5	948.9	949.2	949.5	949.9	950.2	950.6	950.9	951.2
28.1	951.6	951.9	952.3	952.6	952.9	953.3	953.6	953.9	954.3	954.6
28.2	955.0	955.3	955.6	956.0	956.3	956.7	957.0	957.3	957.7	958.0
28.3	958.3	958.7	959.0	959.4	959.7	960.0	960.4	960.7	961.1	961.4
28.4	961.7	962.1	962.4	962.8	963.1	963.4	963.8	964.1	964.4	964.8
28.5	965.1	965.5	965.8	966.1	966.5	966.8	967.2	967.5	967.8	968.2
28.6	968.5	968.8	969.2	969.5	969.9	970.2	970.5	970.9	971.2	971.6
28.7	971.9	972.2	972.6	972.9	963.2	973.6	973.9	974.3	974.6	974.9
28.8	975.3	975.6	976.0	976.3	976.6	977.0	977.3	977.7	978.0	978.3
28.9	978.7	979.0	979.3	979.7	980.0	980.4	980.7	981.0	981.4	981.7
29.0	982.1	982.4	982.7	983.1	983.4	983.7	984.1	984.4	984.8	985.1
29.1	985.4	985.8	986.1	986.5	986.8	987.1	987.5	987.8	988.2	988.5
29.2	988.8	989.2	989.5	989.8	990.2	990.5	990.9	991.2	991.5	991.9
29.3	992.2	992.6	992.9	993.2	993.6	993.9	994.2	994.6	994.9	995.3
29.4	995.6	995.9	996.3	996.6	997.0	997.3	997.6	998.0	998.3	998.6
29.5	999.0	999.3	999.7	1000.0	1000.4	1000.7	1001.0	1001.4	1001.7	1002.0
29.6	1002.4	1002.7	1003.1	1003.4	1003.7	1004.1	1004.4	1004.7	1005.1	1005.4
29.7	1005.8	1006.1	1006.4	1006.8	1007.1	1007.5	1007.8	1008.1	1008.5	1008.8
29.8	1009.1	1009.5	1009.8	1010.2	1010.5	1010.8	1011.2	1011.5	1011.9	1012.2
29.9	1012.5	1012.9	1013.2	1013.5	1013.9	1014.2	1014.6	1014.9	1015.2	1015.6
30.0	1015.9	1016.3	1016.6	1016.9	1017.3	1017.6	1018.0	1018.3	1018.6	1019.0
30.1	1019.3	1019.6	1020.0	1020.3	1020.7	1021.0	1021.3	1021.7	1022.0	1022.4
30.2	1022.7	1023.0	1023.4	1023.7	1024.0	1024.4	1024.7	1025.1	1025.4	1025.7
30.3	1026.1	1026.4	1026.7	1027.1	1027.4	1027.8	1028.1	1028.4	1028.8	1029.1
30.4	1029.5	1029.8	1030.1	1030.5	1030.8	1031.2	1031.5	1031.8	1032.2	1032.5
30.5	1032.9	1033.2	1033.5	1033.9	1034.2	1034.5	1034.9	1035.2	1035.5	1035.9
30.6	1036.2	1036.6	1036.9	1037.3	1037.6	1037.9	1038.3	1038.6	1038.9	1039.3
30.7	1036.6	1040.0	1040.3	1040.6	1041.0	1041.3	1041.7	1042.0	1042.3	1042.7
30.8	1043.0	1043.3	1043.7	1044.0	1044.4	1044.7	1045.0	1045.4	1045.7	1046.1
30.9	1046.4	1046.7	1047.1	1047.4	1047.8	1048.1	1048.4	1048.8	1049.1	1049.5

Table 3-4. Thousandths of an Inch

Inches of Mercury	0.001	0.002	0.003	0.004	0.005	0.006	0.007	0.008	0.009
Millibars	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.3

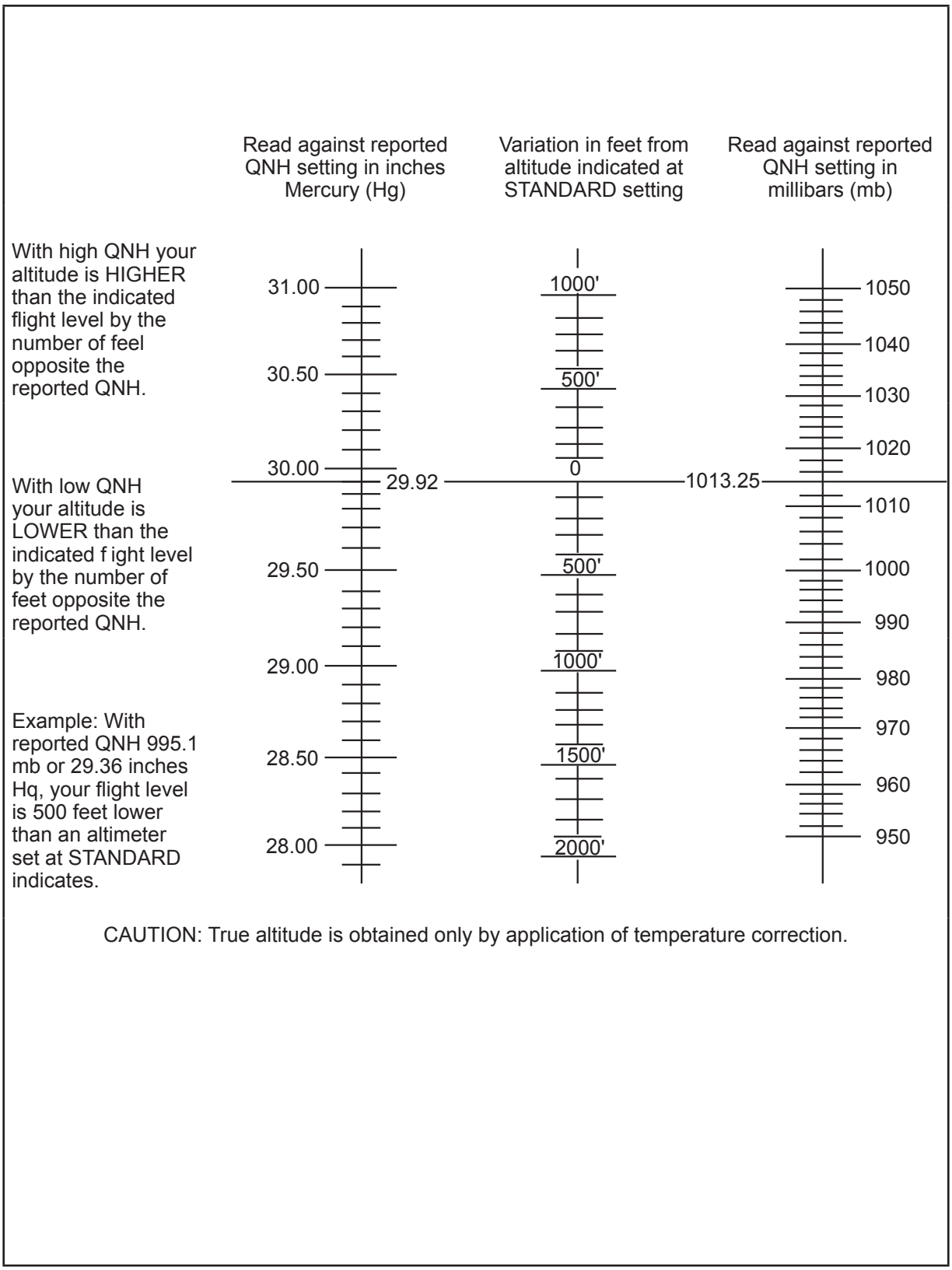
Table 3-5. Millibars to Inches

Millibars	0	1	2	3	4	5	67	7	8	9
	Inches									
940	27.76	27.79	27.82	27.85	27.88	27.91	27.94	27.96	27.99	28.02
950	28.05	28.08	28.11	28.14	28.17	28.20	28.23	28.26	28.29	28.32
960	28.35	28.38	28.41	28.44	28.47	28.50	28.53	28.56	28.58	28.61
970	28.64	28.67	28.70	28.73	28.76	28.79	28.82	28.85	28.88	28.91
980	28.94	28.97	29.00	29.03	29.06	29.09	29.12	29.15	29.18	29.20
990	29.23	29.26	29.29	29.32	29.35	29.38	29.41	29.44	29.47	29.50
1000	29.53	29.56	29.59	29.62	29.65	29.68	29.71	29.74	29.77	29.80
1010	29.83	29.85	29.88	29.91	29.94	29.97	30.00	30.03	30.06	30.09
1020	30.12	30.15	30.18	30.21	30.24	30.27	30.30	30.33	30.36	30.39
1030	30.42	30.45	30.47	30.50	30.53	30.56	30.59	30.62	30.65	30.68
1040	30.71	30.74	30.77	30.80	30.83	30.86	30.89	30.92	30.95	30.98
1050	31.01	31.04	31.07	31.09	31.12	31.15	31.18	31.21	31.24	31.27

Table 3-6. Altimeter Setting

SETTING	AT AIRPORT	IN THE AIR
STANDARD 29.92 in Hg or 1013.25 mb	Variable elevation reading above or below actual elevation	Positive separation by pressure level but at varying actual altitudes
QNH	Actual elevation reading when aircraft is on ground	Altitude indicated (without consideration of temperature)
QNE	Zero elevation reading when aircraft is on ground	Height above ground indicated (without consideration of temperature)

Table 3-7. Flight Levels



CAUTION: True altitude is obtained only by application of temperature correction.

Table 3-8. Altitude and Pressure

Inches	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
28.0	1824	1814	1805	1795	1785	1776	1766	1756	1746	1737
28.1	1727	1717	1707	1698	1688	1678	1668	1659	1649	1639
28.2	1630	1620	1610	1601	1591	1581	1572	1562	1552	1542
28.3	1533	1523	1513	1504	1494	1484	1475	1465	1456	1446
28.4	1436	1427	1417	1407	1398	1388	1378	1369	1359	1350
28.5	1340	1330	1321	1311	1302	1292	1282	1273	1263	1254
28.6	1244	1234	1225	1215	1206	1196	1186	1177	1167	1138
28.7	1148	1139	1129	1120	1110	1100	1091	1081	1072	1062
28.8	1053	1043	1034	1024	1015	1005	995	986	976	967
28.9	957	948	938	929	919	910	900	891	881	872
29.0	863	853	844	834	825	815	806	796	787	777
29.1	768	758	749	739	730	721	711	702	692	683
29.2	673	664	655	645	636	626	617	607	598	589
29.3	579	570	560	551	542	532	523	514	504	495
29.4	485	476	467	457	448	439	429	420	410	401
29.5	392	382	373	364	354	345	336	326	318	308
29.6	298	289	280	270	261	252	242	233	224	215
29.7	205	196	187	177	168	159	149	140	131	122
29.8	112	103	94	85	75	66	57	47	38	29
29.9	20	10	+1	-8	-17	-26	-36	-45	-54	-63
30.0	-73	-82	-91	-100	-110	-119	-128	-137	-146	-156
30.1	-165	-174	-183	-192	-202	-211	-220	-229	-238	-248
30.2	-257	-266	-275	-284	-293	-303	-312	-321	-330	-339
30.3	-348	-358	-367	-376	-385	-394	-403	-412	-421	-431
30.4	-440	-449	-458	-467	-476	-485	-494	-504	-513	-522
30.5	-531	-540	-549	-558	-567	-576	-585	-594	-604	-613
30.6	-622	-631	-640	-649	-658	-667	-676	-685	-694	-703
30.7	-712	-721	-730	-740	-749	-758	-767	-776	-785	-794
30.8	-803	-812	-821	-830	-839	-848	-857	-866	-875	-884
30.9	-893	-902	-911	-920	-929	-938	-947	-956	-965	-974
31.0	-983	-992	-1001	-1010	-1019	-1028	-1037	-1046	-1055	-1064

Table 3-9. Temperature

°C	°F	°C	°F	°C	°F	°C	°F	°C	°F	°C	°F
-40	-40.0	-24	-11.2	-9	15.8	6	42.8	21	69.8	36	96.8
-39	-38.2	-23	-9.4	-8	17.6	7	44.6	22	71.6	37	98.6
-38	-36.4	-22	-7.6	-7	19.4	8	46.4	23	73.4	38	100.4
-37	-34.6	-21	-5.8	-6	21.2	9	48.2	24	75.2	39	102.2
-36	-32.8	-20	-4.0	-5	23.0	10	50.0	25	77.0	40	104.0
-35	-31.0	-19	-2.2	-4	24.8	11	51.8	26	78.8	41	105.8
-34	-29.2	-18	-0.4	-3	26.6	12	53.6	27	80.6	42	107.6
-33	-27.4	-17	1.4	-2	28.4	13	55.4	28	82.4	43	109.4
-32	-25.6	-16	3.2	-1	30.2	14	57.2	29	84.2	44	111.2
-31	-23.8	-15	5.0	0	32.0	15	59.0	30	86.0	45	113.0
-30	-22.0	-14	6.8	1	33.8	16	60.8	31	87.8	46	114.8
-29	-20.2	-13	8.6	2	35.6	17	62.6	32	89.6	47	116.6
-28	-18.4	-12	10.4	3	37.4	18	64.4	33	91.4	48	118.4
-27	-16.6	-11	12.2	4	39.2	19	66.2	34	93.2	49	120.2
-26	-14.8	-10	14.0	5	41.0	20	68.0	35	95.0	50	122.0
-25	-13.0										

Table 3-10. Volume to Weight for Oil

U.S. GALLONS TO POUNDS—OIL		LITERS TO KILOGRAMS—OIL	
GAL	LB	L	KG
1	7.5	1	0.9
2	15.0	2	1.8
3	22.5	3	2.7
4	30.0	4	3.6
5	37.5	5	4.5
6	45.0	6	5.4
7	52.5	7	6.3
8	60.0	8	7.2
9	67.5	9	8.1
10	75	10	9
20	150	20	18
30	225	30	27
40	300	40	36
50	375	50	45
60	450	60	54
70	525	70	63
80	600	80	72
90	675	90	81
100	750	100	90

Table 3-11. Volume to Weight for Fuel

IMPERIAL GALLONS TO POUNDS*—FUEL			U.S. GALLONS TO POUNDS*—FUEL			LITERS TO KILOGRAMS*—FUEL		
AVIATION FUEL (LB)	GAL	TURBINE FUEL (LB)	AVIATION FUEL (LB)	GAL	TURBINE FUEL (LB)	AVIATION FUEL (KG)	L	TURBINE FUEL (L)
7.21	1	8.04	6	1	6.7	0.7	1	0.8
72.1	10	80.4	60	10	66.8	7.2	10	8
144.2	20	160.1	120	20	133.5	14.4	20	16
216.3	30	241.2	180	30	200.3	21.6	30	24
288.4	40	321.6	240	40	267.0	28.8	40	32
360.5	50	402.0	300	50	333.8	35.9	50	40
432.6	60	482.4	360	60	400.6	43.1	60	48
504.7	70	562.8	420	70	467.3	50.3	70	56
576.8	80	643.2	480	80	534.1	57.5	80	64
648.9	90	723.6	540	90	600.9	64.7	90	72
721	100	804.0	600	100	667.6	71.9	100	80
1,442	200	1,600.8	1,200	200	1,335	143.8	200	160
2,163	300	2,412	1,800	300	2,003	215.7	300	240
2,884	400	3,216	2,400	400	2,670	287.6	400	320
3,605	500	4,020	3,000	500	3,338	359.4	500	400
4,326	600	4,824	3,600	600	4,006	431.3	600	480
5,047	700	5,628	4,200	700	4,673	503.2	700	560
5,768	800	6,432	4,800	800	5,341	575.1	800	640
6,489	900	7,236	5,400	900	6,009	647.0	900	720
7,210	1,000	8,040	6,000	1,000	6,676	718.9	1,000	800
14,420	2,000	16,080	12,000	2,000	13,352	1,438	2,000	1,600
21,630	3,000	24,120	18,000	3,000	20,028	2,157	3,000	2,400
28,840	4,000	32,160	24,000	4,000	26,705	2,876	4,000	3,200
36,050	5,000	40,020	30,000	5,000	33,382	3,595	5,000	4,000
72,100	10,000	80,400	60,000	10,000	66,763	7,189	10,000	8,000

*These figures are approximate only, as temperature or octane will change the volume-to-weight ratio.

Table 3-12. Volume

U.S. GAL	L	IMP GAL	U.S. GAL	U.S./ IMP GAL	IMP GAL
0.264	1	0.220	1.200	1	0.833
0.528	2	0.440	2.401	2	1.666
0.793	3	0.660	3.601	3	2.499
1.057	4	0.880	4.802	4	3.332
1.321	5	1.100	6.002	5	4.165
1.585	6	1.320	7.203	6	4.998
1.849	7	1.540	8.403	7	5.831
2.113	8	1.760	9.603	8	6.664
2.378	9	1.980	10.804	9	7.749
2.642	10	2.200	12.004	10	8.330
5.283	20	4.399	24.009	20	16.661
7.925	30	6.599	36.013	30	24.991
10.567	40	8.799	48.017	40	33.321
13.209	50	10.999	60.002	50	41.652
15.850	60	13.198	72.020	60	49.982
18.492	70	15.398	84.030	70	58.312
21.134	80	17.598	96.034	80	66.642
23.775	90	19.797	108.039	90	74.973

Table 3-13. Weight

KG	LB/KG	LB
0.454	1	2.205
0.907	2	4.409
1.361	3	6.614
1.814	4	8.818
2.268	5	11.023
2.722	6	13.228
3.175	7	15.432
3.629	8	17.637
4.082	9	19.842
4.536	10	22.043
9.072	20	44.092
13.068	30	66.139
18.144	40	88.185
22.680	50	110.23
27.216	60	132.28
31.751	70	154.32
36.287	80	176.37
40.823	90	198.42

INTENTIONALLY BLANK

IAN ANNEX 3A Inter-American Navies Reference Data

3A01 Introduction

This annex contains Inter-American Navies supporting data to supplement the accepted operating data in Chapter 2 and the national operating data in MPP-02.1. A glossary (glosario) and brevity code (codigo abreviado) in English and Spanish are included.

3A02 Glossary (Glosario)

A

ADF automatic direction finding
GOA goniómetro automático

AFCS automatic flight control system
SACV sistema automático de control de vuelo

AFFF aqueous film-forming foam
EFPA spuma formadora de película acuosa

AGR vertical sequential order of GSI lighting (amber/yellow, green, red); (Obsolete, see YGR.)
AVR orden de secuencia vertical del indicador de la luz de sendero de aproximación a cubierta (GSI) (ambar/amarillo, verde, rojo); (Obsoleto, ver YGR.)

AIdis. A lamp signaling device used under emergency conditions.
AIdis. Un diapositivo luminoso de señales usado en emergéncias.

approach facility (non-precision). A directional or non-directional navigational beacon that provides track information for initial and final approach.
facilidad de aproximación (no de precisión). Una luz guiadora de navegación direccional o no direccional que da información para la aproximación inicial y final.

approach radar. A ship's radar capable of performing ship/radar-controlled approach.
radar de aproximación. Radar de un buque con capacidad para ejercer un control positivo para la aproximación.

ASR air surveillance radar
RVA radar de vigilancia aérea

ATC air traffic control(ler)
CTA control(lador) de tráfico aéreo

B

BOH break off height. The height at which overshoot procedures are to commence if the pilot is not in visual contact.
ARU altura de ruptura. La altura a la cual deben iniciarse los procedimientos de sobrepasar la pista si el piloto no tiene contacto visual.

BRC base recovery course
RRB rumbo de recuperación de la base

brevity codes. Two-letter coded voice signals used to communicate desires/intents between ship and aircraft.
códigos abreviados. Señales de fonia de dos letras codificadas empleadas para comunicar los deseos/intenciones entre el buque y la aeronave.

C

CATCC carrier air traffic control center
CCTAP centro de control de tráfico aéreo de portahelicópteros

CIC combat information center
CIC centro de información de combate

class. See "level and class."
clase. Véase "Nivel y clase."

CO_2 carbon dioxide, a principal agent in fire-extinguishing equipment and systems.
CO_2 dióxido de carbón, un agente principal de los sistemas y equipo de lucha contraincendio.

cross control approach. A radar approach to one ship, directed by another ship.
aproximación de control cruzado. Una aproximación por radar hacia un buque, dirigido por otro buque.

cross operations. Interoperations between helicopters and helicopter capable ships of two participating nations.
operaciones cruzadas. Operaciones entre helicópteros y buques con capacidad para operar con helicópteros de dos naciones participantes.

D

DAPS deck approach projector sight
VPAC vista del proyector de aproximación a la cubierta

deck markings. High-visibility markings that indicate the approved landing, VERTREP, and HIFR areas on the ship's deck.
marcas de cubierta. Marcas de gran visibilidad que indican las aéreas autorizadas para efectuar el posamiento, REAVERT, y reabastecimiento de combustible en vuelo sobre la cubierta de un buque.

deck status lights. Lights that indicate command approval/non-approval to the LSE/FDO or aircrew. (See also trafficators and stop-go lights.)
luces de estado de la cubierta. Luces que indican la autorización o no del Comando para efectuar operaciones con helicópteros. (Véase también luces semafóricas.)

Delta. A VMC holding pattern.
Delta. Un patrón estable de condiciones meteorológicas visuales (CMV).

Delta hover astern. A VMC holding pattern astern.
Delta hover a popa. Un patrón de CMV a popa.

DFC designated flying course
RVC rumbo de vuelo designado

DME distance measuring equipment
EMD equipo de medición de distancia

Dzus. Commercial name for a quick-opening fitting used to secure access plates, etc.
Dzus. Nombre comercial de un diapositivo de abertura rápida para asegurar placas de acceso, etc.

E

EAT expected approach time
TEA tiempo estimado de aproximación

ELVA emergency low-visibility approach. See also "Smokelight."
AEBV aproximación de emergéncia con baja visibilidad. Véase también "luz de humo."

engines running refueling (ERR). Aircraft refueling with engine(s) running. In the case of helicopters, the rotors will not be turning.
reabastecimiento en caliente (REC). Reabastecimiento de combustible de la aeronave con los motores en servicio. En el caso de helicópteros, los rotores no deberán estar girando.

ETA expected time of arrival
ETA hora estimada de llegada

F

FAF final approach fix
FAF fija de aproximación final

FDD flight deck director. he helicopter director (enlisted) in charge of marshaling the flight deck evolutions (launch and recovery). His station is on the deck. He receives the orders from the officer in charge of the function. (See also LSE.)
DCV director de la cubierta de vuelo. El director del helicóptero (Suboficial) encargado de dirigir las maniobras en la cubierta de vuelo (decolaje y recuperación a posamiento). Su estación es en la cubierta. Recibe las órdenes del Oficial encargado de la función. (Véase también LSE.)

floodlights. Area illumination lights.
luces de proyector. Luces de iluminación del área.

flush deck lights. Lights that are sunk into the flight deck.
luces de cubierta. Luces que estan empotradas en la cubierta de vuelo.

FLYCO. The officer in charge of controlling the flight deck evolutions (launch and recovery). His station is in the "tower."
OCA. El Oficial a cargo del control de las maniobras en la cubierta de vuelo (decolaje y recuperación o posamiento). Su estación es en la "torre." (Oficial de Control Aéreo.)

FOD foreign object damage. Debris, potentially damage-causing, on the flight deck.
DOE daños por objetos extraños. (Debris), productor potencial de daños, en la cubierta de vuelo.

G

GAR vertical sequential order of GSI lighting (green, amber/yellow, red). (Obsolete, see GYR.)
VAR orden de secuencia vertical de la luz de sendero (GSI), (verde - ambar/amarillo - rojo).

GCA ground controlled approach
ACT aproximación controlada desde tierra

Green. Starboard (when referring to relative bearings); affirmative (when referring to deck status) for helicopter operations.
Verde. Estribor (cuando se refiere a marcaciones relativas); afirmativo (cuando se refiere al estado de la cubierta) para operaciones con helicópteros.

GSI glideslope indicator (see also IPD)
GSI luz de sendero (véase también IPD)

GYR vertical sequential order of GSI lighting (green, yellow, red)
VAR orden de secuencia vertical de la luz de sendero (verde, amarillo, rojo)

H

harpoon grid. Securing device fitted to helicopter landing area to secure helicopter.
grilla de arpón. Diapositivo de seguridad colocado en el área de posamiento para asegurar el helicóptero.

HCA helicopter-controlled approach
ACH aproximación controlada por el helicóptero

HC(O) helicopter control officer (shipboard). The tower operator who controls flight deck evolutions and launch and recovery operations.
(O)CH oficial de control del helicóptero (de abordo). El operador de la torre que controla las maniobras de la cubierta de vuelo y las operaciones de decolaje y recuperación o posamiento.

HCS helicopter control station
ECH estación de control del helicóptero

high hover. A minimum hover height of 15 feet (4.57 meters)
hover alto. Una altura mínima de hover de 15 pies (4,57 metros).

HLO helicopter landing officer
OPH oficial de posamiento del helicóptero

hoist transfer. Transfer of personnel and light cargo to and from a helicopter cabin using the helicopter's hoist.
transferencia por winche. Transferencia de personal y carga ligera al y de la cabina del helicóptero usando el winche del mismo.

homing beacon light. An omni- or unidirectional, high-powered, flashing light used as a visual navaid (includes use of masthead obstruction light).
luz guiadora. Una luz intermitente de alta potencia omni- o uni-direccional que se emplea como una ayuda visual para la navegación (incluye el empleo de la luz tope del palo).

horizon lights. Unstabilized lights located at the pilot's eye level when the helicopter is at normal hover height.
luces del horizonte. Luces no estabilizadas ubicadas al nivel del ojo del piloto cuando el helicóptero está a la altura normal de hover.

horse collar. See "strop."
collar de caballo. Véase "estrobo."

HOS. Abbreviation for HOSTAC Working Party when used in STANAG designation.
HOS. Abreviaturadeungrupo detrabajodeHOSTAC cuando seempleaenuna designación STANAG.

I

IAF initial approach fix
FAI fija de aproximación inicial

ICAO International Civilian Aeronautical Organization
OACI Organización Aeronaútica Civil Internacional

IFF identification friend or foe
IFF identificador amigo o enemigo

IFR instrument flight rules
RVI reglas de vuelo instrumental

IMC instrument meteorological conditions; preferred over IFR
CMI condiciones meteorológicas instrumentales; se prefieren a las RVI

internal cargo transfer. As opposed to VERTREP, the transfer of materiel from the cabin of a helicopter to the deck of a ship.
transferencia de carga interna. Lo opuesto a REAVERT, es la transferencia de material de la cabina del helicóptero a la cubierta del buque.

IPD glideslope indicator (France)
IPD luz de sendero (Francia)

K

KIAS knots indicated air speed
VVIN velocidad del viento indicada en nudos

KCAS knots calibrated air speed
VVCN velocidad del viento calibrada en nudos

KTAS knots true air speed
VVVN velocidad verdadera del viento en nudos

L

LAMPS light airborne multipurpose system
ALSMP aeronave liviana con sistema multiproposito

level and class. Technical descriptive term applied to ship to designate operational (“level”) and maintenance service (“class”) capability. In general, Level I, Class 1, when applied to an individual ship, indicates highest degree of helicopter support capability.
nivel y clase. Término descriptivo técnico aplicado para designar la capacidad operacional (“nivel”). En general, Nivel I, Clase 1, cuando serefiere a un buque, indica el grado mas alto decapacidad de apoyo para el helicóptero.

low hover. minimum hover height of 5 feet (1.52 meters).
hover bajo. Una altura mínima de hover de 5 pies (1,52 metros).

LSE. The helicopter director (enlisted) in charge of marshaling the flight deck evolutions (launch and recovery). His station is on the deck. He receives the orders from the officer in charge of the function. (See also FDD.)
LSE. El director del helicóptero (Suboficial) encargado de dirigir las maniobras en la cubierta de vuelo (decolaje y recuperación o posamiento). Su estación es en la cubierta. El recibe ordenes del Oficial encargado de la función. (Véase también OCV.)

LSO landing signal officer
OS oficial de señales

LV limiting visibility. The distance from a ship at which overshoot procedures are to commence if the pilot is not in visual contact.
VL visibilidad de limitación. La distancia desde un buque a la cual deben empezar las operaciones de sobrepasar la pista si el piloto no tiene contacto visual.

LVA low-visibility approach
ABJ aproximación con baja visibilidad

M

MAP missed approach point
PAP punto de aproximación perdido

maximum gross weight. Maximum allowed takeoff weight, including internal and external stores/loads.
peso bruto máximo. Peso máximo permitido para decolar, incluyendo cargas internas y externas.

MDA mimimum descent altitude (non-precision)
ADM altitud de descenso mínima (no precisa)

MSL mean sea level
NMM nivel (pro) medio del mar

N

NAVAID navigational aid
AYUNAV ayuda a la navegación

NDB non-directional beacon
BND luz guiadora no direccional

NORDO no radio
NORDO no radio

O

OA operational approach
AO aproximación operacional

o'clock code. Orientation, relative to the ship's longitudinal axis, used for relative wind direction and helicopter relative heading on the deck. The bow is twelve o'clock and orientation is read as a clock's face.

código del reloj. Orientación relativa al eje longitudinal del buque, usada para referirse a la dirección del viento relativo y al rumbo relativo del helicóptero respecto ala cubierta. La proa es considerada como las doce y la orientación es en sentido horario.

OCL obstacle clearance limit
LDO limite de despeje de obstaculos

OINC officer in charge
OAC oficial a cargo

OOD officer of the deck
OG oficial de guardia

OSE officer scheduling the exercise(s)
OPE oficial que programa el ejercicio

OTC officer in tactical command
OCT oficial en Comando táctico

P

PAR precision approach radar
RPA radar de precisión para aproximación

PIM position and intended movement. Used to indicate the geographic position of ship's movement over a finite time.

PIM posición e intenciones de movimiento. Empleado para indicar la posición geográfica de los movimientos del buque en un tiempo determinado.

POL petroleum, oil, lubricants
POL petróleo, aceite, lubricantes

PVA poor-visibility approach
ABV aproximación con baja visibilidad

Q

QNH altitude above mean sea level (MSL)
QNM altitud sobre el nivel (pro) medio del mar (NMM)

R

RADHAZ electromagnetic radiation hazard. Normally used to describe the effects of radar or radio transmitters on avionics or ordnance.

PELRAD peligro de radiación electromagnética. Empleado normalmente para describir los efectos de los transmisores de radar o radio sobre la aviónica o armamento.

RCA radar-controlled approach
ACR aproximación controlada por radar

Red. Port (when referring to relative bearings); negative (when referring to deck status) for helicopter operations.
Rojo. Babor (cuando se refiere a marcaciones relativas); negativo (cuando se refiere al estado de la cubierta) para operaciones con helicópteros.

reservation. A formal notification by a participating nation that they are unable to comply with a specific standardization agreement (STANAG).
reserva. Una notificación formal y oficial de parte de una nación participante en el sentido de que no está en capacidad de cumplir con un acuerdo de estandarización (normalización) (STANAG).

rotors running refueling (RRR). Helicopters refueling with rotors turning.
reabastecimiento de combustible con los rotores en movimiento. Helicópteros efectuando reabastecimiento de combustible con los rotores en movimiento.

S

SAR search and rescue
BYR busqueda y rescate

SCA ship-controlled approach
ACB aproximación controlada por el buque

SCR self-controlled radar
RAC radar autocontrolado

smokelight. (1) Visual reference device that is deployed over the side of a ship to indicate its course under adverse visual conditions; (2) U.S. Navy's descriptive term for emergency approach that is operationally equivalent to NATO-approved ELVA procedure.
luz de humo. (1) Diapositivo de referencia visual que se coloca en la banda del buque para indicar su rumbo en condiciones visuales adversas. (2) Término usado por la Marina de Guerra de los Estados Unidos para describir la aproximación en emergéncia que es operacionalmente equivalente al procedimiento ELVA aprobado por las NIA.

SSB single sideband radio transmission or transmitter/receiver
BLU transmisión o transreceptor de radio en modo de banda lateral única

STANAG. The record of a formal agreement by participating nations of an intent to standardize specific procedures, definitions, terms, hardware, etc.
STANAG. El registro de un acuerdo formal y oficial de las naciones participantes con la intención de estandarizar o normalizar procedimientos, definiciones, términos, equipos y demás especificos.

Stop-Go Lights. Red and green lights that indicate command approval/non-approval to FDO.
Luces de consentimiento. Luces roja y verde que indican la autorización del Comando al OCV.

strop. Specialized personnel support and securing device used in hoist transfer of personnel to and from a helicopter.

estrobo. Diapositivo de seguridad y de apoyo de personal especializado empleado en transferencia de personal mediante el winche hacia y desde el helicóptero.

T

Tee marking line. A VERTREP deck marking in which the legs of the Tees identify the side on which no danger exists.

Linea de marcas en te. Una marca en cubierta empleada en REAVERT en que las piernas de las "T" indican el lado en que no existe peligro.

trafficators. Red, amber, and green traffic lights to provide visual signals to deck and aircrew personnel of flight deck status.

luces semafóricas. Luces semafóricas roja, ambar y verde que se encuentran en la cubierta de vuelo y sirven para señalizar al personal de la cubierta y de la tripulación del helicóptero acerca del estado de la cubierta de vuelo.

V

VERTREP vertical replenishment. The external transfer of materiel to and from a ship from a hovering helicopter.

REAVERT reaprovisionamiento vertical. La transferencia externa de material hacia y desde el buque desde un helicóptero en hover.

VFR visual flight rules
RVV reglas de vuelo visual

VMC visual meteorological conditions; preferred over VFR
CMV condiciones meteorológicas visuales; se prefiere a las RVV

VOA VERTREP operating area onboard a ship
AOR area de operación de REAVERT en un buque

VOA pickup and delivery zone. The general, unobstructed area within the VOA where loads are picked up and delivered.

Zona de recojo y entrega de REAVERT. El área en general en que no existen obstáculos, que se encuentra en el AOR y en donde se recojen y entregan las cargas.

W

wave-off lights. Flashing red lights that indicate a mandatory wave-off.

luces de ida de largo. Luces rojas intermitentes que indican una ida de largo obligatoria.

Y

YGR vertical sequential order of GSI lighting (yellow, green, red)
AVR orden en secuencia vertical de la luz de sendero (GSI) (ambar, verde, rojo)

Z

ZZ central geographic point of a maritime ship formation
ZZ punto geográfico central de una formación de buques

3A03 Brevity Code (Codigo Abreviado)

Codigo Abreviado	Brevity Code	Remarks
AA	AUTORIZADO PARA APROXIMAR CLEARED TO APPROACH	Ship
AE	AUTORIZADO ORBITE CLEARED TO ORBIT	Ship
AP	AUTORIZADO PARA POSAR CLEARED TO LAND	Ship
CA	CONDICIONES DE ALTIMERO ALTIMETER SETTING	Ship
CB	CONDICIONES DE ROLIDO ROLL CONDITION	Ship
CP	CONDICIONES DE CABECEO PITCH CONDITION	Ship
CV	CONDICIONES DE VEINTO RELATIVO/REAL(*) WIND CONDITION RELATIVE/REAL	Both
EC	LAS CONDICIONES SON DIFICULTOSAS PARA POSAR CONDITIONS ARE TOO DIFFICULT TO LAND	Aircraft
GA	AUTORIZACION PARA PONER EN MARCHA MOTOR REQUEST ENGINE START	Aircraft
GB	AUTORIZACION PARA ENGANCHAR ROTOR REQUEST ROTOR ENGAGEMENT	Aircraft
GC	AUTORIZACION PARA DESPEGAR REQUEST TAKEOFF CLEARANCE	Aircraft
GD	SOLICITO DESPEGAR INMEDIATO (EMERGENCIA) (**) REQUEST IMMEDIATE TAKEOFF (EMERGENCY)	Aircraft
LR	LISTO PARA ABASTECER READY TO REFUEL	Both
LT	LISTO PARA TRANSFERENCIA READY TO PICK UP/VERTREP	Both
LW	SOLICITO MENOS VIENTO EN CUBIERTA REQUEST LESS WIND ACROSS THE DECK	Aircraft

Codigo Abreviado	Brevity Code	Remarks
PA	PERMISO PARA APROXIMAR REQUEST PERMISSION TO APPROACH	Aircraft
PP	PERMISO PARA POSAR REQUEST PERMISSION TO LAND	Aircraft
SA	SOLICITO CONTROL POSITIVO REQUEST POSITIVE CONTROL	Aircraft
SB	AUTORIZACION PARA OPERAR INDEPENDIENTE REQUEST PERMISSION TO OPERATE INDEPENDENTLY	Aircraft
SC	SOLICITO CONDICIONES POSO REQUEST LANDING CONDITIONS	Aircraft
SI	SOLICITO POSO INMEDIATO (EMERGENCIA) REQUEST IMMEDIATE LANDING (EMERGENCY)	Aircraft
SF	SOLICITO COMBUSTIBLE REQUEST FUEL	Aircraft
SK	SOLICITO MEJORES CONDICIONES DE ESTABILIDAD DE CUBIERTA REQUEST IMPROVED SEA-KEEPING CONDITIONS	Aircraft
WO	ESCAPE WAVE-OFF	Ship

(*) Direccioneintensidad/
Direction and velocity

(**) Despego inmediato requirido/
Emergency departure required

Notification/Note

Para asegurar que el personel este usando codigo, despues de contacto inicial, transmita “HOSTAC CODIGO” dos veces, sequido por letras mencionadas foneticamente dos veces. Por ejemplo, “HOSTAC CODIGO HOSTAC CODIGO ALFA PAPA ALFA PAPA” (que significa “Authorizado para posar”).

To ensure that personnel are aware that code is being used, after initial contact, transmit “HOSTAC CODE” twice, followed by letters spoken phonetically twice. For example, “HOSTAC CODE HOSTAC CODE ALPHA PAPA ALPHA PAPA” (meaning “Cleared to land”).

INTENTIONALLY BLANK

ANNEX A Standards for Host Ship's Aviation Facilities

A001 Introduction

This annex provides standardized requirements for the design, equipage, and inspection of shipboard facilities, as opposed to standardization for operations. (See Chapter 2.)

A002 Shipboard Helicopter Facility Designations

1. Chapter 2 provides definitions of the three levels of environmental conditions under which aircraft operations take place and the seven classes of helicopter missions that a ship's facilities are required to support. Further, for transfer of loads by helicopter using the external hook, there are also definitions of the four types of VERTREP marking systems.

2. To enhance the safety of helicopter cross operations between ships of different nations, the system of standard designations into levels and classes will be used.

3. Designation of a shipboard helicopter facility consists of three parts: the level of the operation (environmental conditions), the class of the facility (aircraft missions), and the type of aircraft to be operated.

4. Individual aircraft have specific operating and support requirements that must be considered for each level and class of facility. In order to describe completely a ship's aircraft support capability, the aircraft that can operate safely with the ship in each class must be specified.

5. For the purpose of designating the class, helicopter maintenance is limited to routine inspection, minor repairs, and replacement of parts that do not require special tools or equipment. A maintenance facility should include an aircraft hangar.

6. Similarly, helicopter service facilities include fuel, starting power, ac and dc electrical service power, liquid oxygen (if required), pneumatic servicing facilities, fresh water, consumables, etc.

7. Table A-1 provides a summary of levels and classes of systems and identifies the items that require inspection.

8. The following paragraphs provide examples.

   a. A facility can be capable of a single operation. For example:

   Level III, Class 4—Alouette III

   This ship is capable of conducting VMC day (i.e., Level III) VERTREP operations (i.e., Class 4) with the Alouette III helicopter.

   b. A facility can be capable of conducting several classes of operation and for a variety of aircraft. For example:

   Level I, Class 1—H-2, H-3
   Level I, Class 2—H-46
   Level I, Class 4—H-1, H-2, H-3, H-46
   Level I, Class 6—H-2, H-3, H-46, H-53

Table A-1. Levels and Classes of Systems and Items Requiring Inspection

Systems/Items Requiring Inspection	Levels			Classes						
	Conduct of Operations Under Various Environmental Conditions			Types of Operations						
	I	II	III	1	2	3	4	5	6	7
1. Deck Markings, Surface, and Operating Clearance			X	X	X	X	X	X		
2. Lighting Equipment	X	X								
3. Deck Structure			X	X	X					
4. Deck Handling Equipment			X	X	X	X	X			
5. Mooring Aids			X	X	X					
6. Communication Equipment	X	X	X							
7. Navigation Equipment	X									
8. Fire Protection Equipment			X	X	X	X	X	X	X	
9. Servicing Equipment			X	X						
10. Hangar			X							

This ship is capable of conducting IMC, VMC, day, and night helicopter operations (i.e., Level I). It can land, service, and maintain (i.e., Class 1) H-2 and H-3 helicopters; land and service (i.e., Class 2) H-46 helicopters; conduct VERTREP operations (i.e. Class 4) with H-1, H-2, H-3, and H-46 helicopters; and conduct HIFR operations (i.e., Class 6) with H-1, H-2, H-3, H-46, and H-53 helicopters.

c. A facility can be capable of conducting several levels and classes of operation for a variety of aircraft. For example:

Level II, Class 4—Gazelle, Sea King, Wasp, Wessex
Level III, Class 2—Gazelle, Wasp

This ship is capable of conducting VMC day and night VERTREP operations (i.e., Level II, Class 4) with the Gazelle, Sea King, Wasp, and Wessex helicopters and, under VMC day conditions, can land and service (i.e., Level III, Class 2) the Gazelle and Wasp helicopters. It has no lights at the landing area.

A003 Required Level of Coefficient of Friction for Flight Decks

Refer to ANEP-88 (STANAG 1278), Standard for the Required Level and Measurement of the Coefficient of Friction on Flight Decks, for minimums and measurement specifics of flight deck non-skid coatings.

A004 Glideslope Indicators for Helicopter Operations From Ships

Chapter 2 describes glideslope indicators, defines the three types (YGR, GYR, and FGR) of glideslope indicator used on ships operating helicopters, and illustrates the vertical and horizontal beam cross-sections of a typical glideslope indicator. ***In the interest of safety of helicopter operations, national sections in MPP-02.1 are to include the type of glideslope indicator used.***

MPP-02.3.1 (STANAG 1236), Glide Slope Indicators for Helicopter Operations from Ships, provides the detailed glideslope standards.

A005 Microwave Landing System for Small Ships

To provide a microwave landing aid suitable for helicopter operations from small ships that is interoperable with precision landing systems at main operating bases, the landing aid must:

a. Provide pilot-interpreted helicopter approaches to frigates to 100 feet (height) and 100 meters (range) or closer.

b. Have a combined airborne receiver functionally interoperable with the International Civilian Aviation Organization (ICAO) microwave landing system to be installed at main operating bases.

c. Allow for ship maneuvering during a helicopter's approach.

d. In addition to helicopter recoveries to be undertaken without the use of radar or voice communication, have a low probability of intercept and be resistant to either jamming or deception.

e. Have, where possible, data link capabilities to provide a shipborne display of an individual helicopter's relevant information (i.e., fuel state, height, etc.).

A006 Ship Firefighting Requirements

1. Landing Facility. If the host ship has a helicopter landing capability, it must be equipped with at least two AFFF outlets. These outlets have hoses that can cover all parts of the landing and hangar area and are separated laterally by a minimum of one-half of the maximum width of the flight deck. The foam systems must have a 50 gallon (190 liter) per minute capacity for a minimum duration of 5 minutes.

2. VERTREP, HIFR, and/or Hoist Transfer Facility. If a ship has only a VERTREP, HIFR, and/or hoist transfer capability, it must be fitted with at least one AFFF outlet capable of covering the entire VERTREP, HIFR, and/or hoist transfer area.

A007 Securing Hook for Aircraft Tiedown Fittings

Tiedown fittings for shipborne helicopters and aircraft are to be provided by the receiving ship, not the landing aircraft. They are to conform to the basic dimensions shown in Figure A-1.

A008 Electrical Starting and Servicing Power

For cross-servicing of helicopters the following standards apply:

a. Ac and dc power characteristics supplied by the host ship must conform to ISO 461 AE.

b. Ship's dc starting and servicing power supply connectors must conform to STANAG 7073 AE.

c. Ship's ac starting and servicing power supply connectors must conform to STANAG 7073 AE.

A009 Refueling Nozzle

Refueling of a guest helicopter requires a nozzle that conforms to STANAG 3105 ASP for pressure refueling or STANAG 3212 ASP for gravity refueling.

A010 Vertical Replenishment Operating Area Requirements

Design requirements of VOAs are contained in MPP-02.3.3 (STANAG 1162), Vertical Replenishment (VERTREP) Operating Area Marking, Clearances, and Lighting. To guarantee safe rotor clearances

from obstructions in the vicinity of the VOA, helicopters are classified by rotor diameter into four categories. The maximum rotor diameter permitted in each category and the helicopters assigned to each category are detailed in MPP-02.3.3.

A011 Helicopter In-Flight Refueling Operating Requirements

To permit pressure refueling of a hovering helicopter from a ship, the following minimum HIFR operating requirements must be met.

a. The helicopter is to be refueled safely while in the hover up to a maximum height of 15 meters (49 feet) above the flight deck refueling point, or 20 meters (65 feet) above the water, and up to a maximum lateral distance of 20 meters (65 feet) from the port side of the ship.

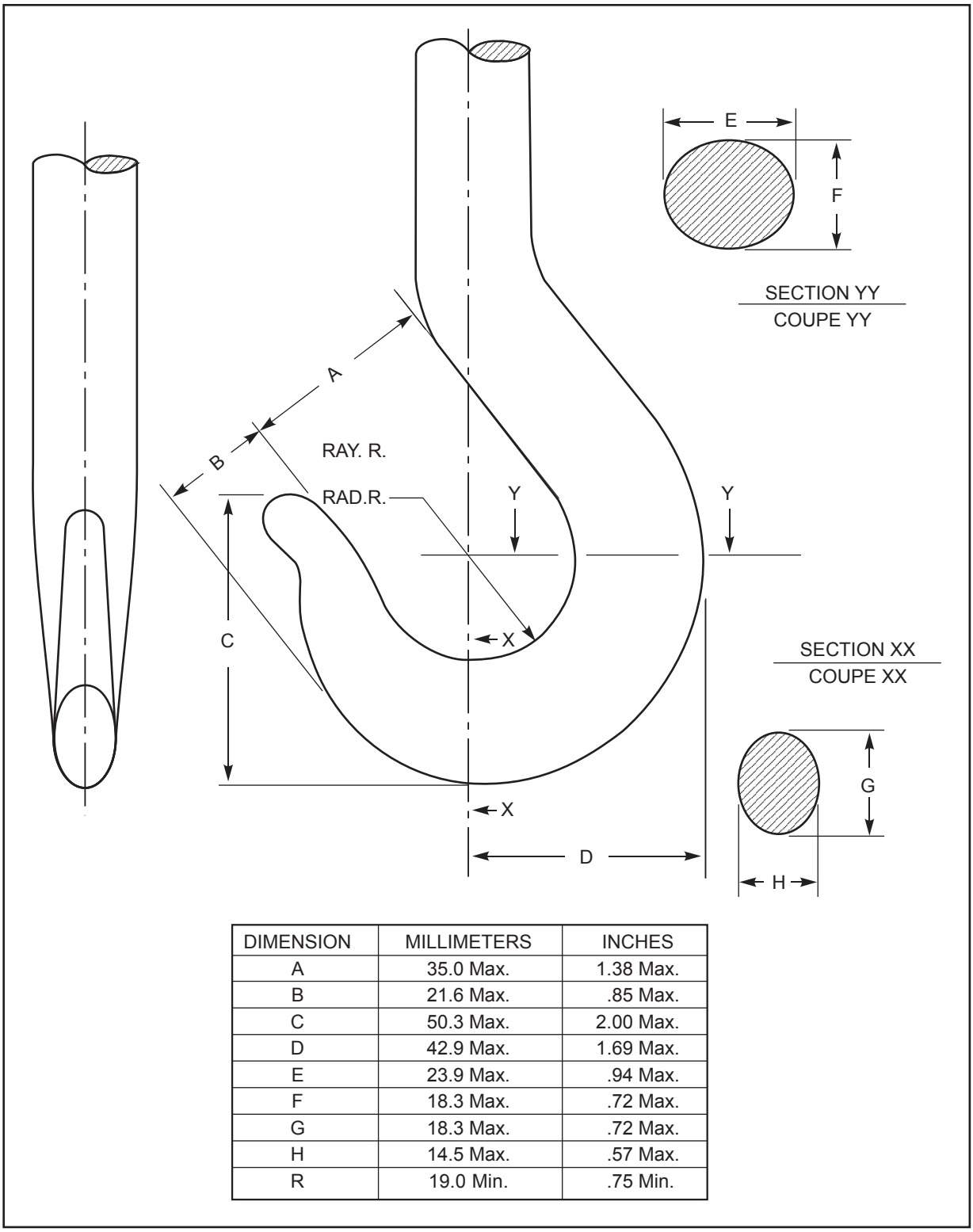
b. A pressure refueling self-sealing coupling is to be provided complete with a manually controlled ON/OFF valve. The hose shall be self-draining and include means to prevent fuel from being removed from the aircraft.

c. Fuel is to be provided to the aircraft at a minimum flow rate of 114 liters (25 Imperial gallons, 30 U.S. gallons) per minute, at a pressure of not less than 1.38 BAR (20 psi) and not greater than 3.44 BAR (50 psi), at the maximum height stated in paragraph a. above.

d. The HIFR equipment shall use the aircraft's rescue hoist hook to reach the fueling connection and shall have a minimum of one self-sealing breakaway coupling, immediately below the hoist connection, to release the aircraft from the ship in an emergency. Automatic release of the emergency coupling is preferred. Breakaway coupling release tension must not exceed the 270 kilogram (595 pound) capacity of the aircraft's rescue hoist.

e. An attachment point, if so equipped, at the ship's end of the hose is required to prevent strain on the ship's deck refueling equipment.

f. An electrical bond is to be provided between the aircraft and ship in order to continually dissipate static electricity.



DIMENSION	MILLIMETERS	INCHES
A	35.0 Max.	1.38 Max.
B	21.6 Max.	.85 Max.
C	50.3 Max.	2.00 Max.
D	42.9 Max.	1.69 Max.
E	23.9 Max.	.94 Max.
F	18.3 Max.	.72 Max.
G	18.3 Max.	.72 Max.
H	14.5 Max.	.57 Max.
R	19.0 Min.	.75 Min.

Figure A-1. Dimensions of Securing Hook for Aircraft Tiedown Fittings

A012 Inspection of Aviation Facilities

1. To enable conduct of safe helicopter operations between ships of different nations, minimum standard requirements for the inspection of shipboard aviation facilities must be established and inspection criteria adopted.

2. Systems or Items Inspected.

a. The aviation facility systems or items requiring inspection are listed in Table A-2. Systems or items to be inspected apply to those that are on board the ship.

b. The aviation facility shall be inspected in accordance with the nation's particular installation drawings, service change documents, repair procedure documents, overhaul instructions, design guides, specification text, and other instructions.

3. Inspection Criteria.

a. Aviation facilities shall be inspected to verify and validate that all of the systems or items necessary for proper, adequate, and safe conduct of helicopter operations are installed and operational in accordance with each nation's national standard.

b. Aviation facility inspections shall be conducted by personnel deemed technically competent to determine the acceptability of the systems or items installed.

4. Inspection Frequency.

a. The complete aviation facility shall be inspected:

(1) After the initial installation of the systems or items.

(2) After major overhaul or modification of the systems or items.

(3) After a major overhaul of the ship.

(4) When doubt exists concerning the capability of the systems or items.

b. Certain portions of the aviation facility shall be inspected just prior to helicopter operations.

5. Waivers.

a. Aviation facility waivers shall only be granted by the appropriate national authority.

b. Aviation facility waivers shall be granted for a specified period not to exceed 1 year from the date of waiver authorization.

A013 Shipboard Hauldown Cable End Fitting for Helicopter Wire Recovery Assist Systems

1. Nations agree to adopt the standard dimensions in any wire recovery assist type system for ships so fitted as detailed in Figure A-2.

Table A-2. Helicopter Aviation Facility Inspection Criteria and Frequency (Sheet 1 of 2)

	Systems or Items	Inspection Criteria	Inspection Frequency	
			Note 1	Note 2
1.	Deck Marking, Surface, and Operating Clearances. a. Landing. b. VERTREP. c. HIFR.	1. Condition of marking and deck surface. 2. Location of marking. 3. Adequacy of clearance for operations to be conducted.	X X X	
2.	Lighting. a. Homing Beacon. b. Flush Deck. c. Floodlights. d. Lineup. e. Glideslope Indicator. f. Horizon Bar. g. HIFR. h. Deck Status Lights.	1. Correct location and quantity of f xtures. 2. Mechanical condition of equipment (i.e., fixture, lamps, lenses, gaskets, cabling, and wiring). 3. Correct operation of equipment (intensity, flashes, and control of brightness). 4. Correct glideslope indicator approach angle.	X X X X	 X
3.	Deck Structure.	1. Verification of strength calculations. 2. Mechanical condition of deck (no evidence of excessive deformation, deterioration, corrosion, or rough, uneven, or failed welding). 3. Coefficient of friction.	X X X	
4.	Deck Handling Equipment.	1. Correct location and condition of equipment. 2. Proper operation of equipment. 3. Availability of static pole.	X X	 X X
5.	Mooring Aids. a. Chocks. b. Tiedowns. c. Harpoon Grid.	1. Correct type and quantity of equipment. 2. Correct location and condition.	X X	
6.	Communications. a. UHF. b. VHF. c. HF.	1. Correct type. 2. Proper operating condition.	X X	 X
7.	Navigation. a. LF Homer. b. Tacan. c. Approach Radar.	1. Correct type. 2. Proper operating condition.	X X	 X
8.	Fire Protection. a. Foam/Light Water. b. Saltwater.	1. Length of hose permits foam or water to reach all points of helicopter area. 2. Mechanical condition of equipment (i.e., hose, fittings, and pumps). 3. Quantity of firefighting agent.	X X X	 X
	c. Portable Extinguishers (CO_2 and Powder). d. Hangar Installed Halon Extinguishers.	1. Correct quantity. 2. Condition. 3. Availability to the aviation facility.	X X X	 X

Table A-2. Helicopter Aviation Facility Inspection Criteria and Frequency (Sheet 2 of 2)

	Systems or Items	Inspection Criteria	Inspection Frequency	
			Note 1	Note 2
9.	Services. a. Fuel System.	1. Correct fuel type. 2. Mechanical condiiton (i.e., pump, nozzle, f ltration method, HIFR rig). 3. Operating condition.	X X X	 X
	b. Fuel Purity Check Capability.	1. Correctly calibrated equipment. 2. Good mechanical condition	X X	
	c. Oil Type.	1. Correct quantity. 2. Correct Type.	X X	
	d. Hydraulic Fluid.	1. Correct quantity. 2. Correct Type.	X X	
	e. Pneumatic Service—Low Pressure and High Pressure.	1. Correct pressure and quality of air outlet. 2. Outlet location relative to helicopter.	X X	
	f. Ground Power Supply ac/dc.	1. Correct voltage and amperes cable and plug type. 2. Location relative to helicopter operating area. 3. Performance test. 4. Batter capacity test.	X X X X	 X
	g. Freshwater Washdown.	1. Correct system capacity and discharge rate. 2. Location of outlet relative to helicopter.	X X	
10.	Hangar.	1. Size and conf guration permits free entry and exit of prescribed helicopter.	X	

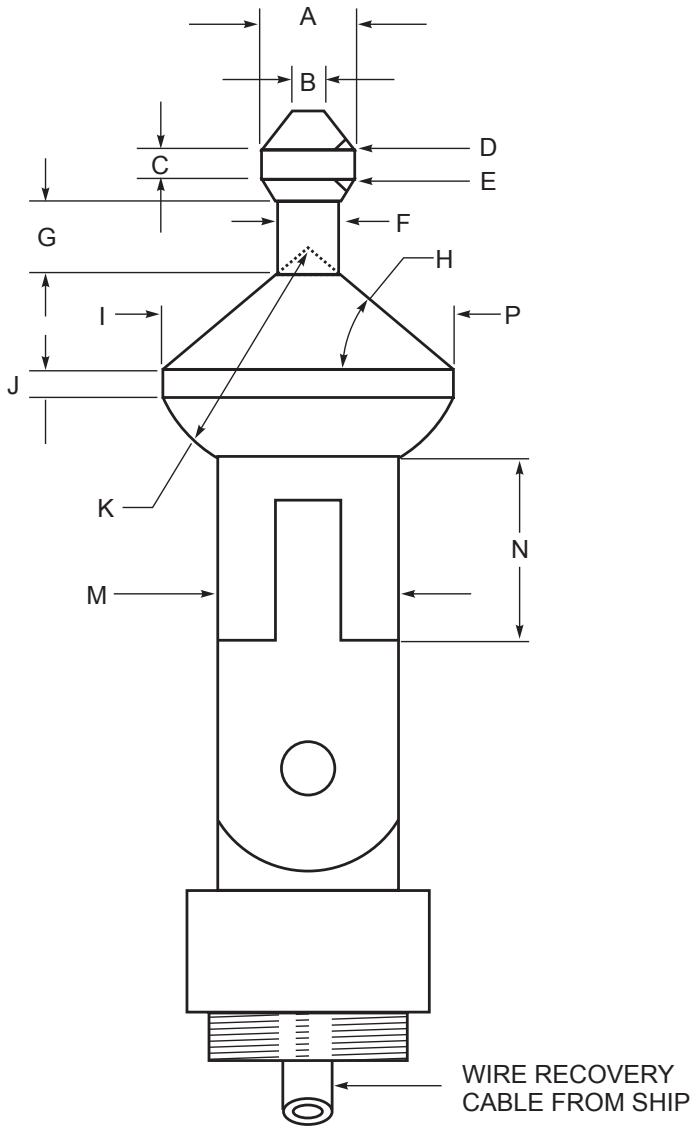
Notes:

1. Inspection required after the initial installation, major overhaul, or modification of the systems or items; when doubt exists concerning the capability of the systems or items; or after major overhaul of the ship.
2. Inspection required just prior to helicopter operations.

2. Definitions.

wire recovery assist system. A system of aiding landing procedures using a ship-fitted constant tension winch with a wire attached to the helicopter. The helicopter hovers and lands with tension applied to the wire, thus enhancing helicopter hovering stability and guiding it towards the landing area.

hauldown cable end fitting. The ship-fitted constant tension winch wire is fitted with an end fitting that permits it to be coupled to the helicopter's messenger wire and subsequently secured solidly to the aircraft's winch system. It provides the major specific interface between the ship system and the helicopter. Standardization of this interface would permit interoperability of wire recovery assist systems.



A	12.7 mm	0.5 in	DIA	H		40°	
B	4.57 mm	0.18 in	DIA	J	3.18 mm	0.125 in	
C	2.54 mm	0.10 in		K	25.4 mm	1.0 in	RAD
D		45°		M	20.32 mm	0.80 in	DIA
E		45°		N	25.4 mm	1.0 in	
F	7.62 mm	0.30 in	DIA	P	37.46 mm	1.475 in	DIA
G	8.89 mm	0.35 in					

Figure A-2. Hauldown Cable End Fitting—Standard Dimensions

A014 Shipborne Helicopter Harpoon/Grid Rapid Securing System

Standards for mandatory characteristics are contained in ANEP/MNEP-83 (STANAG 1276), Shipborne Helicopter and UAV Harpoon-Grid Rapid Securing System.

LEXICON

SECTION I—GLOSSARY

AIdis. A lamp signaling device used under emergency conditions.

approach facility (non-precision). A directional or non-directional navigational beacon that provides track information for initial and final approach.

approach radar. A ship's radar capable of performing ship- or radar-controlled approach.

auxiliary power unit (APU). Dedicated gas turbine for starting the aircraft's engine.

aviation facility. The systems or items specifically provided aboard ship for the operation of helicopters.

azure deck. Descriptive term functionally similar to "green" deck, also "emerald green" (France).

break off height (BOH). The height at which overshoot procedures are to commence if the pilot is not in visual contact.

carmine deck. Descriptive term functionally similar to "red" deck (France).

carrier-controlled approach (CCA). A precision approach using a dedicated ship's radar.

Charlie time. The time, usually given in minutes past the hour, that an aircraft shall be crossing the deck edge during a recovery. Used for Case 1 recovery only.

class. See level and class.

carbon dioxide (CO_2). A principal agent in fire-extinguishing equipment and systems.

cross control approach. A radar approach to one ship, directed by another ship.

cross operations. Operations between helicopters and helicopter-capable ships of two participating nations.

deck markings. High-visibility markings that indicate the approved landing, VERTREP, and HIFR areas on the ship's deck.

deck status lights. Lights that indicate command approval/nonapproval to the LSE/FDO or aircrew. (See also trafficators and stop-go lights.)

Delta. A VMC holding pattern.

Delta hover astern. A VMC holding pattern astern.

expected Charlie time (ECT). The future time, usually given in minutes past the hour, that an aircraft shall be assigned any time a change is made to a previously assigned Charlie time. Aircraft shall recover at the assigned ECT if no further instructions are received or lost communications are experienced.

engines running refueling (ERR). Aircraft refueling with engine(s) running. In the case of helicopters, the rotors will not be turning.

flight deck director (FDD). The helicopter director (enlisted) in charge of marshaling the flight deck evolutions (launch and recovery). His station is on the deck. He receives the orders from the officer in charge of the function. (See also LSE.)

flight deck officer (FDO). The officer in charge of controlling and marshaling the flight deck evolutions (launch and recovery). His station is on the deck.

floodlights. Area illumination lights.

flush deck lights. Lights that are sunk into the flight deck.

FLYCO. The officer in charge of controlling the flight deck evolutions (launch and recovery). His station is in the "tower."

foreign object damage (FOD). Debris, potentially damage-causing, on flight deck.

green. Starboard (when referring to relative bearing); affirmative (when referring to deck status) for helicopter operations.

harpoon grid. Securing device fitted to helicopter landing area to secure helicopter.

helicopter control officer (HC(O)) (shipboard). The tower operator who controls flight deck evolutions and launch and recovery operations.

high hover. A minimum hover height of 15 feet (4.57 meters).

hippodrome pattern. Racetrack pattern (France).

hoist transfer. Transfer of personnel and light cargo to and from a helicopter cabin using the helicopter's hoist.

homing beacon (light). An omni- or uni-directional, high-powered, flashing light used as a visual navaid (includes use of masthead obstruction light).

horizon lights. Unstabilized lights at the pilot's eye level when the helicopter is at normal hover height.

horse collar. See strop.

inspection. The examination of aviation facilities systems or items to ensure that they are in satisfactory condition and proper working order.

inspection frequency. The number of times aviation facilities are inspected within a designated period.

internal cargo transfer. As opposed to VERTREP, the transfer of material from the cabin of a helicopter to the deck of a ship.

landing signalman (LSE). The helicopter director (enlisted) in charge of marshaling the flight deck evolutions (launch and recovery). His station is on the deck. He receives the orders from the officer in charge of the function. (See also FDD.)

level and class. Technical descriptive term applied to ship to designate operational ("level") and maintenance service capability ("class"). In general, Level I, Class 1, when applied to an individual ship, indicates highest degree of helicopter support capability.

low hover. A minimum hover height of 5 feet (1.52 meters).

limiting visibility (LV). The distance from a ship at which overshoot procedures are to commence if the pilot is not in visual contact.

maximum gross weight. Maximum allowed takeoff weight, including internal and external stores/loads.

o'clock code. Orientation, relative to the ship's longitudinal axis, used for relative wind direction and helicopter relative heading on the deck. The bow is twelve o'clock and orientation is read as a clock's face.

position and intended movement (PIM). Used to indicate the geographic position of ship's movement over a finite time.

RADHAZ: Electromagnetic radiation hazard. The risk of inadvertent ignition of electro-explosive devices (EEDs) and flammables, injury to personnel or malfunction/failure of safety critical electronic systems (SCES) resulting from exposure to Electromagnetic Radiation (EMR) environment in the frequency range 10 kHz–300 GHz.

red. Port (when referring to relative bearing); negative (when referring to deck status) for helicopter operations.

reservation. A formal notification by a participating nation that they are unable to comply with a specific standardization agreement (STANAG).

rotors running refueling (RRR). Helicopters refueling with rotors turning.

smokelight. (1) Visual-reference device that is deployed over the side of a ship to indicate its course under adverse visual conditions; (2) U.S. Navy's descriptive term for emergency approach that is operationally equivalent to the standard ELVA procedure.

standardization agreement (STANAG). The record of a formal agreement by participating nations of an intent to standardize specific procedures, definitions, terms, hardware, etc.

stop-go lights. Red and green lights that indicate command approval/nonapproval to FDO.

strop. Specialized personnel support and securing device used in hoist-transfer of personnel to and from a helicopter.

tee marking line. A VERTREP deck marking in which the legs of the tees identify the side on which no danger exists.

trafficator. Red, amber, and green traffic lights to provide visual signals to deck and aircrew personnel of flight deck status.

vertical replenishment (VERTREP). The external transfer of material to and from a ship from a hovering helicopter.

VOA pickup and delivery zone. The general, unobstructed area within the VOA where loads are picked up and delivered.

vertical onboard delivery (VOD) (USA). Logistics movement of high-priority passengers, mail, or cargo to and from aviation and air-capable ships, normally by CH-53E helicopters.

waiver. The authorization that helicopter operations are permitted to be conducted from a facility that does not meet the inspection criteria.

wave-off lights. Flashing red lights that indicate a mandatory wave-off.

wet or dry call. Call made abeam the landing spot, indicating the pilot's intention to use the engine's water injection system for landing.

SECTION II—LIST OF ACRONYMS AND ABBREVIATIONS

ADF	automatic direction finding
AFCS	automatic flight control system
AFFF	aqueous film-forming foam
AGR	vertical sequential order of GSI lighting (amber/yellow, green, red); (Obsolete, see YGR.)
A/MR	accident/mishap response
APU	auxiliary power unit
ARC	aircraft recovery course
ASR	air surveillance radar
ATC	air traffic control(ler)
BOH	break off height
BPH	a ship equipped with a helicopter landing platform (France)
BRC	base recovery course
CASEVAC	casualty evacuation
CATCC	carrier air traffic control center
CCA	carrier-controlled approach
CIC	combat information center
CO_2	carbon dioxide
CRES	corrosion resistant steel
DAPS	deck approach projector sight
DFC	designated flying course
DME	distance measuring equipment
EAT	expected approach time
EED	electro-explosive devices
ECT	expected Charlie time
ELVA	emergency low-visibility approach (See also smokelight.)

ERR	engines running refueling
ETA	expected time of arrival
FAF	final approach fix
FDD	flight deck director (See also LSE.)
FDO	flight deck officer
FOD	foreign object damage
GAR	vertical sequential order of GSI lighting (green, amber/yellow, red); (Obsolete, see GYR.)
GCA	ground-controlled approach
GSI	glideslope indicator (See also IPD.)
GYR	vertical sequential order of GSI lighting (green, yellow, red)
HCA	helicopter-controlled approach
HC(O)	helicopter control officer (shipboard)
HCS	helicopter control station
HDS	helicopter delivery service
HELOPS	helicopter operations
HIFR	helicopter in-flight refueling
HLO	helicopter landing officer
HOS	HOSTAC Working Group; abbreviation used in a STANAG designation
IAF	initial approach fix
ICAO	International Civilian Aeronautical Organization
IFF	identification friend or foe
IFR	instrument flight rules
IMC	instrument meteorological conditions; preferred over IFR
IPD	glideslope indicator (France)
KIAS	knots indicated air speed
KCAS	knots calibrated air speed

KTAS	knots true air speed
LAMPS	light airborne multipurpose system
LSE	landing signalman (See also FDD.)
LSO	landing signal officer
LV	limiting visibility
LVA	low-visibility approach
MAP	missed approach point
MAUM	maximum all up mass
MDA	minimum descent altitude (non-precision)
MEDEVAC	medical evacuation
MMMF	man-made mineral fibre
MRC	main rotor center
MSL	mean sea level
MTACCOPS	Multinational Through-Deck and Aircraft Carrier Crossdeck Operations
MTOW	maximum take-off weight
navaid	navigational aid
NDB	non-directional beacon
NORDO	no radio
NVD	night vision devices
OCL	obstacle clearance limit
OGE	out of ground effect
OOD	officer of the deck
ORM	operational risk management
OSE	officer scheduling exercise(s)
OTC	officer in tactical command
PAR	precision approach radar
PIM	position and intended movement

POL	petroleum, oil, lubricants
PRAD	Personnel RADHAZ Designator
PPE	personal protective equipment
PVA	poor-visibility approach
QNH	altitude above mean sea level
RADHAZ	electromagnetic radiation hazard; normally used to describe the effects of radar or radio transmitters on avionics or ordnance
RAST	recovery assist secure and traverse
RCA	radar-controlled approach
RRR	rotors running refueling
SAR	search and rescue
SCA	ship-controlled approach
SCES	safety critical electronic systems
SCR	self-controlled radar
SHOL	ship helicopter operating limit
SRAD	Susceptability RADHAZ Designator
SSB	single sideband radio transmitter/receiver or transmission
STANAG	standardization agreement
STO	short takeoff
TRAD	Transmitter RADHAZ Designator
VERTREP	vertical replenishment
VFR	visual flight rules
VL	vertical landing
VMC	visual meteorological conditions; preferred usage over VFR
VOA	VERTREP operating area on board a ship
VOD	vertical onboard delivery (USA)
V/STOL	vertical/short takeoff and landing

WOD	wind over the deck
YGR	vertical sequential order of GSI lighting (yellow, green, red)
ZZ	central geographic point of a maritime ship formation

INTENTIONALLY BLANK

LIST OF EFFECTIVE PAGES

Effective Pages	Page Numbers
APR 2017	I thru XVIII
APR 2017	1-1 thru 1-26
APR 2017	IAN-1A-1 thru IAN-1A-4
APR 2017	PAC-1B-1 thru PAC-1B-4
APR 2017	ME-1C-1 thru ME-1C-4
APR 2017	2-1 thru 2-92
APR 2017	IAN-2A-1 thru IAN-2A-6
APR 2017	2B-1, 2B-2
APR 2017	3-1 thru 3-38
APR 2017	IAN-3A-1 thru IAN-3A-12
APR 2017	A-1 thru A-10
APR 2017	Glossary-1 thru Glossary-4
APR 2017	LOAA-1 thru LOAA-6
APR 2017	LEP-1, LEP-2

INTENTIONALLY BLANK

MPP-02(H)(1)
VOLUME I