CHAPTER 3

Planning and Preparation for Flight Operations

3.1 INTRODUCTION

This chapter is intended to assist staffs, helicopter squadrons/units, and ship's personnel in planning and preparing for safe and effective shipboard helicopter operations. Personnel concerned with planning and preparing for helicopter operations should refer to the references that are specified throughout this publication and specific aircraft model NATOPS flight manuals.

3.2 HELICOPTER LIMITATIONS

Safe helicopter operations depend, to a large extent, on a knowledge of the aircraft's design restrictions and operating limitations. Appendix B of this manual provides general characteristics of operational helicopters including their dimensions and relative wind requirements for rotor engagement/disengagement. Paragraphs 3.2.1 and 3.2.2 include the general limitations common to all helicopters. Safe helicopter shipboard operation requires the existence and use of the following:

1. A shipboard helicopter facilities certification
2. A rotor engagement/disengagement wind limitations envelope
3. A launch and recovery wind limitations envelope.

Paragraph 4.6.6 further discusses the rotor engagement/disengagement and launch and recovery wind limitations envelopes. Individual NATOPS flight manuals may contain additional information that may further restrict wind limits or operational procedures. Limits may be reduced by the pilot when any of the following conditions exist:

1. Nonstandard ship configuration that affects helicopter/ship clearances, ship motion, or turbulence
2. Unusual factors that affect crew proficiency (e.g., crew fatigue, training, etc.)
3. Use of a general model envelope that may require limit reductions aboard different ship classes (i.e., a general H-3 launch and recovery wind limitations envelope instead of the SH-3H/CG 10 envelope).

3.2.1 Inherent Limitations. Lift capability is a limiting factor in any helicopter flight configuration and is most critical when hovering. It is a variable influenced by:

1. Ambient temperature — lift capability decreases as temperature increases.
2. Relative humidity — lift capability decreases as relative humidity increases.
3. Pressure altitude — lift capability decreases as pressure altitude increases.
4. Relative wind — lift capability decreases as relative wind decreases.
5. Ground effect — lift capability varies with surface stability and decreases as height above deck is increased. The effect is lost when the helicopter passes over the deck edge.
6. Density altitude is a function of pressure altitude, humidity, and ambient temperature. Density altitude should be included in the prelaunch brief in accordance with paragraph 3.9.2.

WARNING

On DD 963/DDG 993/CG 47 Class ships, the number 3 SSTG is located just aft of the flight deck in the normal approach path of a helicopter. This generator, while operating, emits a large volume of hot exhaust that will degrade helicopter engine performance/lift capability. The pilot shall be informed if the generator is operating.

3.2.2 Operational Limitations

3.2.2.1 Radius of Action. Helicopters have a short radius of action because of a relatively low speed and limited endurance. This limited radius of action can be increased with HIFR from appropriately equipped ships. Maximum speeds range from 95 to 190 knots. Endurance varies from 2 to 5 hours without HIFR, depending on aircraft type, mission configuration, and time spent in hover. Other variables, such as weather/winds, navigation aids, ship's PIM, two-way voice communications, escort aircraft, and availability of positive radar control can further affect the radius of action and shall be given due consideration in the preflight planning of all missions. As a general rule, the radius of action, all conditions being optimum, shall not exceed 45 percent of maximum range specified for each type of aircraft listed in Appendix B. The radius of action may be further reduced at night under electronic EMCON or IMC for those aircraft with limited internal DR navigation systems. Fuel cells are available for certain helicopters over and above normal model configuration and can be used to extend range and endurance (see specific aircraft NATOPS flight manual).

3.2.2.2 Payloads. The takeoff weights listed in Appendix B are published for standard sea-level conditions. The lifting capability may be appreciably different from that which is published when atmospheric conditions and aircraft configurations are not standard. Helicopter loading is limited by the allowable fore-aft shift in the center of gravity. Exceeding the manufacturer's specifications compromises flying safety; therefore, the loading of passengers and cargo must be carefully planned and supervised.

3.3 SUPPORT REQUIREMENTS

3.3.1 Logistics. The Commander, Naval Air Force, or Commanding General, Fleet Marine Force, who provides the helicopter squadron/detachment shall ensure that an appropriate aviation support allowance list is developed and that the required material is provided to the ship concerned. The supporting ship is responsible for maintaining appropriate stock levels.

In certain cases, a helicopter detachment will be assigned to a ship for a limited period of time or specific operational assignment wherein the provision of material support can be satisfied by use of a packup kit developed by the parent command of the detachment. Replacement of expended packup kit support items, if a packup kit is required, will be the responsibility of the helicopter detachment's parent command.

3.3.2 Helicopter Maintenance. The scope of shipboard maintenance will vary depending upon the available facilities and the number of aircraft embarked. Ships that operate independently should use the maintenance facilities of aircraft carriers and shore stations whenever possible. If a helicopter is taken to a shore station for maintenance, it will be necessary for personnel to remain ashore to perform maintenance and to provide security of the helicopter.

Daily, preflight, and/or turnaround inspections may require several hours to perform and may have effective periods that are dependent on aircraft type. Many maintenance functions require a functional checkflight to ensure that correct repairs have been completed. Detailed inspection requirements should be solicited from the helicopter OIC to facilitate daily and weekly planning.

3.3.3 Corrosion Control. Saltwater corrosion is one of the major problems encountered when operating helicopters at sea. Most present-day operational helicopters have structural components made of materials that are susceptible to saltwater corrosion. Additionally, gas turbine engines used in helicopters can suffer a critical loss of performance because of saltwater corrosion and salt encrustation. Damage resulting from corrosion can quickly reduce all aircraft to a nonoperational status unless an effective program of corrosion control is rigorously pursued. The ship is responsible for maintaining a suitable stock of corrosion control materials, tailored to the appropriate type of helicopter, when a detachment is embarked.

Air-capable ships should provide sheltered deck space for helicopters whenever possible. Freshwater outlets and hoses shall be available on the flight deck so that the aircraft can be washed down with fresh water. Although creating an additional demand on the water distilling and storing facilities, a daily freshwater washdown is the most effective method of preventing saltwater corrosion. The frequency of washdowns must be determined on an individual ship basis with due consideration given to operating conditions and the availability

of fresh water from the ship and from outside sources. Helicopters in unsheltered stowage normally require 500 gallons daily for fresh water washdown purposes. Helicopters in sheltered stowage normally require 100 gallons.

Corrosion control and engine maintenance may require the starting of engines without engaging rotors for those aircraft fitted with rotor brakes. Flight quarters need not be set if helicopter personnel have access to firefighting equipment. The OOD shall be notified before starting engines.

3.4 HELICOPTER FACILITIES CERTIFICATION

3.4.1 Air-Capable Ship Certification. Air-capable ships that are charged with conducting flight operations or evolutions, including land/launch, VERTREP, and HIFR, are required to be certified for operation at the levels and classes directed by CNO. The Air-Capable Ships Aviation Facilities Bulletin No. 1 promulgates procedures for formal inspection and certification of all required aviation facilities and equipments to ensure that they are installed and functioning properly and that all safety requirements are met. Upon meeting inspection requirements, each helicopter facility is granted a certification by the Naval Air Warfare Center Aircraft Division, Lakehurst, NJ. These certification requirements are necessary for the ship to meet the level and class operational capabilities established in the OPNAVINST 3120.35 series. The Shipboard Aviation Facilities Resume (NAEC-ENG-7576) lists the established air-capable ships facilities, operations required, certification granted, last certification inspection, and ships in the class.

3.4.1.1 Certification Waivers. When operational necessity requires that an uncertified ship operate with aircraft, or that a currently certified ship operate with aircraft for which it is not normally certified (but whose operation can safely be conducted), the Fleet Commander in Chief is authorized to issue a waiver in accordance with OPNAVINST 3120.28. If granted, the waiver enables the ship to conduct operations within known limitations and/or deficiencies. The waiver is issued by message containing the following information:

1. Specific levels, classes, and types of helicopters
2. Specific operating procedures
3. Specific mission, geographic location, time, etc.

CAUTION

Care must be exercised when operating aircraft from facilities that do not meet certification requirements. When operating under a waiver, all operating personnel, both air and ship, shall be briefed on the operational limitations and deficiencies.

3.4.2 General Requirements. Aviation facilities include visual landing aids, clearance, deck structure, communications, navigation aids, safety items, and mooring aids. Also included are all equipment and facilities to logistically support, service, and maintain a helicopter.

3.4.3 Levels and Classes. Operating levels and class requirements are directed by CNO with respect to the ship's inherent capability, mission, and facilities. Depending on the ship's capabilities and facilities provided, each certification is categorized by three levels, seven classes, and the types of helicopters to be operated.

3.4.3.1 Levels of Operation. The three levels of operation were established to differentiate between operational requirements. The levels are:

1. Level I — IMC day/night operations
2. Level II — VMC day/night operations
3. Level III — VMC day only operations.

3.4.3.2 Classes of Facilities. Seven classes of facilities were established to delineate those items requiring inspection and certification to support the operations intended:

1. Class 1 — Landing area with support (service and maintenance) facilities for the types of aircraft certified
2. Class 2 — Landing area with service facilities for the types of aircraft certified
3. Class 2A — Landing area with limited service facilities for the types of aircraft certified
4. Class 3 — Landing area for the types of aircraft certified; no service facilities
5. Class 4 — VERTREP/hover area (minimum hover height of 5 feet) for types of aircraft certified