U.S. Department
of Transportation
Federal Aviation
Administration

Advisory Circular

Subject: Approval of Offshore Standard Approach Procedures, Airborne Radar Approaches, and Helicopter En Route Descent Areas

Date: 12/21/17
Initiated by: AFS-400

AC No: 90-80C
Change:

This advisory circular (AC) provides guidance for instrument operations to offshore landing facilities. This AC includes application and procedures to show an alternate means authorized by the Federal Aviation Administration (FAA) for compliance with the regulations contained in Title 14 of the Code of Federal Regulations (14 CFR) part 91, which address instrument approach requirements. Specifically, this AC provides guidance for obtaining approval for Offshore Standard Approach Procedures (OSAP), Airborne Radar Approaches (ARA), and Helicopter En Route Descent Areas (HEDA). This AC retains the ARA, parallel offset OSAP, Delta 30° OSAP and the HEDA along with Global Positioning System (GPS) navigation for the OSAP and HEDA operations contained in AC 90-80B. Approvals issued to U.S. operators may be used as a basis for authorization by other state authorities to conduct equivalent operations.

John S. Duncan
Executive Director, Flight Standards Service

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CHAPTER 1. GENERAL INFORMATION AND BACKGROUND

1.1 **Purpose of This Advisory Circular (AC).** This AC provides criteria and describes acceptable methods for obtaining approval to use Offshore Standard Approach Procedures (OSAP), Airborne Radar Approaches (ARA), and Helicopter En Route Descent Areas (HEDA) to descend in uncontrolled airspace to an altitude where the pilot can proceed to land using visual references to the surface. This AC provides operational approval information for operators conducting operations under Title 14 of the Code of Federal Regulations (14 CFR) parts 91, 91 subpart K (part 91K), and 135 to support issuance of operations specifications (OpSpec) or letters of authorization (LOA).

1.2 **Audience.** The primary audience for this AC is the helicopter proponent, principal operations inspectors (POI), and the NextGen Branch (AFS-480) when establishing offshore instrument operations.

1.3 **Where You Can Find This AC.** You can find this AC on the FAA's website at http://www.faa.gov/regulations_policies/advisory_circulars.

1.4 **What This AC Cancels.** AC 90-80B, Approval of Offshore Standard Approach Procedures, Airborne Radar Approaches, and Helicopter En Route Descent Areas, dated April 12, 1999, is canceled.

1.5 **Explanation of Changes.** This AC retains the OSAP, ARA, and HEDA that were in AC 90-80B. It updates the approval and maintenance procedures for an operator to obtain permission to fly the operations. All references to the use of long-range navigation-C system (LORAN-C) have been removed.

1.5.1 Operation Terminology. An OSAP, ARA, and HEDA are not considered special instrument approach procedures (IAP), therefore the appropriate term is "instrument operations." These operations allow helicopters to make an instrument flight rule (IFR) en route descent/letdown offshore within a specified area of operation. Upon reaching visual conditions, the pilot proceeds using visual references to a landing location to execute an offshore landing on an oil rig or platform. These instrument operations are approved by the Federal Aviation Administration (FAA) for individual operators and issued through OpSpecs or LOAs. The FAA does not verify that the procedure is clear of obstructions, only that it is over water. The pilot verifies there are no obstructions using their approved weather radar. The FAA also does not verify that positive course guidance is available, provided the proponent is using a Global Positioning System (GPS) and has procedures to verify GPS availability for the operation. No flight inspection or other validation is provided or required.

1.5.2 Responsibilities. Clarified the responsibilities for the POI and added guidance for AFS-480.

1.5.3 Weather. Added new guidance for approved weather sources and weather reporting requirements for OSAP, ARA, and HEDA (see paragraph 1.9). This guidance reflects the weather requirements that have been available via OpSpec.

1.6 Applicability. For onshore guidance, refer to FAA Order 8260.19, Flight Procedures and Airspace, and FAA Order 8260.42( ), United States Standard for Helicopter Area Navigation (RNAV). In lieu of following the guidance in this AC without deviation, operators may elect to follow an alternative method, provided the alternative method is found to be acceptable by the FAA.

1.6.1 Mandatory terms used in this AC such as "must" are used only in the sense of ensuring applicability of these particular methods of compliance when the acceptable means of compliance described herein are used. This AC does not change, add, or delete regulatory requirements or authorize deviations from regulatory requirements.

1.6.2 Most of the document references in this AC are the current version as designated by parentheses ( ) placed at the end of the document title. In some cases, the actual version will be indicated by a letter. Documents without ( ) or a letter after the end of the document title designates all versions apply. As a convenience, most references are hyperlinked to the source website for that document.

1.6.3 It is not the intent of this AC to imply that operators with approvals to older or expired documents must recertify to the current version. Operators with prior approvals may continue to operate under those approvals.

1.7 Airworthiness Guidance. Airworthiness guidance is provided in this AC primarily for awareness of general legacy standards by the operator community, but it is incomplete for airworthiness applicants (refer to 14 CFR parts 27 and 29).

1.8 Background.

1.8.1 Criteria. The criteria for developing offshore instrument operations are unlike that used for IAPs. Offshore instrument operation course alignment may vary from one operation to the next at the same location. The offshore instrument operation courses depend on the direction and velocity of the wind and the location of transient obstacles such as barges with cranes, and ships. Airborne weather radar in ground mapping mode is used to maintain separation from obstacles. The first instrument operation approved for helicopters operating under IFR over water was the HEDA. This operation allowed helicopters to make an IFR en route descent to a radio altitude (RA) of 400 feet (ft) within a specified area of operation that is clear of obstructions. Upon reaching visual conditions, the helicopter proceeds to its destination. HEDAs permit a single instrument operation to serve multiple offshore landing sites. Helicopter ARAs evolved from HEDAs. AC 90-80, Approval of Airborne Radar Approaches (ARA) Procedures for Helicopters to Offshore Platforms, dated May 18, 1981, contained an acceptable means for operators to obtain approval of ARA. ARAs were intended to replace HEDAs. However, HEDAs were retained because they required less time for approval and served larger areas. By the time an ARA is approved, the platform may have been moved to a new location, making the operation obsolete. It became apparent that a new type of operation was needed that incorporated the advantages of both HEDAs and ARAs while providing an acceptable level of safety. This resulted in OSAPs, which may be automated using a unique aircraft patented solution. For automated OSAPs, there are avionics and application requirements of an OSAP in addition to required aircraft automation equipment.

1.8.2 Testing. In January 1980, the FAA and the National Aeronautics and Space Administration (NASA) conducted a helicopter flight test program in the Gulf of Mexico to evaluate the feasibility of using airborne weather radar in ground mapping mode as an operation system for offshore drilling platforms. In September 1984, the FAA conducted further testing in the Gulf of Mexico. In these later tests, airborne weather radar in ground mapping mode was evaluated to determine if it was feasible to use radar as a primary device for detecting and avoiding obstructions. The radars that were tested were found acceptable for obstruction detection and avoidance only when the cross-wind correction angle did not exceed 10 degrees on final approach course. Recommendations from reports of these tests were used to develop guidelines for the OSAP. OSAPs apply to helicopter operations to and from offshore platforms, rigs, or ships, and are not to be used less than 5 nautical miles (NM) from land. Previously, the OSAP had only an offset final; then AC 90-80B added the use of GPS and the Delta 30° OSAP.

1.9 Weather.

1.9.1 Approved Weather Sources. The following are approved weather sources:

1. Providers using National Weather Service (NWS) weather as their source (including contract observatories).
2. Flight Service Stations (FSS).
3. Automated Surface Observing System (ASOS).
4. Automated Weather Observing System (AWOS).
5. Supplementary Aviation Weather Reporting System (SAWRS).
6. Limited Aviation Weather Reporting Stations (LAWRS).
7. Onsite certified weather observers.

1.9.2 Weather Report Requirements for OSAP, ARA, or HEDA.

1.9.2.1 **Aircraft Performance.** Aircraft performance is predicated on aircraft weight, ambient temperature, wind direction, wind speed, and altimeter setting. In order to ensure aircraft takeoff and landing limitations are met and obstacles avoided, an aviation weather report must contain at least the following elements:

- Station identifier (e.g., airport code);
- Date and time of observation (to establish relevance of the report);
- Ambient temperature at the station (e.g., airport or seaport);
- Wind direction;
- Wind speed;

- Altimeter setting at the station;
- Visibility; and
- Ceiling.

1.9.2.2 ASOS and AWOS. An ASOS or AWOS supplies an automated surface weather observation. ASOS and AWOS observations in Aviation Routine Weather Report (METAR) and Aviation Selected Special Weather Report (SPECI) formats are transmitted electronically to the National Weather Service (NWS) where they are processed (conversion to international units) and retransmitted worldwide. The NWS requires METAR and SPECI for the generation of the Terminal Area Forecasts (TAF). The NWS commissions ASOSs and the FAA commissions AWOS sites. The AWOSs, though not approved directly by the NWS, are approved by agreement and in collaboration with the NWS. The FAA follows the NWS commissioning and installation guidelines.

1. All ASOS are automatically NWS/FAA approved weather sources.
2. All AWOS-3s (or better) are automatically FAA/NWS-approved weather sources. AWOS systems below the AWOS-3 level are not FAA/NWS-approved weather sources, with the exception of an AWOS-2, which is approved for limited use (see item 3 below).
3. AWOS-2 is approved for limited use only. An AWOS-2 does not report ceiling information; therefore, an AWOS-2 is not an NWS/FAA-approved weather source, for use under the following circumstances:
   - IFR operations that require ceiling information are prohibited at airports where AWOS-2 reports are the only official source of weather information.
   - Terminal visual flight rule (VFR) operations are prohibited at airports at which an AWOS-2 is the only official source of weather information.
   - An airport at which an AWOS-2 is used solely as the official source of weather information is prohibited for use as an alternate airport.
   - At airports where ceiling information is required to comply with nonstandard takeoff minimums dictated by 14 CFR part 97 or OpSpecs, IFR takeoffs are prohibited if an AWOS-2 is the sole source of weather information.

1.9.3 Minimum IFR Altitude (MIA). The offshore MIA is as directed by air traffic control (ATC).

1.9.4 Holding. Holding may be accomplished at each of the waypoints depicted in Figure 2-2, OSAP Initial, Intermediate, Missed Approach, and Holding Segments. A standard Area Navigation (RNAV) holding pattern with 3 NM leg length, flown at 100 knots indicated airspeed (KIAS), must be executed to remain within ATC-protected airspace.

1.9.5 Automatic Dependent Surveillance-Broadcast (ADS-B) Installation. ADS-B equipment should be installed in accordance with AC 20-165( ), Airworthiness Approval of Automatic Dependent Surveillance-Broadcast Out Systems. The operator's installed ADS-B Out equipment must meet the performance requirements of one of the following FAA Technical Standard Orders (TSO) or later revisions: TSO-C154c, Universal Access Transceiver (UAT) Automatic Dependent Surveillance-Broadcast (ADS-B) Equipment Operating on Frequency of 978 MHz; or TSO-C166b, Extended Squitter Automatic Dependent Surveillance-Broadcast (ADS-B) and Traffic Information Service-Broadcast (TIS-B) Equipment Operating on the Radio Frequency of 1090 Megahertz (MHz).

1.9.6 Compliance. Flightcrews must comply with the procedures prescribed in the Air Traffic Offshore IFR Helicopter Operations Letter of Agreement for the given area of operations.

Note: Flightcrews should be made aware that not enabling or stopping altitude squawk on some transponders that are certified to TSO-C166b while operating in "ADS-B Only" airspace will lead to a condition where their aircraft's ADS-B signal will not appear on ATC displays.

1.9.7 **AC Feedback Form.** For your convenience, the AC Feedback Form is the last page of this AC. Note any deficiencies found, clarifications needed, or suggested improvements regarding the contents of this AC on the Feedback Form.

CHAPTER 2. OFFSHORE STANDARD APPROACH PROCEDURES

2.1 Applicability. This chapter applies to helicopter OSAP for a descent into uncontrolled airspace to proceed using visual references to offshore landing sites conducted under instrument flight rules (IFR). The operations criteria in this AC apply to airborne weather radar with ground mapping mode that has a demonstrated navigational capability acceptable to the Administrator for OSAP.

2.1.1 Types of OSAP. OSAP consists of two types of procedures: Delta 30° and parallel offset OSAP. For the standard OSAP operations, the Delta 30° OSAP is preferred. A parallel offset OSAP may be used when obstructions do not allow for a Delta 30° OSAP.

2.2 Helicopter Requirements.

2.2.1 Radar and Radio Altimeter. Before being authorized to conduct OSAPs, each operator who applies must have at least one helicopter equipped with airborne radar approved for OSAP use, an IFR-approved Global Positioning System (GPS) navigation receiver, and a radio altimeter.

2.2.2 Navigation Equipment Requirements. The navigation equipment must meet the minimum requirements of Technical Standard Order (TSO)-C129, Airborne Supplemental Navigation Equipment Using the Global Positioning System (GPS); TSO-C145, Airborne Navigation Sensors Using the Global Positioning System (GPS) Augmented by the Wide Area Augmentation System (WAAS); or TSO-C146, Stand-Alone Airborne Navigation Equipment Using the Global Positioning System (GPS) Augmented by the Wide Area Augmentation System (WAAS); with an external course deviation indicator (CDI) or horizontal situation indicator (HSI) mounted in the pilot's primary instrument scan. (Refer to AC 91-70( ), Oceanic and Remote Continental Airspace Operations.)

2.2.3 Reference System Requirements. The reference coordinate datum system used for all operations must be World Geodetic System 1984 (WGS 84) or North American Datum of 1983 (NAD 83).

2.2.4 Airborne Radar.

2.2.4.1 Suitable for Use as Primary Instrument Operation Aid. The airborne weather radar systems that have proved suitable for use as primary instrument operation aids are short-range pulse radars, manufactured and approved for the purpose of weather avoidance rather than navigation. Minimum system components for operations based on airborne radar only (with or without beacon capability) are as follows:

1. Meet the requirements of either TSO-C63, Airborne Weather Radar Equipment, or TSO-C102, Airborne Radar Approach and Beacon Systems for Helicopters.

2. Contain a stabilized 120-degree/60-degree sector scanning antenna with scan rates no less than 12/minute (min) and 24/min respectively.
3. Contain an adjustable, bright display.
4. Contain an alphanumeric display for selected ranges and azimuth markers; however, alphanumeric displays of selected ranges are not required when a positive means of determining the range that has been selected is available and the radar operator is appropriately trained.
5. Contain an indicated range error that does not exceed ±0.2 NM for display ranges of 5 NM or less.
6. Contain a lowest selectable range display of 2.5 NM and a range mark display of 0.5 NM increments or smaller.
7. Contain tilt control of ±15 degrees.
8. Display a test pattern.
9. Be operable in the primary mode.
10. Be equipped with a fault monitor or self-test function.

Note: An operational course bearing cursor that provides course guidance may be used to supplement navigation track accuracy.

2.2.5 Radio Altimeter.

2.2.5.1 **TSO Requirement.** The radio altimeter must meet the requirements of TSO-C87, Airborne Low-Range Radio Altimeter.

Note: A radio altimeter must be installed and operational before descent to the radio altitude (RA) minimum descent height (MDH) is authorized.

2.3 Airworthiness.

2.3.1 Equipage and Installation Requirements. Equipment required for OSAPs must be installed and maintained in a manner that meets all applicable airworthiness standards. The selected equipment components must, as a minimum, meet the referenced TSO applicable to each requirement and be specifically approved for OSAPs by the appropriate Flight Standards office. Equipment not meeting these standards requires further evaluation and approval by FAA engineering before it may be used. Installation of airborne radar, radio altimeter, and GPS equipment may constitute a major alteration to the aircraft. Each person who approves a helicopter for return to service after modification for OSAPs must comply with the provisions of 14 CFR part 43, §§ 43.5 and 43.7.

2.4 Maintenance.

2.4.1 Title 14 CFR Part 135. Part 135 operators must maintain their aircraft under part 135 requirements and their approved maintenance program. Airborne radar, radio altimeter, and GPS maintenance must be performed for this equipment installed in the aircraft.

2.4.2 Title 14 CFR Part 91. Part 91 operators must maintain their aircraft under part 91 operating procedures. Airborne radar, radio altimeter, and GPS maintenance must be performed for this equipment installed in the aircraft. Operators under part 91 using OSAPs who do not have an approved maintenance program should establish procedures to annually inspect and test the OSAP equipment. These procedures should include methods for analyzing malfunctions and defects to determine whether established inspections and tests reasonably ensure the equipment is maintaining its accuracy. In addition to the equipment manufacturer's recommendations and Supplemental Type Certification (STC), the following test and inspections should be included:

2.4.2.1 **Visual Inspection.** A visual inspection to determine the condition and security of the equipment mounting, electrical wiring and connectors, radome, antennas and cables, wave guide and couplings, indicator mounts, knobs, etc.

2.4.2.2 **Functional Test.** A functional test of the airborne radar ground mapping mode, radio altimeter, and navigation system to determine operating condition. Tests should be performed in accordance with appropriate manufacturer's procedures.

2.4.2.3 **Other Tests/Inspections (as appropriate).** Other appropriate tests and inspections are used to determine whether the complete system is operating properly.

Note: The inspection and test procedures will be approved by the Flight Standards office issuing the OSAP authorization before the operator conducts any IFR OSAP in instrument meteorological conditions (IMC).

2.5 **Flight Standards Office Approval.** Each operator's maintenance program must be approved by the Flight Standards office issuing the OSAP authorization before any IFR OSAPs may be conducted. A certificated air carrier submits a written request with the proposed chart through the certificate-holding district office (CHDO) principal operations inspector (POI). The CHDO ensures that a particular radar and GPS meet minimum requirements, the flightcrew training requirements are met, and helicopter and avionics maintenance requirements are adequate. The CHDO should request support from the appropriate Flight Standards office or the NextGen Branch (AFS-480) representative. Each operator's maintenance or inspection program must be approved by the Flight Standards office issuing the OSAP authorization before any OSAP operations in IMC may be conducted.

2.6 Procedure Development Criteria.

2.6.1 Sample OSAP. The certificated air carrier or operator submits the operation request including the proposed chart to the principal inspector (PI) of the appropriate Flight Standards office or CHDO. The PI should notify AFS-480 for operational coordination within their specified area of operation. For operations outside of the appropriate Flight Standards office operational area, AFS-480 should coordinate with the controlling air traffic facility and Flight Standards office (if required) for the intended operational area. Instrument operation chart examples are in Appendix B, Figure B-1, Sample Delta 30° OSAP, and Figure B-2, Sample Parallel Offset OSAP. A separate chart for each OSAP is not required.

2.6.1.1 **Procedure Identification.** The procedure is identified as either, "DELTA 30° OSAP" or "PARALLEL OFFSET OSAP."

2.6.1.2 **Procedure Construction.** En route construction provides separation of aircraft 6 NM either side of course to as small as 4 NM either side of course on airways or routes. The Minimum IFR Altitude (MIA) in offshore airspace and within oceanic airspace is charted on the operation chart. Figure 2-1, En Route Criteria, shows the plan view and cross-sectional view of these criteria in the grid system in the Gulf of Mexico. Sample OSAP charts are in Appendix B, Figures B-1 and B-2. Chart the following notes in the plan view:

1. "Special Authorization Required. WX Radar in ground mapping mode and GPS required."
2. "Maintain MIA until departing the en route fix."
3. "Select a maximum of 1 NM CDI sensitivity when departing the en route fix."

2.6.2 Initial and Intermediate Segment Construction. The initial and intermediate segment construction consists of a route segment that extends from an en route fix (grid fix in the Gulf of Mexico) to fly over the approach target with course reversals that extend to the final course. Seven-NM arcs are also constructed for optional routing to the final course. A 7-NM fix is charted from the approach target site for optional direct routing to the final segment. These segments are flown no lower than 900 ft mean sea level (MSL) until the Final Approach Point (FAP) inbound to the approach target (see Figure 2-2, OSAP Initial, Intermediate, Missed Approach, and Holding Segments). Chart the following note in the plan view: "Clear all obstructions by at least 0.5 NM laterally by radar after FAP inbound."

2.6.3 Final Segment Construction. The final segment construction consists of either the Delta 30° or parallel offset OSAP, which are described in paragraphs 2.15 and 2.16. Figure 2-3, Delta 30° OSAP, and Figure 2-4, Parallel Offset OSAP, depict the Delta 30° and parallel offset OSAPs. Chart the following notes on the Delta 30° OSAP and parallel offset OSAP:

1. "Proceed Visually to the Landing Site."
2. "Maximum Ground Speed is 70 knots between FAP and MAP."
3. "DPA (Not less than 2 NM from approach target)." The Decision Point Altitude (DPA) must not be lower than the barometric minimum descent altitude (MDA) adjusted for the Remote Altimeter Setting Source (RASS). The DPA is charted as follows: "500 MSL or no lower than barometric MDA adjusted for RASS."
4. "Δ 30° heading at 1.1 NM from landing site." In addition to Figure 2-4, annotate on the chart: "0.5 NM offset."

2.6.3.1 **Minimums.** Chart the following note when the radio altimeter is not available for an operation: "Altimeter source more than 5 NM but less than 75 NM, increase MDA 5 ft for each NM beyond 5 NM." (See Appendix B, Figures B-1 and B-2.)

2.6.4 Departure and Alternate. Chart the following notes for the departure and the alternate:

1. "Avoid radar targets by 0.5 NM laterally until reaching 900′ MSL when making IFR departures."
2. "When an offshore facility is designated as an alternate, use 800-2 instrument procedure alternate minimums or as approved by OpSpecs, or LOA (Letter of Authorization)."

2.7 Missed Approach Procedure Construction.

1. Chart the following missed approach instructions for the Delta 30° OSAP: "Climb to 900′ via the Δ 30° heading, then climbing turn to 2000′, direct to the approach target within 10 NM and hold, 3 NM legs, or as directed by ATC."
2. Chart the following missed approach instructions for the parallel offset OSAP: "Climb to 900′ via the offset course, then climbing turn to 2000′, direct to the approach target within 10 NM and hold, or as directed by ATC."

2.7.1 Missed Approach Holding [Delta 30° OSAP, Parallel Offset OSAP]. Chart the following holding instructions: "Hold over the approach target on the inbound course, 3 NM legs, maintain 2000′ or as directed by ATC."

2.8 Operational Requirements.

2.8.1 Approved Weather Observation and Reporting Requirements. Refer to FAA Order 8900.1 Volume 4, Chapter 7, Section 1, Instrument Flight Rules Offshore Operations.

2.8.2 Offshore Environment Operation. Operators approved to conduct IFR operation in the offshore environment in accordance with parts 91, 91K, and 135 for the appropriate operational approval (e.g., letter of authorization (LOA) or operations specification (OpSpec)) may comply with the requirements by any one of the following methods or one with an equivalent level of safety approved by the Administrator:

1. One station: The operation coordinate shall be within 10 NM of an approved weather reporting station.
2. Two stations: The operation coordinates shall fall within an observed area defined by the location of two approved weather reporting stations.
   - The observation area centerline is established by the actual bearing between the two stations. The actual distance between the two stations is not to exceed 40 NM. The centerline shall continue on either side of each weather station by a distance of 10 NM.
   - The lateral width of the observed area may not be greater than 40 NM on either side of the established centerline.
   - The resultant maximum observation area is a rectangle 60 NM by 80 NM.

2.8.3 Parts 91 and 135 Operators—Authorized Areas of En Route Operations, Limitations, and Provisions.

1. Operators conducting IFR operations in areas authorized by OpSpec B050, Authorized Areas of En Route Operations, Limitations, and Provisions, will comply with the requirements of the OpSpec.
2. Part 91 operations within oceanic airspace are covered in LOA H104, Helicopter Offshore Instrument Operations, and the applicable International Civil Aviation Organization (ICAO) Annex.

2.9 Guidelines. Procedures and guidelines of OSAP are as follows:

1. Minimum equipment lists (MEL) must be modified to account for the effect of inoperative equipment on OSAP.
2. Flightcrews are provided with current observed coordinates for landing sites. Before departure, the flightcrew enters the observed landing site coordinates into the navigation system receiver flight plan. This action designates the landing site as a “waypoint.”
3. Flightcrews should use detailed procedures to ensure clearly defined crew duties for two-pilot operations. GPS or wide area augmentation system (WAAS) is used for course guidance, and airborne radar in ground mapping mode is used for obstruction identification and avoidance.
4. All OSAPs are applicable only to helicopter operations to and from offshore platforms, rigs, or ships, and are not to be used less than 5 NM from land.

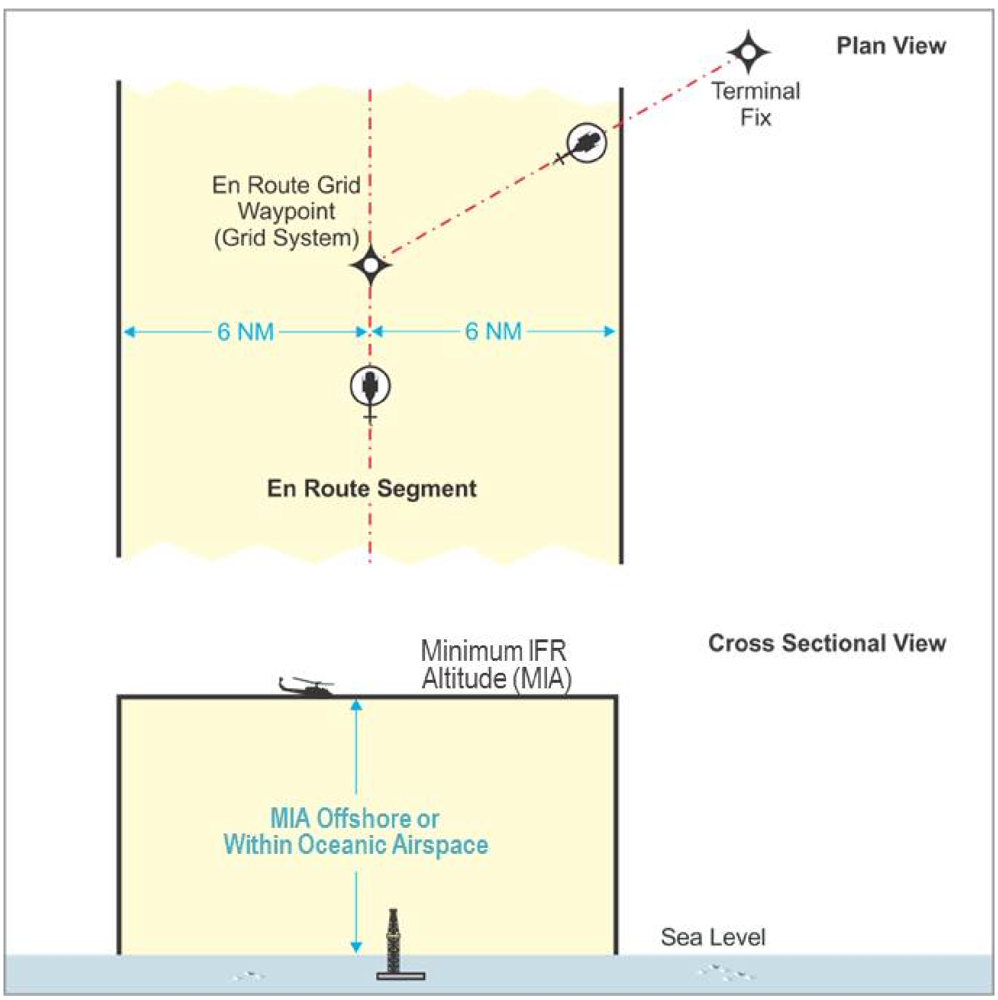
5. Throughout this operation, the airborne radar antenna sweep must not be less than 120 degrees. Less than a 120-degree antenna sweep will limit the radar operator's ability to accurately observe and locate obstructions. Smaller sweep angles increase the possibility of premature loss of peripheral radar targets.

2.10 En Route and Intermediate.

2.10.1 Individual OSAP Accommodation. Accommodations for individual OSAPs is not required for flight from the last fix (or en route grid waypoint in the Gulf of Mexico) on the airway or route segment to the intermediate approach fix (IF) along a Very High Frequency Omnidirectional Range Collocated Tactical Air Navigation (VORTAC) or Area Navigation (RNAV) routing. Procedures unique to an OSAP begin at the IF, which may begin over the approach target, on an arc, or at the IF if approaching "straight-in" to the IF.

2.10.2 Descent Authorization. A descent below the MIA is not authorized at any point until the helicopter has departed the last en route fix and is offshore (see Figure 2-1).

Figure 2-1. En Route Criteria



2.11 Final Approach Segment (FAS).

2.11.1 Alignment with FAS. Alignment with the FAS may be achieved by:

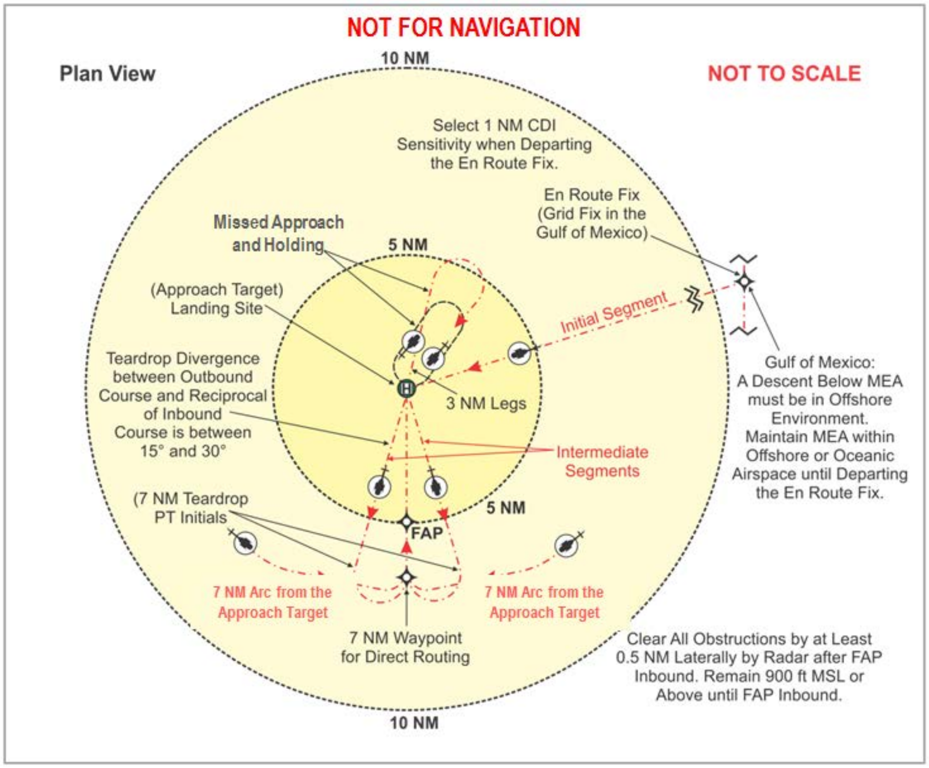
1. Proceeding directly to a user-defined transition waypoint generated 7 NM from the approach target on the final approach to the target;
2. A teardrop 7-NM procedure (the procedure turn must remain within 10 NM of the approach target); or
3. A 7-NM arc entry to the final segment.

2.12 En Route Fix Departure. A CDI sensitivity of 1 NM or less is set when departing the last en route fix.

2.12.1 Airborne Radar and GPS Monitoring. During all phases of the en route and intermediate segments, the flightcrew monitors the airborne radar and GPS systems to determine reliability and operational correctness.

2.13 Final Approach Course. For radar detection and avoidance of obstructions, the final approach course is flown into the wind within 10 degrees of the wind direction for Delta 30° and parallel offset OSAPs. This course is flown to the delta change point for the Delta 30° OSAP and to the missed approach point (MAP) for the parallel offset OSAPs. After turning to the final course (Delta 30° OSAP, parallel offset OSAP), a descent is made to no lower than 900 ft MSL prior to reaching the FAP. The crew establishes the FAP at not less than 5 NM from the approach target. At the FAP, a descent is made to no lower than 500 ft MSL prior to reaching the DPA. The crew establishes the DPA at not less than 2 NM from the approach target. At the DPA, the crew confirms the final approach course is clear laterally of all obstacles by at least 0.5 NM before a descent is made to the MDA. If lateral separation is not assured by 0.5 NM, a missed approach is initiated. For the Delta 30° OSAP, a 30-degree turn is made at 1.1 NM from the approach target to the clear area either to the left or right of the approach target. The Delta 30° course is determined by adding 30 degrees to or subtracting 30 degrees from the inbound heading (see Figure 2-2).

Figure 2-2. OSAP Initial, Intermediate, Missed Approach, and Holding Segments



2.14 Missed Approach.

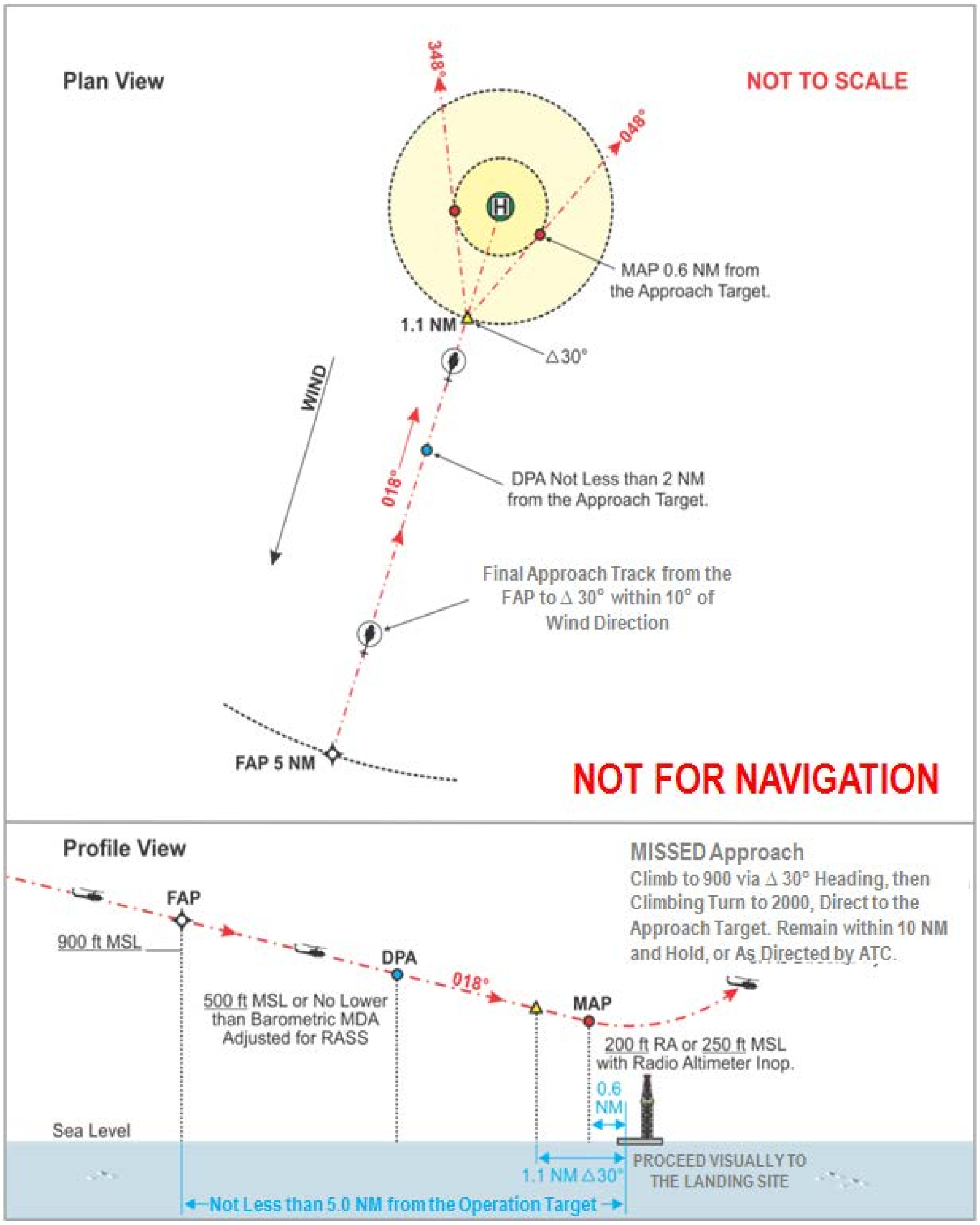
2.14.1 Conditions. During the final approach course, if the navigation system and airborne radar display difference exceeds ±0.2 NM in range or azimuth, or the approach target is lost from the airborne radar display for one full sweep, an immediate missed approach must be made.

2.15 Delta 30° OSAP.

2.15 Delta 30° OSAP. The following operations are required for the Delta 30° OSAP (see Figure 2-3):

1. The DPA is established after the FAP but not less than 2 NM from the landing site, depending on obstacles within 0.5 NM of the final approach course.
2. The Delta 30° heading is made either to the right or left of the straight-in portion of the inbound course depending on the clear area determined by the radar operator. The Delta 30° heading is maintained until the MAP if visual reference is not established with the landing site.
3. Between the FAP and the MAP, the maximum ground speed is 70 knots.
4. While on the Delta 30° heading and prior to the MAP, when visual reference with the landing site is established, the pilot proceeds visually to the landing area. If visual reference with the landing site is not established prior to the MAP and the pilot cannot proceed visually to the landing area, a missed approach must be executed (see Figure 2-3).

Figure 2-3. Delta 30° OSAP



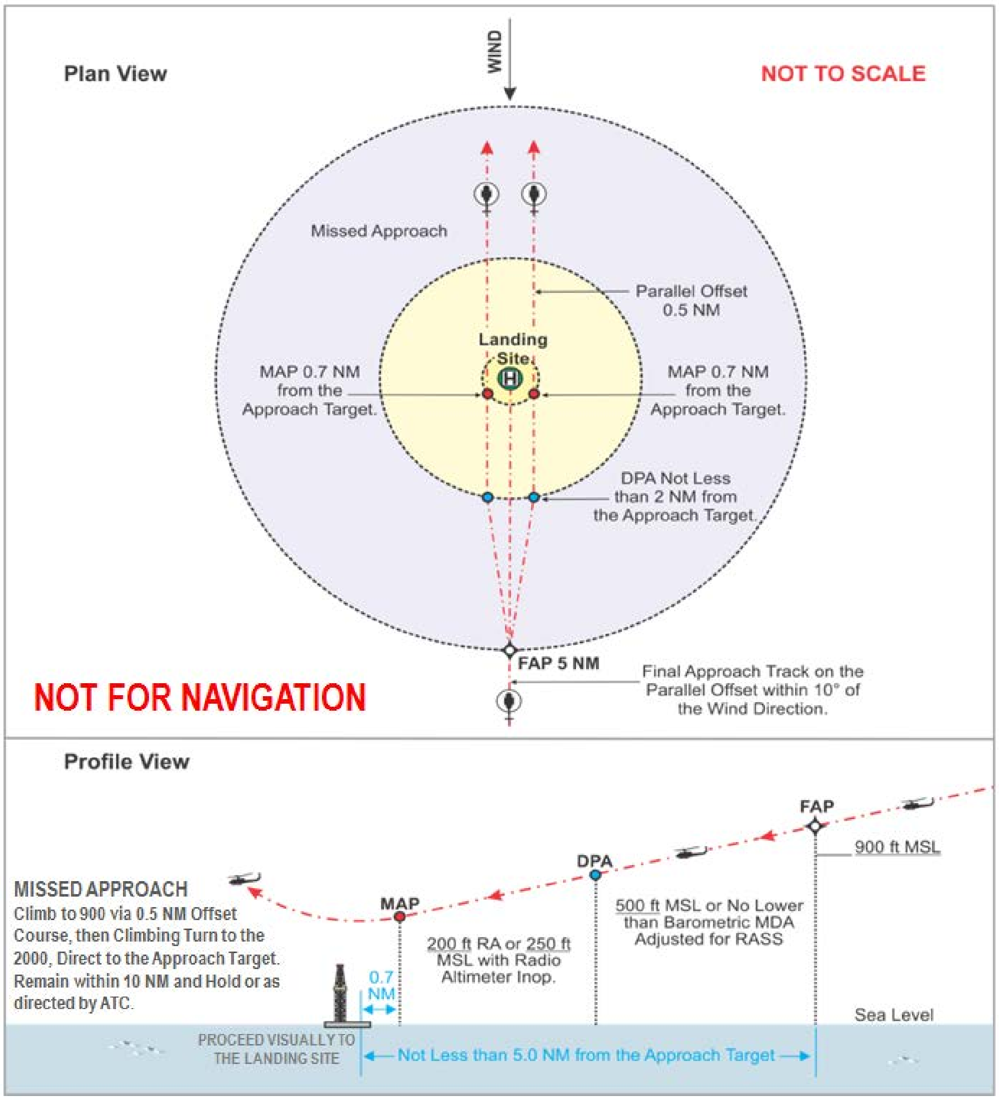
2.16 Parallel Offset OSAP.

2.16.1 Procedures. The following procedures are required for the parallel offset OSAP (see Figure 2-4):

1. Departing the FAP inbound, either a left or right turn is made to a heading that is established from the FAP on the 0.5 NM parallel offset inbound course.
2. The direction of turn is selected based on the clear area determined by the radar operator.

3. The DPA is established after the FAP but not less than 2 NM from the landing site, depending on obstacles within 0.5 NM of the offset course. This depends on the radar return of obstacles within the final area. The helicopter must be established on the parallel offset course prior to the DPA.
4. Between the FAP and the MAP, the maximum ground speed is 70 knots.
5. After passing the DPA, a descent is made to the MDA on the parallel offset course. The parallel offset course is maintained until the MAP or visual reference is made with the landing site.
6. A turn is made to the landing site after visual reference is established.
7. If visual reference with the landing site is not established by the MAP and the pilot cannot proceed visually to the landing site, a missed approach is executed (see Figure 2-4).

Figure 2-4. Parallel Offset OSAP



2.17 Missed Approach and Holding Procedures.

2.17.1 Delta 30°OSAP MAP. The MAP is a point on the course established by the Delta 30° heading at 0.6 NM from the landing site.

2.17.2 Parallel Offset OSAP MAP. The MAP on the parallel offset final approach course is a point on the offset course at 0.7 NM from the landing site.

2.17.3 Missed Approach Procedure. The missed approach procedure for both operations is a climb to 900 ft MSL via the Delta 30° heading or parallel offset course, then a climbing turn to the 2,000 ft direct to the approach target while remaining within 10 NM of the approach target and hold 3 NM legs, or as directed by air traffic control (ATC) (see Figure 2-2).

2.17.4 Holding After the Missed Approach. Holding is over the approach target fix on the missed approach inbound course with 3 NM legs, maintaining the 2,000 ft, or as directed by ATC (see Figure 2-2).

2.17.5 Executing a Missed Approach. A missed approach is executed when any one of the following events occurs:

1. Visual reference with the landing site is not made at the MAP.
2. Failure of the navigation system.
3. Failure of the airborne radar.
4. The approach target is lost from the airborne radar display for one full sweep.
5. When the radar operator determines the helicopter's track will not avoid all obstacles by at least 0.5 NM.
6. When within close proximity of the MAP, if visual contact is not established, make only minor heading changes to avoid flight closer than 0.5 NM to any radar returns while following GPS course guidance during a missed approach.
7. Lost communication procedure after the missed instrument operation. Execute the published missed approach and then proceed directly to the alternate at the MIA.

2.18 Minimums.

2.18.1 Takeoff Minimums:

1. The takeoff visibility for offshore landing sites is ½ statute mile (sm) or lower if authorized by OpSpecs or LOA. In the event that the takeoff is conducted from a facility without weather reporting, the flightcrew may determine the available required visibility.

2. When departing an offshore landing site, avoid all obstructions by at least 0.5 NM when below 900 ft MSL.
3. If unable to comply with the above, maintain visual flight rules (VFR) until clear of all obstructions.

2.18.2 Landing Minimums:

1. RA 200 ft and ¾ sm visibility.
2. Barometric altitude 250 ft MSL and ¾ sm visibility.
3. Requirements for charting the MDA:
   - RA 200 ft: Radio altimeter must be operative.
   - Barometric altitude 250 ft MSL: When radio altimeter is not available. When the barometric altimeter setting is received from a source that is more than 5 NM from the landing site, increase the MDA by 5 ft for each mile in excess of 5 NM. The maximum distance for a remote altimeter setting source from a landing site is 75 NM.

2.18.3 Alternate Minimums and Requirements. Should an OSAP be specified for use as an offshore alternate, use the standard alternate minimums of 800 ft ceiling and 2 sm visibility. Requirements to establish an alternate are listed below:

1. Approved source of weather observations and reports.
2. Two-way communications with the offshore approach facility.
3. Any required onshore alternate requires a standard or special instrument approach other than GPS-based that is anticipated to be operational at the estimated time of arrival, unless the aircraft is equipped with approved TSO-C145( ) or TSO-146( ) avionics and STC for instrument operations, then the onshore airport can have a GPS-based approach.

2.19 Training.

2.19.1 Experience. Before conducting OSAP in IMC, each flightcrew member should have:

1. Ten hours of flightcrew experience operating IFR (at either crew station) in the offshore route structure.
2. A minimum of ten OSAPs for each type of navigation receiver with at least five for each type of procedure (HEDA, ARA, OSAP) and at least four from each crewmember position. This may be reduced by the POI for the operator based on the flightcrew experience and proficiency.

2.19.2 Training.

2.19.2.1 All training must be a matter of record.

2.19.2.2 After completing OSAP training, each flightcrew member must pass an OSAP flight proficiency check. They may then be authorized to use ceiling and visibility minimums of 300 ft RA and 1 sm. Each crewmember must then fly and record ten additional OSAPs for each type of navigation receiver and at least five for each type of procedure before receiving authorization to conduct a procedure to ceiling and visibility minimums lower than 300 ft RA and 1 sm. The POI may reduce these requirements based on the total crew experience provided the pilot in command (PIC) meets all the conditions of this paragraph.

2.19.2.3 The OSAP flight proficiency check is an annual requirement.

2.19.2.4 Helicopter flight simulators specifically approved for OSAP training by the National Flight Simulator Evaluation Team and the POI assigned to the operator may be used for any amount of required training.

2.19.2.5 In accordance with Order 8900.1, operators requesting authority to use OSAPs are required to satisfactorily train their flightcrew members under an FAA-approved training program before beginning OSAP operations. Operators should submit a proposed training program to the CHDO for approval. (See Appendix A for a sample training program.)

CHAPTER 3. AIRBORNE RADAR APPROACHES

3.1 Applicability. This chapter applies to helicopter ARA procedures for offshore landing sites conducted under instrument flight rules (IFR). The procedure criteria in this chapter applies to airborne weather radar with ground mapping mode that has a demonstrated navigational capability acceptable to the Administrator for ARA operations.

3.2 Helicopter Requirements.

3.2.1 Airborne Radar.

3.2.1.1 Suitable for Use as Primary Instrument Operation Aid. The airborne weather radar systems that have proved suitable for use as primary instrument operation aids are short-range pulse radars, manufactured and approved for the purpose of weather avoidance rather than navigation. Minimum system components for procedures based on airborne radar only (with or without beacon capability) are as follows:

1. As a minimum, ARA systems must meet the airworthiness requirements of TSO-C63, Airborne Weather Radar Equipment, or TSO-C102, Airborne Radar Approach and Beacon Systems for Helicopters.
2. Stabilized 120-degree/60-degree sector scanning antenna with scan rates of no less than 12/min and 24/min respectively.
3. Adjustable light display.
4. Alphanumeric display for selected ranges and azimuth markers; however, alphanumeric display for selected ranges is not required when:
   - A positive means for determining selected scale is available, and
   - The radar operator is appropriately trained.
5. The indicated range error should not exceed ±0.2 NM for display ranges of 5 NM or less.
6. The lowest selectable range display should be at least 2.5 NM with a range mark display of 0.5 NM to meet the authorized landing minimums. Equipment that provides a lowest range display of 5 NM with a range mark display of 1 NM may be used, but a ¼ NM penalty is imposed on established visibility minimums.
7. Tilt control ±15 degrees.
8. Test pattern.
9. Primary mode (beacon mode may be necessary for cluster approach).
10. Fault monitor or self-test.

11. An operational course bearing cursor that provides course guidance is required to fly cluster operations below obstacles.
12. With zero pitch and roll signals applied to the antenna scanner representing level flight attitude, the indicator update strobe line should indicate the antenna beam center to within ±3 degrees at any scan angle.

3.2.2 Radio Altimeter.

3.2.2.1 **Technical Standard Order (TSO) Requirement.** The radio altimeter must meet the requirements of TSO-C87, Airborne Low-Range Radio Altimeter.

Note: A radio altimeter must be installed and operational before descent to the radio altitude (RA) minimum descent height (MDH) is authorized.

3.2.3 Offshore Heliport Facilities. When required to ensure positive identification of targets, a radar transponder beacon should be evaluated during the approval process.

3.3 Airworthiness.

3.3.1 Installation Requirements. Installation of an ARA system for IFR use is a major change in type design, and the provisions of 14 CFR part 21, § 21.97 and part 43, §§ 43.5 and 43.7 apply. The following are requirements for system installation:

1. System controls and data displays must be conveniently accessible and visible to radar operators at their duty stations. The system controls should be protected against inadvertent operation.
2. Electrical power for the system should be obtained from a bus that provides maximum reliability for electrical power without jeopardizing other essential or emergency loads.
3. The ARA system should not be a source of objectionable electromagnetic interference and must not be adversely affected by electromagnetic interference from other helicopter equipment.
4. Any probable malfunction of the ARA system should not adversely affect the normal operation of other systems or equipment installed in the helicopter.
5. System performance should not be adversely affected by helicopter attitude, altitude, or main rotor revolutions per minute (rpm) normally encountered in flight operations.

3.4 Maintenance.

3.4.1 Title 14 CFR Part 135. Part 135 operators must maintain their aircraft under part 135 requirements and their approved maintenance program. Airborne radar, radio altimeter, and Global Positioning System (GPS) maintenance must be performed for this equipment installed in the aircraft.

3.4.2 Title 14 CFR Part 91. Part 91 operators must maintain their aircraft under part 91 operating procedures. Airborne radar, radio altimeter, and GPS maintenance must be performed for this equipment installed in the aircraft. Operators under part 91 using ARAs who do not have an approved maintenance program should establish procedures to annually inspect and test the ARA equipment. These procedures should include methods for analyzing malfunctions and defects to determine whether established inspections and tests reasonably assure the equipment is maintaining its accuracy. In addition to the equipment manufacturer's recommendations and Supplemental Type Certification (STC), the following test and inspections should be included:

3.4.2.1 **Visual Inspection.** A visual inspection to determine the condition and security of the equipment mounting, electrical wiring and connectors, radome, antennas and cables, wave guide and couplings, indicator mounts, knobs, etc.

3.4.2.2 **Functional Test.** A functional test of the airborne radar ground mapping mode, radio altimeter, and navigation system to determine operating condition. Tests should be performed in accordance with appropriate manufacturer's procedures.

3.4.2.3 **Other Tests/Inspections (as appropriate).** Other appropriate tests and inspections are used to determine whether the complete system is operating properly.

Note: The inspection and test procedures will be approved by the Flight Standards office issuing the ARA authorization before the operator conducts any IFR ARA procedure in instrument meteorological conditions (IMC).

3.5 **Flight Standards Office Approval.** Each operator's maintenance program must be approved by the Flight Standards office issuing the ARA authorization before any IFR ARA procedures may be conducted. A certificated air carrier submits a written request with the proposed chart through the certificate-holding district office (CHDO) principal operations inspector (POI). The CHDO ensures that a particular radar and GPS meet minimum requirements, the flightcrew training requirements are met, and helicopter and avionics maintenance requirements are adequate. The CHDO should request support from the appropriate Flight Standards office or the NextGen Branch (AFS-480) representative. Each operator's maintenance or inspection program must be approved by the Flight Standards office issuing the ARA authorization before any ARA operations in IMC may be conducted.

3.6 **Procedure Development Criteria.**

3.6.1 Sample ARA. The certificated air carrier or operator submits the operation request including the proposed chart to the principal inspector (PI) of the appropriate Flight Standards office or CHDO. The PI should notify AFS-480 for operational coordination within their specified area of operation. For operations outside of the appropriate Flight Standards office operational area, AFS-480 should coordinate with the controlling air traffic facility and Flight Standards office (if required) for the intended operational area. Instrument operation chart examples are in Appendix B, Figure B-3, Sample ARA Chart for Single Platform, and Figure B-4, Sample ARA Chart for Platform Cluster. The following note is charted in the plan view of the operation: "Special Authorization. WX RADAR in ground mapping mode required."

3.6.1.1 Procedure Identification. The procedure is identified as "ARA" with the name of the cluster or rig (e.g., "WINTR 120"). If the operation requires beacon capability, the operation will be annotated "Beacon Required." A note specifying the platform containing the beacon is printed on the plan view of the chart (e.g., "Beacon on Platform 1"). (See Appendix B, Figure B-4.)

3.6.1.2 Procedure Construction. For ARA procedures, obstructions 50 ft or higher above the surface are considered obstacles. Where landing sites or operation targets are less than 100 ft above the surface, all obstacles within 50 ft of the site's height must be charted. An ARA procedure to an offshore site has two areas: the intermediate area, and the final operation area. Missed approach airspace is contained within the two areas (see Figures 3-1, Single Approach Target Area, and Figure 3-2, Cluster Approach Target Area). Determine whether the operation is for a single landing site or for a cluster of landing sites. Identify the final approach area and connect it to the en route structure by an overlying intermediate area that is used for transition. The procedure must also contain the onshore navigation facility, the route designation, and the location of the destination site or landing site cluster. The ARA chart contains a table to determine the time required to fly an outbound 4 NM leg for a teardrop procedure turn. Sample ARA charts are contained in Appendix B, Figures B-3 and B-4.

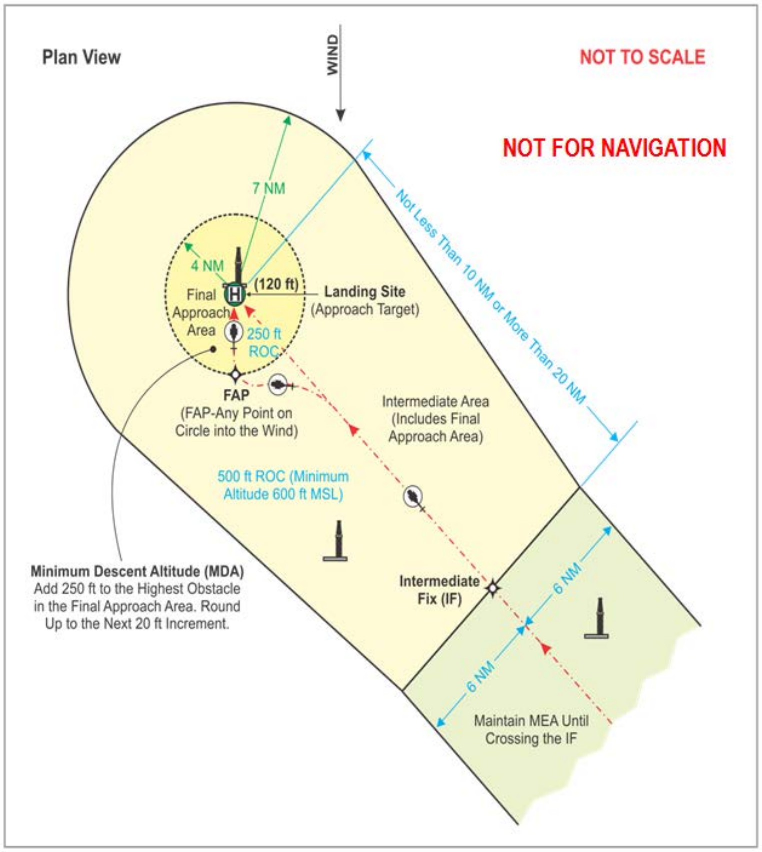
3.6.1.3 Single Approach Target Procedure Construction. This procedure provides for an into-the-wind final descent to the landing site from any direction, depending on the surface wind reported in the approach target area and the operating procedures selected by the flightcrew (see Figure 3-1).

1. Intermediate Approach Fix (IF). The IF is located on the en route course centerline not less than 10 NM or more than 20 NM from the approach target.
2. Obstacle Clearance. The Required Obstruction Clearance (ROC) for the intermediate approach area is 500 ft above the highest known obstacle in the intermediate approach area until arrival at the Final Approach Point (FAP) inbound. The lowest charted minimum altitude is 600 ft mean sea level (MSL) and is charted as follows: "600′ MSL or no lower than the barometric MDA adjusted for RASS." This note is required to assure that the FAP altitude is no lower than the minimum descent altitude (MDA) adjusted for the Remote Altimeter Setting Source (RASS).

3. Intermediate Approach Area. The intermediate approach area is centered on a straight course between the IF and the operation target. The intermediate approach area is bounded by an arc having a 7 NM radius centered on the approach target. Straight lines drawn tangent to the arc extend the area to the en route boundaries at the IF. The intermediate approach area overlies and includes the entire final approach area.

3.6.2 Final Approach Area. The final approach area is the area contained within a circle with a 4 NM radius centered on the approach target.

Figure 3-1. Single Approach Target Area



3.6.2.1 Single Approach Target Landing Minimums.

3.6.2.1.1 Radio Altimeter. The RA is the higher of RA 200 ft or 50 ft above the landing site. The RA MDA visibility is ¾ sm.

3.6.2.1.2 Barometric MDA. The barometric MDA minimums are computed by adding 250 ft to the highest obstacle in the final approach area, and this value is rounded up to the next 20-ft increment. In Figure 3-1, the highest obstacle in the final approach area is a 120-ft oil derrick. A ROC of 250 ft is added to the MSL height of this derrick. The MDA is rounded up to 380 ft MSL. An adjustment is made for the RASS when the source is more than 5 NM from the landing site. The barometric MDA visibility is ½ sm.

3.6.3 Cluster Approach Target Procedure Construction. This procedure provides for an into-the-wind final descent to the cluster area from any direction, depending on the surface wind reported in the cluster area, and the procedure selected by the flightcrew. A plan view for a cluster instrument approach target area is shown in Figure 3-2.

3.6.3.1 **IF.** The IF is located on the en route course centerline not less than 10 NM and/or more than 20 NM from the nearest landing site or approach target in the cluster.

3.6.3.2 **ROC.** The ROC for the intermediate operation segment is 500 ft above the highest known obstacle in the intermediate operation area. The lowest intermediate altitude is 700 ft MSL and is charted as follows: "700′ MSL or no lower than the barometric MDA adjusted for RASS." This note is required to assure that the FAP altitude is no lower than the MDA adjusted for the RASS.

3.6.3.3 **Intermediate Approach Area.** The intermediate approach area is bounded by arcs whose radii are centered on each outlying landing site or approach target in the cluster. Each radius is 7 NM. Straight lines drawn tangent to arcs at the lateral extremities of this area extend the area to the en route boundaries at the IF. The intermediate approach area overlays and includes the entire final approach area.

3.6.4 FAP. The FAP can be any point on the arcs defining the limits of the final approach area. The FAP is a point inbound to the landing site or approach target at 4 NM on the radar display.

3.6.4.1 **Final Approach Area.** The final approach area is bounded by arcs whose radii are centered on each outlying landing site or approach target in the cluster. Each radius is 4 NM.

3.6.5 Cluster Approach Target Landing Minimums (see Figure 3-2).

3.6.5.1 **Radio Altimeter.** The RA is the highest of the following: 200 ft RA, 50 ft RA above the landing site elevation, or 100 ft RA above the highest obstruction located within a cluster if a course bearing cursor is not used. The RA MDA visibility minimum is ¾ sm.

3.6.5.2 **Barometric MDA.** The barometric MDA minimums are computed by adding a ROC of 250 ft to the highest obstacle in the final approach area, and this is rounded up to the next 20-ft increment. In Figure 3-2, the highest obstacle in the final operation area is a 166-ft oil derrick. A ROC of 250 ft is added to this value. The MDA is rounded up to 420 ft MSL.

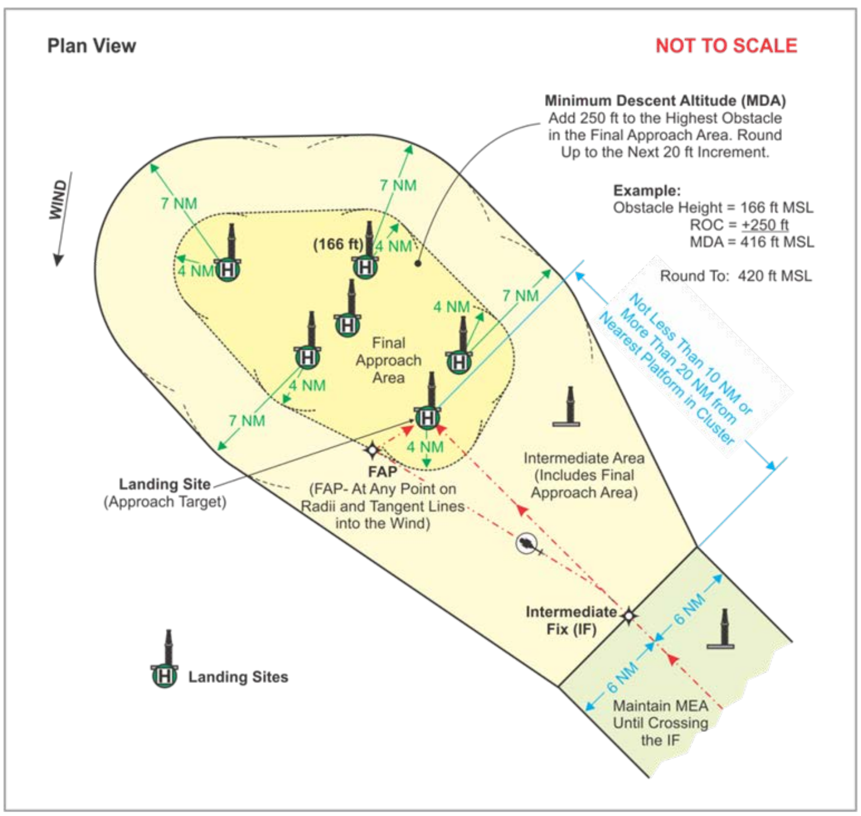
Note: The barometric MDA visibility is ½ sm or ¾ sm.

- If the lowest descent altitude is above obstructions, the lowest visibility is ½ sm.
- If the lowest descent altitude is below obstructions, the lowest visibility is ¾ sm.

3.6.5.3 **Proceeding Visually.** After visual reference with the landing site or approach target is established, the pilot proceeds visually to the landing site. Chart the following note: "PROCEED VISUALLY TO THE LANDING SITE."

3.6.5.4 **Chart Note.** Chart the following note for a RASS for the single and cluster operation target operations using barometric MDAs: "Altimeter source more than 5 NM but less than 75 NM, increase MDA 5′ for each mile over 5 NM from operation target."

Figure 3-2. Cluster Approach Target Area



3.7 Missed Approach Segment.

3.7.1 Missed Approach Construction. The missed approach is constructed for the single and cluster procedures in the same way. The missed approach begins at the missed approach point (MAP) and ends at an appropriate point or fix where intermediate approach or en route obstacle clearance is provided.

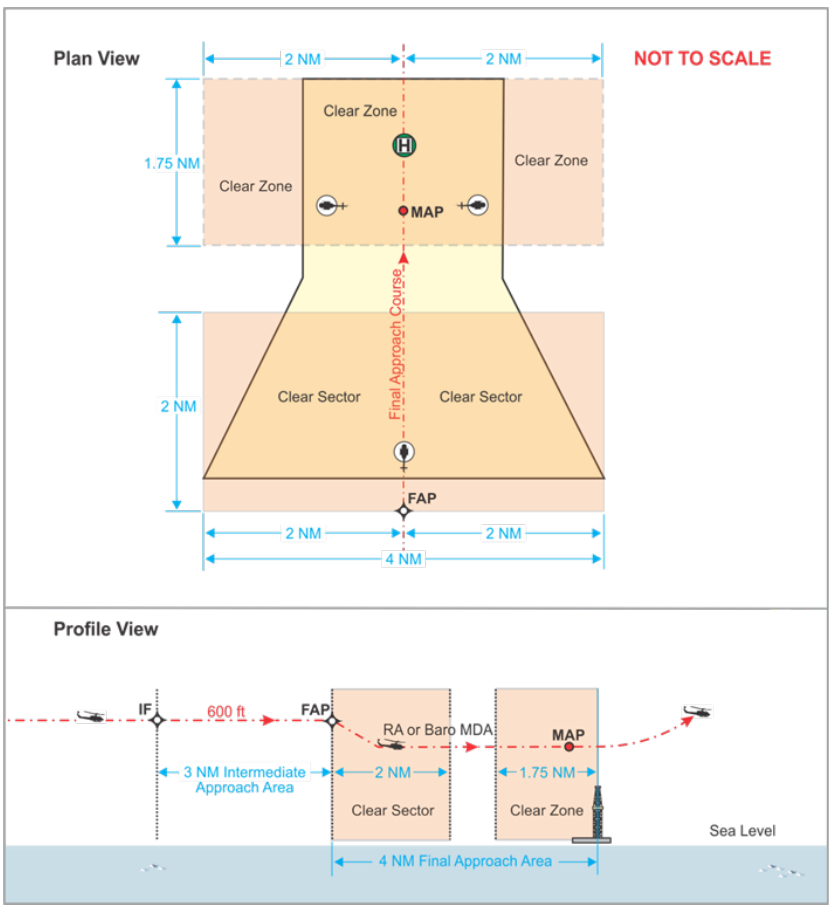
3.7.1.1 **MAP.** The MAP is no closer to the approach target than the minimum authorized visibility for landing, as observed on the radar display.

3.7.1.2 **Missed Approach Area.** The missed approach area is the clear zone left or right of the final approach course, 1.5 NM long and 2.0 NM wide (see Figure 3-3, Clear Zone and Clear Sector).

3.7.1.3 **Recording the Missed Approach.** Chart the following missed approach: "Climbing turn into the clear zone, then climbing turn to the MEA direct to the IF, or as directed by ATC."

3.7.2 Missed Approach Holding. Chart the following holding instructions: "Hold over the intermediate fix on the inbound course, 1 minute legs, maintain the MEA or as directed by ATC."

Figure 3-3. Clear Zone and Clear Sector



3.8 Operational Requirements.

3.8.1 Approved Weather Observation and Reporting Requirements. Refer to FAA Order 8900.1 Volume 4, Chapter 7, Section 1, Instrument Flight Rules Offshore Operations.

3.8.2 Offshore Environment Operation. Operators approved to conduct IFR operation in the offshore environment in accordance with parts 91, 91K, and 135 for the appropriate operational approval (e.g., letter of authorization (LOA) or operations specification (OpSpec)) may comply with the requirements by any one of the following methods or one with an equivalent level of safety approved by the Administrator:

1. One station: The operation coordinate shall be within 10 NM of an approved weather reporting station.
2. Two stations: The operation coordinates shall fall within an observed area defined by the location of two approved weather reporting stations.
   - The observation area centerline is established by the actual bearing between the two stations. The actual distance between the two stations is not to exceed 40 NM. The centerline shall continue on either side of each weather station by a distance of 10 NM.
   - The lateral width of the observed area may not be greater than 40 NM on either side of the established centerline.
   - The resultant maximum observation area is a rectangle 60 NM by 80 NM.

3.8.3 Parts 91 and 135 Operators—Authorized Areas of En Route Operations, Limitations, and Provisions.

1. Operators conducting IFR operations in areas authorized by OpSpec B050, Authorized Areas of En Route Operations, Limitations, and Provisions, will comply with the requirements of the OpSpec.
2. Part 91 operations within oceanic airspace are covered in LOA H104, Helicopter Offshore Instrument Operations, and the applicable International Civil Aviation Organization (ICAO) Annex.

3.9 Course Guidance.

3.9.1 Use of Radar. The radar operator interprets radar returns on the cockpit display and vectors the helicopter clear of observed targets to the MAP. The nature of offshore operations is such that numerous permanent or transient targets may be displayed on radar. For ARA procedures, obstructions 50 ft or higher above the surface are considered obstacles. Where landing sites are less than 100 ft above the surface, all obstacles within 50 ft of the landing site’s height are charted. Those obstacles depicted within the final approach area on the ARA chart will include known height; however, those objects not shown on the chart must be considered moving obstacles of unknown height that radar provides means of lateral rather than vertical clearance on final approach. Before final approach, vertical clearance over surface obstacles is ensured by adherence to specified minimum altitudes. Missed approach obstacle avoidance is provided by an *immediate* climbing turn to a clear zone.

3.10 Planning.

3.10.1 ARA Procedure. Operational experience has shown that an ARA procedure to a single landing site is a relatively uncomplicated operation. However, operations to and from a landing site cluster increase the potential for operator error. This can be reduced by careful evaluation of the procedure during the approval process, adequate training by the operator, proper approach planning, and use of aids such as a course bearing cursor to supplement basic airborne radar.

3.10.2 Target Identification. Prompt and positive identification of the landing site solely by the use of ground mapping mode can be difficult when returns from moving targets confuse the pattern of the targets depicted in a cluster area. Where identification of a cluster cannot be ensured in ground mapping mode and approved air navigation facilities are unavailable to resolve target ambiguity, the approving authority should, as an option, consider whether to require installation of a radar beacon.

3.10.3 Approach Planning. To ensure obstacle-free flightpaths on final and missed approach, it is necessary to thoroughly scan and evaluate these areas before the operation is initiated.

3.10.4 Overshooting the MAP. Range errors caused by the time required for target update, possible equipment malfunctions, equipment accuracy, and crew reaction time may cause the MAP to be closer to the landing site than the desired MAP. While turning during the missed approach, airborne radar cannot be relied upon to provide lateral obstacle avoidance. Therefore, it is imperative that crews be trained to execute an immediate climbing turn toward a clear zone at the MAP. To ensure obstacle clearance, it is necessary to initiate the missed approach at the designated MAP. Otherwise, the flightpath could transgress an area that does not provide missed approach obstacle clearance.

3.10.5 Use of Course Bearing Cursor. A final approach flown by maintaining the operation target on the course bearing cursor increases the probability that the helicopter will be on the final approach course upon arrival at the designated MAP.

3.10.6 Flexibility. An offshore ARA requires procedural flexibility to provide options for the crew in planning the approach. The approach must provide a transition from an en route fix to a downwind position before beginning the final approach. This requires a provision in the approach for selection of a FAP that accounts for variations in wind conditions. On a cluster operation, where the close proximity of other targets does not permit sufficient lateral clearance for an ARA directly to the landing site, the operation can be made to a more suitable operation target located on the perimeter of the cluster and proceed visually to the landing site. Selection of an approach target depends upon existing wind conditions that in turn determine the location of the FAP, landing site selection, and missed approach clear zone. An approved ARA operation will provide an into-the-wind final descent to a cluster perimeter or to a single landing site from any direction.

3.11 System Limitations and Procedural Consideration.

3.11.1 Blind Flightpath Segments. If the FAP is not established directly downwind and the final approach course is not directly upwind, a homing approach will result. A homing approach can result in blind flightpath segments. This means that, with wind speeds as low as 0.3 of the airspeed, segments of the flightpath may not be visible to the radar operator when using a 40-degree sweep angle. When using a 120-degree sweep angle, a wind speed of 0.9 of the airspeed may cause blind flightpath segments. Homing approaches can occur whenever the wind speed-to-airspeed ratio is greater than or equal to:

$$\sin = \left(\frac{\text{sweep angle}}{2}\right)$$

3.11.1.1 **No-Wind Conditions.** In a no-wind condition, a target return 1 NM to the left or right of the 0-degree azimuth mark will disappear from the radar display at the following ranges as the distance to the target decreases:

Table 3-1. No Wind

Sweep Angle	Range
120 degrees	0.58 NM
80 degrees	1.19 NM
60 degrees	1.73 NM
40 degrees	2.75 NM

3.11.1.2 **Cross-Wind Conditions.** When a wind causes a 10-degree crab, or in a 10-degree offset approach, a target 1 NM to the side of the 0-degree azimuth mark away from the crab or offset will disappear at the following ranges:

Table 3-2. Cross Wind

Sweep Angle	Range
120 degrees	0.84 NM
80 degrees	1.73 NM
60 degrees	2.75 NM
40 degrees	5.67 NM

Note: Lateral obstacle clearance is accomplished by radar and therefore it is important that the FAP is clearly established.

3.12 Missed Approach Area.

3.12.1 Clear Zone. The clear zone in Figure 3-3 is designed to protect the missed approach. The dimensions of this figure are based on a helicopter being on track at the MAP with a ground speed of 70 knots and a climb gradient of no less than 304 ft/NM (355 ft/min).

3.13 Flightcrew Duties.

3.13.1 Development of Approach Procedures. Operators using airborne radar for offshore instrument flight should develop detailed approach procedures to ensure clearly defined flightcrew member duties for a two-pilot operation. Confusion or misunderstanding with respect to responsibility and authority during an airborne radar operation can be detrimental to safety. The following operating procedures were found both safe and usable during procedural development testing by the National Aeronautics and Space Administration (NASA) and the FAA.

3.13.2 En Route. Offshore en route navigational guidance may be based upon any approved system appropriate to the route flown. The last en route fix is also the IF and is based on en route facilities. The radar operator obtains weather information and other relevant data for the landing area, identifies the destination area operation target and landing site, determines the FAP and missed approach clear zone, and discusses the operation with the other pilot before arrival at the IF.

3.13.3 Approach. The radar operator vectors the helicopter from the IF to a position downwind from the landing site and provides all further vectors to the MAP. The pilot makes no heading changes except to those vectors specified by the radar operator. At the FAP, the crew confirms the final approach course is clear of all obstacles by at least 1 NM before a descent is made to the RA MDA. Descent on final approach may not begin until the radar operator confirms that all of the following conditions exist:

1. All equipment required for the approach is operating properly.
2. The final approach track does not overlay any obstacles other than the operation target, and when descending to the RA, the clear sector is clear of all obstacles.
3. The missed approach clear zone is free of obstacles.

3.14 Missed Approach and Holding.

3.14.1 Climbing Turn. A missed approach is a climbing turn into the clear zone (Figure 3-3) then a climbing turn to the Minimum IFR Altitude (MIA) direct to the IF or as directed by air traffic control (ATC). Holding is on the IF on the inbound course with 1-min legs or as directed by ATC.

3.14.2 Conditions for Missed Approach. A missed approach will be initiated immediately if:

1. A flightcrew member has not established visual contact with the approach target at the authorized minimum visibility distance as shown on the radar display;
2. During the inbound segment, if there is any malfunction of equipment required for the operation, unless the helicopter is in visual conditions and can continue to the landing site in visual conditions;
3. The operation target is lost during any single radar scan when the helicopter is within 2.5 NM of the target; or
4. Visual reference is lost while maneuvering to the landing site.

3.14.3 Lost Communication Procedure After the Missed Approach. Execute the published missed approach and then proceed direct to the alternate at the MIA.

3.14.4 Takeoff Minimums:

1. The standard takeoff visibility for offshore landing sites is ½ sm.
2. When departing an offshore landing site, avoid all obstructions by at least 0.5 NM when below 900 ft MSL.

3.14.5 Landing Minimums. Landing minimums must be specified as a barometric MDA based on vertical obstacle clearance, or an RA specified for use by operators with an operative radio altimeter and a course bearing cursor for operations to a cluster area. The altitude that descent is authorized depends on the following conditions:

1. All required equipment must be operational before descent to the RA MDA.
2. Descent below the barometric MDA is not authorized if:
   - Lateral clearance of 1 NM cannot be maintained;
   - Required offshore heliport facilities are not operational; and/or
   - A required radio altimeter is inoperative.

3.14.6 RA MDH. The RA is the lowest altitude that a descent is authorized in operations using airborne radar in ground mapping mode, an operational radio altimeter, and for cluster approaches, using a course bearing cursor. It is the highest of the following: 200 ft RA, 50 ft RA above the landing site elevation, or 100 ft RA above the highest obstruction located within a cluster if a course bearing cursor is not used. The RA MDH visibility is ¾ sm.

3.14.7 Barometric MDA. The barometric MDA is the lowest altitude that descent is authorized when 1 NM lateral obstacle clearance is not maintained, the offshore heliport facilities are not available, or the radio altimeter is not operative. The minimum barometric MDA is increased 5 ft for each NM over 5 NM from the altimeter setting source to the landing site. The maximum distance for a remote altimeter setting source from a landing site is 75 NM. The barometric MDA visibility is ½ sm.

3.14.8 Alternate Minimums and Requirements. Standard alternate minimums of 800 ft ceiling and 2 sm visibility for nonprecision procedures apply for ARAs to be used as an alternate. Requirements to establish an airport or landing site as an alternate are listed below:

1. Approved source of weather observations and reports;
2. Two-way communications with aircraft making an operation; and
3. Any required onshore alternate requires a standard or special instrument operation other than GPS-based that is anticipated to be operational at the estimated time of arrival, unless the aircraft is equipped with approved TSO-C145( ) or TSO-C146( ) avionics and STC for instrument operations, then the onshore can have GPS-based operation.

3.15 Training.

3.15.1 Experience. Before conducting ARA procedures in IMC, each flightcrew member should have:

1. Ten hours of flightcrew experience operating IFR (at either crew station) in the offshore route structure.
2. A minimum of ten ARAs and at least four from each crewmember position. This may be reduced by the POI for the certificate holder based on the flightcrew experience and proficiency.

3.15.2 Training.

3.15.2.1 All training must be a matter of record.

3.15.2.2 After completing ARA training, each flightcrew member must pass an ARA flight proficiency check. They may then be authorized to use the ARA to 100 ft above the lowest established ceiling minimums and ½ sm above the lowest established visibility minimums. Each crewmember must then fly and record ten additional ARAs before receiving authorization to conduct operations to the lowest established ceiling and visibility minimums required by the operator. The POI may reduce these requirements based on the total crew experience provided the pilot in command (PIC) meets all the conditions of this paragraph.

3.15.2.3 The flight proficiency check is an annual requirement.

3.15.2.4 Helicopter flight simulators specifically approved for ARA training by the National Flight Simulator Evaluation Team and the POI assigned to the operator may be used for any amount of required training.

3.15.2.5 In accordance with Order 8900.1, operators requesting authority to use ARAs are required to satisfactorily train their flightcrew members under an FAA-approved training program before beginning ARA operations. Operators should submit a proposed training program to the CHDO or appropriate Flight Standards office, as applicable, for approval. (See Appendix A for a sample training program.)

CHAPTER 4. HELICOPTER EN ROUTE DESCENT AREAS

4.1 Applicability. This chapter applies to HEDA procedures for offshore landing sites conducted under instrument flight rules (IFR). The procedure criteria in this AC apply to airborne weather radar with ground mapping mode that has a demonstrated navigational capability acceptable to the Administrator for HEDA operations.

4.2 Helicopter Requirements.

4.2.1 Radar and Radio Altimeter. Before being authorized to conduct HEDAs, each operator who applies must have at least one helicopter equipped with airborne radar approved for ground mapping mode use (see paragraph 4.2.4 below), an IFR-approved Global Positioning System (GPS) navigation receiver, and a radio altimeter (RA).

4.2.2 Navigation Equipment Requirements. The navigation equipment must meet the minimum requirements of Technical Standard Order (TSO)-C129, Airborne Supplemental Navigation Equipment Using the Global Positioning System (GPS); TSO-C145, Airborne Navigation Sensors Using the Global Positioning System (GPS) Augmented by the Wide Area Augmentation System (WAAS); or TSO-C146, Stand-Alone Airborne Navigation Equipment Using the Global Positioning System (GPS) Augmented by the Wide Area Augmentation System (WAAS); with an external course deviation indicator (CDI) or horizontal situation indicator (HSI) mounted in the pilot's primary instrument scan. (Refer to AC 91-70( ), Oceanic and Remote Continental Airspace Operations.)

4.2.3 Reference System Requirements. The reference coordinate datum system used for all operations must be World Geodetic System 1984 (WGS 84) or North American Datum of 1983 (NAD 83).

4.2.4 Airborne Radar.

4.2.4.1 Suitable for Use as Primary Instrument Operation Aid. The airborne weather radar systems that have proved suitable for use as primary instrument approach aids are short-range pulse radars, manufactured and approved for the purpose of weather avoidance rather than navigation. Minimum system components for operations based on airborne radar only (with or without beacon capability) are as follows:

1. Meet the requirements of either TSO-C63, Airborne Weather Radar Equipment, or TSO-C102, Airborne Radar Approach and Beacon Systems for Helicopters.
2. Contain a stabilized 120-degree/60-degree sector scanning antenna with scan rates no less than 12/min and 24/min respectively.
3. Contain an adjustable, bright display.

4. Contain an alphanumeric display for selected ranges and azimuth markers; however, alphanumeric displays of selected ranges are not required when a positive means of determining the range that has been selected is available and the radar operator is appropriately trained.
5. Contain an indicated range error that does not exceed ±0.2 NM for display ranges of 5 NM or less.
6. Contain a lowest selectable range display of 2.5 NM and a range mark display of 0.5 NM increments or smaller.
7. Contain tilt control of ±15 degrees.
8. Display a test pattern.
9. Be operable in the primary mode.
10. Be equipped with a fault monitor or self-test function.

Note: An operational course bearing cursor that provides course guidance may be used to supplement navigation track accuracy.

4.2.5 Radio Altimeter.

4.2.5.1 **TSO Requirement.** The radio altimeter must meet the requirements of TSO-C87, Airborne Low-Range Radio Altimeter.

Note: A radio altimeter must be installed and operational before descent to the radio altitude (RA) minimum descent height (MDH) is authorized.

4.3 Airworthiness.

4.3.1 Minimum Airworthiness Requirements. As a minimum, systems used for HEDA operations must meet the airworthiness requirements of TSO-C63 or TSO-C102. The selected equipment components must, as a minimum, meet the referenced TSO applicable to each requirement and be specifically approved for HEDAs by the appropriate Flight Standards office. Equipment not meeting these standards requires further evaluation and approval by FAA engineering before it may be used.

4.3.2 Installation Requirements. Installation of a systems used for HEDA operations for IFR use is a major change in type design, and the provisions of 14 CFR part 21, § 21.97 and part 43, §§ 43.5 and 43.7 apply. The following are requirements for system installation:

1. System controls and data displays must be conveniently accessible and visible to radar operators at their duty stations. The system controls should be protected against inadvertent operation.

2. Electrical power for the system should be obtained from a bus that provides maximum reliability for electrical power without jeopardizing other essential or emergency loads.
3. The systems used for HEDA operations should not be a source of objectionable electromagnetic interference and must not be adversely affected by electromagnetic interference from other helicopter equipment.
4. Any probable malfunction of the systems used for HEDA operations should not adversely affect the normal operation of other systems or equipment installed in the helicopter.
5. System performance should not be adversely affected by helicopter attitude, altitude, or main rotor revolutions per minute (rpm) normally encountered in flight operations.

4.4 Maintenance.

4.4.1 Title 14 CFR Part 135. Part 135 operators must maintain their aircraft under part 135 requirements and their approved maintenance program. Airborne radar, radio altimeter, and GPS maintenance must be performed for this equipment installed in the aircraft.

4.4.2 Title 14 CFR Part 91. Part 91 operators must maintain their aircraft under part 91 operating procedures. Airborne radar, radio altimeter, and GPS maintenance must be performed for this equipment installed in the aircraft. Operators under part 91 using HEDAs who do not have an approved maintenance program should establish procedures to annually inspect and test the HEDA equipment. These procedures should include methods for analyzing malfunctions and defects to determine whether established inspections and tests reasonably ensure the equipment is maintaining its accuracy. In addition to the equipment manufacturer's recommendations and Supplemental Type Certification (STC), the following test and inspections should be included:

4.4.2.1 **Visual Inspection.** A visual inspection to determine the condition and security of the equipment mounting, electrical wiring and connectors, radome, antennas and cables, wave guide and couplings, indicator mounts, knobs, etc.

4.4.2.2 **Functional Test.** A functional test of the airborne radar ground mapping mode, radio altimeter, and navigation system to determine operating condition. Tests should be performed in accordance with appropriate manufacturer's procedures.

4.4.2.3 **Other Tests/Inspections (as appropriate).** Other appropriate tests and inspections are used to determine whether the complete system is operating properly.

Note: The inspection and test procedures will be approved by the Flight Standards office issuing the HEDA authorization before the operator conducts any IFR HEDA procedure in instrument meteorological conditions (IMC).

4.5 Flight Standards Office Approval.

4.5.1 Maintenance Program. Each operator's maintenance program must be approved by the Flight Standards office issuing the HEDA authorization before any IFR HEDA procedures may be conducted. A certificated air carrier submits a written request with the proposed chart through the certificate-holding district office (CHDO) principal operations inspector (POI). The CHDO ensures that a particular radar and GPS meet minimum requirements, that the flightcrew training requirements are met, and helicopter and avionics maintenance requirements are adequate. The CHDO should request support from the appropriate Flight Standards office or the NextGen Branch (AFS-480) representative. Each operator's maintenance or inspection program must be approved by the Flight Standards office issuing the HEDA authorization before any HEDA operations in IMC may be conducted.

4.6 Procedure Development Criteria.

4.6.1 Sample HEDA. The certificated air carrier or operator submits the operation request including the proposed chart to the principal inspector (PI) of the appropriate Flight Standards office or CHDO. The PI should notify AFS-480 for operational coordination within their specified area of operation. For operations outside of the appropriate Flight Standards office operational area, AFS-480 should coordinate with the controlling air traffic facility and Flight Standards office (if required) for the intended operational area. An instrument operation chart example is in Appendix B, Figure B-5, Sample HEDA Chart. A separate chart for each HEDA is not required. When the operator meets all of the requirements, the CHDO approves the operation and issues operations specifications (OpSpecs) or a letter of authorization (LOA).

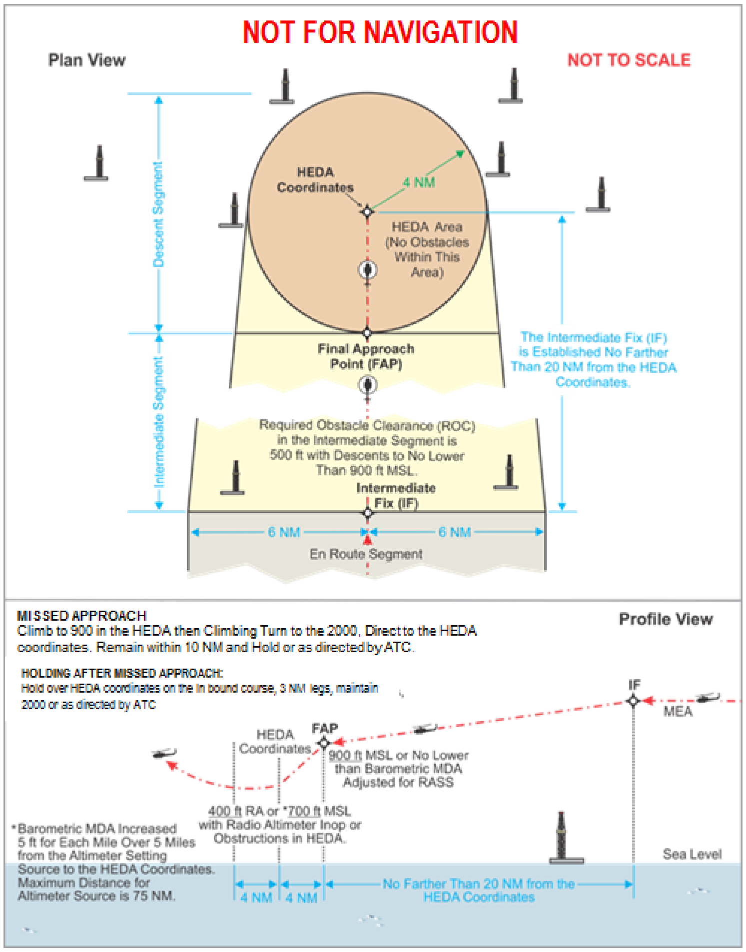
4.6.2 En Route. Apply Chapter 2, paragraph 2.10 for en route criteria.

4.6.3 Intermediate Segment. The plan view of the intermediate segment and HEDAs are shown in Figure 4-1, HEDA Descent Criteria. The intermediate approach fix (IF) is the last fix prior to the HEDA. The intermediate area is the same width dimensions as the en route segment at the IF. The outside edges of the intermediate segment at the IF are drawn tangent to the HEDA. The HEDA is a circle that has a radius of 4 NM. The HEDA must be free of all obstacles and must be located over the water. The Required Obstruction Clearance (ROC) for the intermediate segment is 500 ft with a descent charted to no lower than 900 ft mean sea level (MSL) or no lower than the barometric minimum descent altitude (MDA) adjusted for the Remote Altimeter Setting Source (RASS). The HEDA operation requires special authorization and equipment. Chart the following note in the plan view of the chart: "Special Authorization Required. WX RADAR in ground mapping mode, and GPS Required."

4.6.4 IF. The IF is established at no more than 20 NM from the HEDA coordinates.

4.6.5 Final Approach Point (FAP). The FAP is established on the HEDA circle. A descent is made at the FAP to the MDA.

Figure 4-1. HEDA Descent Criteria



4.6.6 Altitude Minimums. All required flight and navigation equipment must be installed and operative to descend to the 400 ft RA minimums. Chart the following notes (see Appendix B, Figure B-5):

1. "The MDA is 700′ MSL with radio altimeter or airborne radar ground mapping mode inoperative."
2. "The MDA is 700′ MSL with obstruction in HEDA."
3. "Altimeter source more than 5 NM but less than 75 NM, increase MDA 5′ for each NM over 5 NM from HEDA coordinates."
4. "Descent below 700′ is not authorized unless HEDA is clear of all obstructions."
5. "Descent from MIA to 900′ MSL is not authorized until within 20 NM of the HEDA coordinates."

4.6.7 Visibility Minimums. Chart the following note on the published operation: "Proceed VFR to the Landing Site."

4.6.8 Missed Approach. A missed approach is made when visual conditions cannot be established and maintained at the HEDA coordinates.

1. Chart the following missed approach instructions: "Climb to 900, then climbing turn to the 2000, direct to the HEDA coordinates. Remain within 10 NM and hold or as directed by ATC."
2. Chart the following missed approach holding instructions: "Hold over the HEDA coordinates on the inbound course, 3 NM legs, maintain the 2000 or as directed by ATC."
3. Filing a HEDA as an alternate in an IFR flight plan is not authorized. Chart the following note: "Filing HEDA as an alternate not authorized."

4.7 Operational Requirements.

4.7.1 Approved Weather Observation and Reporting Requirements. Refer to FAA Order 8900.1 Volume 4, Chapter 7, Section 1, Instrument Flight Rules Offshore Operations.

4.7.2 Offshore Environment Operation. Operators approved to conduct IFR operation in the offshore environment in accordance with parts 91, 91K, and 135 for the appropriate operational approval (e.g., LOA or OpSpec) may comply with the requirements by any one of the following methods or one with an equivalent level of safety approved by the Administrator:

1. One station: The operation coordinate shall be within 10 NM of an approved weather reporting station.
2. Two stations: The operation coordinates shall fall within an observed area defined by the location of two approved weather reporting stations.
   - The observation area centerline is established by the actual bearing between the two stations. The actual distance between the two stations is not to exceed 40 NM. The centerline shall continue on either side of each weather station by a distance of 10 NM.
   - The lateral width of the observed area may not be greater than 40 NM on either side of the established centerline.
   - The resultant maximum observation area is a rectangle 60 NM by 80 NM.

4.7.3 Parts 91 and 135 Operators—Authorized Areas of En Route Operations, Limitations, and Provisions.

1. Operators conducting IFR operations in areas authorized by OpSpec B050, Authorized Areas of En Route Operations, Limitations, and Provisions, will comply with the requirements of the OpSpec.

2. Part 91 operations within oceanic airspace are covered in LOA H104, Helicopter Offshore Instrument Operations, and the applicable International Civil Aviation Organization (ICAO) Annex.

4.8 En Route.

4.8.1 Navigation Guidance. Offshore en route navigational guidance may be based upon any approved system appropriate to the route flown. The last en route fix is based on en route facilities. In the Gulf of Mexico, the last en route waypoint prior to destination is the last en route waypoint prior to the HEDA. The radar operator obtains all relevant data for the landing area, identifies the destination area and landing site, and determines the FAP and missed approach clear zone. The radar operator then briefs the operation to the other pilot before arrival at the IF.

4.9 Intermediate Segment.

4.9.1 Descent Below Minimum IFR Altitude (MIA). A descent below the MIA is not authorized at any point in the HEDA until the helicopter has departed the last en route fix and is offshore. The en route fix is established prior to the intermediate segment at no more than 20 NM from the HEDA coordinates. A descent to an altitude no lower than 900 ft MSL is made on this segment (see Figure 4-1).

4.9.2 FAP Altitude. The FAP altitude is no lower than 900 ft MSL or the barometric MDA adjusted for the RASS. The FAP is established at 4 NM from the HEDA coordinates.

4.9.3 IF. Upon arrival at the IF, the radar operator will enter the GPS-published coordinates. Within 20 NM, or at the established IF, a descent is made to 900 ft MSL.

4.9.4 Confirm Clear of Obstacles. Confirmation is made by airborne radar that the HEDA is clear of obstacles.

4.9.5 Confirm Proper Equipment Operation Prior to Descent. The radar operator will assure that the airborne radar and radio altimeter are operating correctly prior to descending below 900 ft MSL or the minimum intermediate altitude adjusted for RASS. The lowest barometric MDA is 700 ft MSL.

4.9.6 Confirm Heading. The heading from the HEDA coordinates to the landing site should be confirmed in the intermediate segment.

4.10 Final Descent.

4.10.1 Select Lowest Appropriate Scale. Before descending below 700 ft MSL, the radar operator selects the lowest appropriate scale on the airborne radar and confirms the descent area is still clear and the radio altimeter is still operative.

4.10.2 Visual Conditions. A descent continues to 400 ft RA. Upon reaching visual conditions, the pilot proceeds to the landing site. If the pilot cannot proceed under visual conditions to the landing site, a missed approach is executed.

4.11 Limitations. Descent below 700 ft MSL is not authorized whenever any of the following conditions exist:

1. Any obstruction is detected in the HEDA.
2. Radio altimeter is inoperative.
3. Airborne radar is inoperative.

Note: Lowest altitude used for IFR flight in any HEDA must not be lower than 400 ft RA. The descent area must be entirely over water.

4.12 Missed Approach.

4.12.1 Climbing Turn. The missed approach is a climb to 900 ft in the HEDA then a climbing turn to 2,000 ft directly to the HEDA fix coordinates, remain within 10 NM of the HEDA, or as directed by air traffic control (ATC).

4.12.2 Holding. The missed holding procedure is established over the HEDA fix coordinates on the inbound course, with 3 NM legs, maintaining the MIA or as directed by ATC.

4.12.3 Conditions for Missed Approach Point (MAP). The missed approach must be executed when any of the following occurs:

1. Failure to establish and maintain visual conditions at the HEDA coordinates,
2. Failure of airborne radar or appearance of a radar target in the HEDA below 700 ft MSL, and/or
3. Failure of the radio altimeter below 700 ft MSL.

4.12.4 Lost Communication Procedure After the Missed Approach. Execute the published missed approach and then proceed directly to the alternate at the 2,000 ft.

4.13 Alternate Requirements.

4.13.1 Alternate Destination. When the IFR flight plan destination is a HEDA, an alternate destination must be filed. If the alternate is to an established onshore airport, a standard or special instrument operation other than GPS-based is required unless the aircraft is equipped with approved TSO-C145( ) or TSO-C146( ) avionics and STC for instrument approach procedures (IAP), then the onshore airport can have a GPS-based operation.

4.14 Training.

4.14.1 Experience. Before conducting HEDA operations in IMC, each flightcrew member should have:

1. Ten hours of flightcrew experience operating IFR (at either crew station) in the offshore route structure.

2. A minimum of ten HEDAs and at least four from each crewmember position. This may be reduced by the POI for the certificate holder based on the flightcrew experience and proficiency.

4.14.2 Training.

4.14.2.1 All training must be a matter of record.

4.14.2.2 After completing HEDA training, each flightcrew member must pass an HEDA flight proficiency check. They may then be authorized to use the HEDAs to 100 ft above the lowest established ceiling minimums and ½ sm above the lowest established visibility minimums. Each crewmember must then fly and record ten additional HEDAs before receiving authorization to conduct operations to the lowest established ceiling and visibility minimums required by the operator. The POI may reduce these requirements based on total crew experience provided the pilot in command (PIC) meets all the conditions of this paragraph.

4.14.2.3 The flight proficiency check is an annual requirement.

4.14.2.4 Helicopter flight simulators specifically approved for HEDA training by the National Flight Simulator Evaluation Team and the POI assigned to the operator may be used for any amount of required training.

4.14.2.5 In accordance with Order 8900.1, operators requesting authority to use HEDAs are required to satisfactorily train their flightcrew members under an FAA-approved training program before beginning HEDA operations. Operators should submit a proposed training program to the CHDO or appropriate Flight Standards office, as applicable, for approval. (See Appendix A for a sample training program.)

CHAPTER 5. REQUESTS FOR OPERATIONAL APPROVAL OF OSAP, ARA, OR HEDA OPERATIONS

5.1 Submission of Application for Operations Approval.

5.1.1 Written Request. The certificated air carrier or operator submits the operation request including the proposed chart to the principal inspector (PI) of the appropriate Flight Standards office or certificate-holding district office (CHDO). The PI should notify the NextGen Branch (AFS-480) for operational coordination within their specified area of operation. For operations outside of the appropriate Flight Standards office operational area, AFS-480 should coordinate with the controlling air traffic facility and Flight Standards office (if required) for the intended operational area. When the operator meets all of the requirements, the CHDO approves the operation and issues operations specifications (OpSpecs) or a letter of authorization (LOA). The CHDO may request support from another appropriate Flight Standards office or AFS-480 representative.

5.1.2 Evaluation. The FAA will evaluate the requests to ensure that particular radar and Global Positioning System (GPS) or other navigation requirement combination meets minimum requirements, flightcrew training requirements are met, and helicopter and avionics maintenance requirements are adequate. FAA engineering flight test and evaluation are required if a radar is installed that has not previously been approved for obstruction avoidance with ground mapping mode. The application should include the following items:

5.1.2.1 OSAPs, ARAs, or HEDAs:

1. A list of helicopters, the type of navigation equipment installed, and evidence of FAA approval of the airborne radar system for obstacle avoidance with ground mapping mode in accordance with the requirement of this AC.
2. A description of the equipment installation, helicopter flight manual supplements and changes, and proposed minimum equipment lists (MEL), if appropriate.
3. The training program.
4. The maintenance program.
5. Location of nearest weather and altimeter setting source.
6. Charted operations. The operator or the FAA may chart the operation on a reimbursable basis. The operator will submit the original charted operation to the CHDO with sufficient copies for the CHDO to send to, if appropriate, the Flight Standards office having jurisdiction.
7. Platform lighting.
8. Recommendation as to night operations.

9. Communication frequencies.
10. Platform markings.

5.1.2.2 **ARA (only).** The request should contain evidence of an FAA approval of any required ground-based transponder beacon and a description of any ground-based transponder beacon installation. The following are required for submission:

1. Navigation systems to be used (shore to platform).
2. Elevation and location of all landing platforms, rigs, or drilling ships, and any other obstacles within the intermediate and final operation areas.
3. Availability and requirement for use of a platform-based radar transponder beacon.

5.1.2.3 **HEDA (only):**

1. A representative pictorial and written description of the proposed HEDA.
2. HEDA location (latitude and longitude to within the nearest tenth of a second).
3. Operations and training manual revisions to incorporate HEDAs, if it is an initial application.
4. The date of first intended use and the proposed length of service that authorization is sought.

5.1.3 Instrument Operations.

1. Helicopter OSAP, ARA, and HEDA operations to offshore platforms/helidecks are classified as instrument operations.
2. The OpSpecs or LOAs usually contain conditional authorizations that apply to individual operators. The CHDO approves operations for their operators. All other operators submit requests directly to the appropriate Flight Standards office having jurisdiction over the area of intended operation for approval.

5.2 Specific Operator Requirements and Operations.

5.2.1 Navigation and Facility Requirements. Any operator that wishes to be approved for instrument flight rule (IFR) offshore operations must ensure that the following navigation and facility requirements are met:

5.2.1.1 **Route Requirements.** Operators may develop these proposed and specified routes by onshore station reference navigation where adequate signal coverage is available. Outside of the area where signal coverage is available, the operator must provide a suitable means of navigation. By means of validation tests in visual conditions, principal operations inspectors (POI) must ensure that the operator is able to demonstrate adequate navigational performance for these routes before being granted approval to use them. All fix coordinates will be submitted to the appropriate Flight Standards office by the operator.

5.2.1.2 **Terminal Operations.** Appropriate OSAP, ARA, or HEDA charts and operations must be approved by the POI before being published in the operator's manual. The POI grants the authorization by means of an LOA or OpSpec.

5.2.1.3 **Air Traffic LOA for Area of Operation.** The operator should request support from the CHDO, the Flight Standards office, or AFS-480 representative.

5.2.2 Issuance of an LOA or OpSpecs. An LOA or OpSpec authorizing the use of OSAP, ARA, or HEDA operations is issued to the operator by their appropriate Flight Standards office and/or POI. An LOA or OpSpecs authorizing the use of HEDA procedures is valid for 1 year from the date of issuance. Any operator wishing to obtain HEDA revalidation must submit written confirmation to the POI ensuring that the HEDA is clear of obstructions and that positive course guidance is available. The operator must provide the means for any onsite inspection by the POI (if required).

APPENDIX A. SAMPLE TRAINING PROGRAM FOR OSAP, ARA, OR HEDA

A.1 Sample Training Program.

A.1.1 General. Operators are required to establish and maintain an approved training program appropriate to their operations before final approval of the special instrument operation. Anyone requesting authorization to use an Offshore Standard Approach Procedure (OSAP), Airborne Radar Approach (ARA), or Helicopter En Route Descent Area (HEDA) in instrument flight rule (IFR) flight operations must train each flightcrew member on the following subjects. (The abbreviations of operations enclosed in brackets [ ] indicate application only to that type of operation.)

A.1.2 Basic Airborne Radar Principles and Operation. (Ground school 5 hours, Equipment operation 1 hour.)

A.1.3 Theory of Operation.

1. Terminology.
2. Block diagrams (P-40/50, BDX 1300/1400, etc.).

A.1.4 Interpretation of Radar Returns.

1. Primary.
2. Secondary.
3. False return, clutter, anomalies.
4. Enhancement devices: beacons/reflectors.
5. [ARA] Correlation of ground photos/maps with radar scope pictures, and identification of clusters/targets. (Ground school 8 hours.)

A.1.5 Equipment Limitations.

1. Effects of precipitation.
2. Effects of sea state and wave height.

A.1.6 Detecting and Reporting Equipment Malfunctions.

A.1.7 Emergency Procedures.

A.1.8 [OSAP and HEDA] GPS Principles and Operation. (Ground school 2 hours, Equipment operation 3 hours.)

A.1.9 Introduction and Basic Principles.

A.1.10 Controls, Indicators, and Display Functions.

1. Display unit and functions.
2. Data selector switch, controls, and indicators.
3. Course deviation indicator.
4. Receiver computer unit.

A.1.11 Operating Procedures.

1. General.
2. Preflight and operational checks.
3. Self-test.
4. Initial present position entry.
5. Magnetic variation entry.
6. Area Navigation (RNAV) using waypoints.
7. Leg change entry.
8. Offset track—entry and steering.
9. User-defined waypoints.
10. Identifying and correcting operational problems.

A.1.12 OSAP, ARA, or HEDA Operations. (Ground school 2 hours.)

1. Definitions.
2. Limitations.
3. Minimums.
4. Weather requirements.
5. Equipment requirements.
6. [OSAP or ARA] Approach target identification.
7. [OSAP] Final Approach Point (FAP) identification and verification.
8. Verification and placement of the MAP.
9. Final approach course.
10. [OSAP] Course adjustment to 0.5 NM offset.
11. [OSAP] Decision Point Altitude (DPA).
12. Verification of equipment accuracy at DPA.
13. Verification of minimum horizontal obstacle clearance.
14. Using the lowest appropriate radar scale.

15. Missed approach.
16. Crew coordination, duties, and responsibilities.
17. Before Final Approach Segment (FAS).
18. During FAS.
19. [OSAP or ARA] After visual reference is established with the operation target.
20. [OSAP or ARA] When visual reference is lost while maneuvering to the landing site.
21. [OSAP or ARA] Upon reaching the missed approach point (MAP) without visual reference with the operation target.
22. [HEDA] Upon reaching the HEDA coordinates without establishing visual conditions.
23. [HEDA] When visual conditions cannot be maintained while maneuvering to the landing site.

A.2 Flight Training. (Visual conditions 3 hours.) All assigned pilots and radar operators must complete as many trips over a route terminating in an OSAP, ARA, or HEDA under the supervision of an instructor or check airmen, as may be necessary to:

1. Ensure their competency in the use of the equipment; and
2. Enable certification of their proficiency in the system.

A.2.1 Recurrent Training. Recurrent training for pilots and radar operators is required annually.

A.2.2 Currency Requirements. A flight proficiency check is required annually.

A.3 Records.

1. A method of maintaining flightcrew member training records must be approved by the principal operations inspector (POI) prior to authorizing OSAP, ARA, or HEDA operations.
2. Appropriate training and certification records will be maintained by each operator and shall be presented for inspection on request of the FAA.

Note 1: The ground school and flight hours are for illustrative purposes only. POIs must determine, with their operators, an appropriate number of hours based on the operator’s environment, experience, procedures, and equipment. POIs are directed by policy which prohibits approving any initial training program with less than a specific number of ground and flight training hours.

Note 2: Flight training requirements may be expressed in numbers of operations rather than in numbers of flight-hours.

APPENDIX B. SAMPLE OFFSHORE INSTRUMENT CHARTS

B.1 Sample Offshore Instrument Charts:

- Figure B-1, Sample Delta 30° OSAP.
- Figure B-2, Sample Parallel Offset OSAP.
- Figure B-3, Sample ARA Chart for Single Platform.
- Figure B-4, Sample ARA Chart for Platform Cluster.
- Figure B-5, Sample HEDA Chart.

Figure B-1. Sample Delta 30° OSAP

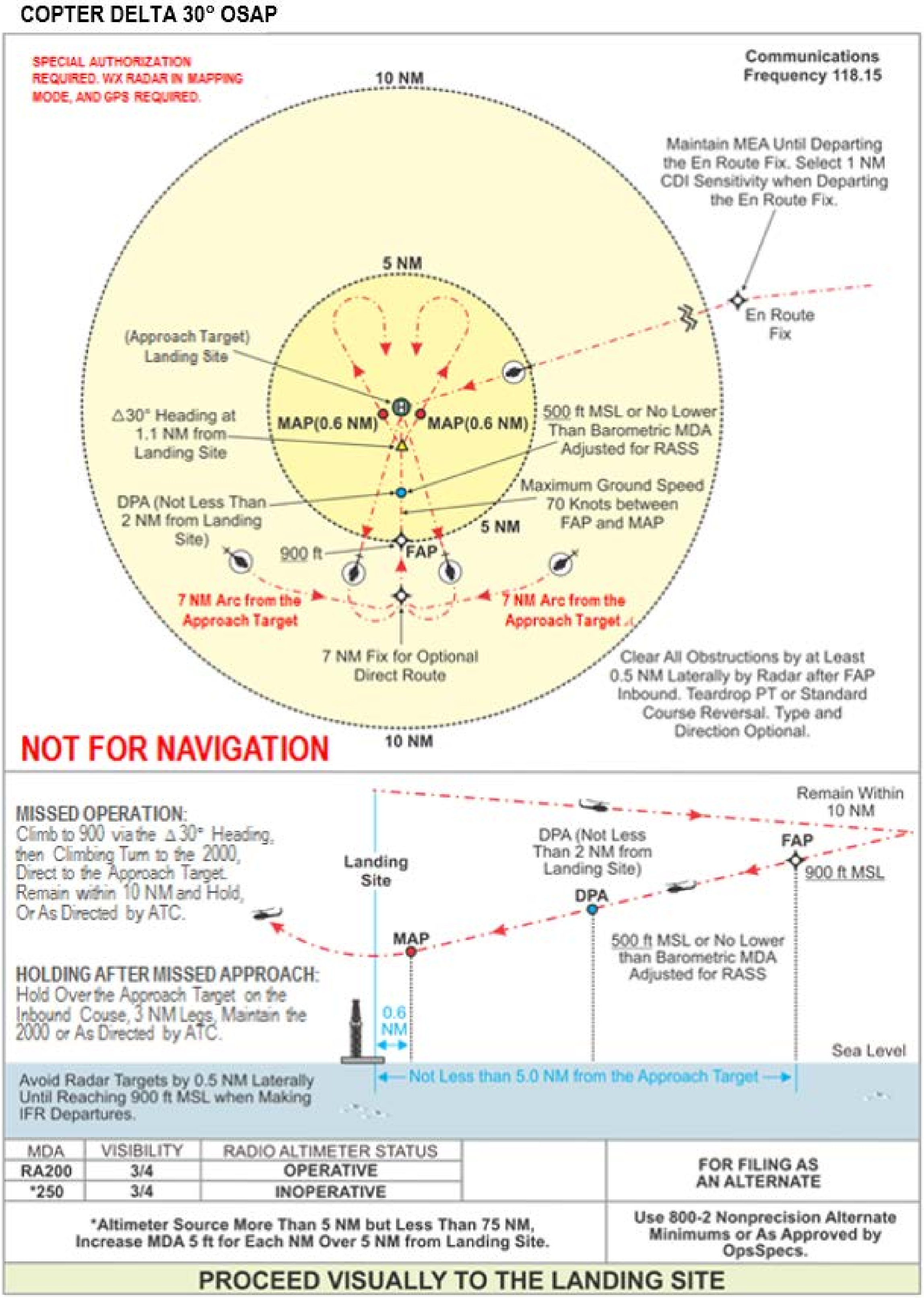
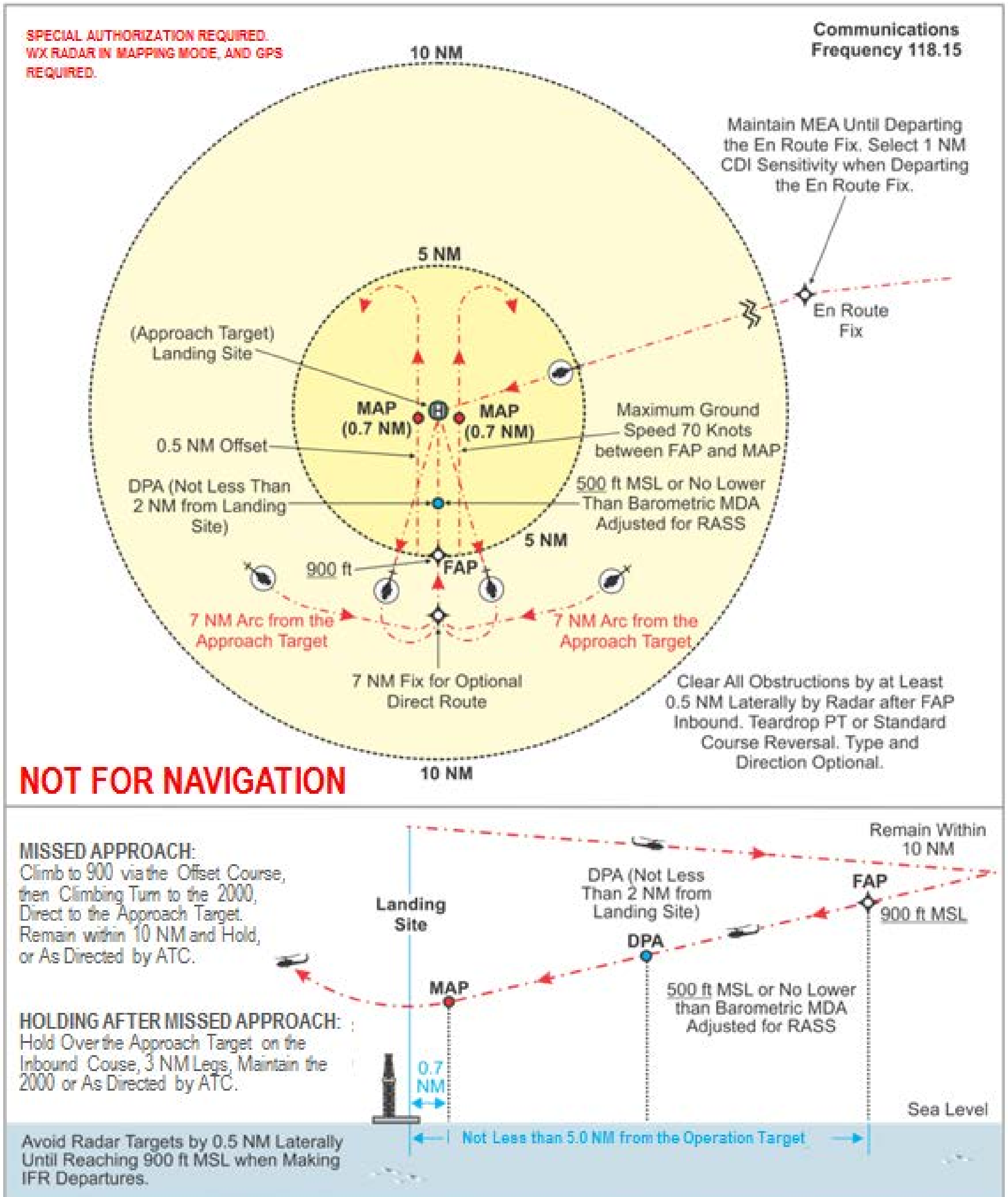


Figure B-2. Sample Parallel Offset OSAP



MDA	VISIBILITY	RADIO ALTIMETER STATUS	FOR FILING AS AN ALTERNATE
RA200	3/4	OPERATIVE	
*250	3/4	INOPERATIVE	
*Altimeter Source More Than 5 NM but Less Than 75 NM, Increase MDA 5 ft for Each NM Over 5 NM from Landing Site.			Use 800-2 Nonprecision Alternate Minimums or As Approved by OpsSpecs.

PROCEED VISUALLY TO THE LANDING SITE

Figure B-3. Sample ARA Chart for Single Platform

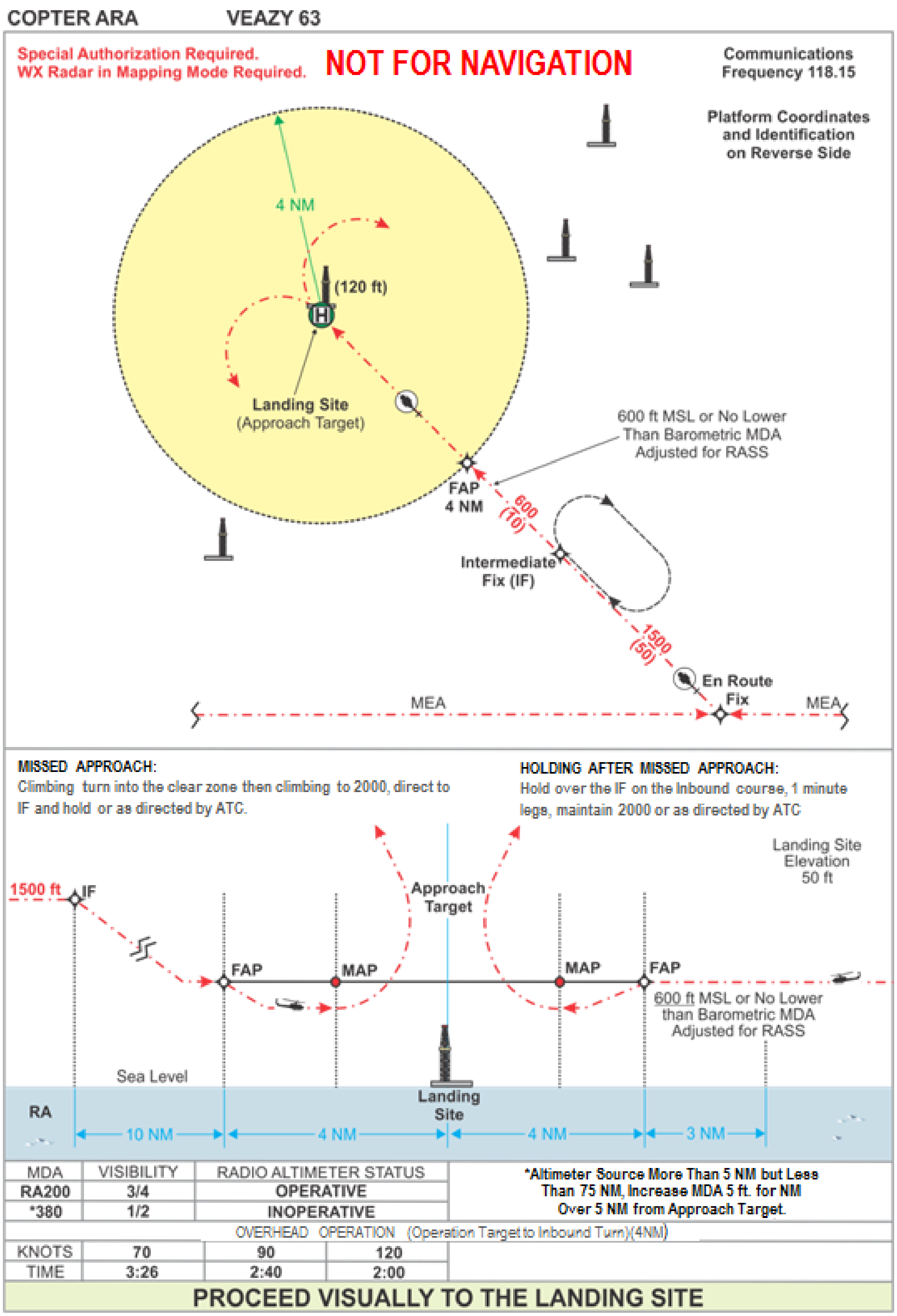


Figure B-4. Sample ARA Chart for Platform Cluster

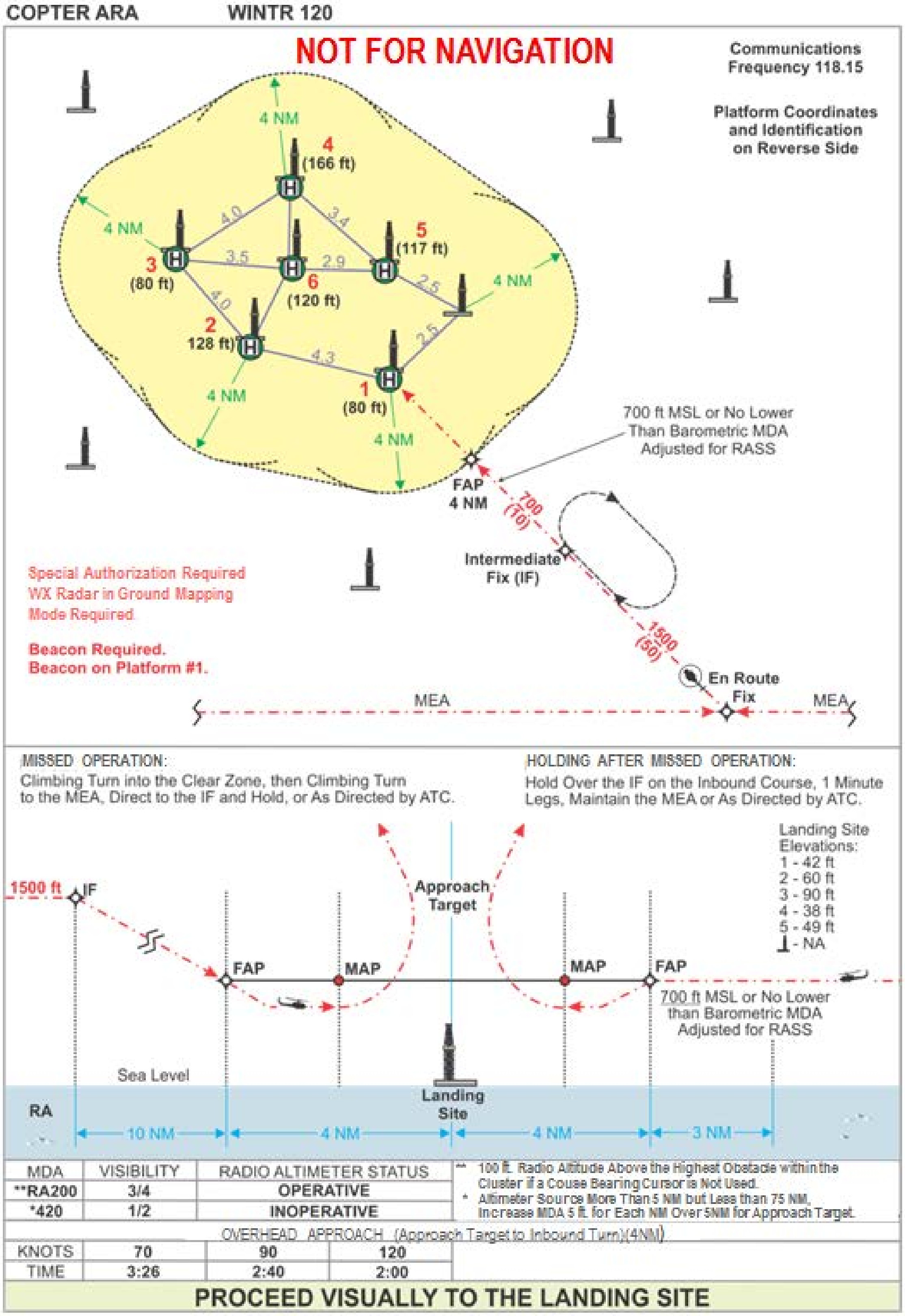
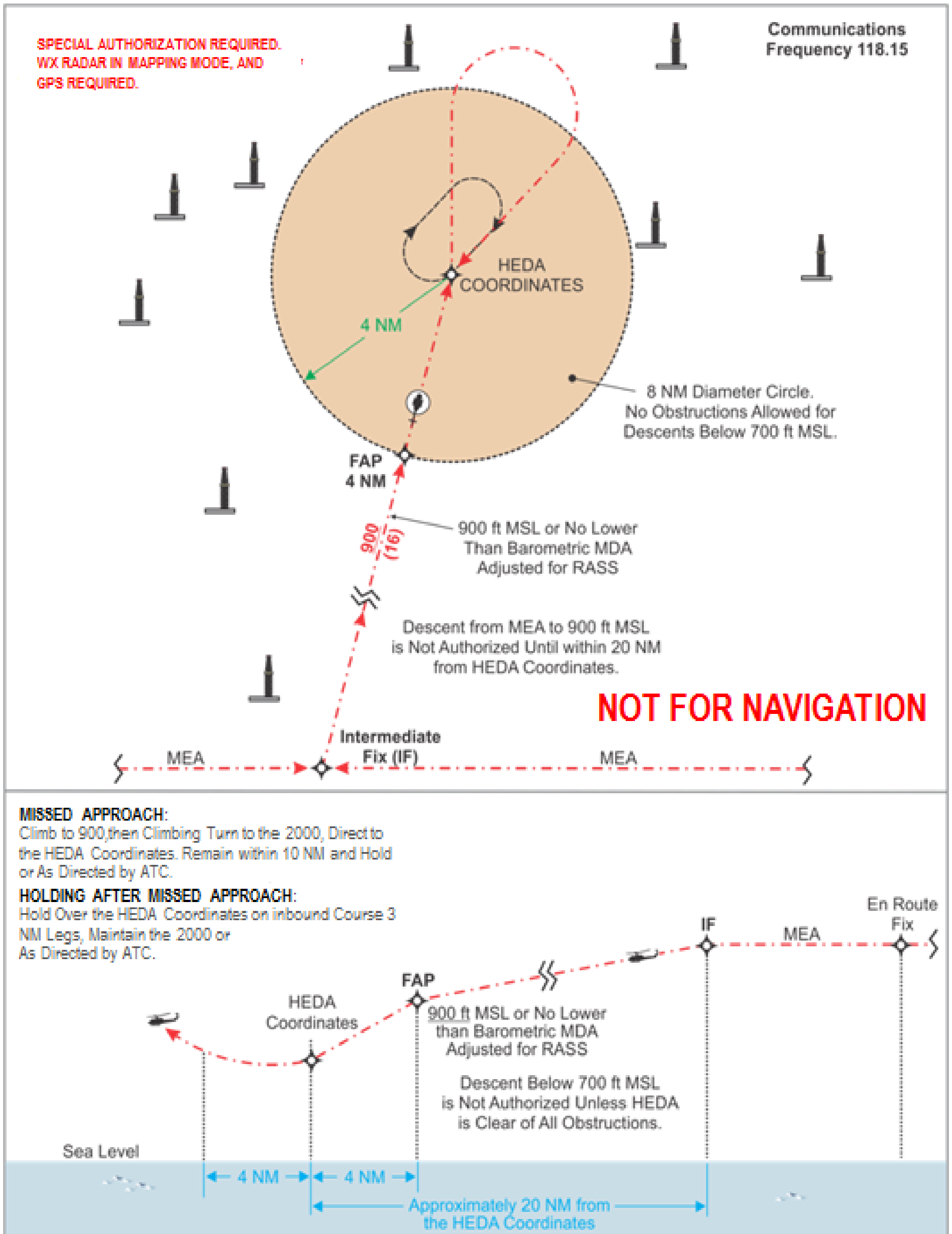


Figure B-5. Sample HEDA Chart

COPTER HEDA PROCEDURE



MDA	VISIBILITY	RADIO ALTIMETER STATUS	
RA400	1	OPERATIVE	Filing HEDA as Alternate Not Authorized.
*700	1	INOPERATIVE	

*The MDA is 700 ft MSL with Radio Altimeter or WX Radar with Mapping Mode Inoperative.
*The MDA is 700 ft MSL with Obstruction in HEDA.
*Altimeter Source More Than 5 NM but Less Than 75 NM, Increase MDA 5 ft for Each NM Over 5 NM from HEDA Coordinates

PROCEED VFR TO THE LANDING SITE

APPENDIX C. ADMINISTRATIVE INFORMATION

C.1 References.

C.1.1 Title 14 of the Code of Federal Regulations (14 CFR):

- Part 91, §§ 91.175, 91.181, and 91.703.
- Part 135, § 135.215.

C.1.2 FAA Orders. For current FAA orders, use the following website: https://www.faa.gov/regulations_policies/orders_notices/index.cfm/go/document.list/documentType/order.

- Order 8260.19( ), Flight Procedures and Airspace.
- Order 8260.3( ), United States Standard for Terminal Instrument Procedures (TERPS).
- Order 8260.42( ), United States Standard for Helicopter Area Navigation (RNAV).
- Order 8900.1, Flight Standards Information Management System (FSIMS).

C.1.3 Advisory Circulars (AC). For current ACs, use the following website: https://www.faa.gov/regulations_policies/advisory_circulars/index.cfm/go/document.list.

- AC 20-165( ), Airworthiness Approval of Automatic Dependent Surveillance-Broadcast Out Systems.
- AC 90-105( ), Approval Guidance for RNP Operations and Barometric Vertical Navigation in the U.S. National Airspace System and in Oceanic and Remote Continental Airspace.
- AC 90-114( ), Automatic Dependent Surveillance-Broadcast Operations.
- AC 91-70( ), Oceanic and Remote Continental Airspace Operations.

C.1.4 Handbooks. Instrument Procedures Handbook (FAA-H-8083-16), Chapter 7, Helicopter Instrument Procedures.

C.1.5 Technical Standard Orders (TSO). For current TSOs, use the following website: http://rgl.faa.gov/Regulatory_and_Guidance_Library/rgTSO.nsf/MainFrame?OpenFrameSet.

- TSO-C63d, Airborne Weather Radar Equipment.
- TSO-C87, Airborne Low-Range Radio Altimeter.
- TSO-C102, Airborne Radar Approach and Beacon Systems for Helicopters.
- TSO-C145a, Airborne Navigation Sensors Using the Global Positioning System (GPS) Augmented by the Wide Area Augmentation System (WAAS).

- TSO-C146a, Stand-Alone Airborne Navigation Equipment Using the Global Positioning System (GPS) Augmented by the Wide Area Augmentation System (WAAS).
- TSO-C146b, Stand-Alone Airborne Navigation Equipment Using the Global Positioning System Augmented by the Satellite Based Augmentation System.
- TSO-C146c, Stand-Alone Airborne Navigation Equipment Using the Global Positioning System (GPS) Augmented by the Satellite Based Augmentation System (SBAS).
- TSO-C154c, Universal Access Transceiver (UAT) Automatic Dependent Surveillance-Broadcast (ADS-B) Equipment Operating on Frequency of 978 MHz.
- TSO-C166b, Extended Squitter Automatic Dependent Surveillance-Broadcast (ADS-B) and Traffic Information Service-Broadcast (TIS-B) Equipment Operating on the Radio Frequency of 1090 Megahertz (MHz).

C.1.6 RTCA, Inc. Documents. For current RTCA documents, use the following website: https://my.rtca.org/nc__store.

- RTCA DO-172, Minimum Operational Performance Standards for Airborne Radar Approach and Beacon Systems for Helicopters.
- RTCA DO-173, Minimum Operational Performance Standards for Airborne Weather and Ground Mapping Pulsed Radars.
- RTCA DO-208, Minimum Operational Performance Standards for Airborne Supplemental Navigation Equipment Using Global Positioning System (GPS).
- RTCA DO-229, Minimum Operational Performance Standards for Global Positioning System/Satellite-Based Augmentation System Airborne Equipment.

C.1.7 International Civil Aviation Organization (ICAO) Documents. For current ICAO documents, use the following website: https://store.icao.int/index.php/.

- ICAO Annex 2, Rules of the Air.
- ICAO Annex 6, Operation of Aircraft.
- ICAO Annex 11, Air Traffic Services.

C.2 **Definitions.** The following definitions apply to Offshore Standard Approach Procedure (OSAP), Airborne Radar Approach (ARA), and Helicopter En Route Descent Area (HEDA) operations unless otherwise noted. Acronyms for the definitions are enclosed in parentheses ( ). The abbreviations for operations are enclosed in brackets [ ] and indicate application only to that type of operation.

C.2.1 Aeronautical Radar Beacon [ARA]. An active transponder that responds to radar interrogations.

C.2.2 Airborne Radar. A system comprised of weather radar with a ground mapping mode which meets the requirements identified in this AC.

C.2.3 Airborne Radar Approach (ARA) [ARA]. A nonprecision instrument operation based upon the use of an ARA system as the primary operation aid in the intermediate, final, and missed operation segments. The system is comprised of weather radar with a ground mapping mode, a Global Positioning System (GPS) navigation receiver, and the cockpit displays, controls, and instrumentation necessary to provide guidance. The airborne weather radar with a ground mapping mode is referred to as "airborne radar" in the preceding chapters.

C.2.4 Clear Area [OSAP]. An area centered on the final and missed operation course that provides 0.5 nautical mile (NM) lateral obstruction clearance starting at the decision point of the Decision Point Altitude (DPA) and continuing throughout the missed operation.

C.2.5 Clear Sector [ARA]. An area overlying and centered on the final operation course. It is 4 NM wide at the Final Approach Point (FAP) and narrows linearly to a 2 NM width at 2 NM from the operation target.

C.2.6 Clear Zone [ARA]. A rectangular zone established for a missed operation to the left or right of the final operation course and clear of any obstacle.

C.2.7 Cluster Operation [ARA]. An ARA to an offshore landing site located less than 4 NM from any other platform, rig, drill ship, or other plotted obstacle.

C.2.8 Course Bearing Cursor [ARA]. An electronically generated course line shown on a radar display to assist pilots in flying a straight line surface track between the FAP and missed approach point (MAP).

C.2.9 Course Bearing Selector [ARA]. A pilot-selectable control that positions the cursor on the display.

C.2.10 Decision Point Altitude (DPA) [OSAP]. A point located on the offset final or Delta 30° operation course at 500 feet (ft) mean sea level (MSL) between the FAP and not less than 2 NM from the operation target. At the DPA, if the radar presentation forward along the operation course is clear laterally of all obstructions by at least 0.5 NM, the operation may continue when equipped with an operable radio altimeter to 200 ft above the surface. However, if at the DPA a lateral separation of 0.5 NM from obstructions is not assured, a missed operation must be initiated.

C.2.11 Delta 30° OSAP (Δ 30°) [OSAP]. An operation flown straight-in toward the landing site using GPS for course guidance and airborne weather radar in ground mapping mode for detecting and avoiding obstructions. The "Δ" symbol represents a heading change. At 1.1 NM from the operation target a Delta 30° turn is made to the clear area located to the left or right of course. The Delta 30° course is determined by adding 30 degrees to or subtracting 30 degrees from the inbound heading. The MAP is located no closer than 0.6 NM from the operation target.

C.2.12 Final Approach Point (FAP) [ARA, OSAP]. The position downwind from the operation target where the final operation is initiated.

C.2.13 Helicopter En Route Descent Area (HEDA) [HEDA]. An instrument operation that provides an en route descent and transition from instrument flight rules (IFR) to visual conditions within a specified area of operation. A HEDA is not an instrument approach procedure (IAP), and it is not authorized as an alternate destination on an IFR flight plan.

C.2.14 HEDA Coordinates [HEDA]. A point in space (PinS) that is the MAP for the HEDA.

C.2.15 Intermediate Approach Fix (IF). The IF may be a Very High Frequency Omnidirectional Range Collocated Tactical Air Navigation (VORTAC) distance measuring equipment (DME) fix or a waypoint based upon an approved Area Navigation (RNAV) system. The IF connects the en route structure to the intermediate segment of the operation.

C.2.16 Minimum Descent Altitude (MDA). The MDA for OSAP, ARA, and HEDA operations is based on either a radio or barometric altimeter. The radio altitude (RA) MDA is prefixed by the RA and the barometric altitude MDA is prefixed by an asterisk.

C.2.17 Minimum Descent Height (MDH). A preselected RA used in the (AUTO) logic of the flight management system (FMS). The selected MDH is used to calculate the decent gradient required from the final approach fix (FAF) to arrive at the preselected altitude 0.25 NM prior to the MAP.

C.2.18 Minimum En Route Altitude (MEA). The lowest published altitude between radio fixes which ensures acceptable navigational signal coverage and meets obstacle clearance requirements between those fixes. The MEA prescribed for a Federal airway or segment thereof, area navigation low or high route, or other direct route applies to the entire width of the airway, segment, or route between the radio fixes defining the airway, segment, or route.

C.2.19 Minimum IFR Altitude (MIA). Minimum altitudes for IFR operations as prescribed in 14 CFR part 91. These altitudes are published on aeronautical charts and prescribed in 14 CFR part 95 for airways and routes, and in 14 CFR part 97 for Standard Instrument Approach Procedures (SIAP). If no applicable minimum altitude is prescribed in part 95 or part 97, the following MIA applies:

1. In designated mountainous areas, 2,000 ft above the highest obstacle within a horizontal distance of 4 NM from the course to be flown;
2. Other than mountainous areas, 1,000 ft above the highest obstacle within a horizontal distance of 4 NM from the course to be flown; or
3. As otherwise authorized by the Administrator or assigned by air traffic control (ATC).

C.2.20 Missed Approach Point (MAP) [OSAP, ARA]. The MAP for an OSAP is a point no closer to the operation target than 0.6 NM for the Delta 30° or 0.7 NM for the parallel offset. The MAP for an ARA is a point no closer to the operation target, as observed on the radar display, than the minimum authorized visibility for landing.

C.2.21 Observed Coordinates. Coordinates established by a GPS TSO-C129, Airborne Supplemental Navigation Equipment Using the Global Positioning System (GPS) (World Geodetic System 1984 (WGS 84) compatible) navigation receiver for a proposed offshore landing site or HEDA location.

C.2.22 Offset Approach [ARA]. An operating technique used when the radar operator at 1 NM from the operation target provides vectors to position the operation target off the zero azimuth mark by no more than 25 percent of the scan angle being used.

C.2.23 Offshore Operations. Operations that routinely have a substantial proportion of the flight conducted over sea areas to or from offshore locations. Such operations include, but are not limited to, support of offshore oil, gas and mineral exploitation, and sea-pilot transfer.

C.2.24 Offshore Standard Approach Procedures (OSAP). An operation designed specifically for helicopters operating at least 5 NM from land. The operation uses GPS for course guidance and airborne weather radar in ground mapping mode for detecting and avoiding obstructions. The OSAP provides the following:

1. A positive fix for the FAP;
2. A positive method of maintaining desired track (DTK) over the surface on the final and missed operation course; and
3. A definite missed operation point.

C.2.25 Operation Target [ARA, OSAP]. A stationary platform, rig, or ship used as an alignment point. The operation target may or may not be the landing site.

C.2.26 Parallel Offset [OSAP]. A segment of the OSAP operation where the final segment is offset 0.5 NM either left or right of centerline, depending upon the missed operation clear area.

C.2.27 Proceed Visually to the Landing Site [OSAP]. This phrase requires the pilot at or prior to the MAP to acquire and maintain visual contact with the landing site. Obstacle or terrain avoidance from the MAP to the landing site is the responsibility of the pilot. A missed operation is not provided between the MAP and the landing site.

C.2.28 Radar Operator. The pilot who operates the radar. The radar operator provides obstacle identification and vector instructions to the pilot at the controls of a helicopter to avoid obstructions during OSAP, ARA, or HEDA operations. The radar operator may be the pilot in command (PIC) or second in command (SIC).

C.2.29 Radio Altimeter. An instrument that uses reflected radio signals to determine the height of the helicopter above the surface.

C.2.30 Radio Altitude (RA). The altitude of a helicopter above the surface determined by a radio altimeter.

C.2.31 Reflector [ARA]. A passive primary radar "skin-paint" source.

C.2.32 Remote Altimeter Setting Source (RASS). An altimeter setting source that is more than 5 NM but less than 75 NM from OSAP and ARA landing sites or HEDA coordinates.

C.2.33 Single Landing Site Operation [ARA]. An ARA to an offshore landing site located 4 NM or more from any other landing site, rig, ship, or other obstacle.

C.2.34 Turning Point (TP). A turning transition on an OSAP from en route flight to align with the final operation course.

C.2.35 Weather Box. An observation area whose boundary is defined by the distance between two weather stations. The centerline distance between the stations may not exceed 40 NM. The centerline may continue 10 NM on either side of each weather station. The total centerline distance may not exceed 60 NM. The lateral width of the observed area is defined as an area 40 NM on either side of the defined centerline. This results in an observed area of 60 NM by 80 NM.

C.3 Acronyms.

Acronym	Meaning
ABAS	Aircraft-Based Augmentation System
AC	Advisory Circular
ACO	FAA Aircraft Certification Office
ADS-B	Automatic Dependent Surveillance-Broadcast
AEG	Aircraft Evaluation Group
AFM	Aircraft Flight Manual
AHRS	Attitude and Heading Reference System
AIP	Aeronautical Information Publications
AIRAC	Aeronautical Information Regulation and Control
ARA	Airborne Radar Approach
A-RNP	Advanced Required Navigation Performance
ARTCC	Air Route Traffic Control Center
ASOS	Automated Surface Observing System
ATC	Air Traffic Control
ATCT	Airport Traffic Control Tower

Acronym	Meaning
ATS	Air Traffic Service
AWOS	Automated Weather Observing System
baro-VNAV	Barometric Vertical Navigation
CA	Course to Altitude
CDI	Course Deviation Indicator
CDU	Control Display Unit
CF	Course to Fix
CFR	Code of Federal Regulations
CHDO	Certificate-Holding District Office
CMO	Certificate Management Office
CPDLC	Controller-Pilot Data Link Communication
CTA	Control Area
CTA/FIR	Control Area/Flight Information Region
DA	Decision Altitude
DF	Direct to Fix
DME	Distance Measuring Equipment
DP	Departure Procedure
DPA	Decision Point Altitude
DTK	Desired Track
EHSI	Electronic Horizontal-Situation Indicator
EPU	Estimate of Position Uncertainty
ESV	Expanded Service Volume
FA	Fix to an Altitude
FAA	Federal Aviation Administration
FAF	Final Approach Fix
FAP	Final Approach Point
FAS	Final Approach Segment
FDE	Fault Detection and Exclusion
FGS	Flight Guidance System

Acronym	Meaning
FIR	Flight Information Region
FLIP	U.S. Flight Information Publication
FM	Fix to Manual Termination
FMS	Flight Management System
FOV	Field of View
FRT	Fixed Radius Transition
FSS	Flight Service Station
FTE	Flight Technical Error
GLS	GNSS Landing System
GNSS	Global Navigation Satellite System
GPS	Global Positioning System
HAA	Helicopter Air Ambulance
HBAT	Flight Standards Handbook Bulletin for Air Transportation
HEDA	Helicopter En Route Descent Area
HSI	Horizontal Situation Indicator
IAF	Initial Approach Fix
IAP	Instrument Approach Procedure
ICAO	International Civil Aviation Organization
IF	Intermediate Approach Fix
IFR	Instrument Flight Rules
ILS	Instrument Landing System
IMC	Instrument Meteorological Conditions
IRS	Inertial Reference System
IRU	Inertial Reference Unit
ISA	International Standard Atmosphere
LAWRS	Limited Aviation Weather Reporting System
LNAV	Lateral Navigation
LOA	Letter of Authorization
LOC	Localizer

Acronym	Meaning
LP	Localizer Performance Without Vertical Guidance
LPV	Localizer Performance With Vertical Guidance
LRNS	Long-Range Navigation System
MAP	Missed Approach Point
MDA	Minimum Descent Altitude
MDH	Minimum Descent Height
MEA	Minimum En Route Altitude
MEL	Minimum Equipment List
METAR	Aviation Routine Weather Report
MIA	Minimum IFR Altitude
MOPS	Minimum Operational Performance Standards
MSL	Mean Sea Level
MSpec	Management Specification
NANU	Notice Advisory to Navstar Users
NAS	U.S. National Airspace System
NASA	National Aeronautics and Space Administration
NAVAID	Navigational Aid
NDB	Nondirectional Radio Beacon
NM	Nautical Miles
NOTAM	Notice to Airmen
NSE	Navigation System Error
NWS	National Weather Service
ODP	Obstacle Departure Procedure
OEM	Original Equipment Manufacturer
OpSpec	Operations Specification
OSAP	Offshore Standard Instrument Operation
PBN	Performance-Based Navigation
PDE	Path Definition Error
PEE	Position Estimation Error

Acronym	Meaning
PF	Pilot Flying
PFD	Primary Flight Display
PI	Principal Inspector
PIC	Pilot in Command
PinS	Point in Space
PM	Pilot Monitoring
POH	Pilot's Operating Handbook
POI	Principal Operations Inspector
PSE	Path Steering Error
RA	Radio Altitude
RAIM	Receiver Autonomous Integrity Monitoring
RASS	Remote Altimeter Setting Source
RF	Radius to Fix
RFM	Rotorcraft Flight Manual
RNAV	Area Navigation
RNP	Required Navigation Performance
RNP AR	Required Navigation Performance Authorization Required
ROC	Required Obstruction Clearance
rpm	Revolutions per Minute
SAO	Special Areas of Operation
SAWRS	Supplementary Aviation Weather Reporting System
SBAS	Satellite-Based Augmentation System
SIAP	Standard Instrument Approach Procedure
SIC	Second in Command
SID	Standard Instrument Departure
SIS	Signal in Space
S-LRNS	Single Long-Range Navigation System
SPECI	Aviation Selected Special Weather Report
STAR	Standard Terminal Arrival

Acronym	Meaning
STC	Supplemental Type Certificate
SUPPS	Regional Supplementary Procedures
TAF	Terminal Area Forecast
TC	Type Certificate
TF	Track to Fix
TOGA	Takeoff/Go-Around
TP	Turning Point
TSE	Total System Error
TSO	Technical Standard Order
VA	Heading to Altitude
VFR	Visual Flight Rules
VHF	Very High Frequency
VI	Heading to Intercept
VM	Heading to Manual
VNAV	Vertical Navigation
VOR	Very High Frequency Omni-Directional Range
VORTAC	Very High Frequency Omnidirectional Range Collocated Tactical Air Navigation
WAAS	Wide Area Augmentation System
WGS	World Geodetic System
XTK	Cross-Track

Advisory Circular Feedback Form

If you find an error in this AC, have recommendations for improving it, or have suggestions for new items/subjects to be added, you may let us know by contacting the Performance-Based Flight Systems Branch (AFS-470) at 9-AWA-AFS400-Coord@faa.gov or the Flight Standards Directives Management Officer at 9-AWA-AFS-140-Directives@faa.gov.

Subject: AC 90-80C, Approval of Offshore Standard Approach Procedures, Airborne Radar Approaches, and Helicopter En Route Descent Areas

Date: ____________________

Please check all appropriate line items:

☐ An error (procedural or typographical) has been noted in paragraph ____________ on page _______.

☐ Recommend paragraph _____________ on page __________ be changed as follows:

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☐ Other comments:

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