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ORANGE COUNTY SHERIFF'S DEPARTMENT

AIR SUPPORT BUREAU

SEARCH AND RESCUE OPERATIONS MANUAL

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Chapter 1 OCSD Search and Rescue Deployment Procedures

1.1 AUTHORITY

OCSD has statutory authority pursuant to the California Government Code, Section 26614 and by Resolution No. 17-092 of the Orange County Board of Supervisors for Search and Rescue services.

OCSD shall follow the guidelines and operating plans contained in the Search and Rescue Model Operating Plan, as developed and adopted by the California Office of Emergency Services (Cal OES). This manual sets forth the operational procedures for the OCSD Air Support Bureau's search and rescue program in accordance with the Cal OES Search and Rescue Model Operating Plan.

1.2 RESPONSIBILITY

The Sheriff's intent is to provide the safest and most efficient search and rescue program possible to the public in Orange County. The Orange County Sheriff's Department shall be the lead agency providing search and rescue services in remote areas where the mission or type of call meets the following criteria:

1. For a mission or call involving the search and rescue of injured and/or uninjured persons, who may be lost, stranded, in distress, or involved in an off-road vehicle accident in (A) mountainous and wilderness areas, hiking trails or County parks, that are (B) not reasonably accessible from a roadway suitable for vehicular traffic. The mountainous and wilderness areas within the Cleveland National Forest, hiking trails or County parks, not reasonably accessible from a roadway suitable for vehicular traffic, shall meet the intent of "OFF-HIGHWAY RESCUE, KNOWN LOCATION, LONG DURATION," and "OFF-HIGHWAY SEARCH OR RECOVERY, UNKNOWN LOCATION," as these missions are defined by Cal OES.

Search and Rescue (SAR) resources are generally designed to access victims utilizing equipment and personnel transported by air, foot or unconventional vehicles. OCSD's SAR strengths are in its ability to reach and operate in locations remote from vehicular access.

Due to the county's geographic dimensions and variety of topography, a hoist-rescue helicopter and crew is an essential tool, and oftentimes the only access to an individual in need of rescue. A properly supported, well-trained, and highly skilled rescue crew and helicopter will provide the quickest link between an individual in need of rescue and the advanced care required to ensure their survival and recovery.

1.3 COMMUNICATION FOR MULTI-AIRCRAFT RESPONSE

The following communication guidelines have been established and agreed upon by Orange County Public Safety Aviation Bureaus to standardize procedures and expectations in aircraft operations. These procedures are intended to enhance safety through improved communications and predetermined operating procedures.

The pilot in command (PIC) of all Orange County public safety aircraft responding to an incident involving one or more aircraft should immediately advise and coordinate on 122.85 or 123.025 (depending on location) of the area from which they are responding. The decision to move to a secondary frequency will be coordinated by the PICs of the aircraft.

The first public safety aircraft to arrive on scene will be designated the primary aircraft and will be in charge of all public safety air operations during the incident. Depending on the circumstances, a second public safety aircraft may be used to assist or relieve the primary aircraft crew.

The PIC of the second public safety aircraft will communicate with the PIC of the primary aircraft. If assistance is requested, the PICs will coordinate the approach and subsequent joining of the second aircraft with the incident. The secondary aircraft will remain at least 500' above and 500' laterally from the primary aircraft unless coordinated otherwise. **If communication is not established, the second aircraft shall not enter the area and shall remain at least 1 mile away. All public safety aircraft shall operate with the transponder in the "on" or "altitude" position, transmitting the approved code for the specific operation.**

1.4 DISPATCH QUALIFICATION

Sheriff's Dispatch has the authority to dispatch rescue aircraft as an EMS designated dispatch center.

OCSD is classified as a designated dispatch center for EMS Aircraft. This is identified in the OCEMS 2014 Emergency Medical Services Plan/2017 Annual Update which was approved by the California Emergency Medical Services Authority on November 27, 2017. On page 35 of the EMS plan, OCSD is identified as a designated dispatch center for EMS Aircraft. On page 77, OCSD is identified as an ALS Response/Transportation/Provider.

1.5 DISPATCH PROCEDURES

Sheriff's Dispatch shall notify OCSD ASB of any 911 calls meeting the criteria listed in paragraph 1.2 above. OCSD ASB will immediately launch a patrol helicopter (Duke 1) and one rescue helicopter (Duke 3, 6, or 7) for search and rescue services that meet the criteria outlined in this manual. If the person is injured, OCSD may request assistance from ground Fire/EMS resources. Sheriff Dispatch shall follow established protocols for the 911 calls that do not meet the criteria listed in paragraph 1.2 above.

If OCSD air rescue is unable to respond or encounters extended delays, the aircrew shall immediately notify the OCSD dispatch of their status. The dispatch center shall notify OCFA or other mutual aid providers to ensure a prompt response by a qualified public safety agency.

1.6 INCIDENT COMMAND SYSTEM FOR MULTI-AGENCY RESPONSE

Search and rescue incidents that require a multi-agency response, shall be managed by the Incident Command System as prescribed by the Cal OES Standardized Emergency Management System (SEMS). Incident Command shall be assigned to the agency having primary responsibility for the incident. The first unit on scene shall assume incident command until the primary agency responsible for the call arrives on scene, at which point incident command may be transferred.

1.7 SEARCH PHASE OF MISSION

Duke 1 and the Duke Rescue Helicopter will both be used for the search phase of the mission. Duke 1 has the option to use the Star Safire 380HDC Camera to search for the victim or by looking outside the helicopter. Duke 1 and the Duke Rescue Helicopter should maintain at least 500 feet of vertical separation during the search phase.

1.8 RESCUE/ HOIST PHASE OF MISSION

Every rescue is unique. No attempt is made in this Operations Manual to dictate how a crew shall react at any rescue. A quick response is essential; however, "Risk vs. Reward" will always be a primary consideration.

No crewmember will be allowed to act as a hoist operator or a downside rescuer in a hoist rescue situation unless that individual has been trained in those techniques as described in the OCSD Search and Rescue Training Manual.

Hoist operations will be conducted in those situations where a victim is in need of immediate extraction from a hazardous condition, or is in need of immediate medical care and the helicopter is unable to effect a safe landing or hover pickup in a timely manner. The hoist system may also be used for cargo delivery or extraction when deemed necessary.

Hoist operations will be conducted at the pilot's discretion, based on, but not limited to, the following criteria:

1. Availability of a qualified flight crew.
2. Completion of Risk Assessment.
3. Aircraft performance limitations: OGE Hover Power Check, Load Calc.
4. Victim location and medical condition. Non-critical or ambulatory victims should be transported to a nearby landing zone or pickup point when possible.

1.9 EQUIPMENT AND PERSONNEL

The OCSD Hoist Rescue Program consists of the following equipment and personnel. For a more detailed description, see the OCSD SAR Training Manual.

Equipment:

1. Bell UH-1H Huey helicopters, and Airbus AS350B3e Helicopters certified by the Orange County Emergency Medical Services (OCEMS) as Advanced Life Support (ALS) Rescue Helicopters, with onboard equipment to include:
 - a. Goodrich external electric hoist.
 - b. Interagency mandated communication P25 compliant radio.
 - c. Appropriate crew intercommunication system.
2. Cabin and cockpit Night Vision Goggle (NVG) lighting systems.
3. 3500 Gallon and 5000 Gallon Fuel Trucks.
4. Helitack Bag and Screamer Suit Rescue Equipment required by OCEMS ALS certification.
5. CMC Hoist Harness for hoist operators and downside rescuers.
6. Personal Flotation Devices (PFD), required for over-water operations.
7. Appropriate support vehicles.

1.10 DEFINITIONS

INCIDENT COMMANDER (IC): The individual on scene responsible for all incident activities, including the development of strategies and tactics and the ordering and release of resources.

LONG DURATION: operations that require lengthy access by foot or specialized off-road vehicles are best handled by search and rescue resources. Regardless of the incident classification, if mutual assistance from another agency would improve the situation, notification and response will be made. Because the primary goal is the well-being of the victim, interagency cooperation is paramount.

OFF-HIGHWAY RESCUE: The incident scene is not easily accessible from highways or roads suitable for vehicular traffic.

OFF-HIGHWAY RESCUE, KNOWN LOCATION: Accessibility from a roadway is the key issue. Most search and rescue teams cannot mobilize immediately while most fire/rescue resources are not trained and equipped to operate far from their vehicles, especially in rough terrain and/or inclement weather.

OFF-HIGHWAY SEARCH OR RECOVERY, UNKNOWN LOCATION: When the location of the victim is unknown and the area to be searched is not on or adjacent to streets or roadways, search and rescue resources are best suited to conduct the operation and will be notified.

SEARCH AND RESCUE: Search and Rescue (SAR), under authority of the Sheriff. Responsible for locating, accessing, stabilizing, and transporting victims in/from locations that are not reasonably accessible from roadways. May include water rescues (ocean, swift water, flood).

UNIFIED COMMAND: A unified team effort which allows all agencies with responsibility for the incident, either geographical or functional, to manage an incident by establishing a common set of incident objectives and strategies. This is accomplished without losing or abdicating agency authority, responsibility, or accountability.

Chapter 2 OCSD Search and Rescue Operations

2.1 EQUIPMENT TRACKING

All Search and Rescue Equipment will be tracked in the red "Hoist Equipment Tracking" Folder in the Operations Sergeant's Office. All equipment will be replaced and inspected per the manufacturer's guidelines and industry best practices. The Air Support Bureau full-time Hoist Operator Instructor will be responsible for inspecting all hoist equipment. The hoist equipment shall be stored in the Air Support Bureau Hoist Equipment Room, located in the hangar.

2.2 OCEMS ACCREDITATION

The Air Support Bureau Medical Air Rescue Program and Tactical Medicine Program shall remain accredited by the Orange County Emergency Medical Services (OCEMS) as an Advanced Life Support (ALS) Provider. The Air Support Bureau shall follow all OCEMS guidelines and have a written agreement with OCEMS. OCSD EMS Policies #100.00 and #110.00 shall be strictly followed.

2.3 MEDICAL INVENTORY

The Air Support Bureau Chief Medic will inventory ALS medical supplies to include all medicines and reorder as necessary to allow ASB to fully deploy assets.

2.4 SEARCH AND RESCUE CURRENCY REQUIREMENTS

All Search and Rescue Personnel shall complete mandatory currency requirements as posted in the Air Support Bureau Quarterly Currency Requirements. The ASB Currency Requirements shall be posted on the door in the hoist equipment room. In addition, each SAR member shall maintain their currency in their individual training binder.

Quarterly Currency

Pilot:

4 single hoist cycles, 1 double Helitack hoist cycle, 1 double Screamer Suit hoist cycle, and 1 hoist emergency procedure.

Hoist Operator:

4 single hoist cycles, 1 double Helitack hoist cycle, 1 double Screamer Suit hoist cycle, and 1 hoist emergency procedure.

Downside Rescuer:

4 single hoist cycles, 1 double Helitack hoist cycle, 1 double Screamer Suit hoist cycle, and 1 hoist emergency procedure.

2.5 HELICOPTER TRACKING

OC Sheriff Helicopters shall maintain Satellite Flight Tracking as required by Cal Fire and the U.S. Forest Service.

2.6 SAR AIRCREW COMPOSITION

The Search and Rescue Aircrew shall consist of, at a minimum, a current and qualified hoist pilot in command, hoist operator, and flight medic. However, the desired SAR aircrew should be a pilot in command, second pilot in command, hoist operator and two flight medics. If the Risk Assessment Form determines the mission is going to be a Tier 3 or 4 risk level, the mission must be completed by 2 pilots.

2.7 INCIDENT COMMAND TRAINING REQUIREMENTS

All supervisors in the Air Support Bureau shall complete ICS 100, 200, 300, 400, 700 and 800. This is a necessary requirement for Search and Rescue Operations and for the integration with fire agencies.

2.8 ENROUTE ALTITUDE

While enroute to a Search and Rescue call with a Type II Helicopter, the enroute altitude should be at least 1,000 feet AGL.

2.9 RISK MANAGEMENT/ SAFETY

It is imperative that all public safety aircraft involved in OCSD Search and Rescue operations comply with the aviation industry's best practices and procedures. The public safety aircraft and crew shall comply with the following safety and training requirements:

1. OCSD's Crew Endurance Policy which meets the standards set by the Public Safety Aviation Accreditation Commission (PSAAC), National Transportation Safety Board (NTSB), and Federal Aviation Administration (FAA).
2. Aircraft must be operated in accordance with an aviation safety program that meets the standards set by PSAAC, NTSB and the FAA.
3. The aircrew on each aircraft shall be formally trained on Search and Rescue techniques and be current and qualified in the type of mission to be performed. The training must be documented in an aircrew training folder or binder.

4. A Flight Risk Assessment Tool (FRAT) must be completed prior to the mission in order to determine the level of risk for the particular type of mission to be flown. The aircrew must have control measures in place to mitigate the risk when the level of risk is considered high.
5. All public safety aircraft responding to assist OCSD in search and rescue operations are expected to comply with the safety and training requirements listed in this section and the communication requirements listed in section 1.3.

2.10 INDIVIDUAL SAR TRAINING REQUIREMENTS

All Search and Rescue Personnel (regardless of position) shall complete the formal search and rescue training package created for OCSD by Advanced Helicopters + Rescue Techniques (AH+RT). All SAR Personnel must have an individual training binder that documents the SAR Training received, and the SAR Recurrent Training received. However, training for all reserves not assigned to the Air Support Bureau that may be transported by air as part of a Search and Rescue Mission, will receive at a minimum annual air crewmember orientation training.

At a minimum the search and rescue training shall consist of:

Search and Rescue Pilot Initial Training:

Minimum Qualification: 1,500 helicopter pilot in command flight hours.

1. Terrain and known hazards to OCSD search and rescue areas.
2. Judgment and decision making
3. Risk management
4. Flight and SAR Risk Assessment
5. Hazard Mitigation
6. Aeronautical decision-making
7. Crew resource management
8. Recovery from Inadvertent Instrument Meteorological Conditions (IIMC)
9. Aviation human factors
10. Stress management for all phases of flight
11. Interpersonal communications between crewmembers, to include:

- a. Delegation of responsibilities
- b. Prioritization and crew coordination
- c. Workload management
- d. Situational awareness

12. Water Dunker Training

13. Pilots shall successfully complete the OCSD Search and Rescue Hoist Pilot training as prescribed in the OCSD SAR Training Manual.

14. In all cases, the following shall apply:

- a. The safe operation of the aircraft throughout all phases of flight shall be the primary concern of the pilot during all missions.
- b. All other mission requirements shall be secondary in priority.

Search and Rescue Pilot recurrent training:

1. The safe operation of the aircraft throughout all phases of flight shall be the primary concern of the pilot during all missions. All other mission requirements shall be secondary in priority.

2. Pilots shall successfully complete a recurrent flight evaluation each year administered by the ASB Chief Pilot in each aircraft for which the pilot is qualified to fly and perform Bureau missions.

3. The recurrent evaluation will include, but not limited to, the following:

- a. The proper and effective use of aircraft checklists
- b. Effective cockpit communications
- c. Effective crew coordination
- d. ASB Pilot shall demonstrate proficiency of all qualified tasks associated with ASB missions
- e. Bureau policies and procedures
- f. Demonstrated pilot proficiency for the tasks prescribed by the ASB Pilot Training Manual

4. Hazard identification & risk management which includes:

- a. Judgment and decision making

- b. Fatigue Management
 - c. Human factors
 - d. Stress management in all phases of flight
 - e. Interpersonal communications between crewmembers, to include prioritization and crew coordination.
 - f. Workload management
 - g. Cockpit distractions
5. Situational awareness
6. Inadvertent Instrument Meteorological Conditions (IIMC) and recovery procedures
7. Emergency Procedures/Recurrent Training:
- a. Shall be conducted annually using Helistream's UH-1 Helicopter.
 - b. Includes an oral exam on the aircraft limitations and emergency sections of the aircraft's flight manual. This will be completed at Helistream and during the annual flight evaluation.

Hoist Operator Initial Training and Recurrent Training:

1. Initial Hoist Operator Training: Normal operating procedures relevant to the aircrew duties, including:
- a. Aircraft pre-flight procedures
 - b. Aircraft re-fueling procedures
 - c. Aircraft fire guard/safety watch starting procedures
 - d. Proper use of aircraft checklists
 - e. Sterile cockpit procedures (M)
 - f. Passenger briefing, including, but not limited to:
 - i. Loading and unloading of passengers while the aircraft is operating and not operating. (With specific attention on the hazards associated with rising terrain)
 - ii. Seatbelt and shoulder harness operation

- iii. Hazards associated with loose objects in the cabin
- iv. Passenger door operation
- v. Passenger inter-communications systems
- g. OCSD SAR Training Manual Procedures and Training Information
- h. Terrain and weather
- i. Orientation to airports
- j. SAR and Flight Risk Assessment
- k. Environmentally appropriate survival training
- l. Hazard Mitigation
- m. Multi-Aircraft Operations
- n. Ability to assist pilot with navigation and communications
- o. Aeronautical Decision Making (ADM)
- p. Crew Resource Management (CRM)
- q. OCSD Aviation Safety Program
- r. Proper wearing and use of Personal Protective Equipment (PPE) and Survival Equipment

2. Mission Training: All hoist operators shall be trained by an OCSD Hoist Operator Instructor on the proper use of all mission, special use techniques, and related equipment in the aircraft that he/she is expected to operate. This includes, where applicable, the following:

- a. Search, rescue, and recovery operations and equipment
- b. Human and non-human external loads, such as hoist, short haul and fast rope
- c. Airborne search techniques
- d. Aircraft ingress and egress
- e. Medical operations, in continuation of a SAR mission
- f. Helicopter Coordinator (HELCO) operations

- g. Special mission equipment and communications equipment
- h. Environmental operations training
- 3. Training shall be provided on the legal aspects of Public Aircraft Operations.
- 4. Incident Command System (ICS)
- 5. Emergency Procedures Training: Crew chiefs shall be trained on the following emergency procedures:
 - a. Passenger briefing for in-flight and ground emergencies
 - b. Emergency egress/aircraft ditching training
 - c. Water egress procedures for all occupants (if applicable)
 - d. Location and use of aircraft emergency/survival equipment
 - e. Emergency radio communications procedures
 - f. In-flight fire considerations
 - g. Crew resource management (CRM)
 - h. Crew member responsibilities during an in-flight emergency
 - i. Inadvertent IMC recovery assistance when appropriate
 - j. Special rescue considerations (aircraft/equipment failures, hoist failure, line entanglements, etc.)

Search and Rescue Downside Rescuer Initial Training and Recurrent Training:

Minimum Qualifications: OCSD Downside Rescuers shall be either an EMT, Advanced EMT or Paramedic.

- 1. Initial Downside Rescuer Training: Normal operating procedures relevant to the aircrew duties, including:
 - a. Trained and certified as a medical care provider consistent with the applicable level of medical care, Basic Life Support (BLS) or Advanced Life Support (ALS). Medical personnel must be accredited by OCEMS.
 - b. Equipment pre-flight procedures

- c. Aircraft fueling procedures
- d. Aircraft fire guard/safety watch starting procedures
- e. Proper use of equipment and operational checklists
- f. Sterile cockpit procedures
- g. Passenger briefing, including, but not limited to:
 - i. Loading and unloading of passengers while the aircraft is operating and not operating. (With specific attention on the hazards associated with rising terrain)
 - ii. Seatbelt and shoulder harness operation
 - iii. Hazards associated with loose objects in the cabin
 - iv. Aircraft door operation
 - v. Emergency exits
 - vi. Passenger inter-communications systems
- h. OCSD SAR Training Manual Procedures and Training Information
- i. Terrain and weather
- j. SAR and flight risk assessment
- k. Hazard Mitigation
- l. Multi-Aircraft Operations
- m. Ability to assist pilot with navigation and communications
- n. Crew Resource Management (CRM)
- o. OCSD Aviation Safety Program
- p. Proper wearing and use of Personal Protective Equipment (PPE) and survival equipment
- q. Environmentally appropriate survival training
- r. Landing zone management

2. Mission Training: All downside rescuers shall be trained by a designated OCSD Downside Rescuer Instructor on the proper use of all mission equipment and

rescue techniques in the aircraft that the rescuer is expected to operate.

This includes, where applicable, the following:

- a. Search, rescue, and recovery operations and equipment
- b. Human and non-human external loads, such as hoist, short haul and fast rope.
- c. Airborne search techniques
- d. Aircraft ingress and egress during SAR missions
- e. Medical operations, in continuation of a SAR mission
- f. Special mission equipment and communications equipment.
- g. Environmental operations training

3. Incident Command System (ICS)

4. Emergency Procedures Training: OCSD Downside Rescuers shall be trained on the following emergency procedures:

- a. Passenger briefing for in-flight and ground emergencies
- b. Emergency egress/aircraft ditching training
- c. Water egress procedures for all occupants (if applicable)
- d. Location and use of aircraft emergency/survival equipment
- e. Emergency radio communications procedures
- f. In-flight fire considerations
- g. Crew resource management (CRM)
- h. Crew member responsibilities during an in-flight emergency
- i. Inadvertent IMC awareness
- j. Special rescue considerations (aircraft/equipment failures, hoist failure, line entanglements, etc.)

HELI-STEP OPERATIONS- UH-1

Entering aircraft

Good standby position and location

Watching crew chief for direction and hand signals (at all times)

Approaching aircraft (with and without equipment)

Watching footing on approach

Forearm to forearm grasp

Smooth transition up skids toward aircraft (never allow feet under skid)

Grab handle or bar inside cabin (mounted on roof on each side)

Smooth transition into and across cabin (keeping feet under you)

Facing straight, or toward the rear of aircraft coming to a seated position

Seatbelt fastened

Assist partner with gear and or seatbelt if necessary

Exiting aircraft

Watch crew chief for direction

Listen to crew chief, 1 minute out, 10 seconds out

Double check you have all gear with you or ready to go

Unfasten seatbelt/safety sign by crew chief (thumbs up)

Unplug helmet or remove headset

Prepare to depart aircraft upon crew chief's direction

Smooth movement through cabin

Facing straight out of aircraft

Step down using skid steps

Kneel in safe location 3-4 feet away from skids

Remain at location until aircraft has departed

Pilots must receive initial training from a qualified Bureau CFI in order to be qualified for Heli-Step Missions. Pilots must maintain annual currency in order to perform Heli-Step Missions.

UH-1 Crewmembers must be training by the designated OCSD Instructors (Hoist Operation or Downside Rescuer) who has previously completed the Heli-Step Training.