

A publication of the
National Wildfire
Coordinating Group



NWCG Standards for Interagency Cooperator Type 2 and 3 Helicopters

PMS 525-1

AUGUST 2021

NWCG Standards for Interagency Cooperator Type 2 and 3 Helicopters

August 2021
PMS 525-1

The *NWCG Standards for Interagency Cooperator Type 2 and 3 Helicopters* establishes the minimum standards for Type 2 and Type 3 helicopters (nine passengers or less), including cooperator aircraft (owned and contracted), personnel, and support equipment when being operated under interagency fire agreements.

The National Wildfire Coordinating Group (NWCG) provides national leadership to enable interoperable wildland fire operations among federal, state, tribal, territorial, and local partners. NWCG operations standards are interagency by design; they are developed with the intent of universal adoption by the member agencies. However, the decision to adopt and utilize them is made independently by the individual member agencies and communicated through their respective directives systems.

Table of Contents

Chapter 1 – Scope	1
1.1 Scope	1
Chapter 2 – Certifications	1
2.1 Standard and Restricted Category Aircraft	1
2.2 Non-Certificated (Carriage of Federal Personnel Prohibited Unless Defined by the LOA).....	2
Chapter 3 – Aircraft Requirements	2
3.1 General	2
3.2 Minimum Performance Requirements	3
3.3 Center of Gravity.....	3
3.4 Condition of Equipment.....	3
3.5 General Equipment.....	3
Chapter 4 – Aircraft Maintenance	7
4.1 General	7
4.2 Non-Certificated Aircraft Specific Requirements.....	9
Chapter 5 – Aircraft and Equipment Security.....	10
5.1 Security	10
Chapter 6 – Avionics Requirements.....	10
6.1 Minimum Requirements	10
6.2 Avionics Specifications.....	11
6.3 Avionics Installation and Maintenance Standards	15
Chapter 7 – Fuel Servicing Vehicle, If Offered	16
Chapter 8 – Operations	16
8.1 General	16
8.2 Special Use Flights.....	16
8.3 Pilot Authority and Responsibilities	17
8.4 Flights with Cowling(s) or Doors Open/Removed	18
8.5 External Load Operations	18
8.6 Tank Operations	19
8.7 Dual Controls	19
8.8 Transportation of Hazardous Material (HazMat).....	19
Chapter 9 – Cooperator’s Environmental Responsibilities	20
Chapter 10 – Personnel	20
10.1 General	20
10.2 Pilot	20
10.3 Mechanic	23
10.4 Fuel Servicing Vehicle and Driver Qualifications (If Ordered).....	23
Chapter 11 – Flight Hour and Duty Limitations	24
11.1 General	24
11.2 Pilots.....	24
11.3 Mechanics	25
11.4 Fuel Servicing Vehicle Drivers (FSVD) (If Ordered).....	25
Chapter 12 – Accident Prevention and Safety & Mishaps.....	25
12.1 Accident Prevention and Safety	25
12.2 Mishaps	26

Chapter 13 – Personal Protective Equipment (PPE)	27
Chapter 14 – Inspection and Acceptance	27
Exhibits	28
EXHIBIT 1 – FIRST AID KIT (AERONAUTICAL).....	29
EXHIBIT 2 – SURVIVAL KIT AERONAUTICAL (LOWER 48).....	30
EXHIBIT 3 – ALASKA SUPPLEMENT.....	32
EXHIBIT 4 – RESTRAINT SYSTEMS CONDITION INSPECTION GUIDELINES	34
EXHIBIT 5 – ADDITIONAL SUPPRESSION/PREScribed FIRE EQUIPMENT	35
EXHIBIT 6 – HIGH VISIBILITY MARKINGS ON MAIN ROTOR BLADES.....	40
EXHIBIT 7 – FUEL SERVICING EQUIPMENT REQUIREMENTS	41
EXHIBIT 8 – OPERATIONS AND SAFETY PROCEDURES GUIDE FOR HELICOPTER PILOTS	46
EXHIBIT 9 – INTERAGENCY GUIDELINES FOR VERTICAL REFERENCE/EXTERNAL LOAD TRAINING	47
EXHIBIT 10 – INTERAGENCY HELICOPTER LOAD CALCULATION	49
EXHIBIT 11 – WEIGHT AND BALANCE FORM A (EXAMPLE).....	52
EXHIBIT 11 – WEIGHT AND BALANCE FORM A (Blank).....	53
EXHIBIT 11 – WEIGHT AND BALANCE FORM C (Example).....	54
EXHIBIT 11 – WEIGHT AND BALANCE FORM B (Example).....	55
EXHIBIT 11 – WEIGHT AND BALANCE FORM B (Blank)	56
EXHIBIT 11 – WEIGHT AND BALANCE FORM C (Blank)	57
EXHIBIT 12 – HELICOPTER LIKE MAKES, MODELS, AND SERIES.....	58
EXHIBIT 13 – HELICOPTER FUEL CONSUMPTION AND WEIGHT REDUCTION CHART ..	59
EXHIBIT 14–DRAWING FS/OAS A-16.....	60
EXHIBIT 15–DRAWING FS/OAS A-17.....	61
EXHIBIT 16 – ACRONYMS	62

Chapter 1 – Scope

1.1 Scope

1. This document contains the aviation standards developed for cooperating fire agencies. These standards are intended for use by federal, state, and local cooperating agencies entering into agreements for the use of aviation assets utilized in the Interagency Fire program. The Interagency Call-When-Needed (CWN) and On Call helicopter contracts were used to develop these standards. In addition, the standards have been rewritten to accommodate Public Aircraft Operations (PAO) specific issues such as the use of non-certificated aircraft.
2. The intent of this document is to define the minimum standards for Type 2 and Type 3 helicopters (nine passengers or less), including cooperator aircraft (owned and contracted), personnel, and support equipment when being operated under Interagency Fire agreements.
3. Cooperator personnel must conduct themselves in a professional and cooperative manner.
4. The aircraft furnished will be used for fire incident support, but may also be used for project, law enforcement, and administrative flights. If the cooperator agrees to perform law enforcement flights, such agreement must be in writing.
5. When operating in Alaska, see Exhibit 3, Alaska Supplement for additional requirements.
6. All operations, involving the carriage of federal personnel, will be in accordance with the *NWCG Standard for Helicopter Operations*, PMS 510, <https://www.nwcg.gov/publications/510>.
7. This standard is not applicable to National Guard or active military agreements.

Chapter 2 – Certifications

2.1 Standard and Restricted Category Aircraft

1. Standard Category Aircraft (carriage of federal personnel to be defined by the LOA)
 - a. All passenger-carrying flights, regardless of the number of passengers carried, must be conducted in accordance with the Operator's 14 CFR Part 135 operations specifications.
 - b. Aircraft must be certificated in Normal or Transport Category.
 - c. The Federal Agency may elect not to utilize individual standard category aircraft for passenger transport.
2. Restricted Category Aircraft (carriage of federal personnel prohibited unless defined by the LOA)
 - a. Aircraft certificated in restricted category must have been issued a Special Airworthiness Certificate.
 - b. Aircraft configured from aircraft types that have FAA Type Certificates obtained by the aircraft manufacturer must incorporate the manufacturer's designated changes to bring the aircraft into conformity with their type design, excluding passenger configuration requirements. All applicable FAA Airworthiness Directives (ADs) and mandatory manufacturer Service Bulletins must be complied with.

- c. Aircraft, which are configured from former military aircraft, which have FAA Type Certificates based upon military operation in lieu of a manufacturer's Type Certificate, must have all applicable Time Compliance Technical Orders (TCTOs), military Service Bulletins, and Safety-of-Flight Messages accomplished. This includes any directives, which refer to later models of the same type, which were issued after the earlier models had left the military inventory. When FAA approvals establish more restrictive limits, such limits will prevail.

2.2 Non-Certificated (Carriage of Federal Personnel Prohibited Unless Defined by the LOA)

1. Aircraft, configured from aircraft types previously certified through FAA Type Certificates obtained by the aircraft manufacturer must incorporate the designated changes to bring the aircraft into conformity with their type design, excluding passenger configuration requirements. All applicable FAA ADs and mandatory manufacturer Service Bulletins must be complied with.
2. Aircraft, which are configured from former military aircraft must have all applicable TCTOs, military Service Bulletins, and Safety-of-Flight Messages complied with. This includes any directives, which refer to later models of the same type, which were issued after the earlier models had left the military inventory. When FAA approvals establish more restrictive limits, such limits will prevail.

Chapter 3 – Aircraft Requirements

3.1 General

1. Cooperators aircraft must conform to the applicable standards including any model-specific requirements contained in the supplements.
2. All required documents needed to verify the data in Form FS-5700-21a or OAS-36B; Helicopter Data Record (including airframe logs, engine logs, compliance with mandatory manufacturer's bulletins, FAA ADs compliance, Instructions for Continued Airworthiness (ICA) and aircraft status record, etc.) must be made available to any appropriate inspector. A status sheet containing the status of inspections, FAA ADs and components having time/life limits must be available with each aircraft.
3. Complete set of current aeronautical charts covering area of operation. The cooperator is responsible for providing navigation publications. Approved "electronic" flight bags meet this requirement.
4. Aircraft must be maintained in accordance with all applicable 14 CFR requirements, mandatory manufacturers' bulletins as required or identified by the USFS and/or DOI, and all applicable FAA ADs.
5. Operations from other than the manufacturer's designated pilot station are allowed only when the aircraft has been properly modified in accordance with the requirements contained within this standard. For standard and restricted category aircraft, alteration of the aircraft must be approved under an FAA Supplemental Type Certificate (STC) or field approval and designation on the aircraft approval documents for single piloted aircraft, field approvals in lieu of STCs are not acceptable unless operational gauges are installed in a manner which allows observation while the pilot's focus is on the external load.

3.2 Minimum Performance Requirements

1. Aircraft must be capable of a jettisonable payload of 550 pounds HOGS at 30 degrees Centigrade at 5,000 feet pressure altitude with a 200-pound pilot and 1½ hours total fuel.
2. Powered by a turbine engine

3.3 Center of Gravity

1. All aircraft must be configured and operated within the center of gravity limits stated in the appropriate flight manual. Actual weights will be used for flight calculation.

3.4 Condition of Equipment

1. Cooperator furnished aircraft and equipment must be operable, free of damage, and in good repair. Aircraft systems and components must be free of leaks except within limitations specified by the manufacturer.
2. All windows and windshields must be clean and free of scratches, cracks, crazing, distortion, or repairs, which hinder visibility. Repairs such as safety wire lacing and stop drilling of cracks are not acceptable permanent repairs. Prior to acceptance, all temporarily repaired windows and windshields must have permanent repairs completed or be replaced.
3. The aircraft interior must be clean and neat. There must be no un-repaired tears, rips, cracks, or other damage to the interior. All interior materials must meet FAA standards. Interior of non-certificated aircraft must meet the manufacturer's standards for their interior and any modifications must meet FAA standards.
4. The exterior finish, including the paint, must be clean, neat, and in good condition (i.e., no severe fading, large areas of flaking, or missing paint, etc.). Military or other low visibility paint schemes are unacceptable. Any corrosion must be within manufacturer or FAA acceptable limits.

3.5 General Equipment

1. Aircraft must be configured with the equipment required by 14 CFR and approved for make and model furnished. In addition, the following will be required:
2. A copy of the applicable agreement (LOA, MOU, Contracts) and modification(s) must remain in the aircraft during the agreement period(s). Electronic copies may be used. However, the cooperator is responsible for ensuring that the documents are uploaded on an appropriate viewing device (e.g., laptop or tablet), which must be charged and made available at the aircraft for reference by Federal Agency representatives upon request.
3. Instrumentation required by the Type Certificate and/or 14 CFR for use with the make and model furnished.
4. Free air temperature gauge.
5. Approved aircraft lighting for night operation in accordance with 14 CFR Part 91.205(c), plus instrument lights.
6. First Aid Kit Aeronautical (Exhibit 1, First Aid Kit Aeronautical)
7. Survival Kit Aeronautical (Exhibit 2, Survival Kit Aeronautical, Lower 48). The weight of the Survival Kit must be considered as an addition to the equipped weight of the aircraft and will be documented on the Weight and Balance.

8. The fire extinguisher(s) must be a hand-held bottle, fully charged, with a minimum of a 2-B:C rating, maintained in accordance with NFPA 10, and mounted with a quick-release attachment accessible to the flight crew while seated.
9. Seatbelts, Shoulder Harnesses, Seats
 - a. FAA-approved double-strap shoulder harness with automatic locking inertia reels for each front seat occupant. Shoulder straps and lap belts must fasten with one single-point, metal-to-metal, and quick-release mechanism. Standard factory shoulder harnesses are acceptable for Aerospatiale and Bell transport category helicopters. Military style harnesses are acceptable. (Exhibit 4, Restraint Systems Condition Inspection Guidelines).
 - b. FAA-approved single diagonal strap with inertia reel or double shoulder harness, with or without inertia reel, integrated with a seat belt, with one single-point metal-to-metal quick-release mechanism for each aft cabin occupant.
 - c. All Seats, Seat Belts and Shoulder Harnesses for all aircraft must either be:
 - i. An Original Equipment Manufacturer/Manufacturing (OEM) installation
 - ii. Supplemental Type Certificate (STC)
 - (1) Approved for installation by an FAA Form 8110-3 with all Designated Airworthiness Representative (DER) supporting engineering substantiation documentation attached, or
 - (2) Field Approved for installation with supporting FAA Form 8110-3 and all DER supporting engineering substantiation documentation attached. Installations of a seat, seat belt, or shoulder harness are not acceptable as a minor alteration.
 - iii. Seatbelt and shoulder harness installations must follow the guidelines and best practices of FAA Advisory Circular (AC) 21-25A and 21-34. Field Approvals based on previously approved installations must match make and model. Field Approvals using previously approved "generic" Field Approvals are not acceptable (i.e., a Field Approval for a Bell 212) based on a previously approved similar installation for an S-58, would not be acceptable.
10. One flight hour meter (Hobbs) installed in a location observable by the pilot and front seat observer while seated. The meter must be wired in series with a switch on the collective control, and a switch activated by engine or transmission oil pressure or equivalent system, to record flight time only. For aircraft with a landing gear incorporating an extendable strut, the hour meter may be activated by a switch mounted in such a manner as to only operate when the strut is fully extended. The hour meter must record actual flight time in hours and tenths of an hour only.
11. Equipped for observation of external loads and landing gear (e.g., convex mirror, camera, etc.).
12. Personnel access steps for standard category aircraft with a floor height greater than 18 inches to ensure safe entrance and exit from each door. A section of the external cargo rack may be utilized as a step by providing a clear space covered with non-skid material.
13. Dual controls are required for pilot evaluations.
14. One or more white or white and red strobe light(s) mounted on top of the aircraft or otherwise visible from above. In accordance with 14 CFR Part 27.1401, Anti-collision Light System (d) Color. Each anti-collision light must be aviation red and meet the applicable requirements of 14 CFR Part 27.1397. An LED aviation red strobe installed by the OEM or STC will also fulfill this

requirement. In order to meet specifications, Cooperators must obtain FAA approval (FAA Form 337) to alter the aircraft, if applicable.

15. High visibility markings on main rotor blades (Exhibit 6, High Visibility Markings on Main Rotor Blades).
16. Cargo Hook
 - a. Keeperless design (Keeper type cargo hooks installed on UH-1 variants may be used when approved through an exemption on local/regional LOAs).
 - b. Refer to Exhibit 5(C) for additional requirements and alternate equipment.
 - c. One keeperless cargo hook that is rated at the maximum lifting capacity of the aircraft.
 - d. The cargo hook must be maintained in accordance with the manufacturer's operating and maintenance instructions. If there is no manufacturer's recommended maintenance and overhaul program, completely disassemble, inspect, repair as required, lubricate, and perform a full-load operational check every 24 calendar months.
17. Remote hook, longline (if offered)
 - a. One remote cargo hook capable of being loaded and locked in a single motion with one hand and is rated at the maximum lifting capacity of the aircraft.
 - b. A minimum of 150 feet of longline. Longline may consist of multiple segments and none shorter than 50 feet as per Exhibit 5.
 - c. The remote hook must be inspected and maintained as stated above (16.d.)
18. Variable capacity bucket(s) (Required for all bucket helicopters)
 - a. All buckets
 - i. One (1) collapsible, variable capacity water/retardant bucket must be furnished under this Standard. Bucket must be capable of being transported in the cabin or baggage compartment or external basket of the aircraft.
 - ii. The bucket at 100 percent of the manufacturer's rated capacity (+/- 5%) must be commensurate with the maximum lifting capability (HOGGE) of the aircraft at 5,000 feet pressure altitude and 30 degrees Centigrade with a 200-pound pilot and 1 ½ hours of total fuel. The bucket must be capable of being operated with all increments of the longline. No partial dips allowed.
 - iii. An Operations Manual for the type bucket(s) provided must be available on site.
 - iv. Must be leak free (½ gallon or less in a 24-hour period)
 - v. The jettison-arming switch, if applicable, must be in the armed position during external load operations.
 - vi. When a bucket is attached directly to the cargo hook, it is critical to measure the maximum length of the extended bucket from the shackle on the control head to the extended dump valve/fire sock, making sure that it is at least 6 inches less than the distance from the belly hook to the closest possible point on the tail rotor. Lines attached between the cargo hook and the bucket must extend the bucket past the outside arc of the tail rotor, the line must be no shorter than 50 feet.

- vii. The bucket gate open/close switch(es) must be clearly marked for open and closed, spring-loaded to the OFF position. The switch must be of a different design and be mounted in such a way as to not easily be confused with the RPM Control (Beep) switch.
- b. Non-Gated buckets and Non-PowerFill buckets
 - i. Bucket Capacity of each position or adjustment level must be marked on the bucket. Collapsible buckets with cinch straps must only be adjusted to the marked graduations (i.e., 90%, 80%, 70%). Attempts to establish intermediate graduations or capacities below the manufacturer's minimum graduation (by tying knots, etc.) are prohibited.
 - ii. Either the weight of the bucket or capacity at each adjustment level must be marked on the bucket or the operator must have a written statement of the maximum capacity (weight) at each adjustment point.
 - c. Gated Buckets and PowerFill buckets (optional)
 - i. Requires electronic hook load measuring system that provides cockpit readout of the actual weight.
 - ii. Either the weight of the bucket or capacity must be marked on the bucket or the operator must have a written statement of the maximum capacity.
 - iii. If PowerFill equipped, the bucket must fill to maximum capacity in no more than 90 seconds.
19. Fixed Suppressant/Retardant Delivery Tank with Self-Filling Capability
 20. Refer to Exhibit 5 for additional requirements and alternate equipment.
 21. If installed, an auxiliary power connector, three-pin, (MS3112E12-3S) protected by a 5-amp circuit breaker connected to the avionics or main aircraft power buss must be permanently mounted in a location convenient to the passenger compartment. (see Exhibit 15)
 22. If installed, part number MS 3101E24-11S, nine-pin connector, for use as the power source for helitorch. (see Exhibit 15)
 23. FAA-Approved Extended Height /High Skid Landing Gear (if available by STC or aircraft manufacturer) required on aircraft approved to carry federal personnel.
 24. FAA-approved high visibility, pulsating, forward-facing, conspicuity lighting.
 25. Approved locking cap(s) on all fuel filler ports. Single-point refueling port dust caps need not have an FAA-approved locking device.
 26. (Required on aircraft approved to carry federal personnel) Internal baggage compartment/external cargo baskets. All internal cargo restraint anchor locations must have cargo rings installed. Fifteen (15) cubic feet of cargo space with isolated internal baggage compartment(s) capable of accommodating 58-inch long shovels, rakes, and other firefighting tools (requires rear bulkhead modification of baggage compartment of some models). All aircraft equipped with an external basket must have an FAA STC or field approval applicable for make and model, for dimension, load carrying capability, and material construction. The basket will have a hinged top with a suitable method to secure the top closed in flight, to prevent the contents from exiting. All helicopters must have FAA-approved internal cargo area restraints or barriers which extend from the floor to the ceiling, isolating the passenger area from the cargo area (transmission wells), sliding door area, and will not compromise passenger ingress and egress. Cargo behind soft passenger seats must be restrained while seats are occupied per 14

CFR requirements. Restraints or barriers must be capable of being removed within 15 minutes. Restraints within the cargo area of the transmission wells must have netting restraints only.

27. FAA-approved wire strike protection system (mechanical) is required for all helicopters carrying Federal personnel.
28. FAA-approved floor protection. Aircraft must have floor protection within the cargo area. Floor protection is not required within the passenger seating areas. Floor protection must not be greater than ½" thick to allow for the installation of all passenger seats and access to all installed anchor points. (Not applicable to restricted category aircraft).
29. Engine inlet air filtration system/particle air separator.
30. Heating system for windshield de-fog.
31. Kit for disposal of fuel during start-up/shutdown, i.e., EPA Bell Kit if commercially available.

Chapter 4 – Aircraft Maintenance

4.1 General

These general maintenance requirements are applicable to both certificated and non-certificated aircraft. See below for additional specific compliance instructions for non-certificated aircraft.

1. Type certificated aircraft must be maintained in accordance with the requirements of 14 CFR Part 43 and Part 91 and the manufacturer's instructions regardless of its PAO status.
2. Persons authorized to perform maintenance, preventive maintenance; rebuilding, and alterations will do so in accordance with 14 CFR Part 43 and Part 65. 14 CFR Part 145 Repair Stations may be used for specific maintenance functions that the repair station is certified for. The aircraft must be returned to service under the repair station certificate and not under an individuals' certificate for the repair station, for example, repairman or airframe and powerplant (A&P) mechanic. Refer to the non-certificated aircraft supplements for specific requirements.
3. Special equipment and/or modification of the aircraft to meet requirements of this Standard must be inspected, repaired, and altered in accordance with 14 CFR requirements and manufacturer's recommendations or engineered data and, if required, be FAA-approved.
4. Aircraft must have discrepancies and inoperative equipment repaired or replaced in accordance with 14 CFR 91.405.
5. Except as provided in 14 CFR 91.213, no pilot will take off an aircraft with inoperative instruments or equipment. Placards will be installed for any inoperative instruments or equipment allowed by 14 CFR 91.213(d)(2).
6. No aircraft will be operated in an un-airworthy or unsafe condition in accordance with 14 CFR 91.7 and will have such conditions repaired before resuming normal operations.
7. Maintenance record keeping will be in accordance with 14 CFR Parts 43, 91, and 135 as applicable. Reference FAA AC No. 43-9C as revised. A copy of the current maintenance record required by 14 CFR 91 must be available upon request. Updates must be transmitted to the operator's home office every 12 flight hours or 7 days, whichever occurs first. All maintenance performed must be recorded in accordance with 14 CFR 43 and 91 including aircraft time in service and hour meter reading. Electronic copies of manuals and records are acceptable.

8. In accordance with 14 CFR 91.403(c), no aircraft will be operated unless the mandatory replacement times, inspection items, or related procedures are complied with. Aircraft must not be approved or used if any component time in service exceeds the manufacturers' recommended Time Between Overhaul (TBO) unless authorized by an industry accepted extension (Manufacture, Military, FAA-approved extension, etc.). The extension authorization must be kept with the aircraft.
9. The applicable FAA ADs required by 14 CFR Part 39 must be complied with. Refer to the non-certificated aircraft supplements for specific requirements.
10. The manufacturer's mandatory bulletins are to be complied with. Refer to the non-certificated aircraft supplements for specific requirements.
11. Aircraft must comply with the inspection requirements of 14 CFR 91.409. Refer to the non-certificated aircraft supplements for specific requirements.
12. Inspections must be performed in a maintenance facility, or in the best field conditions available.
13. The aircraft's equipped weight is to be calculated using weight and balance data which was determined by the actual weighing of the aircraft. The weight and balance record must be current, within the preceding 24 calendar months. The aircraft must be weighed following any major repair, major alteration, or change to the equipment list that significantly affects the center of gravity of the aircraft. A signature of a rated mechanic verifying the accuracy of the record is required. All weighing of aircraft must be performed on scales that have been certified as accurate within the previous one (1) year. The certifying agency may be any accredited weights and measures laboratory, using standards traceable to the National Institute of Standards and Technology (NIST). The scales must be listed by make model and calibration date in the aircraft weight and balance documentation (see example at Exhibit 11).
14. A list of equipment installed in the aircraft at the time of weighing must be compiled. The equipment list must include the name of each item installed. Items that may be easily removed or installed for aircraft configuration changes (seats, doors, radios, cargo hook, baskets, special mission equipment, etc.) must also be listed including the name, weight, arm, and moment of each item. Each page of the equipment list must identify the specific aircraft by serial and registration number. Each page of the equipment list must be dated indicating the last date of weighing. The weight and balance must be revised, using a weight and balance revision record (see example at Exhibit 11) each time equipment is removed or installed.
15. A power assurance check must be accomplished on the first day of operation, and thereafter within each 10-hour interval of flight operation unless prohibited by environmental conditions (i.e., weather, smoke). The power assurance check must be accomplished by the cooperator in accordance with the Aircraft Flight Manual or approved cooperator performance monitoring program. The results must be recorded in the appropriate aircraft flight records. Aircraft with power output below the minimum published performance charts or procedures must be removed from service. The below-minimum power condition must be corrected before returning to service and availability. The operational environment may subject the helicopter engine to frequent smoke, sand, and dust ingestion. All helicopters must comply with the erosion inspection procedures at the recommended intervals in accordance with the engine operation and maintenance manual for the aircraft.
16. The Cooperator must perform an operational check flight following installation, overhaul, major repair, or replacement of any engine, propeller, power train, rotor system, flight control system, or when requested by the USFS, DOI, or Federally approved Aviation Maintenance Inspector.

The pilot must enter the result of this test flight in the aircraft records, as outlined in 14 CFR 91.407. The results of the test flight must be reported to and approved by the USFS, DOI, or Federally approved Maintenance Inspector.

17. Do not return aircraft having mechanical or equipment deficiencies to availability until the aircraft has been approved by a USFS, DOI, or Federally approved Maintenance Inspector. When any unscheduled maintenance or repairs are performed for mechanical or equipment deficiencies, a USFS, DOI, or Federally approved Maintenance Inspector will be notified for return to availability status before the aircraft may again be allowed to fly under the Federal dispatch order. Depending on the complexity of the maintenance or repair, “return to availability status” may be given by electronic or verbal means.

4.2 Non-Certificated Aircraft Specific Requirements

1. Non-type certificated PAO aircraft must be maintained in a manner consistent with certificated aircraft and in accordance with the aircraft model-specific ICA.
2. Inspection programs, airworthiness limitations, overhauls, and FAA AD compliance are all addressed in each aircraft model’s ICA.
3. The aircraft, components, parts, etc. must be considered certificated for the purpose of determining persons authorized to perform maintenance, preventive maintenance, rebuilding, and alterations and for determining the requirements for return to service in accordance with 14 CFR Part 43 with the following exceptions:
 - a. In lieu of the certificate number required by 14 CFR 43.9 and 43.11, a cooperators issued unique number or stamp, which identifies the individual, may be utilized.
 - b. The execution of the repair or alteration form authorized by or furnished by the Administrator in accordance with 14 CFR 43.5(b) is to be completed and retained with the aircraft records, but a copy need not be submitted to the FAA.
4. The following requirements must be met when performing major modifications on non-certificated aircraft:
 - a. Modifications performed on non-certificated aircraft are to be based on acceptable data and sound aeronautical practices. Examples of acceptable data:
 - i. Data such as Supplemental Type Certificates applicable to certificated versions of the aircraft or similar aircraft.
 - ii. Generic STCs, such as an STC for a radio install on all aircraft.
 - iii. Data reviewed by an FAA Designate Airworthiness Representative (DER) or Designated Engineering Representative (DAR) representative.
 - iv. Manufacturer’s data.
 - v. Military modification data.
 - vi. Standard practices such as the latest version of AC 43.13.
 - b. The modifications must be documented in the aircraft’s records.
 - c. The weight and balance record and equipment list must be updated.

- d. Instructions for Continued Airworthiness (ICA) are to be incorporated into the aircraft's records and maintenance program to ensure that the aircraft is properly maintained. Refer to FAA Order 8110.54 for assistance. At a minimum ICAs must include the following:
 - i. Instructions for compliance with 14 CFR Part 39 ADs.
 - ii. Airworthiness limitations section including mandatory replacement times and mandatory inspection items.
 - iii. Inspection procedures.
 - iv. Overhaul intervals and data to be used for overhauls.
 - v. Maintenance instructions.
- e. A flight manual supplement must be added to the flight manual when a modification affects the operation of the aircraft.

Chapter 5 – Aircraft and Equipment Security

5.1 Security

1. The security of cooperator provided aircraft and equipment is the responsibility of the cooperator.
2. Aircraft must be electrically and/or mechanically disabled by two independent security systems whenever the aircraft is unattended. Deactivating security systems must be incorporated into preflight checklists to prevent accidental damage to the aircraft or interfere with safety-of-flight.
3. Examples of Unacceptable disabling systems are:
 - a. Locked door/windows; and/or
 - b. Fenced parking areas.
 - c. Any device that could induce an unsafe condition.

Chapter 6 – Avionics Requirements

6.1 Minimum Requirements

All avionics used to meet this Standard must comply with the requirements of paragraph 6.2 “Avionics Specifications” and paragraph 6.3 “Avionics Installation and Maintenance Standards.” The following are the minimum avionics that must be installed.

1. All Aircraft
 - a. One VHF-AM Radio (COM 1)
 - b. One VHF-FM Radio (FM 1)
 - c. One Auxiliary FM system (AUX FM) or one VHF-FM (FM 2) (applicable only to aircraft approved to carry federal personnel)
 - d. One Global Positioning System (GPS)
 - e. An Intercom System (ICS) {Not required in single occupant aircraft}
 - f. Audio Control systems applicable to the type of aircraft offered

- g. An Emergency Locator Transmitter (ELT)
- h. An Automated Flight Following System (AFF)
- i. One Transponder
- j. One Altimeter and Automatic Pressure Altitude Reporting system
- k. ADS-B OUT

2. Aircraft approved for Air Tactical operations

Aircraft may be approved for Air Tactical operations provided they meet the requirements of 6.1.1(c) through 6.1.1(k) and the following requirements based on the type of Air Tactical approval. These requirements are for optional mission approval only. Paragraph 6.1.1 will remain the minimum required avionics for aircraft under this Standard.

- a. Air Tactical Type 1 (minimum requirements for Air Tactical operations in California)
 - i. Two VHF-AM Radios (COM 1 & COM 2)
 - ii. Two VHF-FM Radios (FM 1 & FM 2)
 - iii. Radio transmit capability from the aft passenger compartment connected to the SIC/observer Audio Control system. An Aft Audio Control system for this position is acceptable.
- b. Air Tactical Type 2
 - i. Two VHF-AM Radios (COM 1 & COM 2)
 - ii. One VHF-FM Radio (FM 1)
 - iii. Radio transmit capability from the aft passenger compartment connected to the SIC/observer Audio Control system. An Aft Audio Control system for this position is acceptable.
- c. Air Tactical Type 3
 - i. Two VHF-AM Radios (COM 1 & COM 2)
 - ii. One VHF-FM Radio (FM 1)

6.2 Avionics Specifications

All avionics used to meet this Standard must comply with the following requirements and paragraph 6.3 “Avionics Installation and Maintenance Standards.”

1. Communications systems

Transmitters must not open squelch on, or interfere with, other AM, or FM transceivers on the aircraft which are monitoring different frequencies. Transmit interlock functions must not be used with communication transceivers. (This paragraph does not apply to single pilot helicopters which are not approved for passengers or non-fire aircraft.)

a. VHF-AM Radios

VHF-AM radios must be TSO approved aeronautical transceivers, permanently installed, and operate in the frequency band of 118.000 to 136.975 MHz with a minimum of 760 channels in no greater than 25 KZ increments. Transmitters must have a minimum of 5 Watts carrier output power.

b. VHF-FM Radios

All aircraft approved for fire operations must use P25 Digital VHF-FM transceivers meeting the specifications of FS/OAS A-19. FM radios used in all aircraft must be agency approved. FS/OAS A-19 and a list of currently approved FM radios can be found at <https://www.nifc.gov/resources/NIICD/niicd-documents>. The following requirements must be met:

- i. VHF-FM radios must be aeronautical transceivers, permanently installed in a location that is convenient to the PIC and SIC/observer and operate in the frequency band of 138 to 174 MHz's All usable frequencies must be programmable in flight. Narrowband and digital operation must be selectable by channel for both Main and Guard operation. Carrier output power must be 6-10 Watts nominal.
- ii. Transceivers must have a Guard capability constantly monitoring 168.625 MHz and have a tone of 110.9 on all Guard transmissions. Simultaneous monitoring of Main and Guard is required. Scanning of Guard is not acceptable. Aircraft not approved for Air Tactical operation only require one FM Guard receiver. Use of a second FM set to Guard, is acceptable. For cooperator owned aircraft, AUX FM meets this requirement.
- iii. Transceivers must have the capability of encoding CTCSS sub-audible tones on all channels. A minimum of 32 tones meeting the current TIA/EIA-603 standards must be selectable.
- iv. Transceivers must have the capability to display both receiver and transmitter frequencies. Activation indicators for transmit and receive must be provided for both Main and Guard operation.
- v. The radio must use an external broadband antenna covering the frequency band of 138 to 174 MHz (Comant CI-177-1 or equivalent).

c. Auxiliary FM systems (AUX FM)

An interface to properly operate a portable FM radio through the aircraft audio control systems must be provided using an MS3112E12-10S type bulkhead mounted connector with contact assignments as specified by FS/OAS A-17 available at <http://www.nifc.gov/NIICD/documents.html>. Sidetone for the portable radio must be provided (AEM AA34 or equivalent). The following applies to all AUX FM installations.

- i. An external broadband antenna covering the frequency band of 138 to 174 MHz (Comant CI-177-1 or equivalent) must be installed with the associated coax terminated in a bulkhead mounted BNC connector adjacent to the above 10 pin connector.
- ii. A portable radio mount (Field Support Services AUX-EPH-RB or equivalent) must be installed providing the crew unrestricted operation of the radio controls when connected with an 18-inch adapter cable.
- iii. A VHF-FM radio meeting the requirements of paragraph 6.2.1(b) may be installed, in addition to the radios already required, in lieu of the AUX FM system.

2. Audio Systems

a. Intercom Systems (ICS)

- i. ICS must integrate with the aircraft audio control systems and mix with selected receiver audio. An independent ICS volume control, keyed operation, and a "hot mic" capability

must be provided for each required position. Passenger volume adjustments must not affect other positions. Hot mic may be voice-activated (VOX) or controlled via an activation switch. The ICS must have the capability to isolate the flight crew from passengers.

- ii. ICS is required for the PIC and SIC/observer for all aircraft. Helicopters approved for carriage of federal personnel must provide ICS for two aft exit passenger positions. See the applicable “CWN Helicopter Audio Requirements” drawing for locations.

b. Audio Control Systems

i. General

- (1) Aircraft configuration must comply with the applicable drawing for Helicopter Audio Requirements, <https://www.nifc.gov/resources/NIICD/niicd-documents>. A master radio volume control and collocated controls for transmitter selection and independent receiver selection of all required radios must be provided for each required audio control system. Each system must have the capability to simultaneously select and utilize a different transceiver (and PA if required). Sidetone must be provided for the user as well as for cross monitoring by all installed systems. Receiver audio must be automatically selected when the corresponding transmitter is selected. Receiver audio must be provided to each position that requires ICS (refer to the ICS section for requirements). AFT audio control systems are not required to provide NAV audio.
- (2) All required passenger positions must utilize the SIC/observer’s audio control system unless an aft audio control system is installed.
- (3) Audio controls must be labeled as COM-1, FM-1, AUX, PA etc. as appropriate or as COM-1, COM-2, COM-3, etc. with the corresponding transceiver labeled to match. Audio must be free of distortion, noise, or crosstalk. The system must be designed for use with 600-ohm earphones and carbon equivalent, noise-canceling, boom-type microphones (Gentex 5060-4 or equivalent). The PIC and SIC/observer must have U-92 type audio jacks.
- (4) All required passenger positions with ICS, including the SIC/observer, must be wired for compatibility with an appropriate drop cord (Alpine Aerotech AAL280 series or equivalent). Aft passenger connectors must be mounted above the seats and near the passenger’s head. Drop cords must be provided with the aircraft for all passenger positions which require ICS. Crew positions must have radio and ICS PTT switches on their respective cyclic controls in addition to the previous requirements.

ii. Drop Cord Requirements

- (1) U-92 (TJT-120) type audio jack on the housing
- (2) Volume control
- (3) ICS switch with momentary and lock positions
- (4) Radio PTT switch (only for positions that require radio transmit)

iii. Required Audio Control systems

The following audio control systems are required based on helicopter type

- (1) Helicopters not approved for carriage of federal personnel.

A single audio control system for the PIC and SIC/observer

(2) Helicopters approved for carriage of federal personnel.

Two separate audio control systems (which may be combined in a single unit) for the PIC and SIC/observer

3. Navigation Systems

a. Global Positioning Systems (GPS)

i. Aeronautical GPS

Each required GPS must be TSO approved, permanently installed where both the PIC and SIC/observer can clearly view the display, use an approved external aircraft antenna, and be powered by the aircraft electrical system. The GPS must utilize the WGS-84 datum, reference coordinates in the DM (degrees/minutes/decimal minutes) format and have the ability to manually enter waypoints in flight. The GPS navigation database must be updated annually covering the geographic areas where the aircraft will operate.

ii. Portable Aviation GPS

Portable aviation GPS units (Garmin GPSMAP, aera hand-held/portable, or equivalent) are acceptable when an Aeronautical GPS is not specified. They must be securely mounted via an approved installation using the aircraft electrical system and a remote antenna. The GPS must present information from an overhead perspective. The PIC must have a clear view of the display and unrestricted access to the controls. The SIC/observer must also have a clear view of the display in Air Tactical aircraft. The GPS must meet the above datum, coordinate, and database requirements for an aeronautical GPS. Portable GPS units are not acceptable for aircraft performing IFR or NVG operations.

4. Surveillance Systems

a. Emergency Locator Transmitters (ELT)

ELTs must be approved to TSO-C126 or newer. ELTs must be automatic-fixed, installed in a conspicuous or marked location, and meet the same requirements as those detailed for airplanes in 14 CFR 91.207 (excluding section f). ELT mounts must use rigid attachments and meet the deflection requirements of RTCA/DO-204. Velcro-style mounts are not acceptable. ELT antennas must be mounted externally to the aircraft unless installed in a location approved by the aircraft manufacturer. Documentation of current registration is required from the national authority for which the aircraft is registered.

b. Automated Flight Following (AFF) Systems

Automated flight following systems must be compatible with the government's tracking program (AFF.gov, <https://www.aff.gov/>), utilize satellite communications, and use aircraft power via a dedicated circuit breaker. AFF must be functional in all phases of flight and in all geographic areas where the aircraft will operate. The following additional requirements must be met.

- i. A subscription service must be maintained through the equipment provider allowing position reporting via the Government AFF Program. The reporting interval must be every two minutes while aircraft power is on.

- ii. AFF equipment must be registered with AFF.gov providing all requested information. Changes to equipment and registration information must be reported to AFF.gov ensuring the program is current prior to aircraft use. For assistance, the Fire Applications Help Desk (FAHD) may be reached at (866) 224-7677 or (616) 323-1667.
 - iii. An AFF operational test must be performed by the vendor no less than seven calendar days prior to the annual compliance inspection. This test must ensure that the system meets all requirements and is displayed in the AFF viewer with the correct information. A username and password are required. Registration and additional information are available at <https://www.aff.gov/>. If the aircraft is not displaying properly, the vendor must notify AFF.gov.
 - iv. If AFF becomes unreliable the aircraft may, at the discretion of the Government, remain available for service utilizing radio/voice systems for flight following. The system must be returned to full operational capability within five calendar days after the system is discovered to be unreliable.
 - v. This clause incorporates the JavaScript Object Notation (JSON) Specification Section Supplement available at https://www.aff.gov/documents/Json_Specification_Section_Supplement.pdf as if it was presented as full text herein.
 - vi. For questions about current compatibility requirements contact the AFF Program Manager by emailing affadmin@firenet.gov.
- c. Transponders
- Transponder systems must meet the requirements of 14 CFR 91.215(a). Part 135 aircraft must meet the “Mode S” requirements of 14 CFR 135.143(c). Transponder systems must be tested and inspected every 24 calendar months as specified by 14 CFR 91.413.
- d. Altimeter and Automatic Pressure Altitude Reporting systems
- Altimeter, static pressure, and automatic pressure altitude reporting systems must be installed and maintained in accordance with the IFR requirements of 14 CFR Part 91. These systems must be tested and inspected every 24 calendar months as specified by 14 CFR 91.411.
- e. Automatic Dependent Surveillance–Broadcast Out (ADS-B OUT)
- ADS-B OUT systems must be approved to TSO-C154c or TSO-C166b. Aircraft operating outside of the United States must be equipped with systems approved to TSO-C166b.

6.3 Avionics Installation and Maintenance Standards

All avionics used to meet this Standard must comply with the manufacturer’s specifications and installation instructions, federal regulations, and the following requirements.

1. Strict adherence to the guidelines in FAA AC 43.13-1B Chapter 11 *Aircraft Electrical Systems* and Chapter 12 *Aircraft Avionics Systems* as well as FAA AC 43.13-2B Chapter 1 *Structural Data*, Chapter 2 *Communication, Navigation, and ELT System Installations* and Chapter 3 *Antenna Installation* is required.
2. All antennas must be FAA-approved, have a Voltage Standing Wave Ratio (VSWR) less than 3.0 to 1, and be properly matched and polarized to their associated avionics system.

3. Labeling and marking of all avionics controls and equipment must be understandable, legible, and permanent. Electronic label marking is acceptable.
4. Avionics installations must not interfere with passenger safety, space, or comfort. Avionics equipment must not be mounted under seats designed for energy attenuation. In all instances, the designated areas for collapse must be protected.
5. All avionics equipment must be included on the aircraft's equipment list by model, nomenclature, and location.
6. Avionics systems must meet the performance specifications of FS/OAS A-24 Avionics Operational Test Standards. For a copy of all FS/OAS documents visit <https://www.nifc.gov/resources/NIICD/niicd-documents>

Chapter 7 – Fuel Servicing Vehicle, If Offered

See Exhibit 7 Fuel Servicing Equipment Requirements

Chapter 8 – Operations

8.1 General

1. Regardless of any status as a public aircraft operation, the Cooperator must operate in accordance with the applicable portions of 14 CFR part 91.
2. A Federal Representative, Aviation Manager, or Flight Manager has mission control and can delay, terminate, or cancel a flight at any time.
3. Payload will be determined using the Interagency Helicopter Load Calculation or comparable Cooperator Load Calculation Form, appropriate performance charts, and current local temperature and pressure altitude. When applicable, the weight of the empty bucket and any associated suspension hardware (lines, cables) must be included when calculating the actual payload.
4. Downloads will be used when federal personnel are onboard.
5. Performance enhancing data (Power Assurance Checks, wind charts, fleet average, etc.) must not be used. Only charts based on manufacturer's minimum specification engine performance must be used.
6. Use (Exhibit 10, Interagency Helicopter Load Calculation and Exhibit 13, Helicopter Fuel Consumption and Weight Reduction Chart) per aircraft type and the appropriate Hover Ceiling Charts (HOGE and HIGE) from the Rotorcraft Flight Manual.
7. For longline operations, any combination of line length (> 50 feet) may be used at the discretion of the pilot, provided the pilot is approved for Longline VTR and interagency policies (obstacle and tail rotor clearance etc.) are adhered to.
8. IFR operations are not authorized.

8.2 Special Use Flights

1. The following special use flight operations associated with wildland fire operations are incorporated into this Standard for approval.

- a. External load, belly hook
 - b. External load, longline VTR
 - c. Helitack/personnel transport
 - d. Low level and Reconnaissance
 - e. Mountainous terrain
 - f. Fixed Suppressant/Retardant Delivery Tank (Snorkel)
 - g. Water/Retardant, bucket/tank
 - h. Aerial Supervision/Helicopter Coordinator (ATGS/HLCO)
2. Other special use missions (Rappel, NVG, Hoist, Short-haul, STEP, Aerial Ignition) require specific agency review/approval and must meet the comparable federal standard (contract, guide, handbook, etc...)
 3. Night operations are not authorized unless conducted under a special use mission approval for NVG.

8.3 Pilot Authority and Responsibilities

1. The Pilot-In-Command (PIC) is responsible for the safety of the aircraft, loading, and unloading of occupants and cargo. The pilot must comply with the directions of the Federal Agency, except when in the pilot's judgment compliance will be a violation of applicable federal or state regulations or agreement provisions. The Pilot has final authority to determine whether the flight can be accomplished safely and must refuse any flight or landing which is considered hazardous or unsafe.
2. The pilot is responsible for computing the weight and balance for all flights and for assuring that the gross weight and center of gravity do not exceed the aircraft's limitations. Pilots must be responsible for the proper loading and securing of all cargo. Helicopter load calculations or comparable Cooperator Load Calculation (Exhibit 10, Form 5700-17 or OAS-67) must be computed and completed by the pilot using appropriate flight manual hover performance charts.
3. Smoking is prohibited within 50 feet of a fuel servicing vehicle, fueling equipment, or aircraft.
4. After rotorcraft engine(s) shutdown, the pilot may exit the aircraft while the rotor(s) are turning unless prohibited by the Rotorcraft Flight Manual (RFM). The pilot must remain within the arc of the rotor(s). The pilot must coordinate this action with the Helicopter Manager. If not allowed by the RFM, aircraft must be shut down and rotors stopped for the pilot to exit the aircraft or change seats.
5. The pilot will use an approved aircraft cockpit checklist for all flight operations.
6. Single-Skid, Toe-In, and Hover Exit/Entry Procedures (STEP) operations are only authorized with specific agency approval. (See 8.2, 2.)
7. Equipment such as radios, survival gear, fire tools, etc., must be located in or on the aircraft in such a manner as to potentially not cause damage or obstruct the operation of equipment or personnel. All cargo must be properly secured.
8. The pilot must not permit any passenger in the aircraft or any cargo to be loaded therein unless authorized by the Helicopter Manager.

9. Passenger Briefing. Before each takeoff, the PIC must ensure that all passengers have been briefed in accordance with the briefing items contained in 14 CFR Part 135. Briefing must include the following:
 - a. Personal Protective Equipment (PPE),
 - b. Shut-Off Procedures for Battery and Fuel, and
 - c. Aircraft Hazards.
10. Flight Plans. When relocating aircraft, pilots must file, and operate on a FAA, ICAO, or agency flight plan when outside of dispatches control. Flight plans must be filed prior to takeoff when possible.
11. Flight Following. Pilots are responsible for flight following with the FAA, ICAO, or in accordance with USFS or DOI-Bureau approved flight following procedures, which includes AFF and radio check-ins. Failure of the AFF is not grounds for aborting a mission. Prompt repair of the AFF system is required. If AFF is not operational, 15-minute radio check-ins are required.
12. Manifesting must be completed prior to any flight involving federal personnel. Information will be completed and transmitted or retained locally (not carried on manifested aircraft).
13. Fuel Reserve. To provide adequate fuel reserve all operations must comply with 14 CFR Part 91 for VFR helicopter (20 minutes reserve).

8.4 Flights with Cowling(s) or Doors Open/Removed

The cooperators is responsible for the removal, reinstallation, and security of the doors. All loose items must be secured prior to flight with doors open/removed (Velcro is not considered a secure attachment). Flights with cowlings, fairings, and panels removed are not permitted. The aircraft external registration number must be clearly visible at all times.

8.5 External Load Operations

The following procedure must be used for bucket operations:

1. At the beginning of the fuel cycle, bucket capacity must be adjusted so that the bucket, when filled to the adjusted capacity, does not exceed the allowable payload.
2. Helicopters equipped with electronic hook load measuring systems that provide cockpit readout of the actual external load and a bucket that is equipped with a gating system that allows part of the load to be released while retaining the remainder of the load is authorized.
3. For calculation of the allowable bucket payload, use 8.3 pounds per gallon for water and 9 pounds for mixed retardant.
4. Bucket capacity at each position or adjustment level must be marked on the bucket. Collapsible buckets with cinch straps must only be adjusted to marked graduations (e.g., 90%, 80%, 70%). Intermediate graduations, partial dips, or capacities below the manufacturer's minimum graduation (by tying knots, etc.) are prohibited.
5. Buckets must be attached directly to the belly hook unless the pilot is approved for vertical reference.
6. Extension (Tag) lines of less than 50 feet are not permitted for bucket operations

7. Aircraft equipped with a tail rotor and conducting external load operations (excluding class A loads) will be limited to an airspeed of 80 knots indicated or the airspeed limitation established by the RFM, whichever is less. All other aircraft conducting external load operations must comply with applicable RFM Limitations.
8. When conducting external load operations, rotors will remain above the canopy, or aircraft will operate within an opening no less than 1 ½ times the main rotor diameter (e.g., an aircraft with a 48' main rotor diameter would require a 72' diameter opening).

8.6 Tank Operations

The following procedure must be used for all Tank operations (also see Exhibit 5):

1. For calculation of the allowable tank payload, use 8.3 pounds per gallon for water and 9 pounds for mixed retardant.
2. Snorkel removal and installation must be the pilot's responsibility at all times.
3. However, Government personnel may assist with removal and installation when properly trained by the mechanic or pilot.

8.7 Dual Controls

Dual controls are required and must be made accessible to a USFS, DOI, or Federally approved Pilot Inspector for all pilot performance evaluations. For Type 3 aircraft, the dual controls must be removed except during pilot evaluation. During flight operations with ins installed (Type 2) the front seat not occupied by a pilot may only be occupied by personnel briefed and authorized by PIC.

8.8 Transportation of Hazardous Material (HazMat)

1. Cooperators must be on file as Grantees or aircraft must be under the operational control of a Grantee to qualify for relief under DOT-SP 9198.
2. All transportation of hazardous materials by aircraft must be in accordance with Department of Transportation Special Permit DOT-SP 9198 (available at <https://www.doi.gov/aviation/library/guides>) and the *NWCG Standards for Aviation Transport of Hazardous Materials*, PMS 513, <https://www.nwcg.gov/publications/513>. A copy of the current DOT Special Permit, *NWCG Standards for Aviation Transport of Hazardous Materials*, and *DOT Emergency Response Guidebook*, <https://www.phmsa.dot.gov/hazmat/erg/emergency-response-guidebook-erg>, must be carried aboard each aircraft transporting hazardous materials. The cooperator is responsible for obtaining the *DOT Emergency Response Guidebook*.
3. Each employee who may perform a function subject to this DOT Special Permit has completed the *Interagency Aviation Training Module A-110, Aviation Transportation of Hazardous Materials*, within the previous 3 years. The training can be completed online at <http://www.iat.gov>. The cooperator must document this training in the employee's records and make it available to the government when requested.
4. The pilot must ensure personnel are briefed on specific actions required in the event of an emergency. The pilot must be given initial written notification of the type, quantity, and location of hazardous materials placed aboard the aircraft before the start of any project. Thereafter, verbal notification before each flight is acceptable. For operations where when the type and quantity of the materials do not change, repeated notification is not required.

Chapter 9 – Cooperator’s Environmental Responsibilities

1. The cooperator is responsible to ensure that all maintenance, fueling, and flight activities do not cause environmental damage to property or facilities. The cooperator is responsible to clean and rehabilitate areas adversely affected by cooperator activities and must, whenever practical, and possible, utilize solvents, and cleaning agents that are either biodegradable or consistent with acceptable safety, health, and environmental concern practices.
2. The cooperator is responsible for all cleanup of fuel, oil, and retardant contamination on airport ramps, retardant sites, parking areas, landing areas, etc. when caused by cooperator aircraft or personnel.
3. The government may, at its option, assign an area to be utilized by the cooperator for storage of support equipment. Oil, solvents, parts, engines, etc. must be stored and utilized in a manner consistent with acceptable safety, health, and environmental concerns.
4. The cooperator is responsible for ensuring compliance with 40 CFR Part 112, including a written Spill Prevention, Control, and Countermeasure Plan (SPCC) for each mobile fueler (fuel servicing vehicle).

Chapter 10 – Personnel

10.1 General

1. Pilots, fuel servicing personnel, and mechanics must speak English fluently and communicate clearly.
2. Only authorized personnel are allowed on tactical flight missions. The Mechanic and Fuel Servicing Vehicle Driver are not allowed to be onboard the aircraft during tactical flight missions unless determined essential to the mission.

10.2 Pilot

1. The Cooperator’s Chief Pilot will verify that cooperator pilots meet the experience and qualification requirements under this Standard.
2. Each PIC must pass a special use mission flight evaluation check. The satisfactory completion of the evaluation flight will not substitute for any of the total flight hour requirements listed in this clause.
3. The PIC must be capable of performing basic programming functions and operations of installed aircraft avionics. This includes the ability to enter and utilize newly assigned frequencies and tones by selected channel positions. The PIC must demonstrate the ability to initially program, reprogram in flight, and use the aircraft GPS system as the primary navigation tool.
4. All pilots must complete an annual safety briefing (see Exhibit 8) and successfully complete an evaluation flight once every 3 years in make, model, and series; conducted over typical terrain by a USFS, DOI, or Federally approved Pilot Inspector.
5. Commercial or Airline Transport Pilot (ATP) Certificate with appropriate rating (Rotorcraft-Helicopter) and a valid Class I or Class II FAA Medical Certificate.

6. Pilots must complete appropriate portions of the Helicopter Pilot Qualifications and Approval Record (Form FS-5700-20a or OAS-64) prior to evaluation. Each cooperators pilot must be approved in the aircraft make, model, series, and mission prior to use.
7. Airman Competency documentation (when applicable);
 - a. For government cooperators pilots, written evidence of annual competency check performed by a check airman and signed by the Chief Pilot.
 - b. For contract cooperators pilots under contract specifying conformity to 14 CFR Part 135, written evidence of 14 CFR Part 135 competency requirements.
 - c. For contract cooperators pilots under contract for other than 14 CFR Part 135, written evidence of 14 CFR Part 61.56 (single piloted) or 14 CFR Part 61.58 (multi-piloted) competency requirements.
 - d. For cooperators pilots of Restricted Category aircraft, written evidence of an annual Equipment Check Endorsement and signed by the Chief Pilot.
 - e. Written evidence of qualification to transport external loads (14 CFR Part 133).
 - f. Written evidence of qualification to perform agricultural/dispensing operations (14 CFR Part 137).
8. All pilots must have completed the IAT Aviation Firefighting courses MH1, MH2, and MH3 within the last 36 months.
9. Pilots must have completed A-110 Hazardous Materials within the last 36 months (as applicable).
10. Pilots must have accumulated as PIC the minimum flight hours listed below. Flight hours must be determined from a certified pilot log. Further verification of flight hours may be required at the discretion of the USFS, DOI, or Federally approved Pilot Inspector.
 - a. Minimum Requirements

Table 1: Minimum Flight Hour Requirements for Pilots

Description	Hours Required
Pilot-in-command, helicopters	1,500 hours
Helicopter, preceding 12 months	100 hours**
Weight Class	100 hours
Turbine helicopter operations	100 hours
Make and model	50 hours*
Make, model, and series, preceding 12 months (see Exhibit 12)	10 hours

* Flight hour requirements may be reduced by 50% if the pilot submits evidence of satisfactory completion of the manufacturer's approved pilot ground and flight procedures training in the applicable make and model.

** The cooperators may request that this pilot flight hour requirement be waived for a pilot under special circumstances; however, the waiver may or may not be granted. The cooperators should contact the Regional / Unit Aviation Officer in advance of this need for additional information on this process. No other pilot qualification exceptions will be considered by the USFS/DOI.

b. Additional Special Mission Requirements:

Pilot-in-Command (PIC) (as related to the applicable special mission approval)

Table 2: Additional PIC Flight Hour Requirements for Special Mission

Special Missions	Hours Required
Mountain Flying ***	200 hours
Mountain Flying Experience—Make and Model	10 hours
Longline Vertical (VTR) Reference Experience	10 hours
Annual Longline VTR Recurrency Training	2 hours
***Operating helicopters in mountainous terrain identified in 14 CFR 95 Subpart B-Designated Mountainous Area. Experience operating outside the United States may be considered Mountain Flying providing it is conducted in mountainous regions defined as 2,000 feet above surroundings containing long slopes, deep valleys, and high ridges. Operating includes maneuvering and numerous takeoffs and landings to pinnacles, ridgelines, and confined areas.	

11. All special use evaluations must be conducted in accordance with the Interagency Helicopter Practical Test Standards by a USFS, DOI, or Federally approved Pilot Inspector.

12. Vertical Reference Proficiency (if offered)

- a. Prior to a vertical reference longline special use mission evaluation performed by a USFS, DOI, or Federally approved Pilot Inspector, pilots must meet the training standard as described by Exhibit 9, Interagency Guidelines for Vertical Reference/External Loads. The Chief Pilot will verify standards have been met by signing Exhibit 9.
- b. Vertical reference qualified pilots must maintain proficiency in vertical reference or external load operations. When active under an agreement for a period of 30 consecutive days and no vertical reference activity occurs, the pilot will be provided a 1-hour proficiency flight at the cooperator's expense.

13. Pilots may function as mechanics providing:

- a. The pilot meets all the Mechanic Qualifications of this Standard.
- b. Pilot duty limitations will apply to the pilot when functioning as a mechanic.
- c. When pilots act as a mechanic, mechanic duties in excess of 2 hours will apply as flight hours on a one-to-one basis toward flight hour limitations.
- d. A mechanic, other than the pilot, must perform any scheduled inspections such as 50-hour, 100-hour, or progressive inspections.
- e. If approved by the Cooperator's Operations Specifications, and in accordance with 14 CFR Part 43.3(h), 43.5, and 43.7, pilots may perform preventive maintenance on the aircraft.

10.3 Mechanic

1. Mechanic Qualifications

The following requirements apply to maintenance technicians maintaining aircraft under field conditions:

- a. The mechanic must have a valid FAA mechanic certificate with airframe and powerplant (A&P) ratings.
- b. The mechanic must meet one of the following qualifications:
 - i. The mechanic must have held a valid FAA mechanic certificate, with A&P ratings, for 24 months and been actively engaged in aircraft maintenance as a certificated mechanic for at least 18 months out of the last 24 months.
 - ii. The mechanic must have held a valid FAA mechanic certificate, with A&P ratings, for 12 months and show evidence of four years military experience of aircraft maintenance training and qualification as a Technical Inspector, or service equivalent, for Airframe, or Powerplant.
 - iii. The mechanic must have held a valid FAA mechanic certificate, with A&P ratings, for 12 months, and have held a foreign equivalent mechanic certificate for 24 months.
- c. The mechanic must have 12 months experience as an A&P mechanic, or foreign equivalent, in maintaining helicopters (3 of those 12 months must have been within the preceding 24 months).
- d. The mechanic must show evidence of maintaining a helicopter of the same make and model as offered under "field" conditions for at least one full season. Three months' experience maintaining a helicopter away from the operator's principle base of operations and, while under minimal supervision, will meet this requirement.
- e. The mechanic must have 12 months maintenance experience on the same make and model offered or satisfactory completion of a manufacturer, or equivalent, maintenance course for the same make and model offered.

2. Mechanic Availability

- a. A mechanic (other than the pilot) must maintain the aircraft in accordance with the Cooperator's Maintenance Program.
- b. When the mechanic serves as the fuel servicing vehicle driver, the more stringent of the duty limitations apply.

10.4 Fuel Servicing Vehicle and Driver Qualifications (If Ordered)

1. The cooperator must furnish a Fuel Servicing Vehicle Driver (FSVD) for each day the aircraft is available. The driver must meet all DOT requirements.
2. Driver(s) must be experienced in proper fueling procedures and be familiar with the safety equipment installed on the fuel servicing vehicle.

Chapter 11 – Flight Hour and Duty Limitations

11.1 General

1. All flight time, regardless of how, or where performed, except personal pleasure flying, will be reported by each flight crewmember and used to administer flight hour and duty time limitations. Flight time to and from an Assigned Work Location as a flight crewmember (commuting) will be reported and counted toward limitations if it is flown on a duty day. Flight time includes, but is not limited to: military flight time; charter; flight instruction; 14 CFR Part 61.56 flight review; flight examinations by FAA designees; any flight time for which a flight crewmember is compensated; or any other flight time of a commercial nature whether compensated or not.
2. Various work schedules are acceptable. The compliment of cooperators personnel must be on the same work schedule however days off may be staggered (Examples of work schedules are 12 on and 2 off, or 12 on and 12 off).
3. For each day during mobilization and demobilization, duty time will be computed based on the time zone at the point-of-hire.

11.2 Pilots

Pilot flight hour computations must begin at liftoff and end at touchdown and will be computed from the flight hour meter installed in the aircraft. All flight hours must fall within duty hour limitations.

1. Flight time must not exceed a total of 8 hours per day.
2. Pilots accumulating 36 or more flight hours in any 6-consecutive duty-days must be off-duty the next day. Flight time must not exceed a total of 42 hours in any 6 consecutive days. After any 1 full off-duty day, pilots begin a new 6 consecutive day duty-period for the purposes of this clause, providing during any 14 consecutive day period, each pilot must have two full days off-duty. Days off need not be consecutive.
3. Prior to use on any (non-unified command) Federal incident, assigned duty of any kind must not exceed 14 hours in any 24-hour period. Within any 24-hour period, pilots must have a minimum of 10 consecutive hours off-duty immediately prior to the beginning of any duty day. Local travel up to a maximum of 30 minutes each way between the work site and place of lodging will not be considered duty time. When one-way travel exceeds 30 minutes, the total travel time must be considered as part of the duty day.
4. Duty includes flight time, ground duty of any kind, and standby, or alert status at any location.
5. During times of prolonged heavy fire activity, the federal agencies may issue a notice reducing the pilot duty day/flight time and/or increasing off-duty days on a geographical or agency-wide basis.
6. Aircraft operated on point-to-point flights (airport to airport, heliport to heliport, etc.) with a pilot and copilot must be limited to 10 flight hours per day. (An aircraft that departs Airport A, flies reconnaissance on a fire, and then flies to Airport B is not point-to-point.)
7. Pilots may be relieved from duty for fatigue or other causes created by unusually strenuous or severe duty before reaching duty limitations.
8. When pilots act as a mechanic, mechanic duties in excess of 2 hours will apply as flight hours on a one-to-one basis toward flight hour limitations.

9. Relief, additional, or substitute pilots reporting for duty must furnish a record of all duty and all flight hours during the previous 14 days.

11.3 Mechanics

1. Within any 24-hour period, personnel must have a minimum of eight consecutive hours off-duty immediately prior to the beginning of any duty day.
2. Mechanics will have 2 full calendar days off-duty during any 14-day period. Days off need not be consecutive.
3. Duty includes standby, work, or alert status at any location.
4. Mechanics may be removed from duty for fatigue or other causes created by unusually strenuous or severe duty before reaching duty limitations.
5. The mechanic must be responsible to keep the Government apprised of their ground duty limitation status.
6. When the mechanic serves as the FSVD, the more stringent of the duty limitations apply.

11.4 Fuel Servicing Vehicle Drivers (FSVD) (If Ordered)

1. It is the cooperators' responsibility to ensure that employees comply with DOT Safety Regulation 49 CFR Part 390-399, including duty limitations.
2. FSVDs may be removed from duty for fatigue or other causes created by unusually strenuous or severe duty before reaching duty limitations.
3. The FSVD will be responsible to keep the government apprised of their ground duty limitation status.
4. DOT Safety Regulation 49 CFR Part 390-399, the FSVD must have a minimum of two (2) full calendar days off-duty during any 14-day period. Off-duty days need not be consecutive.

Chapter 12 – Accident Prevention and Safety & Mishaps

12.1 Accident Prevention and Safety

1. If requested by federal agencies, the cooperator must furnish a copy of all reports required to be submitted to the Federal Aviation Administration (FAA) by the Federal Aviation Regulations (FAR) that relate to pilot and maintenance personnel performance, aircraft airworthiness, or operations.
2. Cooperator aircraft under the operational control of the federal government must complete a Flight Risk Assessment Tool (FRAT), at a minimum, prior to the first flight of the day. If during the operational period there is a change in mission, medium, man, machine, or management then a verbal re-evaluation of the FRAT should be completed by the crew.
3. The cooperator must keep and maintain programs necessary to assure the safety of ground and flight operations. The development and maintenance of these programs are a material part of the performance of safe operations. When, in the sole judgment of the Federal Agency using the aircraft, that the safety programs will not adequately promote the safety of operations, the using agency may terminate the approval of the cooperator for cause.

4. Examples of such programs are (1) personnel activities, (2) maintenance, (3) safety, and (4) compliance with regulations.

12.2 Mishaps

1. Following a mishap and based on an investigation by the Agency Investigator In Charge (IIC), Federal Agencies will determine whether the cooperator was in compliance with the agreement and/or with the FAR applicable to the cooperator's operations, Company policy, procedures, practices, or programs, and/or negligence on the part of employees that may have caused or contributed to the mishap. The cooperator must fully cooperate with the Agency IIC, ASM, and USFS/DOI Region managers.
2. Reporting. The cooperator must, by the most expeditious means available, notify the National Transportation Safety Board (NTSB) and the USFS or DOI ASM when an aircraft accident or NTSB reportable incident occurs. The appropriate method for notifying DOI or the USFS is 888-4MISHAP.
3. Forms Submission
 - a. Following an aircraft accident or when requested by the NTSB following the notification of a reportable incident, the cooperator must provide the Agency IIC with the information necessary to complete a NTSB Form 6120.1/2.
 - b. The cooperator must submit a SAFECOM, <https://www.safecom.gov/>, to the USFS/OAS ASM within five days upon the occurrence of any condition, observance, act, maintenance problem, or circumstance which has potential to cause an aviation-related mishap.
 - c. The NTSB Form 6120.1/2 does not replace the cooperator responsibility, within five days of an event, to submit to the USFS/DOI a SAFECOM to report any condition, observance, act, maintenance problem, or circumstance that has potential to cause an aviation-related mishap.
4. Wreckage Preservation. The cooperator must not permit removal or alteration of the aircraft, aircraft equipment, or records following an aircraft accident, incident, or incident with potential until authorized to do so by the agency IIC or other authorized agency representative. Permitted exceptions to this requirement may be when life or property are threatened, when the aircraft is blocking an airport runway, etc. The cooperator must immediately notify the agency ASM and NTSB before taking such actions. The NTSB's release of the wreckage does not constitute a release by the agency ASM and the Agency IIC.
5. Mishap Investigation. The cooperator must maintain an accurate record of all aircraft accidents, incidents, aviation hazards, and injuries to cooperator or government personnel arising in the course of performance of operations. Further, the cooperator fully agrees to cooperate with the USFS or DOI during an investigation and make available personnel, personnel records, aircraft records, and any equipment, damaged, or undamaged, deemed necessary by the USFS or DOI. Following a mishap, the cooperator must ensure that personnel (pilot, mechanics, etc.) associated with the aircraft must be readily available to the mishap investigation team.
6. Related Costs. The NTSB, USFS, or DOI must determine their individual agency investigation cost responsibility. The cooperator will be fully responsible for any cost associated with the reassembly, approval for return-to-duty availability, and return transportation of any items disassembled by the USFS or OAS.

7. Search, Rescue, and Salvage. The cost of search, rescue, and salvage operations made necessary due to causes other than negligent acts of a federal employee must be the responsibility of the cooperator.

Chapter 13 – Personal Protective Equipment (PPE)

1. General Operations

The following PPE must be furnished by the cooperator, be operable, and maintained in serviceable condition as per the appropriate manufacturer's specifications.

2. PPE for Flight Operations

- a. Cooperator must provide and require personnel to wear PPE in accordance with *The Interagency Aviation Life Support Equipment (ALSE) Guide/Handbook*, <https://www.doi.gov/sites/doi.gov/files/interagency-aviation-life-support-equipment-handbook-guide-v3.0.pdf>.
- b. The DOI/FS ALSE Guide/Handbook, the Aviation Helmet Standard and the certificates of compliance are available on the OAS website, <https://www.doi.gov/aviation/safety/helmet>.

3. PPE for Ground Operations

- a. While within the safety circle of an aircraft with engine(s) running and/or rotor(s) turning, all cooperator personnel must wear the following PPE:
 - i. Shirt with long-sleeves overlapping gloves, long-pants, hardhat/flight helmet with chinstrap, appropriate footwear, hearing, and eye protection.
 - ii. Maintenance personnel working on a running aircraft are exempt from gloves, eye protection (eye protection may be worn at the option of maintenance personnel or company policy), long-sleeves, and hardhat/flight helmet requirements.
- b. During all fueling operations, fuel servicing personnel must wear a long-sleeved shirt, long trousers, boots, and gloves. The shirt and pants must be made of 100% cotton or other natural fiber or be labeled as non-static.

Chapter 14 – Inspection and Acceptance

1. Inspection and acceptance of personnel and equipment provided under this standard must be performed at a time and location mutually agreed upon by the parties involved.
 - a. Special use pilot evaluations will be conducted in accordance with DOI OPM 29 (<https://www.doi.gov/aviation/library/opm>) and the Interagency Helicopter Pilot Practical Test Standards (<https://www.iat.gov/library.asp>).
 - b. Aircraft and equipment must meet the provisions of this document.

Exhibits

1. First Aid Kit (Aeronautical)
2. Survival Kit Aeronautical (Lower 48)
3. Alaska Supplement
4. Restraint Systems Condition Inspection Guidelines
5. Additional Suppression/Prescribed Fire Equipment
6. High Visibility Markings on Main Rotor Blades
7. Fuel Servicing Equipment Requirements
8. Operations and Safety Procedures Guide for Helicopter Pilots
9. Interagency Guidelines for Vertical Reference/External Load Training
10. Interagency Helicopter Load Calculation
11. Weight and Balance Form (Example)
12. Helicopter Like Makes, Models, Series
13. Helicopter Fuel Consumption and Weight Reduction Chart
14. Drawing FS/OAS A-16
15. Drawing FS/OAS A-17
16. Acronyms

EXHIBIT 1 – FIRST AID KIT (AERONAUTICAL)

First aid kit must be in a dust-proof and moisture-proof container. The kit must be readily accessible to the Pilot and passengers. At a minimum, the contents must include the following items:

Table 3: Minimum Contents Requirement for First Aid Kit

Item Description	Passenger Seats (0-9) Quantity	Passenger Seats (10-50) Quantity
Adhesive bandage strips (3 inches long)	8	16
Antiseptic or alcohol wipes (packets)	10	20
Bandage compresses, 4 inches (aka, field dressing)	4	8
Triangular bandage compresses, 40 inch (sling)	2	4
Roller bandage, 4 inches x 5 yards (gauze)	2	4
Adhesive tape, 1 inch x 5 yards (standard roll)	1	2
Bandage scissors	1	1
Body Fluids Barrier Kit: 2-pair of nitrile or non-latex surgical gloves 1-face shield 1-mouth-to-mouth barrier 1-protective gown 2-antiseptic towelettes 1-biohazard disposal bag	1	1

Notes: Splints are recommended if space permits.

Kits may be commercially available types that are FAA-approved for the appropriate number of crew and passengers carried.

EXHIBIT 2 – SURVIVAL KIT AERONAUTICAL (LOWER 48)

The survival kit must include the following minimum items:

Table 4: Minimum Contents Requirement for Survival Kit

Survival Kit Content Requirements
Fire Starter (can be two boxes of matches in waterproof containers, metal match, etc.)
Magnesium fire starter
Signal mirror
Whistle
One knife (includes multi-tools with knives)
Wire saw, ax, hatchet, or machete
Nylon rope or parachute cord (50 feet, minimum 1/8 inch [3mm] thick)
Collapsible water container (Sealing clear plastic bag[s])
Water purification tablets
Water (one quart per occupant required except when operating over areas without adequate drinking water)
Food (2 days emergency rations per occupant, with a caloric value of 1,000 calories per day)
At least one of the following will be in the aircraft: <ul style="list-style-type: none"> • AFF system • Satellite phone • 406 MHz personal locator beacon (PLB) with GPS or aircraft-mounted 406 MHz ELT • Handheld UHF or VHF radio

Table 5: Additional items suggested for Survival Kit

Suggested additional survival kit items (appropriate to the geographic area)
Flashlight with spare batteries, chemical light sticks, or LED light
Signal flares (consider fusees and road flares for starting fires in any weather condition)
Laser rescue light
Signal panels

Suggested additional survival kit items (appropriate to the geographic area)
Large plastic trash bags
Collapsible shovel
Insect repellent (can be used for fire starter)
Sunblock
Sleeping bag (one bag per two people)
Snowshoes

Note: A handheld 760 channel VHF transceiver radio or satellite phone is recommended. It should be located on a crewmember rather than placed in the aircraft survival kit.

EXHIBIT 3 – ALASKA SUPPLEMENT

The following provisions must apply when operating in Alaska. All other provisions not expressly changed herein continue to apply.

1. General Equipment (Equipment required in addition to Chapter 3, 3.5):
 - a. One set of approved Tundra Boards or Snow Pads with accompanying FAA certification.
 - b. Complete set of current aeronautical charts and navigation publications covering areas of operation within Alaska and Canada.
 - c. Survival kit: All aircraft will carry survival equipment.
 - d. Survival kits will contain at least the following items and additional items required by local regulation as is appropriate for local climate and terrain conditions. The minimum equipment to be carried during the summer months:

Table 6: Additional Survival Kit Contents Requirement while operating in Alaska.

Item	Item
Ax or hatchet (1), and knife (1)	Water purification tablets
Magnesium fire starter	Mosquito repellent containing DEET
Whistle	Mosquito headset for each occupant (1 each)
Signal mirror	Candles (5 each)
Signal flares (6 each, non-marine signal flares)	Space Blanket (1 per occupant)
Matches (2 small boxes in waterproof containers)	Nylon rope or parachute cord (50 feet)
Food (each occupant sufficient to sustain life for one week)	An assortment of fishing tackle, such as hooks, flies, lines, sinkers, etc.
Personal Locator Beacon (PLB) (Note: required only if aircraft ELT requires tools to be removed)	Collapsible water container (Sealing clear plastic bag(s))

Additionally, the following must be carried as minimum equipment from October 15 to April 1 of each year:

Table 7: Additional Survival Kit Contents Requirement while operating in Alaska from October 15 to April 1.

Item	Item
Pair of snowshoes (1)	Sleeping bag per two occupants (1)
Wool blanket or equivalent for each occupant over four years of age (1)	

Note: A handheld 760 channel VHF transceiver radio is recommended. It should be attached, or immediately accessible, to a crewmember rather than placed in the aircraft survival kit.

See other recommended survival kit items at <https://www.doi.gov/aviation/library/guides>.

2. Fuel Servicing Specifications

- a. A fuel servicing vehicle and driver are not required.
 - i. The Government will furnish, transport, and store all aircraft fuel required at no expense to the cooperator. Grades of government-furnished fuel vary from location to location, and the cooperator must use the grade available. The appropriate type of fuel (Avgas or Jet fuel) will be available at each location.
 - ii. All lubricating oil, parts, and supplies must be furnished and transported by the cooperator to the Assigned Work Location.
- b. The Cooperator must furnish for each aircraft a portable hand or electrically operated fuel pump, barrel stem, hoses, and filtration system for refueling in remote areas.
 - i. The filtration system must include a unit which accomplishes water separation with positive shut-off. The size of the filtration system unit must be compatible with pump size. One acceptable three-stage unit is Facet part number 050971. If this model Facet is used, the third-stage monitor should be a Velcon part number CDF-210K which is rated to 10 GPM. Also acceptable are Velcon filter spin on five-micron cartridges, part number 40505SP, rated to 13 GPM; or Velcon VF-31 with one micron cartridge element, part number ACO-21005B, rated to 15 GPM. All filtering components must be changed annually or sooner if needed, and the date of the change must be placarded on the canister.
 - ii. Two complete spare filter changes must be furnished by the cooperator.

3. Availability of Mechanics

The mechanic must be present for all operations in Alaska. The mechanic must accompany the aircraft to any Assigned Work Location.

EXHIBIT 4 – RESTRAINT SYSTEMS CONDITION INSPECTION GUIDELINES

1. FAR require that occupant restraint systems are to be replaced in aircraft manufactured after July 1, 1951; such systems must conform to standards established by the FAA. These standards are contained in Technical Standard Order TSO-C22. Restraint systems eligible for installation in aircraft may be identified by the marking TSO-C22, TSO-C114 on the webbing or by a military designation number since military systems comply with the strength requirements of the TSO. Aircraft manufacturer installed restraint systems with part numbers are acceptable. Each system must be equipped with an approved metal-to-metal latching device.
2. FAR provide minimum inspection guidance, other than to state, that mildew and fraying may render the restraint system un-airworthy and that suspected webbing should be tested for tensile strength. The tensile strength requirement for a single person system is 525 pounds (most systems are rated at 1,500 pounds).
3. Unacceptable Condition Criteria:

Table 8: Unacceptable Condition Criteria for Restraint Systems.

Webbing	Hardware	Stitching
Frayed (5%)	Inoperable	Broken
Torn	Damaged	Excessive Wear
Crushed	Corroded	Missing
Swollen	Excessive Wear	
Creased		
Deteriorated		

4. References:

14 CFR Part 91.205, '14 CFR Part 21.607, AC 21-34, TSO-C22, TSO-C114

EXHIBIT 5 – ADDITIONAL SUPPRESSION/PRESCRIBED FIRE EQUIPMENT

This section contains additional requirements for equipment specified or alternate equipment being utilized.

1. Fixed Suppressant/Retardant Delivery Tank with Self-Filling Capability

In Lieu of the variable capacity bucket, one (1) externally mounted or one (1) or more internally mounted baffled, fixed suppressant/retardant delivery tank(s) that meets or exceeds the following specification:

Capacity commensurate with the maximum related lifting capability of the helicopter equipped with the tank at sea level on a standard day.

Note: ALL CONTROLS FOR TANK SYSTEM MUST BE LABELED AS TO FUNCTION

a. Door(s)

The Tank door(s) must be designed such that:

- i. The frontal area of the retardant column is minimized.
- ii. The door(s) does not appreciably deflect the water/retardant when fully opened.
- iii. The tank and doors must be leak proof, i.e., ½ gallon or less in a 24-hour period
- iv. The doors must be closeable in flight if the aircraft is not capable of landing with the door(s) open without damaging the door(s).

b. Venting

- i. The tank must be vented so that no more than 0.25 PSI negative pressure will be created in the tank head space during the fastest drop sequence.
- ii. The vent must not leak during filling or normal flight maneuvers.

c. Fill Port(s)

- i. The fill port must be a 3-inch Kamlock® fitting (male) and must be located on the right and left sides of the aircraft.
- ii. The fill port must not leak or overflow during ground operations or during normal flight maneuvers.

Note: For hover draft operations, fill ports are not required.

d. Controls

- i. The door open switch must be the same switch that opens the water bucket.
- ii. When required, the tank close switch must be the same switch that closes the water bucket.
- iii. All tanks must be equipped with an independently controlled and operated emergency dump system enabling the entire load to be dropped in less than 6 seconds. This system must use mechanical, pneumatic, or fluid pressure for operation.
- iv. Emergency systems operated by pneumatic or fluid pressure must be isolated from the normal tank system pressure. Normal function or failure of the normal system must not affect the emergency system pressure. Emergency systems dependent on normal operating aircraft or tank systems for initial charge must have a pressure gauge or

indicator readily visible to the crew. Emergency systems dependent on pre-charged bottles must have a positive means of checking system charge during preflight.

- v. The primary emergency dump control must be positioned within easy reach of the pilot and copilot while strapped in their respective seats. Electrically operated controls must be wired direct to a source of power isolated from the normal aircraft electrical bus and protected by a fuse or circuit breaker of adequate capacity.

e. Certifications

- i. Weight and balance computations must be made with the tank full, empty, and removed, showing the helicopter to remain within the acceptable center of gravity limits at all times.
- ii. The tank being offered and installed in aircraft must be filled to calculated capacity via snorkel in no more than 90 seconds at sea level on a standard day.

2. Suppressant/Retardant Mixing Equipment

- a. Refer to the latest agency guidance regarding on board mixing systems.

- b. If cooperator approved, chemical fire retardant/suppressants may be loaded in the cooperator's aircraft. All products must be listed on the Qualified Products List (QPL) as approved for the intended mission.

c. Installation

The unit must be designed for ease of installation and loading and must not require any modifications to the helicopter. Modifications are defined as any change to the integrity of the structural components of the helicopter airframe, such as drilling holes in tubing or distorting the metal.

d. Containment

Any unit mounted inside the helicopter (other than those that have STCs or 337s) must have a containment vessel around the pumping and concentrate storage supply. The containment vessel must be able to hold 125% of the concentrate supply. The discharge hose and fittings must be able to withstand 150 PSI or two times the rated maximum pressure output of the pump, whichever is greater. The discharge hose that is inside the cabin must have a containment sleeve of clear hose to check for leaks.

e. Restraint

The concentrate pumping unit containment vessel and concentrates must be affixed to the helicopter to prevent injury to any occupants. The design must meet the maximum inertia forces specified in 14 CFR 23.56 I (b)(2).

f. Hose Routing

The hose used to carry the concentrate must be routed out the side of the helicopter away from the pilot. Hoses will be routed in a manner that will not interfere with flight controls.

g. Breakaway Fittings

Any hose must have a disconnect that will pull away from the hose when the bucket is released. The disconnect must be close to the helicopter to keep the hose from beating against the helicopter. The disconnect must hold the pressure of the line and be able to activate at 1/3 of the bucket empty weight.

h. Compatibility of Materials

The materials used in the construction of any foam dispensing unit must be compatible with all foams. Materials must be resistant to corrosion, erosion, etching, or softening. To evaluate the materials, submerge in foam concentrate for 96 hours then in a 1 1/2% solution for 96 hours. Material samples must be measured, weighed, and visually examined to ensure that deterioration of the materials and the assembly does not occur with operational use.

Unacceptable conditions may be, but are not limited to cracking, crazing, softening, joint separation, bulging, diminished wall thickness, glue or mastic breakdown, or defective fasteners, gaskets, or fittings.

i. Concentrate Quantity

Unit is to be of the optimum size compatible with the make and model helicopter. However, the unit must carry a minimum of 5 gallons of concentrate for each 100 gallons of bucket capacity. Downloading may be accomplished when desirable during operations.

j. Power

Power source for the dispenser must be obtained from the helicopter by installing a MS 31I6FI2-3P, 3 pin connector on the cord to the unit pin A must be +28 VDC and pin B for ground (this is the same plug used for the infrared imaging system). Electrical power required to operate the concentrate pump must not be in excess of that normally available from the plug used as the source of power.

k. Vibration

The unit must not cause undue vibration in the helicopter during operation or in flight. The unit must be padded to keep from causing any single stress points on any parts not designed for such.

l. Operation

The pilot must be able to operate the unit with a minimal level of attention. The system must be automated to the point where the pilot has one control to operate. Once the control is set for flow rate there should be no further adjustment necessary to the unit.

m. Flow Rate

The system must be capable of dispensing a variable amount of concentrate, in flight, to achieve a mixture ratio ranging from 0.1 to 1.0% by volume in 0.1 % increments.

n. Concentrate Loading

Loading using 5-gallon containers is preferred. Bulk loading must be performed so such loading will avoid any spillage on the helicopter or come in contact with the helicopter. Servicing must be accomplished during normal refueling time for the helicopter and take no longer than the refueling operation. Loading operations are to be performed by Cooperator personnel.

o. Approved Concentrate Products can be found at: Wildland Fire Chemical Systems (WFCS), www.fs.fed.us/rm/fire.

- i. When transporting retardant or equipment containing retardant residue, cooperator must take precautions to prevent retardant from coming in contact with the aircraft structure.
- ii. Offered equipment will be approved by the Federal Agency Official prior to any use under an agreement.

3. **Additional equipment (if offered) must meet the following requirements:**

- a. Power source for a Helitorch or remote cargo hook.
 - i. An MS3101A-24-11S, 9-pin connector must be provided. Pin D must be airframe ground. Pin E must be switched 28VDC, protected by a 50-amp circuit breaker that can be manually opened and reset. The water bucket open switch must also activate this circuit.
 - ii. The connector must be mounted adjacent to the cargo hook (within 12 inches). A wire rope lanyard or other similar device must be provided for support of the connector so that tension loads will not be placed on the electrical wiring.
 - iii. This connector has multiple circuit capacity sufficient to provide power and control for cooperators furnished equipment such as the required water bucket. Water buckets must be wired through this connector.

Note: See FS/AMD A-16 for a 9-pin wiring diagram for suppressant/retardant buckets, https://www.nifc.gov/sites/default/files/NIICD/docs/avionics/FSOAS_A16C.pdf.

b. Remote Cargo Hook

- i. The cargo hook must be inspected, overhauled, and tested in accordance with the manufacturer's instructions. If the manufacturer has no requirements, then as a minimum, the cargo hook must be completely disassembled and inspected with repairs made as required, lubricated, and a full-load operational check in accordance with manufacturer's recommendations every 24 months.

c. Longlines

ii. Rotation resistant wire rope

- (1) Rotation resistant wire rope with swaged fittings rated in accordance with ANSI standards
- (2) Fabrication and installation methods must be in accordance with aircraft and ANSI standards.

iii. Synthetic Longline

- (1) Helicopter synthetic longlines must be constructed from the High Molecular Weight Polyethylene Equipment (HMWPE) or High Molecular Polyethylene Equipment (HMPE) family of rope fibers including brand names such as Spectra® by Allied Signal or fibers with similar properties.

(2) Working or Rated Load

The working or rated load of a rope is the maximum static load that will be lifted by the rope. Working loads are based on a percentage of the approximate breaking or ultimate strength of the rope when new and unused. The working load must be appropriate to the lifting capability of the helicopter.

(3) Factor of Safety

A factor of safety of seven must be used for helicopter synthetic longlines. Therefore, all ropes must have an ultimate strength of seven times the rated or working load. For example, if a Type 2 (Medium) helicopter line will have a working load of 4,500 pounds, the rope must have strength, when new, of at least 31,500 pounds. Rope diameters will vary depending on strength and type of rope.

(4) Knots and Splices

Knots are not permitted in the synthetic longline. Knots can decrease rope strength by as much as 50%. Splices may be used in the assembly of the longline, but no mid-line splicing repairs may be done. Re-splicing at the end of the line is permitted only if the rope is in good condition, and the new splice is done per the manufacturer's recommended splicing practices. Splices should always follow the manufacturer's recommended splicing practices.

(5) Maintenance and Inspections

Manufacturer's recommended maintenance and inspection procedures must be complied with.

EXHIBIT 6 – HIGH VISIBILITY MARKINGS ON MAIN ROTOR BLADES

Acceptable Paint Schemes:

1. Starting at the blade tip, paint the first 1/6th of blade length with gloss white. Paint the second 1/6th of blade length with a contrasting color. Paint third 1/6th of blade length with gloss white. Paint next 1/3rd of blade length with a contrasting color. Paint remaining 1/6th of blade length with gloss white.

Table 9: Example of Acceptable Paint Scheme

White	Contrasting	White	Contrasting	White	H U B
1/6	1/6	1/6	1/3	1/6	

2. One black and one white blade.
3. Paint schemes and color variations specified by manufacturer in a service bulletin, instructions, or other manufacturer published document or text.

EXHIBIT 7 – FUEL SERVICING EQUIPMENT REQUIREMENTS

1. General

- a. The FSV must be inspected and approved annually and must be stationed as assigned by the requesting agency.
- b. The fuel servicing vehicle must be capable of transporting fuel over typical local terrain to include unmaintained roads and grades of up to 9%. Fuel tank/chassis combinations must meet DOT requirements.
- c. Fuel tank/chassis combinations that are not compatible and/or that exceed the gross vehicle weight rating (GVWR) when tank(s) are full are not permitted.
- d. Fuel servicing vehicles must be properly maintained, cleaned, and reliable. Tanks, plumbing, filters, and other required equipment must be free of leaks, rust, scale, dirt, and other contaminants. Trailers used for the storage and transport of fuel must have an effective wheel braking system.
- e. Spare filters, seals, and other components of the fuel servicing vehicle filtering system must be stored in a clean, dry area in the fuel servicing vehicle. A minimum of one set is required to be with the vehicle.
- f. The fuel servicing vehicle tank capacity must be sufficient to sustain 8 hours of flight (14 hours of flight when the aircraft is doubled crewed and required in the Schedule of Items). Note that the aircraft's fuel load, at the start of the day, may be considered part of the sustained flight time requirement. Barrels are not acceptable. The fuel servicing vehicle manufacturers' gross vehicle weight (GVW), with a full fuel tank, must not be exceeded.
- g. All tanks will be securely fastened to the vehicle frame in accordance with DOT regulations and must have a sump or sediment settling area of adequate capacity to provide uncontaminated fuel to the filter.
- h. A 10 gallon per minute filter and pump is the minimum size acceptable. Filter and pump systems sizes must be compatible with the aircraft being serviced.
- i. The filter manufacturer's Operating, Installation, and Service Manual must be with the fuel servicing vehicle. Filters must be changed in accordance with the filter manufacturer's manual, at a minimum of every 12 months, whichever is less, and documented. The filter vessel must be placarded indicating filter change date and documented in the service vehicle log.
- j. Gasoline engine-driven pumps must be designed to pump fuel, have a shielded ignition system, Forest Service approved spark arrestor muffler, and a metal shield between the engine and pump. Other exposed terminal connections must be insulated to prevent sparking in the event of contact with conductive material.

2. Equipment

- a. Each aircraft fuel servicing tank vehicle must have two fire extinguishers, each having a rating of at least 40-B:C with one extinguisher mounted on each side of the vehicle. Extinguishers must comply with NFPA 10 Standards for Portable Fire Extinguishers. Fire extinguishers with an A rating will not be acceptable.
- b. Fuel tanks must be designed to allow contaminants to be removed from the sediment settling area.

- c. Fuel hoses must be compatible with the fuel being dispensed. Hoses must be kept in good repair. The fueling hose length must be a minimum of ½ the rotor diameter plus 20 feet for rapid refueling. Aircraft fueling hose shall be removed from service after 10 years from date of manufacture. Aircraft fueling hose not placed into service within 2 years of the date of manufacture shall not be used. (NFPA 407)
 - d. Fuel nozzle must include a 100-mesh or finer screen, a dust protective device, and a bonding cable with a clip or plug. Except for closed-circuit systems, no hold-open devices will be permitted.
 - e. An accurate fuel metering device for registering quantities in U.S. gallons of fuel pumped must be provided. The meter must be positioned in full view of the fuel handler while fueling the aircraft.
 - f. Fuel servicing vehicles must have adequate bonding cables.
 - g. Fuel servicing vehicles must comply with DOT and EPA requirements for transportation and storage of fuel and must carry sufficient petroleum product absorbent pads or materials to absorb or contain up to a five-gallon petroleum product spill. The cooperators are responsible for proper disposal of all products used in the cleanup of a spill in accordance with the EPA, 40 CFR 261, and 262.
 - h. All tank inlet ports, drains, and the fuel nozzle must be locked closed or stored inside locked compartments when not in use to preclude tampering, contamination, or improper drainage of the fuel supply.
 - i. A deadman flow control must be installed in the fuel system in accordance with NFPA 407.
3. Markings
- a. Each fuel servicing vehicle must have no smoking signs with minimum three-inch letters visible from both sides and rear of the vehicle.
 - b. Each vehicle must also be conspicuously and legibly marked to indicate the nature of the fuel. The marking must be on each side and the rear in letters at least three inches high on a background of sharply contrasting color such as Avgas by grade or jet fuel by type. Example: Jet-A, white on black background.
 - c. All fuel servicing vehicles must be placarded in accordance with 49 CFR 172.
4. Filtering System (Three-Stage or Single-Stage is acceptable)
- a. The first and third-stage elements of a three-stage system and the elements of a single-stage system must be new and installed by the cooperators during the annual inspection.
 - b. The separator element (Teflon screen) of the three-stage system must be inspected and tested as prescribed by the manufacturer during the inspection. The filter assembly must be placarded with that data.
 - c. If equipped with a drain, the bottom of the filter assembly must be mounted to allow for draining and pressure flushing into a container. If the unit is drained overboard, the fuel must not come in contact with the exhaust system or the vehicle's wheels. If the unit is equipped with a water sight gauge, the balls must be visible.
 - d. Three-Stage (filter, water separator, monitor) System:
 Fueling systems must utilize a three-stage system such as a Facet Part Number 050970-M2 for 20 Gallon Per Minute (gpm) pump, or equal. A Facet Part Number 050971-M2 for a 10

gallon per minute pump, or equal. An acceptable third-stage (monitor) unit is Velcon CDF-220 Series for 20-gpm flow or Velcon CDF-210E for 10-gpm systems.

e. Single-Stage System or Three-in-One Filter Canister:

Fueling systems must utilize a single element system such as a Velcon. filter canister with Aquacon cartridge of a size compatible with pumps flow rate. Example: Velcon VF-61 canister with an ACO-51201C cartridge.

f. Differential pressure gauge(s) must be installed and readable.

5. Fuel Servicing

a. General

- i. The cooperator must supply all aircraft fuel unless the government exercises the option of providing fuel. All fuel provided by the cooperator will be commercial-grade aviation fuel. Only fuels meeting the specifications contained in the aircraft's flight manual must be used.
- ii. Fueling operations, including storage, and handling, must comply with the airframe and engine manufacturer's recommendations and all applicable FAA standards. NFPA Standard No. 407, Aircraft Fuel Servicing, must be followed except that no passengers may be on board during fueling operations.
- iii. The cooperator must ensure that they are in compliance with 40 CFR Part 112: Oil Pollution Prevention; Spill Prevention, Control, and Countermeasure Plan Requirements (SPCC).
- iv. Fuel must pass through a filtering system in accordance with the filter manufacturer's recommendations.

b. Rapid Refueling

- i. There are two approved methods (Closed-Circuit Refueling (CCR) and Open Port) for fueling helicopters with the engine(s) running.
 - (1) CCR. This method of refueling uses a CCR system designed to prevent spills, minimized fuel contamination, and prevent the escape of flammable fuel vapors.
 - (2) Open Port. This method of refueling allows flammable fuel vapors to escape.
- ii. Rapid refueling of helicopters is permitted if requested by the Federal Agency, and the cooperator follows NFPA 407 procedures, and the cooperator has an approved rapid refueling procedure. For 14 CFR Part 133 and 137 operators a copy of company rapid refueling procedures must be submitted prior to rapid refueling. Rapid refueling authorization must be annotated on the aircraft approval. Additionally, the cooperator must meet the following requirements:
 - (1) A pilot must be seated at the controls of the aircraft during refueling operations.
 - (2) The aircraft must be shut.
 - (3) down after every four hours of flight (HOBBS) time or two fuel cycles (whichever occurs first).
 - (4) Personnel providing onsite fire protection are briefed on the cooperator's rapid refueling procedures.

- (5) Federal personnel must not refuel aircraft unless the pilot requests their assistance due to an emergency situation; or when the government provides the fuel servicing system and dispensing personnel.
- (6) The hose must be a minimum of ½ the rotor diameter plus 20 feet for rapid refueling.
- (7) A CCR adapter must be provided to allow fueling of aircraft with standard fueling ports.
- (8) A copy of the rapid refueling procedures must be kept with the fuel servicing vehicle.
- (9) Federal personnel are not allowed in the safety zone during aircraft fueling operations. The safety zone is defined as within 50 feet of aircraft refueling receptacle.

6. Fuel Quality Control Procedures

Compliance with fuel quality control requirements is the responsibility of the cooperator. NFPA 407 must be followed for Aircraft Fuel Servicing.

Note 1: Cooperators must advise an appropriate inspector if consecutive contaminated samples are collected from any port.

a. Daily

- i. Check for and remove any water from fuel tanks. A water check will be performed each morning before the vehicle is moved, after every reloading of fuel, washing of equipment, and after a heavy rain or snowstorm.
- ii. Drain all filter/separator drain valves and check for water and other contaminants. Draw off any accumulation of water.
- iii. Draw off a sample from the fuel nozzle. Sample must be collected in a clean, clear glass jar, and examined visually. Any visual water, dirt, or filter fibers are not acceptable.

b. During Aircraft Fueling Process

- i. Check sight gauge for water, if equipped.
- ii. Visually inspect fuel system for leaks. Repair as necessary.
- iii. Monitor differential pressure reading.

c. Weekly

- i. With pump operating, pressure flush filter assembly. Continue flush operation until the sample is clear, clean, and bright.
- ii. Sample from closed-circuit nozzle for contaminants.
- iii. Check the condition of covers, gaskets, and vents.
- iv. Inspect all fire extinguishers for broken seals, proper pressure, and recharge date. Recharge as necessary.
- v. Inspect hoses for abrasions, separations, or soft spots. Weak hoses will be replaced.

d. Record Keeping. The fuel handler must keep a daily record containing the following information: (as a minimum)

- i. Condition (clean, clear, bright, etc.) of fuel sample at:

(1) Nozzle Sample

- (2) Filter Sump Sample
- (3) Tank Sump Sample
- ii. Filter change (reason & date)
- iii. Record of source, location, when, and quantity of fuel loaded into the fuel servicing vehicle.
- iv. Fuel servicing vehicle tank ports will be secured and locked to prevent access by unauthorized individuals.

EXHIBIT 8 – OPERATIONS AND SAFETY PROCEDURES GUIDE FOR HELICOPTER PILOTS

Pilot operation briefings will emphasize the following areas:

1. Pilot Authority and Responsibility
2. Helicopter Management
3. Operational Requirements
4. Operating Limitations and Weather Requirements
5. FM Radio and GPS Operations
6. Flight Following and Flight Plans
7. Incident Airspace
8. Knowledge and Procedure Overview
9. Reference Web Sites
10. Pilot Certification
11. Verification of Longline and/or Snorkel Training
12. Flight Hour requirements and experience verification
13. Required documentation for pilot approval

EXHIBIT 9 – INTERAGENCY GUIDELINES FOR VERTICAL REFERENCE/EXTERNAL LOAD TRAINING

(If Applicable)

Each cooperator pilot must have a minimum of 10 hours vertical reference/external load flight training during initial qualification and a minimum of two hours annual recurrent training prior to use.

1. The pilot must be able to demonstrate proficiency with 150-foot length line, and
2. Exhibit knowledge by explaining the elements of external load operations.
3. Perform a thorough preflight briefing of ground personnel to include hookup procedures, signals, pilot, and ground personnel actions in the event of an emergency or hook malfunction.
4. Visually determine that the cargo hook(s) and cables are installed properly and that electrical and manual releases are functioning properly.
5. Ascend vertically using vertical reference techniques while centered over the load until the load clears the ground, then maintain a stable hover with a load 10 feet (+–5 feet) above the ground for 30 seconds.
6. Control the hook movement and stop load oscillations while in a hover.
7. Maintain positive control of the load throughout the flight while maintaining specified altitude within 50 feet, airspeed within 10 knots, and heading within 10°.
8. Maintain the proper approach angle and rate of closure to establish an out-of-ground effect hover with the load 10 feet above the ground (+/-5 feet) for 30 seconds. The load will then be placed within a 10- foot radius of the specified release/touchdown point.
9. Maintain the proper approach angle and rate of closure to establish an out-of-ground effect hover within a confined area with the load 10 feet above the ground (+/-5 feet) for 30 seconds. The load will then be placed within a 10-foot radius of the specified release/touchdown point.

I certify that _____ meets the currency and performance requirements of our Cooperator’s Vertical Reference/External Load Training Manual.

Chief Pilot Signature

Date

Organization

Each cooperator pilot must have an annual proficiency endorsement from the cooperator's Chief Pilot.

1. GUIDELINES FOR HELICOPTERS USING A FIXED TANK WITH SNORKLE

- a. The pilot must demonstrate proficiency with the snorkel by:
 - i. Exhibiting knowledge of the elements of operations.
 - ii. Performing a thorough preflight of the tank and snorkel
 - iii. Establishing a hover before takeoff by ascending vertically while not dragging the snorkel.
 - iv. Establishing and maintaining the proper approach angle and rate of closure to establish a 5-foot snorkel height above the porta-tank and then lowering the snorkel into the tank. Maintain a stable hover for 30 seconds. Ascend vertically while keeping the snorkel clear of the edges of the tank until the snorkel is at least five (5) feet above the tank. Transition to forward flight without allowing the snorkel to settle back into the tank,

OR

- i. Establishing and maintaining a proper approach angle and rate of closure to establish a 5-foot snorkel height above the ground and over a circle of 8 to 10 feet in diameter. The circle must be marked by paint or other easily identifiable material. From a stable hover, lower the aircraft until the snorkel head is touching the ground. Execute a 360-degree turn (left or right) while maintaining the snorkel head in contact with the ground within the circle and not allowing any part of the snorkel hose to touch the outside of the circle. The maneuver should be completed in 90 to 120 seconds,

2. AND

- i. Perform a landing while placing the main landing gear in a 6-foot diameter circle

I certify that _____ meets the currency and performance requirements of our Cooperator's Vertical Reference/External Load Training Manual.

Chief Pilot Signature

Date

Organization

EXHIBIT 10 – INTERAGENCY HELICOPTER LOAD CALCULATION

INTERAGENCY HELICOPTER LOAD CALCULATION OAS-67/FS 5700 -17 (07/13)		MODEL	
		N#	
PILOT(S)		DATE	
MISSION		TIME	
1 DEPARTURE	PA	OAT	
2 DESTINATION	PA	OAT	
3 HELICOPTER EQUIPPED WEIGHT			
4 FLIGHT CREW WEIGHT			
5 FUEL WT (_____ gallons X _____ lb. per gal)			
6 OPERATING WEIGHT (3 + 4 + 5)			
	Non-Jettisonable		Jettisonable
	HIGE	HOGE	HOGE-J
7a PERFORMANCE REF (List page/chart from FM)			
7b COMP GROSS WT (FM performance section)			
8 WT REDUCTION (Req for all non-jettisonable)			
9 ADJUSTED WEIGHT (7b minus 8)			
10 GROSS WT LIMIT (FM limitations section)			
11 SELECTED WEIGHT (Lowest of 9 or 10)			
12 OPERATING WEIGHT (From line 6)			
13 ALLOWABLE PAYLOAD (11 minus 12)			
14 PASSENGERS/CARGO MANIFEST			
15 ACTUAL PAYLOAD (Total of all weights listed in Item 14) Line 15 must not exceed line 13 for the intended mission.			
PILOT SIGNATURE			
MGR SIGNATURE		Hazmat Yes ___ No ___	

Interagency Helicopter Load Calculation Instructions

A load calculation must be completed for all flights. A new calculation is required when operating conditions change ($\pm 1,000'$ in elevation or $\pm 5^{\circ}\text{C}$ in temperature) or when the helicopter operating weight changes (such as changes to the equipped weight, changes in flight crew weight, or a change in fuel load).

All blocks must be completed. Pilot must complete all header information and items 1-13. Helicopter Manager completes items 14 and 15.

1. **Departure.** Name of departure location and current pressure altitude (PA), read altimeter when set to 29.92) and outside air temperature (OAT) in Celsius, at departure location.
2. **Destination.** Name of destination location and PA and OAT at destination. If destination conditions are unknown, use Mean Sea Level (MSL) elevation from a map and standard lapse rate of $2^{\circ}\text{C}/1,000'$ to estimate OAT.

Check the box in line 1 (departure) or line 2 (destination) to indicate the most restrictive values used to obtain computed gross weight in line 7b.
3. **Helicopter equipped weight.** Equipped weight equals the empty weight (as listed in the weight and balance data) plus the weight of lubricants and onboard equipment required by contract (i.e., survival kit, rappel bracket).
4. **Flight crew weight.** Weight of the pilot and any other assigned flight crewmembers on board (i.e., copilot, flight engineer, navigator) plus the weight of their personal gear.
5. **Fuel weight.** Number of gallons on board X the weight per gallon (Jet fuel = 7.0 lbs./gal; AvGas = 6.0 lb./gal).
6. **Operating weight.** Add items 3, 4, and 5.
7. 7a. **Performance references.** List the specific flight manual supplement and hover performance charts used to derive computed gross weight for line 7b. Separate charts may be required to derive HIGE, HOGE, and HOGE-J. HIGE: Use hover-in-ground-effect, external/cargo hook chart (if available). HOGE and HOGE-J: Use hover-out-ground-effect charts for all HOGE operations.

7b. **Computed gross weight** Compute gross weights for HIGE, HOGE, and HOGE-J from appropriate flight manual hover performance charts using the PA and temperature (OAT) from the most restrictive location, either departure, or destination. Check the box in line 1 (departure) or line 2 (destination) to indicate which values were used to obtain computed gross weight.
8. **Weight reduction.** The Government weight reduction is required for all “non-jettisonable” loads. The weight reduction is optional (mutual agreement between pilot and helicopter manager) when carrying jettisonable loads (HOGE-J) where the pilot has total jettison control. The appropriate weight reduction value, for make, and model, can be found in the current helicopter procurement document (contract).
9. **Adjusted weight.** Line 7b minus line 8.
10. **Gross weight limitation.** Enter applicable gross weight limit from Limitations section of the basic flight manual or the appropriate flight manual supplement. This may be maximum gross weight limit for takeoff and landing, a weight/altitude/temperature (WAT) limitation or a maximum gross weight limit for external load (jettisonable). Limitations may vary for HIGE, HOGE, and HOGE-J.

11. **Selected weight.** The lowest weight, either line 9, or 10, will be entered for all loads. Applicable limitations in the flight manual must not be exceeded.
 12. **Operating weight.** Use the value entered in line 6.
 13. **Allowable payload.** Line 11 minus line 12. The maximum allowable weight (passengers and/or cargo) that can be carried for the mission. Allowable payload may differ for HIGE, HOGE, and HOGE-J.
 14. **Passengers and/or cargo.** Enter passenger names and weights and/or type and weights of cargo to be transported. Include mission accessories, tools, gear, baggage, etc. A separate manifest may be used.
 15. **Actual payload.** Total of all weights listed in item 14. Actual payload must not exceed allowable payload for the intended mission profile, i.e., HIGE, HOGE, or HOGE-J.
- Both pilot and helicopter manager must review and sign the form.** Check if hazmat is being transported. Manager must inform the pilot of type, quantity, and location of hazmat on board.

EXHIBIT 11 – WEIGHT AND BALANCE FORM A (EXAMPLE)

Form A : List of approved equipment (EXAMPLE)							Date Weighed 9/15/2009	Date Weighed		
Page	A/C Make, Model, Series	Registration Number			Serial Number		In A/C	ON 'C' Chart	In A/C	ON 'C' Chart
1 of 1	Bell 205A -1	N12345			111111					
Location and Description of Item		Weight	Arm	Moment	Lat. Arm	Lat. Moment				
Fuselage:										
Ballast		25.3	+ 8.5	215.1	+ 3.4	86	X			
Battery		52.5	+ 8.5	446.3			X			
Wire Strike kit upper and lower							O			
Pulse light kit							X			
Strobe							X			
Cargo Hook							X			
Cabin:										
Instruments										
Radios										
Automated Flight Following (AFF)										
Seats										
Engine Deck:										
Rotor brake							X			
T-53 engine							X			
212 Rotor assy							X			
Tail:										
Fast Fin							X			
Strake Kit							X			
212 Tail Rotor Assy							X			
Strobe Light							X			
Removable Equipment:										
Fill Pump								C		
Rappel Kit								C		
Survival Kit								C		
First Aid Kit							X			
Fire Tank		395.2	+ 125	49400				C		

- X: Item was on the aircraft at the time aircraft was weighed or is included in the basic weight
O: Item was off the aircraft at the time aircraft was weighed or is not included in the basic weight.
C: Item is n Form C when installed.

EXHIBIT 11 – WEIGHT AND BALANCE FORM B (Example)

Form B : Aircraft Weighing Record (EXAMPLE)							
Make, Model, Series		Registration Number		Serial Number		Date	
Bell, 205A -1		N12345		66666		9/15/2009	
Datum is		Leveling Means		Weighing Procedures References		Scale Location	
7.60" aft of cabin nose		Plumb line from top of left main door frame		CFR, part 29 / OEM Maint. Manual Chapter 8 / Type Certificate DS		Jack points	
Scale Readings							
Scale	Reading	Tare	Net Weight	Long. Arm	Moment	Lat. Arm	Moment
Left Front or Nose	1478	0	1478	+ 61.69	91177.8	- 30	44340
Right Front	1116	0	1116	+ 61.69	68846.1	+ 30	33480
Left Aft or Tail	1215	0	1215	+ 211.58	257069.7	- 30	36450
Right Aft	1974	0	1974	+ 211.58	417658.9	+ 30	59220
Basic Weight			Total	5783	144.46	834752.5	2.06
Fluids (Fuel & Oil, etc.) at Time of Weighing				Notes			
	Full	Defueled	Drained	Oil and unusable fuel in basic weight			
Fuel		X					
Oil Engine	X						
Oil Transmission	X						
Oil Tail Gearboxes	X						
Hydraulic Fluid	X						
Items Weighed not part of Basic Weight				Items not Weighed but part of Basic Weight			
Item	Weight	Arm	Moment	Item	Weight	Arm	Moment
Usable fuel (if full)	1457.5	+ 150.4	219208	Unusable fuel (if drained)	16.5	+ 144	3276
Total (-)	1457.5			Total (+)			
Adjusted Basic Weight of Aircraft as Weighed							
				CG		Moment	
Total Basic Weight of Aircraft as Weighed				5783	Longitudinal EW, CG	+ 144.46	834752.5
					Lateral EW CG	+ 2.06	11910
Aircraft Weighed By				Scales			
Print Name :				Type :			
Signature:				Serial Number:			
Certificate Type and Number:				Calibration Date:			

EXHIBIT 11 – WEIGHT AND BALANCE FORM B (Blank)

Form B : Aircraft Weighing Record									
Make, Model, Series			Registration Number			Serial Number		Date	
Datum is			Leveling Means		Weighing Procedures References		Scale Location		
Scale Readings									
Scale		Reading	Tare	Net Weight	Long. Arm	Moment	Lat. Arm	Moment	
Left Front or Nose									
Right Front									
Left Aft or Tail									
Right Aft									
Basic Weight			Total						
Fuel & Oil at Time of Weighing				Notes					
	Full	Defueled	Drained						
Fuel									
Oil Engine									
Oil Transmission									
Oil Tail Gearboxes									
Hydraulic Fluid									
Items Weighed not part of Basic Weight				Items not Weighed but part of Basic Weight					
Item	Weight	Arm	Moment	Item	Weight	Arm	Moment		
Total (-)				Total (+)					
Adjusted Basic Weight of Aircraft as Weighed									
Total Empty Weight of Aircraft as Weighed						CG		Moment	
						Longitudinal EW. CG			
						Lateral EW CG			
Aircraft Weighed By				Scales					
Print Name :				Type :					
Signature :				Serial Number :					
Certificate Type and Number :				Calibration Date :					

EXHIBIT 12 – HELICOPTER LIKE MAKES, MODELS, AND SERIES

<u>Make</u>	<u>Model Groups*</u>	<u>Series Groups**</u>
Airbus	H125/AS350	All AS350C, AS350D, AS350D1, AS350B, AS350B1, AS350B2, AS350BA
		AS350B3, AS350B3e
		AS350FX, AS350FX2, AS350SD2
	EC-130	EC130B4, EC130T2
	SA 315, SA 316, SA 319	All
	H215, AS 330, 332	All
	H45, EC145, UH-72A, BK 117	All
Bell	204, 205, 210, 212 Single, UH-1 (single engine)	All
	206	All 206B, TH67, OH-58A, OH-58C
		All 206L
	407	407, 407GT, 407GX, OH-58D
		407HP (Eagle)
	212, 412, UH-1N (twin engine)	All 212, All UH-1N (twin engine)
All 412		
214, (except 214ST)	All	
Kawasaki	KV107, BV107, CH-46	All
MD Helicopters	369, 500, 520, 530, 600, OH-6	All 369/500 (except 369F, 369FF, and 500N)
		369F and 369FF
	900, 902	All
Robinson	R-66	All
Sikorsky	S-64, CH-54	All
	S-70, UH-60	All
<p>*Aircraft within each block are considered like make and model, as well as unlisted aircraft with the same model number. PIC time accumulated in an aircraft model or combination of models from the same block will meet PIC make and <u>model</u> experience requirements.</p> <p>**Aircraft within each block are considered like series, PIC time accumulated in an aircraft series or combination of aircraft series from the same block will meet PIC make, model, and <u>series</u> experience requirements.</p>		

Note: Helicopters with the same type rating designation are considered like make and models.

EXHIBIT 13 – HELICOPTER FUEL CONSUMPTION AND WEIGHT REDUCTION CHART

Helicopter Make and Model		Fuel Consumption	Load Calculation
Make	Model	<u>Gallon/Hour</u>	<u>Weight Reduction-Lb.</u>
EUROCOPTER	AS-330J	179	NOT ESTABLISHED
	AS-332L-1	160	NOT ESTABLISHED
	AS-350B/350BA	45	130
	AS-350B-1	46	160
	AS-350B-2	48	160
	AS-350B-3/ H125	50	175
	AS-350D	38	130
	AS-355F-1/355F-2	58	140
	AS-365N-1	87	275
	BK-117	77	160
	BO-105CBS	55	180
	SA-315B	58	180
	SA-316B	58	170
	SA-318C	56	180
	SA-319B	55	NOT ESTABLISHED
	SA-341G	56	170
	EC-120	31	NOT ESTABLISHED
	EC-130-B4	53	NOT ESTABLISHED
	EC-135	64	220
	EC-145	80	NOT ESTABLISHED
	EC-155B1	95	NOT ESTABLISHED
EC-225	183	NOT ESTABLISHED	
BELL	47/SOLOY	23	120
	204B (UH-1 SERIES)	86	200
	204 Super B	90	200
	205A-1	88	260
	205A-1++	90	260
	206B-II	25	100
	206B-III	27	130
	206L-1	32	150
	206L-3 (Incl L-1 20P), L-4	38	180
	210, 212 Eagle Single	90	260
	212	100	390
	214B	160	380
	214B1	145	380
	214ST	133	NOT ESTABLISHED
	222A	70	NOT ESTABLISHED
	222B, 222UT	83	NOT ESTABLISHED
	407	45	155
	412, 412HP	110	390
	429	73	210
	505	39	120
	UH-1B	86	260
UH-1B Super, 1F, H (-13)	88	260	
UH-1H (-17 eng.)	90	260	
TH-1L	88	N/A	
LEONARDO/AGUSTA	A-109	72	N/A
	A-119	70	N/A
	AW-139	140	N/A
MD	500C	23	110
	500D/E	28	120
	520N	32	100
	530F	34	120
	600N	41	155
	900/902	69	210
HILLER	1100B	22	130
	UH-12/SOLOY	23	100
SIKORSKY	S-55T	47	170
	S-58T/PT6T-3	115	400
	S-58T/PT6T-6	115	460
	S-70	160	530
	S-76C+	90	NOT ESTABLISHED
ROBINSON	R-66	24	130

EXHIBIT 14–DRAWING FS/OAS A-16

Accessory Connector Pin Assignments AUX 3

Helicopter 9 Pin Connectors

#1. Two wire type connectors (remote hook, bucket, helitorch and seeders)

- D Aircraft ground
- E +28 VDC (bucket/hook open & torch/seeder on)

#2. Three wire type connectors with Additional Telemetry Unit (ATU) support (remote hook, bucket, helitorch and seeders)

- D Aircraft ground
- E +28 VDC (bucket/hook open & torch/seeder on)
- G ATU bucket ground connection

Connectors on helicopters shall be secured to the airframe by a wire lanyard or other acceptable method. Any method must ensure the connector's electrical wiring shall not carry any physical load when the connector is disconnected.

Mating connectors on buckets, remote hook, etc., must have the threaded locking ring removed.

Power to the Helicopter 9 Pin Connector typically requires a 50 ampere circuit breaker (see contract specifications)

Parts for Helicopter 9 Pin Connectors

- Connector on helicopter: In-line type MS3101E24-11S
- Bulkhead type MS3102E24-11S
- Mating connector (on device) MS3107B24-11P
- Dust cap for Helicopter connector (optional) MS25043-24D
- Dust cap for Mating connector (optional) MS25042-24D

Auxiliary 3 Pin Power Source Connector (AUX)

Connector used as a general power source for a wide range of equipment. Only two pins shall be operational.

- A +28 VDC (used on 28 volt aircraft only)
- B Aircraft ground
- C +14 VDC (used on 14 volt aircraft only)

Each AUX connector shall have its own dedicated circuit breaker (see contract specifications for required amperage). The amperage of the circuit breaker is typically 10 amperes in fixed wing aircraft and 5 amperes in helicopters.

Parts for AUX Connector

- AUX Connector: Bulkhead type MS3112E12-3S
- Mating connector (on device) MS3116F12-3P
- Dust cap for AUX connector (optional) MS3181-12C

FS/OAS drawings are available at:
www.nifc.gov/NIICD/documents.html

RevNo	Revision note	Date	Initials	Checked	National Interagency Fire Center (NIFC)				Avionics (208) 387-5648			
1	Specified connector cap and added AUX-FM & AUX power connectors	02/10/1988	Unknown	Unknown	Designed by VRGIL	Checked by UNKNOWN	Approved by - date UNKNOWN	Filename 120003C	Date 02/02/2017	Scale NONE		
A	Consolidated connector listing	02/08/2000	FAS	BC	U.S. FOREST SERVICE			STANDARDIZED CONNECTORS FS/OAS A-16				
B	Revised connector information	02/01/2017	FAS	Group								
C	Consolidated information onto one page	02/02/2017	FAS	Group								
											Revision C	Sheet 1/1

EXHIBIT 15–DRAWING FS/OAS A-17

Auxiliary FM Radio Interface

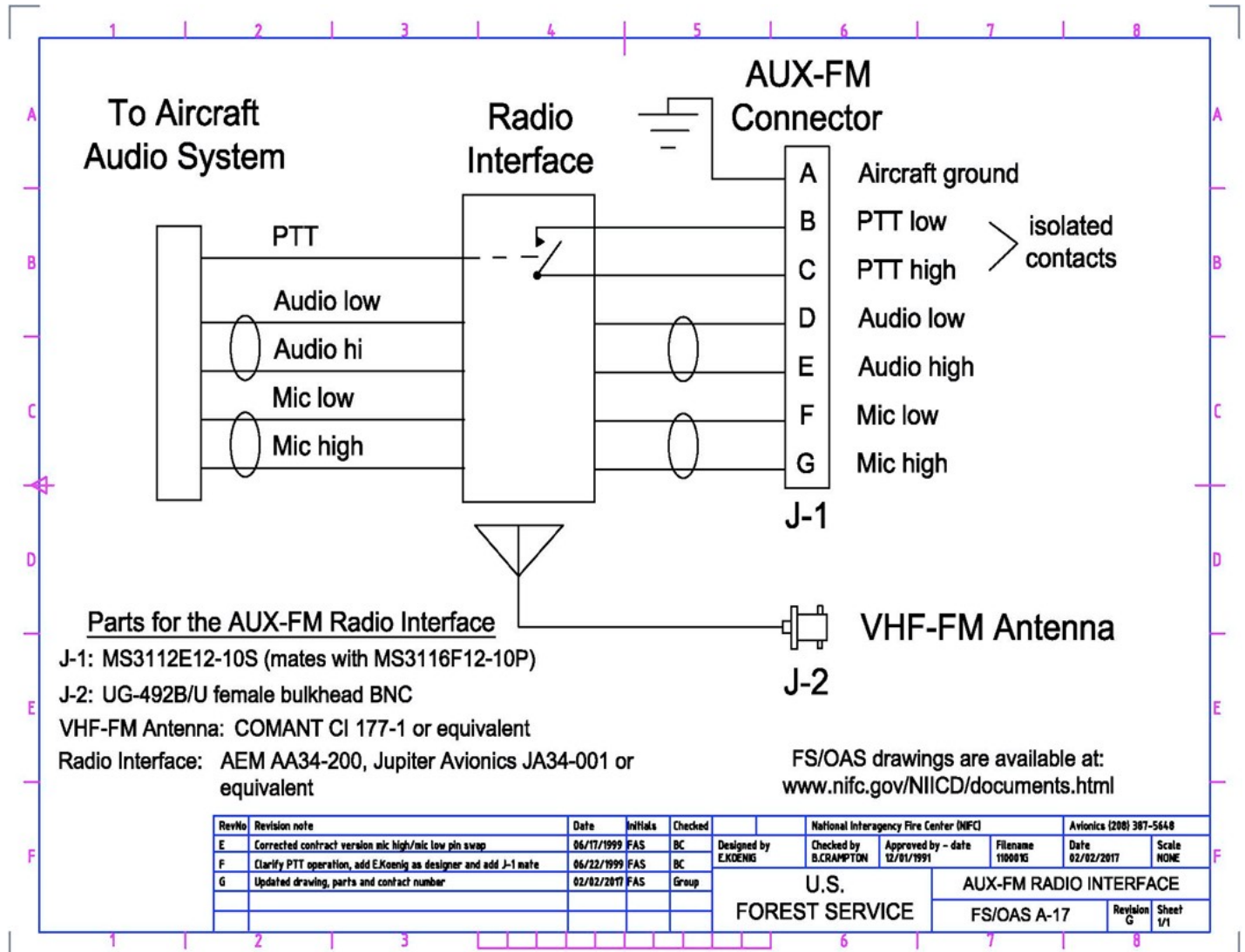


EXHIBIT 16 – ACRONYMS

AC	Advisory Circular	IPP	Invoice Processing Platform
AD	Airworthiness Directive	LOA	Letter of Authorization
AMS	Aviation Management System	MMSB	Manufacturer’s Mandatory Service Bulletins
A&P	Airframe and power plant	MOU	Memorandum of Understanding
APCO	Association of Public-Safety Communications Officials	NFPA	National Fire Protection Association
AQD	Acquisition Services Directorate	NTSB	National Transportation Safety Board
ASM	Aviation Safety Manager	NVG	Night Vision Goggles
ASO	Aviation Safety Office	NWCG	National Wildfire Coordinating Group
ASTM	American Society for Testing and Material	OAS	Office of Aviation Services
ATC	Air Traffic Control	PA	Public Address System
ATGS	Air Attack Group Supervisor	PA	Pressure Altitude
AUR	Aircraft Use Report	PAO	Public Aircraft Operation
CFR	Code of Federal Regulations	PFD	Personal Flotation Device
CO	Contracting Officer	PIC	Pilot-in-Command
COR	Contracting Officer’s Representative	PPE	Personal Protective Equipment
COTR	Contracting Officer’s Technical Representative	PSD	Plastic Sphere Dispenser
CFR	Code of Federal Regulations	PSI	Pounds Per Square Inch
CTCSS	Continuous tone coded squelch system	PTT	Push to Talk
DM	Degrees/Minutes/Decimal Minutes	RFQ	Request for Quotes
DOI	Department of Interior	RPM	Revolutions Per Minute
DOT	Department of Transportation	SFI	Safety Foundation Incorporated
ELT	Emergency Locator Transmitter	SIC	Second-in-Command
EPA	Environmental Protection Agency	STEP	Single-skid, Toe-In, and Hover Exit/Entry Procedures
ERG	Emergency Response Guidebook	TBO	Time between Overhaul
FAA	Federal Aviation Administration	TSO	Technical Service Order
FAR	Federal Acquisition Regulations	UL	Underwriter’s Laboratory
FRAT	Flight Risk Assessment Tool	USDA	United States Department of Agriculture
FTR	Federal Travel Regulations	USFS	United States Forest Service
FSV	Fuel Servicing Vehicle	VFR	Visual Flight Rules
FSVD	Fuel Servicing Vehicle Driver	VNE	Velocity Never Exceed
GVW	Gross Vehicle Weight	VOX	Voice Activation
GPM	Gallons Per Minute	VSWR	Voltage Standing Wave Ratio
GPS	Global Positioning System		
HIGE	Hover-in-Ground Effect		
HLCO	Helicopter Coordinator		
HOGE	Hover-out-of-Ground Effect		
IAT	Interagency Aviation Training		
IBC	Interior Business Center		
ICAO	International Civil Aviation Organization		
ICS	Intercom System		
IFR	Instrument Flight Rules		
IP	Institute of Petroleum		

The *NWCG Standards for Interagency Cooperator Type 2 and 3 Helicopters* is developed and maintained by the National Interagency Aviation Committee (NIAC), an entity of the National Wildfire Coordinating Group (NWCG).

Previous editions: First.

While they may still contain current or useful information, previous editions are obsolete. The user of this information is responsible for confirming that they have the most up-to-date version. NWCG is the sole source for the publication.

This publication is available electronically at <https://www.nwcg.gov/publications/525-1>.

Comments, questions, and recommendations shall be submitted to the appropriate agency program manager assigned to NIAC. View the complete roster at <https://www.nwcg.gov/committees/national-interagency-aviation-committee/roster>.

Publications and training materials produced by NWCG are in the public domain. Use of public domain information, including copying, is permitted. Use of NWCG information within another document is permitted if NWCG information is accurately credited to NWCG. The NWCG logo may not be used except on NWCG authorized information. “National Wildfire Coordinating Group,” “NWCG,” and the NWCG logo are trademarks of NWCG.

The use of trade, firm, or corporation names or trademarks in NWCG products is solely for the information and convenience of the reader and does not constitute endorsement by NWCG or its member agencies of any product or service to the exclusion of others that may be suitable.

This NWCG publication may contain links to information created and maintained by other non-federal public and/or private organizations. These organizations may have different policies from those of NWCG. Please note that NWCG does not control and cannot guarantee the relevance, timeliness, or accuracy of these outside materials.