

Appendix B – Helitorch Operations

Required Forms

Information may be contained in the Incident Action Plan (IAP), prescribed fire plan, *NWCG Standards for Helicopter Operations* (NSHO), PMS 510, or agency-specific form – such as Project Aviation Safety Plan (PASP) or Mission Aviation Safety Plan (MASP) – and may be utilized in lieu of the following forms. Required forms are available at <https://www.nwcg.gov/committees/interagency-aerial-ignition-unit>.

- Helitorch Operations Go/No-Go Checklist (required format)
- Helitorch PASP or MASP
- Job Hazard Analysis (JHA) or Risk Management Assessment (RMA)
- Aviation Risk Assessment Worksheet ([NWCG Standards for Aviation Risk Management, PMS 530](#))
- Helitorch Organization Chart – Helitorch Prescribed Fire
- Helitorch Organization Chart – Helitorch Wildland Fire
- Helicopter Crash Rescue/Medivac Plan ([NSHO, HBM Forms, 2019](#))
- Hazardous Materials Manifest ([NWCG Standards for Aviation Transport of Hazardous Materials, PMS 513](#))
- [Interagency Transportation Guide for Gasoline, Mixed Gas, Drip Torch Fuel, and Diesel](#)
- Helitorch Inspection Checklist
- Helitorch Mix Systems Checklist

Optional Documents

- Aerial Ignition Preplanning Checklist
- Helitorch Post-Use Maintenance Checklist
- Helitorch Annual Maintenance and Winterization Checklist
- Helitorch Use Record (Example)
- Briefing Checklist
- Aerial Ignition Device Additional Training

Project Aviation Safety Plan

OPM-6 and FSM-5700 require an agency-specific PASP/MASP be completed prior to any special use missions involving aircraft. The PASP/MASP is a proactive measure used for preplanning and risk assessments which are paramount to a successful accident-free mission. The PASP/MASP allows for a collaborative effort of all personnel involved to address all elements of the mission and generate a plan with risks at acceptable levels. Once the PASP/MASP is completed, project supervisors or flight managers must get approval to execute the mission. The amount of risk involved to accomplish the mission, dictates the level of approval required. The risk assessment matrix included in the PASP/MASP template provides guidance on the level of approval based on the level of risk. A mission with a level of risk in “Low” or “Medium” may only need approval from a Unit Aviation Manager or Forest Aviation Officer, but a mission in the “Serious” or “High” category will require approval from an Aviation Division or Regional Aviation Manager.

After the mission is approved, conduct an on-site briefing covers the elements of the mission with all participants, and then you may implement the plan.

The key to a smooth process for the PASP/MASP is to be thorough. Line Officers and Incident Management Team (IMT) Incident Commanders (IC) must be able to understand your plan from a written form.

Helitorch Operations Go/No-Go Checklist

The helicopter operations on this project require the use of this checklist. If all items are not checked as satisfactory (go) and maintained in that state for the duration of the mission, flying operations will be suspended until the deficiency is mitigated.

| | | |
|--------------------------|--------------|---|
| Project/Incident | | Location |
| Helitorch Manager | | Date |
| Firing Boss | | Date |
| DAILY INSPECTION | | |
| ORGANIZATION | | |
| GO | NO-GO | |
| | | Helitorch organization chart has been prepared and posted showing responsibility for functions by name. |
| | | All helitorch positions are filled by qualified personnel and trainees are identified. |
| | | Pilot and aircraft agency approved cards checked. |
| | | Agency helitorch module certified by agency aviation manager/HOS and documentation checked by HTMG. |
| | | Vendor provided equipment and personnel approved through contracting and checked by HTMG. |
| | | Multiple aircraft – Helibase manager qualified and assigned. |
| | | Briefing: to include as a minimum all required helitorch personnel, key-firing personnel, fire protection personnel, fuel handling personnel, and helitorch pilot. |
| | | Overhead personnel responsibilities and authorities identified and discussed. |
| | | Area flight hazard map posted, hazards discussed and mitigated with pilot. |
| | | Personnel assignments, duties, responsibilities known and understood. |
| | | Helibase manager checklist reviewed. |
| | | Fire shelter provided for pilot, is on board and accessible; pilot familiar with use. |
| | | Establish rendezvous point, escape routes, and safety zone for personnel and equipment accountability for Helitorch base incidents and escaped fire situation. Radio notification will be made in the event personnel need to evacuate work area. |
| | | All personnel will be briefed on the hazards associated with the handling of the materials. |
| CRASH RESCUE PLAN | | |
| | | Aviation safety plan approved and posted at helibase. |
| | | Helibase crash rescue personnel assigned; duties discussed and understood. |
| | | Aircraft incident response plan and crash rescue plan posted at helitorch base and dispatch. |
| | | Map showing flight routes, helitorch area, flight hazards, ground access routes, and alternate landing posted on a bulletin board. |
| | | Emergency procedures with torch operations reviewed; duties discussed and understood. |
| | | Emergency fire suppression and medivac procedures reviewed, duties discussed and understood. Location of crash rescue, evacuation, and first aid equipment discussed with all. |
| MIXING AREA | | |
| | | Separate from other helibase activities. |
| | | Traffic, ground vehicles, personnel, and aircraft control measures in place. |
| | | Bulk fuel supply available and properly located, bonding measures properly applied, and fuel handlers briefed. |
| | | Operational 15-minute gravity fed portable eye wash station that meets ANSI Z358.1-1998, OSHA 1910.141 |

Helitorch Operations Go/No-Go Checklist (continued)

| MIXING AREA (continued) | | |
|--------------------------------|--------------|---|
| GO | NO-GO | |
| | | Fire suppression equipment in place: Reference SAI Chap IV section VI |
| | | Post no smoking signs at all vapor removal outlets and mixing areas. |
| | | Equipment operational, dry run with mixing personnel completed. |
| | | Personal protective equipment: Personnel must be equipped with eye protection, hardhat, fire retardant anti-static or 100 percent cotton coveralls, and nitrile chemical resistant gloves. |
| | | Mixing equipment located outside of safety circle and out of approach and departure paths. |
| | | OSHA 1910.141 and 1926.51 requires that potable drinking water be provided at each jobsite. In addition if the employee is consuming their lunch at the site then hand soap and water or another form of cleansing and disinfecting agent must be provided. |
| LANDING AREA(s) | | |
| | | Approach and departure paths adequate. |
| | | Landing area and safety circle free from hazards. |
| | | Traffic, ground vehicles, personnel, and aircraft control measures in place. |
| | | Dust abatement measures taken. |
| | | Helicopter fuel truck parking area and driving route designated; located away from flight routes, landing areas, and personnel. |
| | | Fire extinguishers, crash rescue and extraction kit, and evacuation kit on site per NSHO. |
| COMMUNICATIONS | | |
| | | Communication plan completed and posted at helitorch base |
| | | Have established radio frequencies as designated on the aviation safety plan. |
| | | Parking tender is equipped with a radio and headset, and hardhat or approved flight helmet with remote transmit button or switch. |
| | | Radio frequency assignments established to include the discrete frequency. |
| | | Communications tested and operational with all functions to include dispatch and ICP. |
| FIRING BOSS | | |
| | | Aerial firing patterns and commands discussed and understood |
| | | Crew resource management between pilot, FIRB, and helitorch module |
| | | Understanding of radio frequencies |
| | | Understand aircraft limitations and flight profile; discussed with pilot, FIRB, and helitorch module |
| | | Communication terminology and objectives discussed. |
| | | Flight routes include jettisoning torch considerations and alternate landing sites; identified during pilot orientation flight and briefing. |
| | | Location of control lines and personnel known discussed between FIRB and pilot |
| GO/NO-GO CHECKLIST | | |
| | | All checklists completed (Helitorch Inspection Checklist, Mixing Systems Checklist). |
| | | Helitorch Operations Go/No-Go Checklist Completed. (All items must be checked in the go column prior to commencing operations.) |

Helitorch Manager

Date

Mixmaster

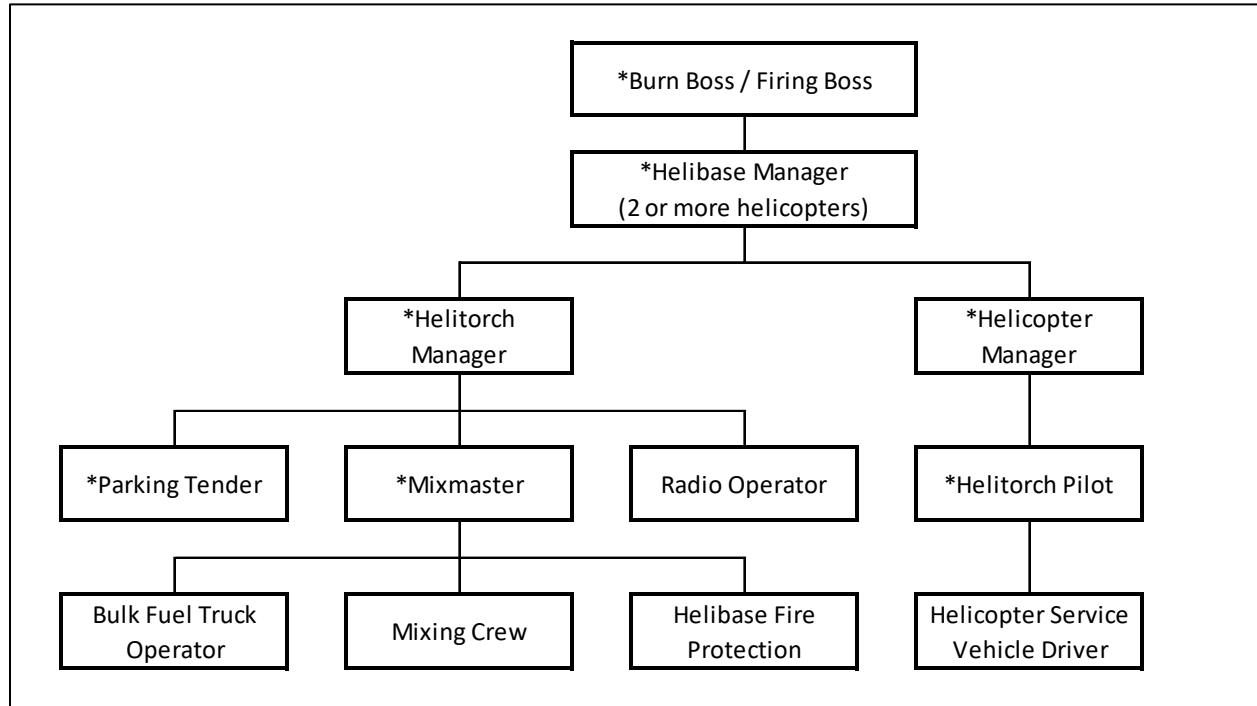
Date

Firing Boss

Date

Helitorch Organization Chart – Prescribed Fire

Figure B-1. Helitorch Organizational Chart for Prescribed Fire



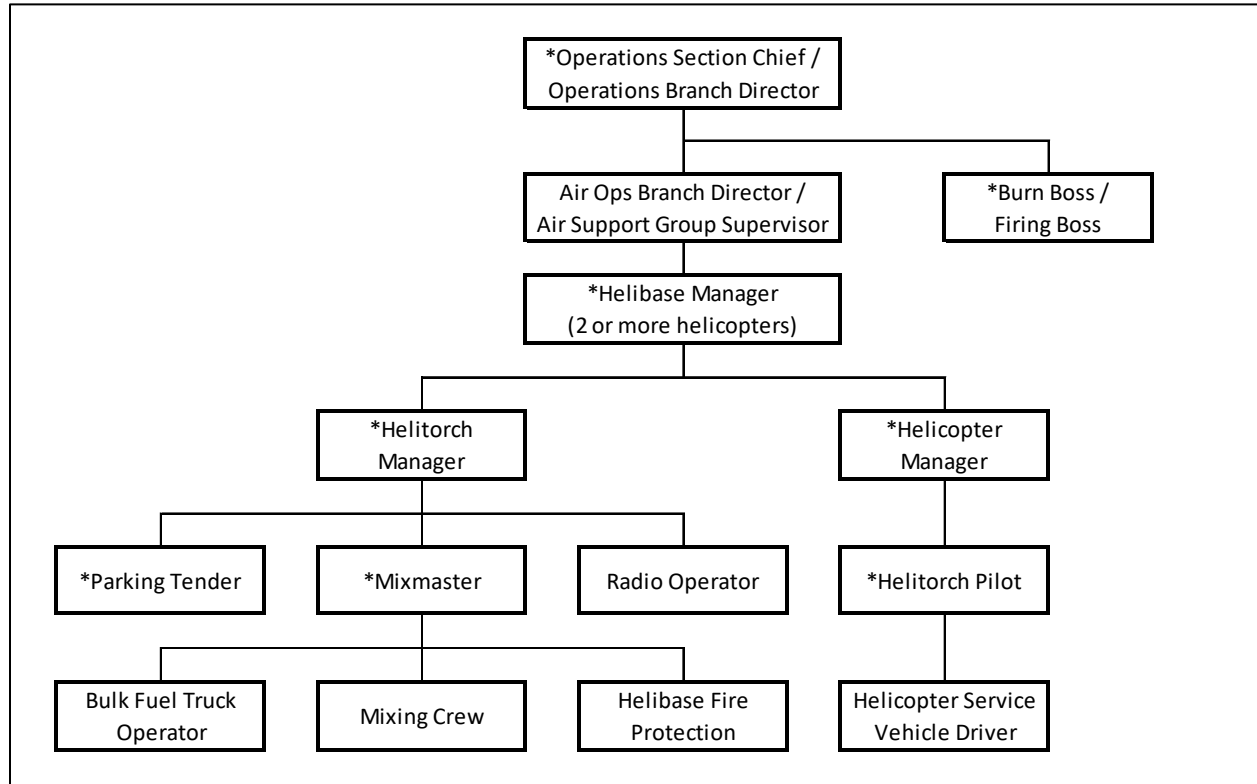
*Minimum required organization. Deviation from staffing required positions requires prior approval from Regional Helicopter Operations Specialist or State/Regional Aviation Manager. Other positions to be filled as needed to provide for a safe and efficient operation.

Note: Helibase fire protection may be staffed by members of the mixing crew.

Note: Identify all trainees for given positions on the organization chart.

Helitorch Organization Chart – Wildland Fire

Figure B-2. Helitorch Organization Chart for Wildland Fire



*Minimum required organization. Deviation from staffing required positions requires prior approval from Regional Helicopter Operations Specialist or State/Regional Aviation Manager. Other positions to be filled as needed to provide for a safe and efficient operation.

Note: On operations utilizing only one helitorch helicopter, the Helicopter Manager may have collateral duties as the HTMG or HTPT.

Note: Helibase Fire Protection may be staffed by members of the Mixing Crew.

Note: Identify all trainees for given positions on the organization chart.

Helitorch Aerial Ignition Preplanning Checklist

Prescribed Burn plan approved ☐ yes ☐ no ☐ NA

Project Aviation Safety Plan approved ☐ yes ☐ no ☐ NA

Burn Blocks prepped for aerial ignition ☐ yes ☐ no ☐ NA

Helitorch Equipment serviced and ready ☐ yes ☐ no ☐ NA

Approved Flight Helmets for all occupants of aircraft ☐ yes ☐ no ☐ NA

Adapters needed/available ☐ yes ☐ no ☐ NA

Extra Gelling Agent/Propane/Fuel available/where ☐ yes ☐ no ☐ NA

Backup/spare Helitorch ☐ yes ☐ no ☐ NA

Crash rescue/Evacuation equipment ready ☐ yes ☐ no ☐ NA

Helispots prepared and approved ☐ yes ☐ no ☐ NA

Fire Suppression needs available (extinguishers, foam, engine, CAFS) ☐ yes ☐ no ☐ NA

Enough qualified people available ☐ yes ☐ no ☐ NA

Helicopter Manager(s) ☐ yes ☐ no ☐ NA

Helibase Manager ☐ yes ☐ no ☐ NA

Helitorch Manager ☐ yes ☐ no ☐ NA

Parking Tender(s) ☐ yes ☐ no ☐ NA

Mixmaster ☐ yes ☐ no ☐ NA

Mixing Crew ☐ yes ☐ no ☐ NA

Fire Protection Group ☐ yes ☐ no ☐ NA

Approved aircraft availability ☐ yes ☐ no ☐ NA

Aircraft and fuel truck reserved/scheduled the week before ☐ yes ☐ no ☐ NA

Additional reminders:

_____ ☐ yes ☐ no

_____ ☐ yes ☐ no

_____ ☐ yes ☐ no

Estimated cost: _____

Location of aircraft: _____

Briefing Checklist

Discussion Items: Pre-flight discussion points to be briefed with all.

Items that are not being met below require justification and may require a new risk assessment.

The project supervisor is responsible for this per the Project Aviation Safety Plan.

☐ Clear and bright complete-fuel sample (if vendor fuel truck is used)

☐ Fuel planning (fuel truck not on on-site)

☐ Aircraft still meets mission objectives (equipment and performance capabilities)

☐ Load calculation(s), weight, and balance (complete and adjusted as needed)

☐ Manifest(s) and briefings

☐ Risk assessment still applicable to mission objectives

☐ Aerial hazard and site map available and reviewed for specific project hazards

☐ Project site conditions evaluated (sending and receiving)

☐ Crash rescue and medivac plan procedures reviewed

☐ Equipment inspected (sling gear, nets, swivels, and others)

☐ Airspace de-conflicted (if required)

☐ Hazardous materials addressed per Interagency Aviation Transportation of Hazardous Materials Guide (NFES 1068) and SDS.

☐ Communication and contact information plan reviewed

☐ PPE and ALSE requirements met

☐ Personnel assignments identified, individual qualifications and aviation training verified

☐ Flight follow procedures

☐ Required Go/No-Go check lists completed pending mission type

☐ Weather briefing complete

Briefing Notes:

Helitorch Inspection Checklist

| | | |
|---|---|---|
| Project or Incident | | Location |
| Helitorch Manager | | Date |
| Helitorch Mixmaster | | Date |
| DAILY INSPECTION | | |
| HELITORCH DRUM/TANK | | |
| | Visually inspect for damage and leaks | |
| | Clean and ready for use | |
| | Valves clean and working properly (Clay & Bailey and Dry Break) | |
| | All fittings in place and leak free | |
| | Removable drum head in place, securing band tight, and leak free | |
| | All bolts and pins in place and secure | |
| | Bonding cable connection paint free and clean to allow continuity | |
| | Replacement drum or helitorch available on-site | |
| HELITORCH FRAME | | |
| | No cracks or breaks | |
| | Clean and ready for use | |
| | All bolts and pins in place and secure | |
| MOTOR AND ELECTRICAL HOUSING | | |
| | Clean | |
| | Motor pulley and belt in good condition (if applicable) | |
| | Electrical wiring free from cracks and corrosion; connected properly | |
| | Pump motor lubricated | |
| | All screws and bolts in place and tight | |
| | Pump operating (primed) | |
| | Ignition system adjusted, clean, and working | |
| HOSE CONNECTIONS | | |
| | Clean with clamp or compression fittings tight and leak free | |
| | Dry break valves clean. Caution! Do not open valve unless attached! | |
| | Swivel rotates freely and not leaking | |
| SUSPENSION SYSTEM AND HELITORCH ELECTRICAL CABLE | | |
| | Clean and free of kinks, nicks, corrosion, and burrs | |
| | Suspension line connectors secure and in good condition | |
| | All bolts, nuts, and attachment ring meet MTDC drawing; properly secured | |
| | Electrical connector clean and tight with line properly attached to suspension system and helitorch | |
| | Separator bars not cracked or broken and properly attached between cable swedges | |
| HELITORCH SUPPORT KIT | | |
| | Windsock | Dust masks |
| | Eye wash station with water | Single pole guarded electrical switch |
| | Fire extinguishers: one per pad, four per mixing area; 40 BC, or compressed foam extinguishers (see Chapter IV) | Nitrile, cotton, leather gloves |
| | Headset and patch cords | Spare dry break valves |
| | Propane bottles if applicable | Clay & Bailey pressure relief valve |
| | Tool kit and bung wrench | Wire brush, steel wool |
| | Spare parts kit | Wire ties |
| | Hearing and eye protection | Electrical tape and duct tape |
| | Orange paint, fluorescent flagging, and pad markers | Silicon based lubricant and engine de-greaser |
| | First aid kit and burn kit | Washbasin, soap, and 5 gallons of water |
| | Emery cloth and extra tip parts | Hand cleaner, rags, and garbage bags |
| | 100 percent cotton coveralls or carbon fiber Nomex (variety of sizes) | |
| | Approved flight helmet, flight suit | |
| | Approved vapor recovery/removal hose 2" | |

| | | | |
|--|-------------------------------------|--|-----------------------------------|
| | 2 extra sight glasses | | |
| | Clay & Bailey pressure relief valve | | VEHICLE SUPPORT |
| | Extra fuses | | Spare tire, jack, tire lug wrench |
| | Grease gun with grease | | Spare trailer light bulbs |
| | Extra nuts and bolts | | Chock blocks |
| | 5-gallon hazmat spill kit | | Jumper cables, tow chain |
| | 2 nonferrous metal pipe wrenches | | Barrier flagging |

Helitorch Parking Tender

Date

Helitorch Mix Systems Checklist

| | | |
|---|---|--|
| Project or Incident | | Location |
| Helitorch Manager | | Date |
| Helitorch Mixmaster | | Date |
| DAILY INSPECTION | | |
| DRUMS/TANK | | |
| | Visually inspect for damage and leaks | |
| | Clean and ready for use | |
| | Valves clean and working properly | |
| | All fittings in place and leak free | |
| | Removable drum head in place, securing band tight, and leak free | |
| | All bolts and pins in place and secure | |
| | Bonding cable connections paint free and clean to allow continuity throughout mixing system | |
| | Drum stand on-site and in working condition | |
| | Replacement drum available on-site | |
| MIXING SYSTEM FRAME | | |
| | No cracks or breaks | |
| | Properly bonded | |
| | All bolts and pins in place and secure | |
| ENGINE AND ELECTRICAL SYSTEMS | | |
| | Clean | |
| | Pulleys, shafts, and belts in good condition | |
| | Electrical wiring free from cracks, corrosion, and connected properly | |
| | Drive shaft bearings lubricated | |
| | All screws and bolts in place and tight | |
| | Pump operation checked | |
| | Gas tank full | |
| | Oil clean and at operating level | |
| | Spark plug operational and spare available | |
| | Air filter clean and foam sponge lightly oiled | |
| | Ignition system clean and operational | |
| PLUMBING AND HOSES | | |
| | Clean with clamp or compression fittings tight and leak free | |
| | Dry break valves clean. Caution! Do not open valve unless attached! | |
| | Bonding continuity tested | |
| | Check for cracks, wear, and serviceability | |
| | No leaks | |
| MIXING SYSTEM SUPPORT KIT (in addition to helitorch support kit) | | |
| | Gelling agent 8 hours' worth | Nonferrous paddle or scraper |
| | Current copy of Interagency Aerial Ignition Guide | Approved hearing and eye protection |
| | Copy of MSDS | <u>IF APPLICABLE</u> |
| | North America Hazardous Materials Guide | Metal funnel and coffee can |
| | Extra motor oil | DOT papers |
| | Safety can of gasoline | 20-foot emergency shut off lanyard |
| | Extra pressure gauge | Emergency release attachment handle |
| | Continuity tester | Terra torch wand |
| | Two 5-gallon slop buckets | Scale, scoop for measuring gelling agent |
| | Bonding cables | |

PSD Operator Date _____

Helitorch Post-Use Maintenance Checklist

Date: ____/____/____

Inspector: _____

- _____ Flush batch mixer and helitorch(s) with diesel; remove residual gel.
- _____ Ensure pump switches are turned off.
- _____ Cover helitorch tips.
- _____ Cover batch mixer dry break.
- _____ Remove spreader bars.
- _____ Tape up cables.
- _____ Protect torches and pump with covers.
- _____ Grease trailer axles.
- _____ Ensure all lights and electrical connections on trailer functioning.
- _____ Properly secure all items on trailer.

Helitorch Annual Maintenance and Winterization Checklist

Date: ____/____/____

Inspector: _____

- _____ Completely clean and drain batch mixer and barrels.
- _____ Remove all gas from pump.
- _____ Add 5 gallons diesel to batch mixer, circulate, and store.
- _____ Grease all zerk fittings on batch mixer.
- _____ Disassemble and clean all helitorch tips.
- _____ Inspect all items and store trailer in covered area.
- _____ Ensure all items on inventory are present and functioning.
- _____ Reorder any needed items.
- _____ Routine inspection of equipment should occur even during times of non-use to prevent corrosive damage.

Helitorch Use Record (Example)

Date: ___/___/___ Location: _____

Agency: _____ Management Code: _____

Burn Boss: _____

Helitorch Base Manager: _____

Mixmaster: _____

Parking Tender: _____

Driver (Batch Mixer): _____

Torch #: _____ Fuel Used (gal): _____ Gelling Agent Used (lb/gal): _____

Bottles of Propane Used: _____ Acres Treated: _____

Fuel Vendor: _____

Helicopter Make/Model: _____ N#: _____

Helicopter Company: _____ Pilot: _____

Weather: _____

Problems Encountered: _____

Maintenance Performed/Needed: _____

Comments: _____

| Aerial Ignition Device Additional Training | |
|--|--|
| Trainee | |
| Unit | |
| Specific Device Training (for example, Red Dragon) | |
| Date of Classroom Training for Specific Device | |
| Training Location | |
| Instructor | |
| Device which Originally Completed Position Task Book (PTB) | |
| Instructor Comments: | |
| <p>Purpose of Additional Device Training: to show additional aerial ignition devices in which the operator has received classroom training and is certified to operate. An initial PTB must have been completed and the user showing qualified as PLDO/HTMG/HTMM/HTPT within the IQCS/IQS system. This does not replace the PTB.</p> | |
| Instructor Home Unit and Contact Information | |

Instructor Signature Date