
PLDO Plastic Sphere Dispenser Operator Training



Instructor Guide



Prepared by the Interagency Aerial Ignition Group
Revised April 24, 2015

PLDO Plastic Sphere Dispenser Operator

Revision History

Version	Description	Date
1.00	Original Materials	Date
1.10	Incorporate all PSD Manufacturer's training curriculum into one instructor guide.	1.29.2015

PLDO

Plastic Sphere Dispenser Operator

Course Overview

What is the purpose of the course?

The purpose of this course is to provide you with a working knowledge of the various PSD machines approved for use by the Interagency Aerial Ignition Guide.

Who are the intended participants?

Interagency personnel who utilize the Plastic Sphere Dispenser for aerial ignition missions.

Course Prerequisites:

Prior to requesting enrollment in PLDO, prospective students must complete the following pre-requisites:

Specific required training and qualifications can be found in the current Federal Wildland Qualifications Supplement to the NWCG PMS 310-1.

<http://www.nwcg.gov/pms/docs/supplement-2015.pdf>

REQUIRED TRAINING:

National Incident Management System, An Introduction (IS-700)

Introduction to ICS (ICS-100)

Annual Fireline Safety Refresher (RT-130)

Aviation Transport of Hazardous Material (A-110); triennial requirement

Plastic Sphere Dispenser (N-9016)

Annual Plastic Sphere Dispenser Refresher (RT-9016), required annually after initial training

REQUIRED EXPERIENCE:

Satisfactory performance as Project Helicopter Crewmember (minimum)

AND

Interagency PLDO Training: A minimum of one successful assignment to include a minimum 1-hour in-flight machine operation and completion of the position Task book

PHYSICAL FITNESS LEVEL:

None

How is the course conducted?

Instructor-led delivery in classroom with hands-on demonstration of the skills identified in the position tasksheet for PLDO.

What are the minimum instructor qualifications for the course?

This will vary based on agency specific requirements.

What are the course objectives?

At the conclusion of this course, participants will be able to:

1. Identify the approved Plastic Sphere Dispenser (PSD) machines approved for use as identified in the Interagency Aerial Ignition Guide.
2. Identify the organization required for a safe operation.
3. Identify the requirements for safely working with the hazardous materials involved with PSD operations.
4. Demonstrate knowledge of the operational functions before, during and after the project.
5. Demonstrate knowledge of the firing commands and actions of a PSD operator.
6. Demonstrate knowledge of emergency procedures.
7. List three advantages of using the PSD machine versus the helitorch aerial ignition device.
8. Identify the parts and basic functions of each PSD machine.
9. Demonstrate knowledge to perform routine maintenance on the PSD machine.
10. Demonstrate knowledge and perform a bench-test of the PSD machine.
11. Demonstrate knowledge and perform the operational functions of the Plastic Sphere Dispenser Operator (PLDO) duties as identified in the position Task book.

What is required to pass the course?

Include any specific requirements to pass the course, i.e. exam minimum score, proficiency demonstrations, etc.

Logistical Information:

Recommended Class Size: 2 Min. 20 Max.

Length of Course: Approximately 4 - 6 hrs.

Supplies:

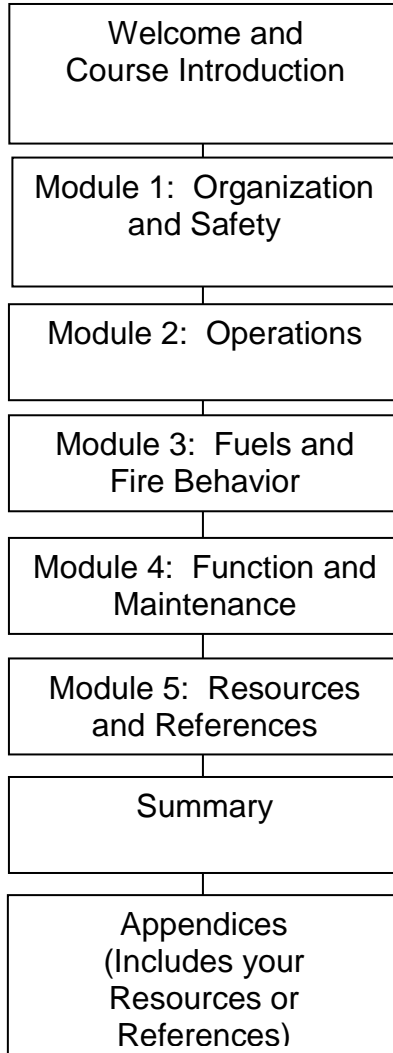
- Computer/laptop
- Projector
- Screen
- Speakers
- Course electronic presentation slides
- Course Participant Guide
- Student Roster

- OAS-111 Student Course Evaluations
- Course Exam
- Hardcopy or electronic version of the Interagency Aerial Ignition Guide for each student
- Position Task book for each student
- Plastic Sphere Dispenser Machine with tool kit
- Personal Protective Equipment for bench testing equipment.
- Appropriate equipment as identified in the Interagency Aerial Ignition Guide for bench testing equipment (metal bucket, glycol, potassium permanganate spheres, 40 rated B:C fire extinguisher, 5-gallons of water, etc...).

Internet Connection (not mandatory, but useful) for video and resource files to demonstrate effective PSD Operations.

PLDO Plastic Sphere Dispenser Operator

Course Map



<p>Est. Instruction Time: varied.</p>	<p>Welcome and Course Introduction</p>
<p>PPT – Title Slide to be inputted by instructor related to equipment on site.</p> <p>PPT – Introduction</p>	<p>Welcome the students to the course.</p> <p>Introduce yourself.</p> <p>Have participants introduce themselves. You could have them share some of the following information (as time allows):</p> <ul style="list-style-type: none"> • Name • Where do you work? • Have you ever been involved in aerial ignition operations or used a Plastic Sphere Dispenser before?
<p>PPT - Participant Workbook</p>	<p>Participant Workbook</p> <p>Ensure each student has a Participant Workbook. Explain that this is designed to be a guided note-taking tool as well as a source of valuable information for review. Participants will be asked to refer to it throughout the course.</p> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p>Instructor Note: The icon in the lower right corner on some of the presentation slides indicates the page reference that the student should be viewing in the Participant Workbook.</p> </div>
<p>PPT – Course Purpose</p> <p>PPT – Course Objectives</p>	<p>Course Purpose</p> <p>This course is designed to provide you with a working knowledge of the various PSD machines approved for use by the Interagency Aerial Ignition Guide.</p> <p>This instructor guide is designed to be used for all the PSD presentations, regardless of what is on site for inspection or field use. The slide presentation will vary based on which machine is being used and local modifications.</p> <p>The instructor guide will cover the aspects of PSD operations common to all machines.</p> <p>The final unit PSD Function and Maintenance provides the information for all three of the machines however the instructor should focus their delivery for the machine(s) that is on-site for</p>

	<p>use and bench testing with the remaining information as optional.</p> <p>Course Objectives</p> <p>Introduce the Course Objectives.</p> <p>At the conclusion of this course, participants will be able to:</p> <ol style="list-style-type: none"> 1. Identify the approved Plastic Sphere Dispenser (PSD) machines approved for use as identified in the Interagency Aerial Ignition Guide. 2. Identify the organization required for a safe operation. 3. Identify the requirements for safely working with the hazardous materials involved with PSD operations. 4. Demonstrate knowledge of the operational functions before, during and after the project. 5. Demonstrate knowledge of the firing commands and actions of a PSD operator. 6. Demonstrate knowledge of emergency procedures. 7. List three advantages of using the PSD machine versus the helitorch aerial ignition device. 8. Identify the parts and basic functions of each PSD machine. 9. Demonstrate knowledge to perform routine maintenance on the PSD machine. 10. Demonstrate knowledge and perform a bench-test of the PSD machine. 11. Demonstrate knowledge and perform the operational functions of the Plastic Sphere Dispenser Operator (PLDO) duties as identified in the position Task book. <p>Explain that as you cover each module, the specific objectives for that module will be addressed.</p>
	<p>Segue to next module: Organization and Safety Let's take a look at what is required for a safe PSD operation.</p>

Est. Instruction Time: XX min.	Module 1: Organization and Safety
PPT – Module 1	<p>Introduce the module/topic:</p> <p>The Plastic Sphere Dispenser, otherwise known as PSD machine, was developed to provide a method of igniting continuous surface fuels in a short time, on large acreage without causing undue damage to the over story. It is cost effective, environmentally acceptable, simple to use and readily available.</p> <p>In general PSD operations are essentially a self-contained operation with the PLDO and possibly one assistant are the only personnel required.</p> <p>The PSD ignition method may be used in any stand that can be burned by conventional methods. The plastic sphere ignition system is an excellent tool for hazard fuel reductions in pine plantations. This system is safe, efficient, and economical for users to burn with less risk to the plantation than by using the helitorch ignition system.</p>
PPT – Objectives	<p>Objective(s): After completing this module, participants should be able to:</p> <ol style="list-style-type: none"> 1. Identify the approved Plastic Sphere Dispenser (PSD) machines approved for use as identified in the Interagency Aerial Ignition Guide. 2. Identify the organization required for a safe operation. 3. Identify the requirements for safely working with the hazardous materials involved with PSD operations. <p>Key teaching points to accomplish module objectives:</p> <ul style="list-style-type: none"> • Discuss the machines approved for use for PSD operations • Discuss the minimum safety organization needed for PSD operations • Identify the safety requirements for working with PSD equipment.

<p>PPT – Title of Slide</p> <p>PPT – Title of Slide</p> <p>Est. Time for Activity: XX min.</p> <p>PW Page: XX</p>	<p>Overview</p> <p>PSD operations require the helicopter to maintain flight below 500 feet above ground level (AGL) and at a speed of less than 50 mph. The recommended operational flight altitude is 300 feet AGL.</p> <p>Hovering out of ground effect (HOGE) is the typical flight profile. The Pilot must keep altitude, airspeed, wind direction and aircraft capabilities and limitations in mind during all phases of flight operations.</p> <p>The Interagency Aerial Ignition Guide identifies 3 PSD machines that have been approved for use for the Department of the Interior and US Forest Service agencies. They are:</p> <ol style="list-style-type: none"> 1. Premo Mark III Aerial Ignition Device http://www.sei-ind.com/products/premo-fire-ignition-products 2. SEI Red Dragon http://www.sei-ind.com/products/premo-fire-ignition-products 3. Aerostat PSDS Mark V http://www.aerostatinc.com/MarkVUserTools.asp <p>The basic function of the PSD machine is the same for each manufacturer: to inject undiluted ethylene glycol into a plastic sphere containing potassium permanganate and to expel the primed sphere from the aircraft after which an exothermic reaction takes place.</p> <p>The ethylene glycol commonly used is standard vehicle antifreeze. Other types of antifreeze may not contain enough ethylene glycol to create proper reaction with the potassium permanganate. These other types of antifreeze include biodegradable, RV, and antifreeze with high concentrations of additives. Propylene glycol is not to be used.</p> <p>The rate of chemical reaction is dependent on particle size and concentration of the chemicals involved. Water-glycol solutions ranging from 90 to 100% concentration of ethylene glycol (common antifreeze) is advocated and will provide a reliable ignition with a time delay of at least 20 seconds.</p> <p>All shipping cases are labeled with the recommended percentage of glycol solution needed to obtain the desired time</p>
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	<p>delay for the sphere type in the case.</p> <p>Let's take a look at the organization and safety practices necessary for a safe operation.</p> <div style="border: 1px solid black; padding: 5px;"> <p>Instructor Note: Review the current copy of the Interagency Aerial Ignition Guide for changes in approved equipment since the completion of the instructor guide.</p> </div> <p>Interaction/Activity: REVIEW QUESTION</p> <p>Question: What are the three approved PSD machines identified in the aerial ignition guide?</p> <p>Answer: Premo Mark III, Red Dragon, and Aerostat PSDS Mark V.</p>
<p>PPT – Title of Slide</p> <p>PPT – Title of Slide</p> <p>Est. Time for Activity: XX min.</p> <p>PW Page: XX</p>	<p>Organization, Personnel Qualifications and Responsibilities</p> <p>As with any special use mission, the pilot and aircraft must be carded for aerial ignition operations, and a project aviation safety plan (PASP) completed and approved prior to commencing prescribed fire operations.</p> <ol style="list-style-type: none"> 1. Burn Boss (Qualified as Prescribed Fire Burn Boss 1 or 2 (RXB1 / RXB2)) <ul style="list-style-type: none"> ○ Has complete authority for firing operation. ○ Directs firing operation. ○ Develops the firing plan. ○ Performs the initial briefing. ○ Details assignments of each boss/supervisor and the pilot. ○ May be located in the aircraft with the PSD Operator. 2. Firing Boss (Qualified as a Firing Boss (FIRB)) <ul style="list-style-type: none"> ○ Reports to Burn Boss. ○ Instructs the pilot as to the plan, firing sequences and keeps the pilot informed throughout the entire operation. ○ Directs the PSD operator. ○ May be functioning as collateral duty/Burn Boss. ○ May also be called Ignition Specialist 3. PSD Operator (Qualified as Plastic Sphere Dispenser Operator (PLDO))

- Works for the Firing Boss/Ignition Specialist.
- Briefs the pilot, identifies safety requirements at the operations briefing and monitors overall operation.
- Provides information on aerial safety procedures to be used by the Firing Boss/Ignition Specialist.
- Prepares, operates and maintains the PSD machine.
- Observes spacing of ignition of spheres and makes recommendations to Firing Boss/Ignition Specialist for adjustments to meet project objectives.
- Monitors operation of PSD machine and takes appropriate action should a malfunction occur.
- Determines whether a fire contained within the machine can be safely extinguished or if the unit must be jettisoned in coordination with the pilot.
- Communicates with the pilot and Firing Boss/Ignition Specialist on all procedures associated with the operation and/or emergencies occurring during the operation.

4. Pilot

(Carded for Aerial Ignition Operations – Current, confirm prior to commencing operations.)

- Responsible for all matters related to aircraft operations and safety.
- Follows the ignition plan under the direction of the firing boss.
- Oversees the PSD installation to the aircraft.
- Completes the helicopter performance planning using the load calculation form.

5. Helicopter Manager (may have collateral duties as PSD Operator – PLDO)

- Qualified as Helicopter Manager (HMGB) and manages the helicopter in compliance with agency policy.

6. Helibase Support (Helibase Manager (HEB2) required if 2 or more helicopters are on-site)

- a. **Helibase Fire Protection:** At a minimum, one 40-B:C rated fire extinguisher and five gallons of water will be positioned at the helibase.
 - i. Provide crash rescue and evacuation equipment at the helibase.
- b. **Radio Operator:** Will be positioned at the helibase.
 - i. Will initiate radio communications with Burn Boss and dispatch.

Communications: Internal and External

1. Internal Communications

- All personnel inside the ship must have the ability to communicate via intercom.
- Consider a noise cancelling mic for the PSD Operator to reduce wind noise.

2. External Communication

- Use a dedicated air to ground frequency to communicate to holding forces.
- Some burns may use only one frequency
- All flight following requirements will be followed by the pilot.

Hazardous Material Handling

(Completing A-110 Aviation Transport of Hazardous Materials is a prerequisite to this training. <http://www.iat.gov/>)

All hazardous materials handling will be in compliance with the following Renewed Hazmat Special Permit: DOT-SP-9198 (Sixteenth Revision)

http://oas.doi.gov/dts/library/TechBull/TB_2015-02.pdf

1. Potassium permanganate and ethylene glycol are classified as hazardous materials by DOT regulations. Use in aerial ignition devices by the USDA Forest Service and US Dept. of the Interior is exempt from these regulations under the above mentioned permit as long as handling is in compliance of the permit.

- **Under NO circumstances will extra ethylene glycol be carried on board the aircraft.**
- The glycol tank **MUST** be filled and capped **at least 25 feet** away from the aircraft.
- When transporting to the project site, spheres and glycol **MUST** be in separate compartments.
- Absolutely NO batteries will be carried on board the aircraft **to operate** the PSD machine.

2. Storage of spheres containing potassium permanganate

- Keep boxes dry and **rotate stock regularly.**
- Store away from ethylene glycol and petroleum products.

- Sweep away residue and spills promptly.
- Unused spheres should be stored in a clean plastic bag and place in the original box.

CAUTION: An inadequate quantity of ethylene glycol injected into the sphere can induce a violent reaction causing the sphere to spin or roll and spray a hot mixture of potassium permanganate and ethylene glycol a considerable distance.

Personal Protective Equipment (PPE)

1. Approved ALSE rated Flight Helmet (ex: SPH-5)
2. Fire resistant/Nomex® long sleeved shirt and pants or Nomex® flightsuit. (**PSD operator should be prepared for very cold temperatures in flight and consider wearing natural fiber undergarments and/or a Nomex® or Natural fiber jacket.**)
3. Leather or leather/Nomex® flight gloves
4. Leather boots minimum above the ankles, pants should cover the tops or the boots when the PSD operator is sitting down.
5. Approved harness, tether and tether attachment.
6. Approved seat belt cutter for cutting strap in case of the need to jettison the PSD.
7. Fire Shelter for EACH occupant of the helicopter.

Interaction/Activity: REVIEW QUESTIONS:

Question: What Personal Protective Equipment is required for the PSD Operator?

Answer: Approved ALSE rated Flight Helmet, Fire resistant/Nomex® long sleeved shirt and pants or Nomex® flightsuit, leather or leather/Nomex® flight gloves, leather boots minimum above the ankles, pants should cover the tops or the boots when the PSD operator is sitting down, approved harness, tether and tether attachment, approved seat belt cutter for cutting strap in case of the need to jettison the PSD, and a fire shelter.

Question: Can the spheres and glycol be transported in the same compartment if they are both in factory sealed containers?

Answer: No!!

	<p>Segue to next module: Operations</p> <p>Let's take a look at the steps to conduct safe PSD Operations.</p>

(2) Engines, hand crews, dozers and aircraft
10. Contingency Plan (for escape)

Once the mission has been briefed, it's time to bench test the equipment to make sure everything is functioning properly.

PSD Bench Test

The purpose of the bench test is to confirm proper operation of the PSD and proper sphere ignition.

This phase of the training requires the activation of ignited spheres that has the potential to create several safety hazards to personnel and adjoining property if not properly conducted.

The following **safety procedures** will be followed during bench testing:

1. The training site must be outdoors and clear of buildings, vehicles, aircraft, and flammable materials.
2. Adequate fire extinguishers and water sources must be available.
3. During this testing, spheres shall not be dropped in the water. If moisture is allowed to come in contact with an injected live sphere, the sphere may be propelled erratically long distances endangering personnel and property.
4. The wind direction must be considered so that the operator and trainees will stay clear of the smoke.
5. During bench testing operations, designated individuals will remove activated spheres from the test area.
6. The students shall wear eye and hand protection, and flight gloves.
7. The test platform needs to be a minimum of 30 inches high and stable to allow for the proper installation of the PSD (i.e., PSD box, heavy duty picnic table, or bench).

Testing Procedures:

Review manufacturers manual and procedures for bench testing.

1. Bench testing should occur in an appropriate safe area.
2. To calibrate the machine, use empty plastic spheres to determine proper calibration. Calibration instructions are contained in manufacturer's manual.

CAUTION: Place **DRY** metal bucket under chute. **NO WATER in bucket.**

3. Temperature and humidity may affect ignition delay, causing delays to be greater than 20 seconds. Colder temperatures will cause longer ignitions, often as long as 40 to 60 seconds. This is an appropriate ignition timeframe if all spheres are igniting.
4. During machine start-up, it is normal for two of the first four spheres that pass through the machine to not be injected with sufficient glycol to promote ignition due to the cam sequence and slipper block location. It is recommended to promote priming of the glycol pump by running for 30 seconds prior to adding balls into the slipper blocks for testing purposes.

This test need only be conducted once at the start of the day.

Cleaning should follow the bench test in accordance with manufacturer's specifications.

Specific details of bench testing individual machines will be covered in the PSD Function and Maintenance Unit.

Helibase Briefing

1. Organization and personnel
2. Communications
3. Landing Areas
4. Safety / Hazards
5. Operations
6. Administration

The Interagency Helicopter Operations Guide (IHOG) has the Helibase Briefing Checklist (HJA-1) which is a helpful tool for this briefing and can be found in Appendix A.

Preparation for Aerial Ignition

1. The PLDO and the Pilot must discuss flight profiles for aerial ignition operations which shall be jointly determined before each mission by the pilot and crew based on the environment and mission. The pilot and burn crew shall minimize their time inside the Height/Velocity "avoid" areas as much as possible. Any flight profile that results

	<p>in transference of risk to ground operations must be mitigated to the extent possible.</p> <ol style="list-style-type: none">2. In addition, crew resource management discussions must occur between the pilot, Prescribed Fire Burn Boss, Helicopter Manager, and PLDO's prior to all ignition operations. The discussion shall focus on a heightened awareness of the risks involved in low level flights the limitations section of the flight manual and be familiar with the limitation of flight with the door(s) removed.3. Helicopters shall be equipped with a power source for PSD.4. A bulkhead mounted MS 3112E- 12 3S, 3-pin connector shall be provided. Pin B shall be airframe ground. Pin A shall be +28 V.C. for a 28-volt aircraft system. Pin C shall be +14 for a 14-volt aircraft system. The circuit shall be protected by a 5-amp circuit breaker. The mating connector for the Government-furnished PSD shall be an MS 3116E-12-3P wired with the same pin assignments. Reference a wiring diagram in the aircraft procurement document.5. Remove appropriate door/doors.6. Remove all loose cushions and other loose materials.7. Locate and assure proper electrical connections.8. Utilize approved aircraft hard point anchor or install tether attachments to hard points per instructions on MTDC drawing # 993 (See Appendix B.)9. Install secondary restraint using approved carabiner and adjust tether length. A properly adjusted tether shall insure that the operator is restrained inside the aircraft and will not reach beyond the sill of the aircraft if the seat belt should become unbuckled during flight.10. Fill glycol tank at least 25 feet from aircraft.11. Fill water storage tank.12. Ensure adequate supply of plastic spheres is available to complete project.13. Ensure one-gallon container of water and seatbelt cutter is on board, secured, and are readily accessible.14. Fire shelters for all occupants must be on board and accessible, and one or more hand tools are recommended.
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Preflight Briefing

1. The pilot, ignition specialist, and PSD operator must be present at the pre-mission aircraft briefing. This is the standard pilot preflight aircraft safety briefing that in addition should address:

- a. Safety / Aerial Hazards
- b. Weight and Balance
- c. In-flight Commands
- d. Emergency Procedures
- e. Frequency Management
- f. Available Flight Time
- g. Aircrew Responsibilities
- h. PSD Go / No Go checklist.

2. The pilot and/or mechanic must inspect and approve of the PSD machine installation.

3. Preflight Test of the PSD Machine

Sphere ignition delay time need not be checked in the Preflight Test if the Bench Test has been performed.

CAUTION: Do not conduct this test near refueling area or in flashy ground fuels.

Test procedures are as follows:

- a) Place metal container under the exit chute.
- b) Connect power leads
- c) Power on – A/C.
- d) Start up the PSD
- e) Deposit one sphere in a slipper block/shuttle block to track calibration.
- f) Once the sphere has dropped into the metal container, remove it from the vicinity of the aircraft.
- g) Time ignition delay by measuring time of injection to ignition. Repeat as necessary.
- h) Check system for leaks.
- i) Test PSD emergency water system.
- j) Secure Machine
- k) Fill hopper with spheres.
- l) Check intercom communications and air-to-ground communications.

Inflight Operations

Dry Run over Burn Area Procedures

1. Check that ignition area is clear of personnel.
2. Identify burn area boundaries.

It is important that all parties (burn boss/ignition specialist, pilot, and PLDO) understand where the firing is to be done. This includes the starting points, ending points, and desired placement and spacing.

3. Ensure communication with ground personnel.
4. Make practice run of the first firing sequence.
5. Coordinate machine speed and sphere spacing to be used on first run with RXB1/2 or FIRB
6. Identify helispots and emergency landing areas.
7. After a dry run and prior to aerial firing the crew will evaluate the risk assessment mitigations and readjust as necessary. The RXB1/2 or FIRB will confirm that all ground personnel are clear of the area and that firing may commence.

Once the dry run is complete and personnel are clear of the area

RXB1/2 or FIRB communicates to PLDO, "Prepare to fire; activate machine."

1. Operator actions:
 - a. Activates machine
 - b. **PLDO communicates to RXB1/2 or FIRB, "Ready to fire."**
2. **RXB1/2 or FIRB communicates to PLDO to "Start firing/Number of chutes or machine speed"**
3. **PLDO replies, "Firing/Number of chutes or machine speed."**
4. Operator monitors machine operation and refills hopper as needed. Operator observes spheres after they have made contact with the ground to confirm ignition.
5. When appropriate, **RXB1/2 or FIRB communicates,**

	<p>“Prepare to stop firing.”</p> <p>6. PLDO places hand on controls and communicates, “Ready to stop.”</p> <p>7. RXB1/2 or FIRB gives the order “Stop firing.”</p> <p>8. PLDO closes chutes and responds, “Firing stopped.”</p> <p>9. PLDO observes last sphere clear of the PSD and relays, “Machine cleared.”</p> <p>Clear communication is critical to prevent inadvertent dropping of spheres outside of burn area boundaries.</p> <p>10. RXB1/2 or FIRB gives order to PLDO to “secure machine” or “prepare to fire.”</p> <ul style="list-style-type: none"> ○ If securing the machine, operator actions: <ul style="list-style-type: none"> a. Hopper feed switch off b. Drive motor off c. Glycol pump off <p>11. PLDO responds appropriately.</p> <p>12. Conduct a post mission debriefing that includes a review and update of hazards and risk mitigations.</p> <p>Emergency Procedures</p> <p>PLDO notifies Pilot of problem and gives brief description.</p> <ol style="list-style-type: none"> 1. Pilot should maintain aircraft flight in the burn area until emergency is resolved. 2. PLDO closes chute feed handles. 3. <u>Jammed Machine:</u> PLDO pulls manual assist wheel outward and rotates forward then backward. If obstruction clears, turn on drive motor, check circuit breaker, and notify Pilot and RXB 1/2 FIRB crew before resuming operations. 4. <u>Fire in the Machine:</u> PLDO pushes red button (emergency water) and holds button depressed for up to 30 seconds. If necessary, uses additional container of water to extinguish fire by pouring down feed chutes in hopper. If problem persists, land as soon as possible
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	<p>5. PLDO notifies Pilot of problem status and takes appropriate actions.</p> <p>Although there are two types of machine malfunctions that can leave a live sphere in the machine and will cause a fire inside, the emergency corrective procedure is the same.</p> <p>Post Operations</p> <ol style="list-style-type: none"> 1. Conduct and After Action Review (AAR) to identify areas for improvement and highlight the strengths of the operation. 2. Remove and clean the PSD Machine according to manufacturer's instructions. 3. Complete the PSD Log for use. <p>Complete required documentation: Unit log, training documentation, flight use invoice, and SAFECOM if applicable.</p> <p>Interaction/Activity: REVIEW QUESTION</p> <p>Question: What are the two actions to be taken if a fire occurs in the machine?</p> <p>Answer:</p> <ol style="list-style-type: none"> 1. Notify the Pilot 2. Press the Emergency Water Switch
	<p>Segue to next module: Fuels and Fire Behavior</p> <p>An understanding of the fire environment will help PLDO's understand the advantages of using the PSD machine to achieve specific burn objectives.</p>

Est. Instruction Time: XX min.	Module 3: Fuels and Fire Behavior
PPT – Module 3	Introduce the module/topic: An understanding of the fire environment will help PLDO's understand the advantages of using the PSD machine to achieve specific burn objectives.
PPT – Objectives	Objective: After completing this module, participants should be able to: 7. List three advantages of using the PSD machine versus the helitorch aerial ignition device. Key teaching points to accomplish module objectives: • Discuss advantages and disadvantage of using the PSD versus the helitorch.
PPT – Title of Slide PPT – Title of Slide Est. Time for Activity: XX min. PW Page: XX	Fire Environment Aerial ignition can utilize firing patterns that could not be implemented by ground forces due to safety concerns. The PSD machine was developed to provide a method of igniting ground fuels, in a short time, on large acreage without causing undue damage to the over story. Faster speed, additional chutes and strip spacing/timing could create a more intense burn pattern. Likewise a slower speed, fewer chutes and strip spacing/timing could produce a lower intensity burn pattern. PSD operators should maintain situational awareness of the flight pattern as it relates to approaching fuel types, the ignition pattern, and unit boundaries. Fuels, weather, topography, fire behavior and ignition pattern interact to create fire effects. The desired objectives of the plan will determine the fire type: 1. surface fire 2. crown fire Adjustments to firing patterns can be made to produce fire

effects that will meet burn objectives.

If the objective is to burn the over story with a rate of high mortality, the helitorch would be a more effective tool to create that desired condition.

Advantages of PSD versus the Helitorch Aerial Ignition Device

Better Control

- Firing Boss onboard helicopter
- Operator can assess / address problems
- Operator can monitor quantity of spheres remaining

Less Complex

- Separate helibase is not required
- Spheres safer to transport and handle

Lower Cost

- Lower equipment cost
- Less support staff

Fire Behavior

- Minimum damage to the tree canopy
- Possible to lay very long ignition lines

Disadvantages of PSD versus the Helitorch Aerial Ignition Device

Fire Behavior

- Spheres burn for a shorter time
- Cannot duplicate the helitorch drop pattern
- Fire lines take longer to form

Safety

- Possible fire in PSD
- Requires constant operator attention
- Pilot cannot jettison PSD

Instructor Note:

Additional training of fire behavior and ignition operations can be found in the following NWCG Training Courses:

<http://training.nwcg.gov/>

S-290 Intermediate Wildland Fire Behavior

S-219 Firing Operations

	<p>Interaction/Activity: REVIEW QUESTION</p> <p>Question: Aerial ignition can utilize firing patterns that could not be implemented by ground forces due to safety concerns. True or False?</p> <p>Answer: True.</p>
	<p>Segue to next module: PSD Function and Maintenance</p> <p>Let's take a look at the function of each PSD Machine.</p>

Est. Instruction Time: XX min.	Module 4: PSD Function and Maintenance
PPT – Module 4	<p>Introduce the module/topic:</p> <p>This unit covers all the PSD Machines approved for use. Focus the learning objective to the machine(s) on site for bench testing. (Example: If the Premo Mark III is the only machine for use and bench testing, that is all that is covered – the additional sections are OPTIONAL to cover for informational purposes only.)</p> <p>The Missoula Technology and Development Center has the latest information for Aerial Ignition.</p> <p>http://www.fs.fed.us/t-d/aerial_ign/plsphere/training/index.htm</p> <p>This site is your information source for:</p> <ul style="list-style-type: none"> ○ Equipment and spare parts information ○ Operating manuals and guides ○ Links to training sites ○ Mixing instructions and Material Safety Data Sheets (MSDS) ○ Ignition system residue reports ○ Links to aviation, D.O.T. (Department of Transportation), and other Web sites
PPT – Objectives	<p>Objective(s): After completing this module, participants should be able to:</p> <ol style="list-style-type: none"> 8. Identify the parts and basic functions of each PSD machine. 9. Demonstrate knowledge to perform routine maintenance on the PSD machine. 10. Demonstrate knowledge and perform a bench-test of the PSD machine. 11. Demonstrate knowledge and perform the operational functions of the Plastic Sphere Dispenser Operator (PLDO) duties as identified in the position Task book. <p>Key teaching points to accomplish module objectives:</p> <ul style="list-style-type: none"> ● Identify the individual parts of the PSD Machine. ● Identify the basic functions of the PSD Machine.

C. **Feed chute:** Feeds balls from hopper to injection assembly.

D. **Hopper:** Holds 450 spheres. Separate unit that mounts on the mainframe. Contains motorized shaker that prevents the balls from jamming.

E. **Tie down straps:** Two-inch wide nylon webbing used to secure machine to aircraft. (Longer straps will be required for some types of aircraft.)

F. **Power cable:** From aircraft. 12- or 24-volt.

G. **Emergency water tank:** Holds .8 gallons. The emergency water supply is for extinguishing fires in the PSD.

H. **Feed control:** Four levers control ball entry to slipper blocks. Determines number of spheres ejected. Newer models have locking levers.

I. **Manual assist:** Gear used to manually cycle injection mechanism. It is used to clear PSD following a power loss or jam.

J. **Exit chute:** Ensures all spheres will fall clear of aircraft. Ensure knurled nuts and wing nuts are tight. Extensions are used in some aircraft.

K. **Control panel:** Switches, fuses and breakers to control pumps, emergency water, main power, and slipper block speed.

L. **Hopper power cord:** Provides power to shaker assembly in the hopper.

M. **Hopper controls:** Switches, fuses and breakers.

N. **Transparent plastic lid:** Must be on Premo Mark III.

Specifications

- o Main frame mass, glycol full 27.5 kg 61.0 lb.
- o Hopper and chutes 10.5 kg 23.0 lb.
- o Emergency water tank full 3.8 kg 8.5 lb.
- o Hopper capacity (450 spheres) 2.7 kg 6.0 lb.
- o Approximate operational weight 44.5 kg 98.0 lb.
- o Glycol tank volume 9.0 liters 2.4 US
- o Emergency water tank volume 3.2 liters 0.8 US

Instructor Note: Emergency water is power dependent.

Cleaning and Maintenance

A. Tool Kit

1. 1/8 and 3/16 Slot screwdrivers
2. No.0, No.1 and No.2 Philips Screwdrivers
3. No.1 Robertson screwdriver (square drive)
4. Set of Imperial Allen keys
5. Set of wrenches (5/16, 3/8, 7/16, 1/2, 9/16, 5/8, 11/16)
6. Adjustable pliers and adjustable wrench
7. Wire cutters and wire strippers
8. Soldering iron and solder
9. Small smooth file for emergency touch up to the needles
10. Cleaner or degreaser
11. Small can of lubricant (Tri-Flow or Never-Seize)
12. Permatex No.2 form-a-gasket sealant for all pipe threads (non-hardening)
13. Brass wool for cleaning
14. Small brush for cleaning
15. Special rubber tool to remove light bulbs

B. Spare Parts

1. Fuses 5A, 2A, 2 amp circuit breakers (Klixon)
2. Needles (set of four)
3. Valve springs (set of four)
"O" rings for valve stems (set of four)
4. Pump
5. Drive motor
6. Bulbs for indicator lights
7. Solenoid

Instructor Note: The motors used for the main drive and the hopper are identical, however, the hopper motor uses the high-speed wire for its operation. The pumps used for the glycol and the emergency water are also identical. It is therefore only necessary to carry one of each to ensure rapid replacement.

C. Cleaners and Lubricants

Use a citrus based cleaner / degreaser to clean (Simple Green® or equivalent).

	<p>D. Daily Cleaning for Multiple Day Operations</p> <ol style="list-style-type: none"> 1. Wipe down hopper 2. Check linkages for wear 3. Inspect glycol & water pumps and hose connections 4. Clean using cloth and cleaner / degreaser as required 5. Check condition of needles and sharpen as required 6. Check pump(s) operation 7. Clean needle block assembly area regularly 8. Clean using a cloth and cleaner / degreaser 9. Check for smooth operation and signs of wear 10. Wipe tank surfaces with cloth to remove any glycol 11. Check tanks and lines for signs of leakage <p>E. Long Term Storage</p> <ol style="list-style-type: none"> 1. Drain the glycol tank 2. Drain the water tank 3. Store PSD indoors at room temperature 4. Store PSD spheres in a dry location to avoid humidity 5. Confirmed, specific shelf life is not currently known exactly but reducing stored spheres from exposure to humidity can extend the life of the spheres and see consistent performance over many years. <p>http://www.premofire.com</p> <p>http://www.sei-ind.com/fireignition</p> <p>Interaction/Activity: REVIEW – HANDS ON</p> <p>Ask students to demonstrate how to perform the bench test and maintenance on the PSD machine.</p>
<p>PPT – Title of Slide</p>	<p>Red Dragon</p> <p>In 2006 SEI Industries introduced its Red Dragon Dispenser and Dragon Egg Spheres aerial ignition spheres.</p> <p>Parts of the dispenser and function</p> <p>A. Mounting System</p> <ul style="list-style-type: none"> ○ Removable adapter fits the body contour of Bell 206

<p>PPT – Title of Slide</p> <p>Est. Time for Activity: XX min.</p> <p>PW Page: XX</p>	<p>series aircraft. For aircraft with flat cabin floors, an adapter is not required.</p> <ul style="list-style-type: none"> ○ Nylon “Y” strap secures dispenser to the aircraft. Standard strap suits all type III helicopters. <p>B. Tank Assembly</p> <ul style="list-style-type: none"> ○ Acts as a frame to which other components are mounted ○ Contains the water and glycol tanks. ○ Drain valves for tanks <p>C. Hopper</p> <ul style="list-style-type: none"> ○ Stores 950 unprimed spheres. ○ Agitator provides a constant supply of spheres to the feed gates. ○ Receives power from gate assembly via an automatically mating plug. <p>D. Feed Gate Assembly</p> <ul style="list-style-type: none"> ○ Controls the flow of spheres from the Hopper into the Injection Head. ○ Easily removable from the Injection Head. ○ Feed gate position controlled by a toggle switch on the remote control. ○ Manual override to close and lock the feedgate. <p>E. Injection Head</p> <ul style="list-style-type: none"> ○ Injects the spheres with glycol. ○ One reciprocating shuttle with two sphere cavities. ○ Two constant displacement glycol pumps that inject the same amount of glycol regardless of drop rate. No need to calibrate. ○ Water nozzles connected to the emergency water tank and pump to direct water into the injection chamber. ○ Manual hand wheel to drive cam and shuttle in case of power failure. Machine can be turned in either direction. <p>F. Outlet Chute</p> <ul style="list-style-type: none"> ○ Guides primed spheres from the Injection Head to a point below the aircraft. <p>G. Main Control Panel</p> <ul style="list-style-type: none"> ○ Houses the main control board, switches and indicators. ○ “RUN/STOP” switch controls the hopper motor and enables the injection drive motor. ○ “RUN/STOP” indicator illuminates when the hopper motor is turned on. It flashes when the injection drive motor is running.
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- “WATER” switch activates the emergency water pump. This switch is always active because of battery backup.
- “LOW WATER” indicator illuminates when the water level is too low and the machine will not start.
- “RESET” switch controls the count display. Pushing the switch toggles between trip count and lifetime count. Pushing and holding resets the trip count.
- “POWER” indicator illuminates when the machine is connected to an external power source.
- “MOTOR FAULT” indicator illuminates when the injection drive is jammed.
- Pump indicator illuminates when the emergency water pump is operating.
- Segment LED displays the sphere count and low battery warning message.

H. Tethered Remote Control

- Controls the feed gates and adjusts the drop rate.
- Seven-position “SPEED” knob to adjust the drop rate.
- “FEED GATE” momentary toggle switch opens and closes the feed gates and controls the injection drive motor.
- “POWER” indicator illuminates when dispenser is connected to an external power source.
- “RUN/STOP” indicator illuminates when hopper motor is turned on. It flashes when injection drive motor is running.
- “FAULT” indicator flashes when there is a problem.

I. Power Cords

- The main power cord connects dispenser to aircraft’s power system using a standard MS3116F-12-3P plug.
- The auxiliary power cord connects to the auxiliary power supply or to batteries.

Dispenser Specifications

1. Performance

of Speeds 7

Min Drop Rate 25 spheres per minute

Max Drop Rate 175 spheres per minute

Hopper Capacity 950 spheres

2. Power

Voltage 24 – 32 VDC

Connector MS3116F-12-3P (A +28, B Gnd)

Circuit Breaker 5A, MS3320

3. Fluid Volumes

	<p>Glycol Tank 0.8 gal 3.2 liter (5000 spheres) Water Tank (Full) 0.5 gal 1.9 liter Water Tank(Min) 0.4 gal 1.5 liter</p> <p>4. Weights Red Dragon 48.0 lb. 21.8 kg Spheres (950) 10.0 lb. 4.5 kg Ethylene Glycol 7.9 lb. 3.6 kg Emergency Water 4.1 lb. 1.9 kg</p> <p>5. Dimensions Length 24.5 in 63 cm Width 10.8 in 27 cm Height (No Base) 19.0 in 61 cm</p> <p>Cleaning and Maintenance</p> <p>A. Tool Kit</p> <ol style="list-style-type: none"> 1. 1/4" Slotted Screwdriver 2. #1 Phillips Screwdriver 3. 7/16" Combination Wrenches 4. Long Nose Pliers 5. 1/8" Allen Key Wrench 6. 2.5 mm Allen Key Wrench 7. Tip Cleaner Set 8. Metal Bristle Brush 9. Scotch Brite® Abrasive Pad <p>B. Spare Parts</p> <ol style="list-style-type: none"> 1. (2) Injection Needles 2. 6mm x 12" Blue Tube 3. 6mm x 12" Red Tube 4. 8mm x 32" Red Drain Tube 5. (2) 6mm Tube Caps <p>C. Cleaners and Lubricants</p> <ol style="list-style-type: none"> 1. Use a citrus based cleaner / degreaser to clean the Red Dragon (Simple Green® or equivalent). 2. The running surfaces of the injection head are self-lubricating. Do not lubricate with WD-40® or light machine oil. These will cause potassium permanganate residue to accumulate and may cause mechanical seizure. <p>D. Daily Cleaning for Multiple Day Operations</p> <ol style="list-style-type: none"> 1. Hopper <ol style="list-style-type: none"> (a) Remove the hopper from the Red Dragon (b) Empty any remaining spheres. (c) Wipe down interior of hopper
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	<p>(d) Check agitator and linkage for signs of wear.</p> <p>2. Gate Assembly</p> <ul style="list-style-type: none">(a) Unlock gate and remove assembly from injection head.(b) Unlock the feed gate control rod using screwdriver.(c) Clean the sphere paths using a cloth and a citrus based cleaner / degreaser.(d) Close gates using manual knob and check lock. <p>3. Glycol Pumps</p> <ul style="list-style-type: none">(a) Remove glycol pump assemblies from injection head(b) Clean using cloth and cleaner / degreaser as required(c) Check condition of needles and sharpen as required.(d) Check the pump operation. <p>4. Injection Head</p> <ul style="list-style-type: none">(a) Loosen any potassium permanganate residue from the shuttle and injection block using the wire brush provided.(b) Clean the surfaces of the injection block and shuttle using a cloth and cleaner / degreaser as required.(c) Rotate the handwheel and check for smooth operation(d) Check cam guides and shuttle guides for signs of wear.(e) Replace the glycol pumps. <p>5. Tank Assembly</p> <ul style="list-style-type: none">(a) Wipe down surfaces with cloth to remove and glycol(b) Check tanks and lines for signs of leakage. <p>E. Long Term Storage</p> <p>1. Drain the glycol tank.</p> <ul style="list-style-type: none">(a) Insert drain tubing into drain valve.(b) Using screwdriver, rotate drain valve so slot is vertical.(c) Close drain valve when empty. <p>2. Drain the water tank.</p> <ul style="list-style-type: none">(a) Insert drain tubing into drain valve.(b) Using screwdriver, rotate drain valve so slot is vertical.(c) Close drain valve when empty.
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	<p>Interaction/Activity: REVIEW – HANDS ON</p> <p>Ask students to demonstrate how to perform the bench test and maintenance on the PSD machine.</p>
	<p>Aerostat PSDS Mark V</p> <p>Aerostat introduced the PSDS Mark V which has the same footprint at the Premo Mark III but with a stronger hopper and chassis and lighter gross weight. The parts of the dispenser and function are the same as the Premo Mark III. It uses the same diameter sphere as the Premo Mark III.</p> <p>Dispenser Specifications</p> <ol style="list-style-type: none"> 1. Dispenser weight fully assembled less glycol and water 65 lbs. 2. Power source 24 – 28 VDC 3. Dimensions fully assembled length 27.25 inches width 10.50 inches height 26.00 inches 4. Hopper capacity (approx.) 450 spheres 5. Glycol tank capacity 2.4 gal. 6. Emergency water tank capacity .8 gal. 7. Sphere Diameter 1.25 inches 8. Sphere shell material High Impact Polystyrene <p>Cleaning and Maintenance</p> <p>A. Tool Kit (Comes with PSDS Mark V)</p> <ol style="list-style-type: none"> 1. Screw Drivers 2. Cleaning Brushes 3. Tape 4. Pliers 5. Spare Hose and Fitting 6. Scotch Brite® Abrasive Pad 7. Hex Keys 8. Knife 9. Wrenches 10. Spare Hardware <p>B. Spare Parts</p>

Provided in the tool kit listed above.

C. Cleaners and Lubricants

To clean the MARK V it is recommended that the user purchase a bottle of white vinegar and a bottle of 3% hydrogen peroxide.

Prepare a mixture containing:

- 1 part water
- 2 parts white vinegar
- 1 part 3% hydrogen peroxide

For lubricating the machine, a non-drying, oily film lubricant such as LPS2 in aerosol form along with an extension tube that can be inserted in the nozzle is ideal.

1. Liberally apply the lubricant to the slipper block assembly then use the manual assist wheel to move the blocks several times to spread the lubricant around evenly.
2. Using an extension tube on the lubricant can spray each plunger in the manifold block close to where the plunger enters the block. Then depress each plunger several times to spread the lubricant.
3. Insert the extension tube behind the manual assist wheel into the chain drive cover and spray. Turn the manual assist wheel about a half turn and spray again. This will get lubricant on to the drive chain and drive gears.

Keep in mind that a machine can never be over lubricated providing the right lubricant is used.

SAFETY NOTE: Do not store the cleaning solution near aerial ignition spheres as contact between the two may result in ignition.

Contact Aerostat, Inc. at (352) 787-1348 for support if needed.

D. Daily Cleaning for Multiple Day Operations

1. In a well-ventilated area using rubber gloves and goggles apply the solution to the machine (i.e., use a spray bottle, a brush, cloth, etc.).
2. Work the solution into heavily soiled spots with a brush and then let it stand for no more than 15 minutes [Note: If left on more than 15 minutes the

	<p>solution may begin to corrode some metal parts.]</p> <ol style="list-style-type: none"> 3. Spray the machine with a water hose to remove all of the solution. Once it is completely rinsed [Note: Don't forget the rinse the bottom of the machine.] move it to a dry location and allow it to air dry. <p>E. Long Term Storage</p> <p>Carefully remove the dispenser from the helicopter and place it on a solid surface.</p> <ol style="list-style-type: none"> 1. Empty any spheres that may be remaining in the hopper and inspect the four chutes to be certain no spheres are left in them. 2. Remove the hopper from the mainframe section of the dispenser. 3. Drain the water tank by removing the cap and then lifting it from the PSD and turning it over. 4. Drain the glycol by positioning the machine so that the drain valve located at the bottom of the glycol tank is accessible. Open the valve and allow the glycol to flow out into a container. 5. Place the stabilization tray into the transit case so that it will sit under the mainframe. 6. Place the mainframe and hopper in their respective places in the transit container. (NOTE: When properly placed in the container the tops of both the mainframe and hopper should be parallel to the upper edge of the case.) 7. Place the drop chute extension in the case making certain it is properly placed in the designated spot. 8. Close the transit case lid and make sure it latches. [NOTE: If the lid does not drop down easily and latch the machine is not properly positioned in the case.] <p>Interaction/Activity: REVIEW – HANDS ON</p> <p>Ask students to demonstrate how to perform the bench test and maintenance on the PSD machine.</p>
	<p>Segue to next module: References and Resources</p>

Est. Instruction Time: XX min.	Module 5: References and Resources
PPT – Module 5	Introduce the module/topic: The Aerial Ignition Unit is committed to providing up-to-date information to the users in the field.
PPT – Title of Slide PPT – Title of Slide Est. Time for Activity: XX min. PW Page: XX	Resources The Missoula Technology and Development Center has the latest information for Aerial Ignition. http://www.fs.fed.us/t-d/aerial_ign/plsphere/training/index.htm This site is your information source for: <ul style="list-style-type: none"> ○ Equipment and spare parts information ○ Operating manuals and guides ○ Links to training sites ○ Mixing instructions and Material Safety Data Sheets (MSDS) ○ Ignition system residue reports ○ Links to aviation, D.O.T. (Department of Transportation), and other Web sites The Bureau of Land Management’s Aviation Website also provides limited information related to aerial ignition training. http://www.blm.gov/nifc/st/en/prog/fire/Aviation/training.html

<p>Est. Instruction Time: XX min.</p> <p>PPT – Summary</p> <p>PPT – Objectives Review</p>	<p>Summary</p> <p>Review the course objectives and address any remaining questions.</p> <p>Objectives:</p> <ol style="list-style-type: none"> 1. Identify the approved Plastic Sphere Dispenser (PSD) machines approved for use as identified in the Interagency Aerial Ignition Guide. 2. Identify the organization required for a safe operation. 3. Identify the requirements for safely working with the hazardous materials involved with PSD operations. 4. Demonstrate knowledge of the operational functions before, during and after the project. 5. Demonstrate knowledge of the firing commands and actions of a PSD operator. 6. Demonstrate knowledge of emergency procedures. 7. List three advantages of using the PSD machine versus the helitorch aerial ignition device. 8. Identify the parts and basic functions of each PSD machine. 9. Demonstrate knowledge to perform routine maintenance on the PSD machine. 10. Demonstrate knowledge and perform a bench-test of the PSD machine. 11. Demonstrate knowledge and perform the operational functions of the Plastic Sphere Dispenser Operator (PLDO) duties as identified in the position Task book.
<p>PPT - Exam</p> <p>PPT - Questions and Evaluations</p>	<p>Distribute and administer the course exam.</p> <p>Once again, ask students if they have any remaining questions.</p> <p>If you have any questions, contact your agency representative of the Aerial Ignition Unit.</p>

APPENDIX A: Helibase Briefing Checklist (HJA-1)

DAILY HELICOPTER OPERATIONS BRIEFING/DEBRIEFING CHECKLIST							
Checklist Item							
I. Organization and Personnel							
A	Helibase Organization Chart completed, reviewed and posted. Trainee assignments made.						
B	Personnel responsibilities (job descriptions, IHOG Chap 2) reviewed. Personnel are aware of their days assignment.						
C	Pilot flight time is being recorded on the helibase board.						
D	Contractor and Government personnel are properly rested. Work /rest and length of assignment guidelines being adhered to.						
E	Appropriate personnel have a copy of the Incident Action Plan or Project Plan, all Pilots, Helispot Managers, and Helicopter Managers have a copy of ICS-220, ICS-205 and Incident Map.						
II. Communications							
A	Communications plan available, current, discussed, and posted. Frequencies known to all personnel						
B	Flight Following and TOLC procedures known and discussed; communications within helibase, to Incident Command Post or Project Base, and to Helispots are adequate.						
C	Adequate number of radios and batteries available to cover appropriate helibase positions and helispots. All radios (including Aircraft) are tested prior to operations.						
III. Landing Areas							
	Check Off Box when Briefing Completed:						
A	Separation between helibase pads is adequate; separate areas are established for different types of helicopters and operations; adequate distance for rotor and fixed wing at active airports.	1	2	3	4	5	6
B	Dust abatement is available or other measures are taken as necessary; if chemicals are used, a local Resource Advisor is consulted.						
C	Helibase approach and departure paths and hover lanes, incident or project flight routes are established, reviewed and posted on the Helibase Display Board.						
D	Operating procedures established and reviewed for movement of helibase personnel and vehicles.						
E	Security procedures are established as appropriate.						
	All helispots are inspected, approved, numbered, and hazards have been discussed with Pilots.						
IV. Safety							
	Check Off Box when Briefing Completed:						
A	Helibase Emergency and Crash Rescue Plan is updated, discussed, and posted. Medivac helicopter is assigned and Manager is aware of assignment.	1	2	3	4	5	6
B	Helibase Aircraft Rescue and firefighting is assigned and personnel are aware of assignments. Fire Extinguisher requirements met and personnel are aware of use.						
<div style="display: flex; justify-content: space-between; align-items: center;"> Insert Date for Next 7 Days: HJA-1 (03/2006) REQUIRED </div>							

DAILY HELICOPTER OPERATIONS BRIEFING/DEBRIEFING CHECKLIST

Checklist Item

IV. Safety (continued)	Check Off Box when Briefing Completed:					
	1	2	3	4	5	6
	7					
C Visibility at 1/2 mile minimum, weather forecasts and contingency plans for adverse weather and inversion (smoke, fog) discussed.						
D Use of Personal Protective Equipment for Pilots and helibase personnel known and discussed. Helispot personnel have firefighting tools, PPE, and overnight gear available at staffed helispots.						
E Military training routes and special use airspace considerations have been discussed with Pilots and Managers.						
F Temporary flight restriction (if applicable) has been checked by ASGS or AOBD and discussed with Pilots and Managers.						
G Helibase and on-incident hazards (wires, towers, smoke inversions, other aircraft, etc) are posted on maps and have been discussed.						
H Previous days safety problems discussed and mitigated.						
V. Operations						
A IAP and ICS-220 discussed. Priorities established and reviewed. Initial missions entered into Mission Request Log. Unscheduled Mission request procedures known.						
B Previous days operational problems discussed and mitigated.						
C Helicopter tactics discussed. Supervisor/control, role of Air Attack and/or Helicopter coordinator known. Aviation Locations Information Summary (HBM-2) distributed to all Pilots.						
D Load calculations for each helicopter posted and disseminated.						
E Deck coordination Procedures discussed and known. Passenger briefing, manifesting, cargo, hover hookups, movement of personnel and vehicles around helibase.						
F Transportation of hazardous materials procedures discussed and personnel are aware of packaging requirements.						
G Commonly requested items (water and rations) are available at the Helibase. Ordering procedures are in place with the Supply Unit.						
H Initial Attack helicopter and crew is assigned and have been briefed by the local unit as necessary.						
I Special Operations (helitorch, plastic sphere dispenser, retardant mixing, etc) plans, procedures, and checklists have been reviewed and approved.						
J Insure Form HCM-4 Helicopter Power check Turbine Engine and Form HCM-5 Turbine Engine Power Trend Analysis is being completed every 10 hours.						

Insert Date for Next 7 Days:

HJA-1 (03/2006) REQUIRED

DAILY HELICOPTER OPERATIONS BRIEFING/DEBRIEFING CHECKLIST
Checklist Item

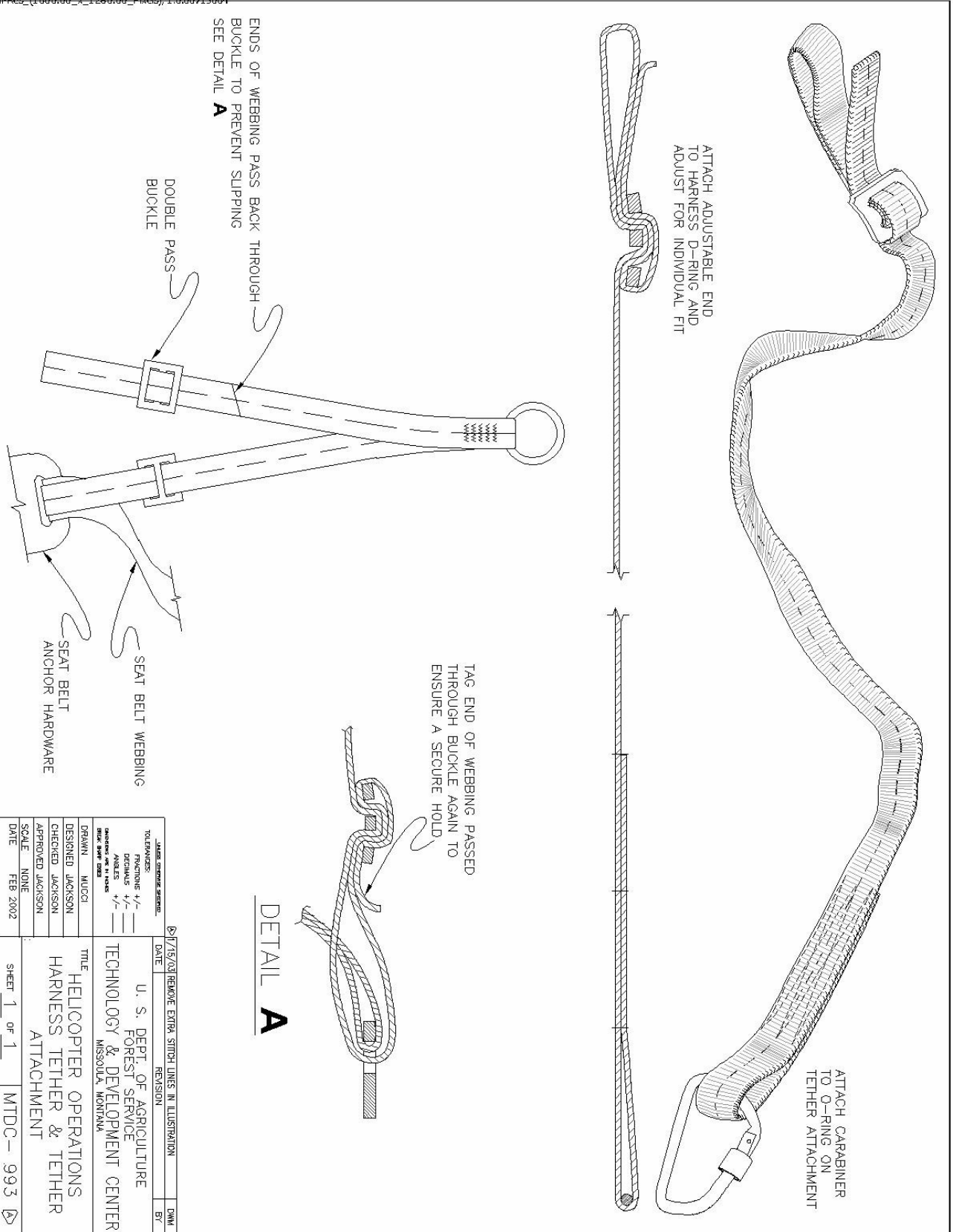
	Check Off Box when Briefing Completed:						
	1	2	3	4	5	6	7
VIII. Daily Debriefing							
A Feedback from Pilots.							
B Communications/TOLC/Radio Operator successes/problems.							
C Mission scheduling successes/problems.							
D Deck Coordination successes/problems.							
E Helispot Manager successes/problems.							
F Passenger/cargo manifesting successes/problems.							
G New hazards identified.							
H General Helibase Successes/problems.							
I Briefing on next days shift plan and missions. Pilot schedule and start time reviewed. Helibase personnel start times reviewed.							
J Helicopter Daily Use and Cost Summary (HCM-15) submitted.							
K Equipment rental shift tickets reviewed and approved.							
L Crew Time Reports reviewed and approved.							
Additional Items							

IX. Problems/Mitigation Notes

HJA-1 (03/2006) REQUIRED

APPENDIX B: MTDC Drawing # 993

Hi-Res (1600.00 x 1280.00 Pixels), 1:0.00713064



**Appendix C: Plastic Sphere Dispenser Operator (PLDO)
Position Task book**

(When available, place here.)

Appendix D: PLDO Exam

Appendix E: PLDO Exam ANSWER KEY