
HTMG / HTMM / HTPT (Helitorch Manager / Mixmaster / Parking Tender) Helitorch Training



Instructor Guide



Prepared by the Interagency Aerial Ignition Group
Revised 2016

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HTMG/HTMM/HTPT Helitorch Training Revision History

Version	Description	Date
1.00	Original Materials	Date
1.10	Incorporate all Helitorch training curriculum into one instructor guide.	2016

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HTMG/HTMM/HTPT Helitorch Training

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 Helitorch equipment approved for use by the Interagency Aerial Ignition Guide.

Who are the intended participants?

Interagency personnel who utilize the helitorch for aerial ignition missions.

Course Prerequisites:

Prior to requesting enrollment in helitorch training, 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/publications/310-1>

REQUIRED PREREQUISITES FOR HELITORCH 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

Annual Helitorch Manager Refresher Training (RT-9012); is required annually after the initial training.

How is the course conducted?

Instructor-led delivery in classroom with hands-on demonstration of the skills identified in the position taskbooks for the various positions of helitorch operations.

What are the minimum instructor qualifications for the course?

This will vary based on agency specific requirements.

What is required to pass the course?

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

Logistical Information:

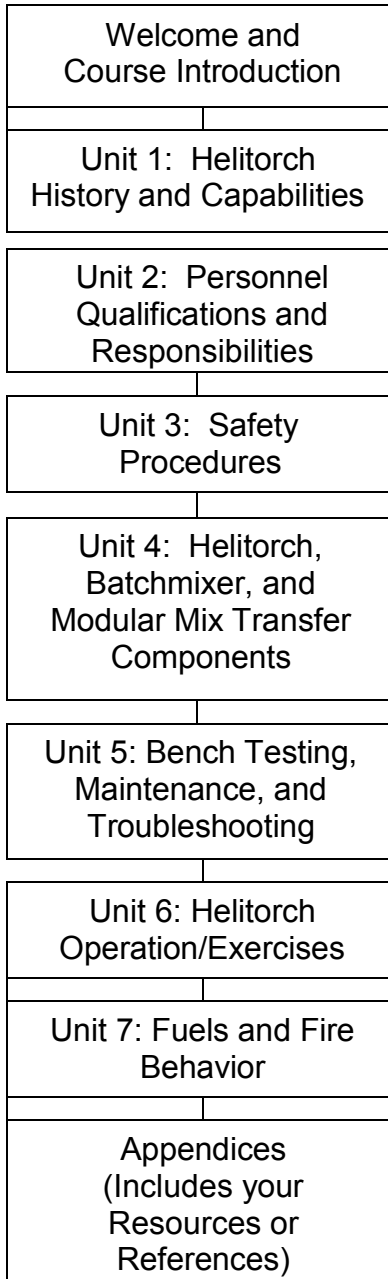
Recommended Class Size: 2 Min. 20 Max.

Length of Course: Approximately 4 - 6 hrs.

Supplies:

- Computer/laptop
- Projector
- Screen
- Speakers
- Course electronic presentation slides
- Student Roster
- OAS-111 Student Course Evaluations
- Hardcopy or electronic version of the Interagency Aerial Ignition Guide for each student
- Position Task Book for each student
- Helitorch equipment with tool kits
- Personal Protective Equipment for bench testing equipment
- Appropriate equipment as identified in the Interagency Aerial Ignition Guide for bench testing equipment (in addition to the required 40-B:C per pad, fire suppression requirements for helitorch operations provide a minimum of four extinguishers each rated 40-B:C, or two 3 gallon compressed air foam system extinguishers capable of using Class B foam, or a staffed 30 gallon class B foam capable system, or a staffed engine with Class B foam on site)
- Internet Connection (not mandatory, but useful) for video and resource files to demonstrate effective Helitorch Operations


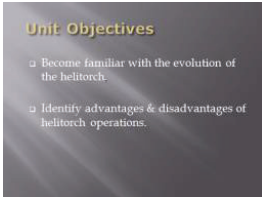
HTMG/HTMM/HTPT Helitorch Training Course Map

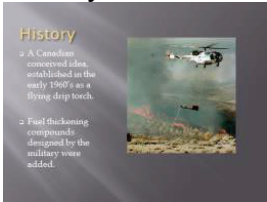
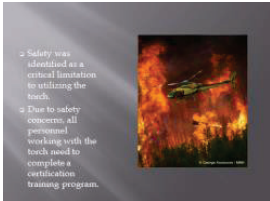



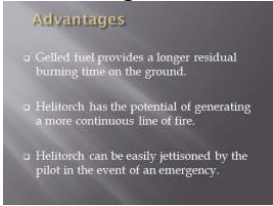
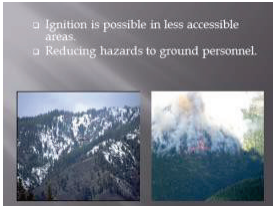
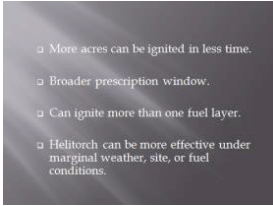
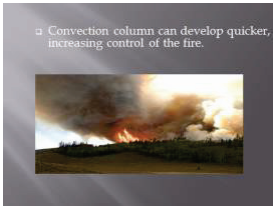
Est. Instruction Time: varied.	Welcome and Course Introduction
PPT – Title Slide to be inputted by instructor related to equipment on site. PPT – Introduction	<p>Welcome the students to the course.</p> <p>Introduce yourself.</p> <p>Have participants introduce themselves. You could have them share some 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 helitorch before?
PPT – Course Purpose	<p>Course Purpose</p> <p>This course is designed to provide you with a working knowledge of the various helitorch equipment approved for use by the Interagency Aerial Ignition Guide.</p> <p>This instructor guide is designed to be used for the helitorch presentation, regardless of what is on site for inspection or field use. The slide presentation will vary based on which helitorch is being used and local modifications.</p>


PPT – Course Objectives	<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 Helitorch systems for use as identified in the Interagency Aerial Ignition Guide.2. Identify the Advantages and Disadvantages of the Helitorch in relation to the Plastic Sphere Dispenser (PSD).3. Identify the personnel requirements/responsibilities and qualifications required to perform a Helitorch operation.4. Identify training and recertification requirements for all Helitorch positions.5. Identify the requirements for safely working with the hazardous materials involved with Helitorch operations to include: MSDS, Mixing Hazards, Static Bonding, Transportation, Fire Protection, and Spill response procedures.6. Become familiar with Pre and Post operational briefings, and Communication requirements during Helitorch operations.7. Understand Job Hazard Analysis/Risk Assessment, and appropriate checklists to be utilized.8. Identify the parts and basic parts and mechanics of a helitorch, and associated maintenance with each Helitorch.9. Demonstrate knowledge and perform a bench-test of the Helitorch, and trouble shoot problems.10. Demonstrate knowledge to choose a Helitorch site and requirements to be on scene.11. Identify the proper steps associated with hooking up the helitorch, mixing gel, and filling the helitorch.12. Discuss pre burn reconnaissance and fire behavior associated with the helitorch. <p>Explain that as you cover each module, the specific objectives for that module will be addressed.</p>
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<p>Est. Instruction Time: 30 min.</p>	<p>Unit 1: Helitorch History and Capabilities</p>
<p>PPT – Unit 1 Slide #1</p> 	<p>Introduce the unit/topic:</p> <p>The Helitorch, was developed in the 1960s by a Canadian conceived idea as a flying drip torch, to provide a method of igniting sparse or continuous fuels in a short time, on a large scale in remote areas. It is cost effective, environmentally acceptable, and allows for a more broad prescription window.</p> <p>The Helitorch is a gelled fuel aerial ignition device that is attached to a helicopter’s external cargo hook. The ignition and fuel feed are controlled by the pilot through a simple electrical connector on the belly of the helicopter, usually the water bucket plug. The complete system is jettisonable by the pilot in case of emergency.</p> <p>Utilizing the Helitorch takes considerable planning, due to the amount of personnel needed, set up location, pilot carding and availability, and proper fuel service availability.</p> <p>The Helitorch may be used in any fuel type, and dependent upon conditions, results may vary from understory to stand replacement burns. This system is safe, efficient, and economical for users to burn with less risk to ground personnel in rugged terrain.</p>
<p>PPT – Objectives Slide #2</p> 	<p>Objective(s): After completing this module, participants should be able to:</p> <ol style="list-style-type: none"> 1. Become familiar with the evolution of the Helitorch. 2. Identify advantages and disadvantages of the Helitorch. <p>Key teaching points to accomplish module objectives:</p> <ul style="list-style-type: none"> • Discuss the history of the Helitorch and review previous use of the Helitorch. • Discuss the advantages and disadvantages of utilizing the Helitorch.

<p>Slide #3 History</p> 	<p>Adding fuel-thickening compounds to raw fuel reduces the volatility and is therefore more manageable for dispersment. This increases the safety of handling the fuel, improves its drop characteristics, puts more fuel onto the ground (rather than burning off in the air), and increases residual burning time allowing the aircraft to be flown higher and faster than some other aerial ignition systems.</p> <p>Discuss History of the Helitorch on your local land management area.</p> <ul style="list-style-type: none"> ○ Review previous seasons burns <p>Fuel thickening compounds currently utilized are:</p> <ul style="list-style-type: none"> ○ Allumagel (Powder) ○ Flash 21
<p>Slide #4</p> 	<p>This aerial ignition device is a tool used in backfiring and burnout operations for wildfires and is also a mainstay to the prescribed fire arena for reduction of hazard fuels. It is a very effective tool but must be used by very skilled, qualified pilots and trained, qualified field personnel for a safe operation.</p> <p>Utilizing the Helitorch can be done safely if personnel are trained properly</p> <ul style="list-style-type: none"> ○ Certification of positions are model specific.
<p>Slide #5</p> 	<p>These are examples of some of the different Helitorches currently being utilized:</p> <ul style="list-style-type: none"> ○ Upper Left- Norther Helitorch (Barrel Helitorch) ○ Upper Right-Simplex5400 ○ Lower Left-Fire Spec 2000 ○ Lower right-Isolair Helitorch <p>What other Helitorches are approved:</p> <ul style="list-style-type: none"> ➤ Refer to AIG Page I-I

<p>Slide #6 Advantages</p>  <p>Advantages</p> <ul style="list-style-type: none"> □ Gelled fuel provides a longer residual burning time on the ground. □ Helitorch has the potential of generating a more continuous line of fire. □ Helitorch can be easily jettisoned by the pilot in the event of an emergency. 	<ol style="list-style-type: none"> 1. Sites where burn areas have sparse or patchy fuel distribution and high fuel moisture content, the pattern of fire laid down by the torch can provide a greater chance of ignition and under some conditions reduce emissions. 2. Gelled fuel provides longer residual burn time on the ground. <ul style="list-style-type: none"> ○ Why is this important in relation to meet burn objectives? 3. Helitorch has the potential of generating a more continuous line of fire. <ul style="list-style-type: none"> ○ Unlike the PSD, Jell will not roll down the hill. 4. Helitorch can be easily jettisoned by the pilot. <ul style="list-style-type: none"> ○ Discuss the importance of the preburn reconnaissance, and looking at alternate landing/jettison sites.
<p>Slide #7</p>  <ul style="list-style-type: none"> □ Ignition is possible in less accessible areas. □ Reducing hazards to ground personnel. 	<ol style="list-style-type: none"> 5. Burning is possible in less accessible areas, reducing hazards to ground personnel. Where wildland fire burnout is the best option for safety and control, the helitorch can expedite the operation without compromising personnel safety.
<p>Slide #8</p>  <ul style="list-style-type: none"> □ More acres can be ignited in less time. □ Broader prescription window. □ Can ignite more than one fuel layer. □ Helitorch can be more effective under marginal weather, site, or fuel conditions. 	<ol style="list-style-type: none"> 6. More acres can be ignited in less time. <ol style="list-style-type: none"> a. It can be cost effective b. Smoke constraints may be met. 7. Provides a broader prescription window. <ol style="list-style-type: none"> a. Fuels may be on the wetter side. b. Temperatures/RH may be higher. 8. It can ignite more than one fuel layer. <ol style="list-style-type: none"> a. It can burn ground material and aerial canopy with little ground litter. 9. Helitorch may be more effective under marginal weather, site conditions, or fuel conditions.
<p>Slide #9</p>  <ul style="list-style-type: none"> □ Convection column can develop quicker, increasing control of the fire. 	<ol style="list-style-type: none"> 9. Convection columns can develop quicker, increasing control of the fire. <ul style="list-style-type: none"> ○ Aided by proper pilot techniques. ○ Assistance on the ground may be needed to assist with blacklining to ensure control lines are secure.

<p>Slide #10</p> <p>Advantages - Barrel Torch</p> <ul style="list-style-type: none"> ▫ The small size of the torch allows it to be transported to remote areas inside any medium and most light helicopters. ▫ No need to transport large amounts of mixing equipment and supplies. ▫ Requires a smaller ground crew to mix, gel, operate, and maintain. 	<p>1. Advantages of the Barrel Torch:</p> <ul style="list-style-type: none"> ○ Can be transported inside helicopters, but this is rare. ○ Smaller area is required for set up and operation
<p>Slide #11</p> 	<p>2. Photos of Barrel Torch:</p> <ul style="list-style-type: none"> ○ Example would be the Northern Helitorch.

Slide #12 Disadvantages

Disadvantages

- The use of gasoline is hazardous.
- There is substantial resource outlay.
- Crew requires extensive training and commitment.
- Bulk fuel and chemicals must be hauled to the site complying with DOT and OSHA requirements.
- Costs can be significant.



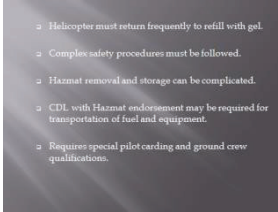
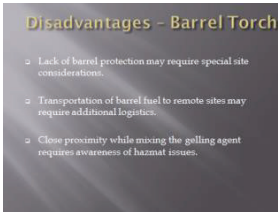
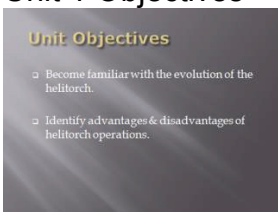
1. More logistics than PSD operation.
2. The use of gasoline is hazardous since it is highly flammable in its ungelled state.
3. There is substantial resource outlay: three-to five-person crew, with one or two vehicle and/or trailer units for most burning operations.
4. Crew requires extensive training and a commitment to the program for the duration of the burning season.
5. Bulk fuel and chemicals must be hauled to the site; the DOT and OSHA requirements must be known, understood, and complied with.
6. Operation requires considerable planning and setup time to organize the mixing/loading site and helipad.
7. Rigorous safety procedures must be followed. Hazmat removal and storage may be a problem.
8. It is easier to establish a convection column because of helitorch mass ignition; it is as easy to lose control of the column with a break in ignition.
9. Helitorch does not lend itself to under-burning operation. The burning fuel globules can ignite tree crowns.
10. Commercial driver's license (CDL) with HAZ-MAT endorsement maybe required for transportation of mixing equipment.
11. Requires special pilot and ground crew techniques in order to operate effectively.

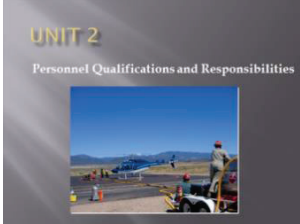
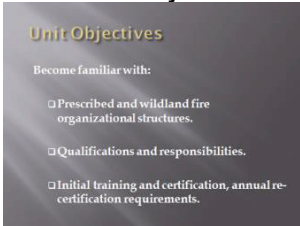
Slide #13


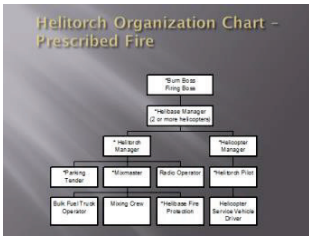
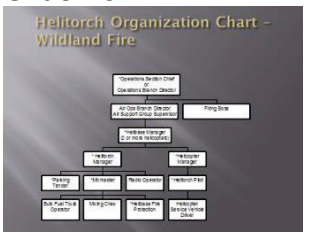
- Control of the convection column may be lost with a break in ignition operations.

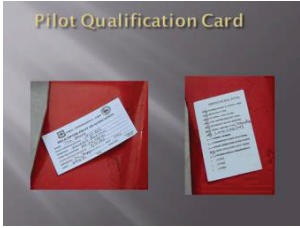


12. Pilot has to return frequently for refill on Helitorch.
 - a. Consider site location in relation to Burn.
 - b. Smoke considerations.

<p>Slide #14</p> 	<p>Consider PSD for an understory burn.</p> <p>Fire Behavior can be controlled:</p> <ul style="list-style-type: none"> ○ Discuss lighting pattern with Pilots ○ Current fuel moistures and conditions ○ Weather Forecasted
<p>Slide #15</p> 	<p>Discuss what needs to be planned:</p> <ul style="list-style-type: none"> ○ Location ○ Qualified Helitorch Crew ○ Helicopter and Pilot Carded ○ Fuel Truck <ul style="list-style-type: none"> - Ethanol Fuel is most widely available in filling stations, but will not gel the fuel properly, you must use NON-ETHANOL FUEL for proper gelling. ○ Burn Plan ○ PASP
<p>Slide #16</p> 	<p>6. Other considerations?</p>
<p>Slide #17</p> <p>Disadvantages - Barrel Torch</p> 	<ol style="list-style-type: none"> 1. Avoid rocky landing areas, barrels can be punctured. 2. If no mechanized system to mix gel, additional personnel may be needed to move and assist with operation.
<p>Slide #18</p> <p>Unit 1 Objectives</p> 	<ol style="list-style-type: none"> 1. Discuss History of the use of the Helitorch on your unit and the future of the program. 2. Discuss alternate ignition methods.

<p>Est. Instruction Time: 30 min</p>	<p>Unit 2: Personnel Qualifications and Responsibilities</p>
<p>PPT – Unit 2 Slide #1</p> 	<p>Introduce the unit/topic:</p> <p>All individuals involved with a Helitorch operation must be qualified. Training is model specific per the Aerial Ignition Guide! This is a quality control issue and is your responsibility while performing in any position.</p>
<p>Slide #2 Objectives</p> 	<p>Objective(s)</p> <p>After completing this module, participants should be familiar with:</p> <ul style="list-style-type: none"> ○ Prescribed and wildland fire organizational structures ○ Qualifications and responsibilities ○ Initial training and certification, annual re-certification requirements <p>Key teaching points to accomplish module objectives:</p> <ul style="list-style-type: none"> ○ Required positions for prescribed and wildland fire helitorch operations ○ How to become qualified ○ How to maintain your qualification

<p>Slide #3</p> 	<p>Refer to Appendix B in the Interagency Aerial Ignition Guide Organization Charts for required positions in both wildland and prescribed fire helitorch organizations.</p> <p>Positions include:</p> <ol style="list-style-type: none"> 1. Helitorch Manager 2. Helicopter Manager – may be collateral duty with helitorch manager, if using one helitorch helicopter 3. Mixmaster 4. Mixing Personnel - optional 5. Helitorch Parking Tender 6. Helitorch Base Radio Operator - optional 7. Pilot 8. Fire Protection Crew – as needed based on organization <p>Discuss - Module configurations and Crew Resource Management needed for safe and efficient operations.</p>
<p>Slide #4</p> 	<p>Who can act in dual positions?</p> <ul style="list-style-type: none"> ○ Refer to the Aerial ignition guide. HTMG may also serve as the HMGB. Consider utilizing HMGB trainee to assist with this. ○ In multiple aircraft situations an HEB2 required.
<p>Slide #5</p> 	<p>Other items that should be considered or required during wildland fire Helitorch operation:</p> <ol style="list-style-type: none"> 1. PASP 2. Discrete frequency for helitorch operation 3. Working location away from main helibase operation

<p>Slide #6</p> <p>Pilot - Qualifications</p> <ul style="list-style-type: none"> ❑ Pilot must have completed helitorch ground school (this power-point training). ❑ Pilot must have an endorsement for helitorch operations on their current pilot qualification card. ❑ Helicopter must be carded for helitorch operations. 	<p>There is a lack of Helitorch pilots nationally. One new option for carding is utilizing the water torch. In order to get carded through the water torch:</p> <ol style="list-style-type: none"> 1. Carded 1 year PSD prior 2. Refer to the Pilot Training Standards
<p>Slide #7</p> <p>Pilot Qualification Card</p> 	<p>Ensure Helitorch is on the pilot card.</p> <p>Some confusion could be if aerial ignition is marked and Torch is not specified. Contact helicopter inspector pilot.</p>
<p>Slide #8</p> <p>Pilot - Responsibilities</p> <ul style="list-style-type: none"> ❑ Basic knowledge of wildland and prescribed fire operations. ❑ Communicates and coordinates with Burn Boss/ Firing Boss and Parking Tender. ❑ Knows aircraft limitations section of flight manual. ❑ Knowledge of procedures for helitorch installation and operations. ❑ Maintains desired flight profile to meet burn unit objectives. ❑ Pilot is responsible for all helicopter operations and flight safety. 	<p>Ensure proper briefing from the agency is given to the pilot.</p>
<p>Slide #9</p> <p>Burn Boss - Qualifications</p> <ul style="list-style-type: none"> ❑ Prescribed Fire Burn Boss. ❑ Received helicopter safety training. ❑ Knowledgeable of ICS organization concepts and is familiar with aerial ignition operations. ❑ Knowledge of weather & fire behavior. 	<p>Discuss your agencies policy on burn boss qualifications required: RXB1/RXB2?</p>
<p>Slide #10</p> <p>Burn Boss - Responsibilities</p> <ul style="list-style-type: none"> ❑ Coordinates development of firing plan and has overall responsibility for firing operations. ❑ Performs the initial briefing and covers assignments. ❑ Briefs pilot and personnel on the plan and firing sequence. ❑ Observes helitorch operations and adjusts firing patterns by communicating with pilot. 	<p>Helitorch Manager needs to assist the burn boss with:</p> <ol style="list-style-type: none"> 1. Briefings 2. CRM 3. Communications <ul style="list-style-type: none"> ○ With the pilot ○ With the Helitorch operation (crew)

<p>Slide #11</p> <p>Firing Boss - Qualifications</p> <ul style="list-style-type: none"> □ Qualified as Firing Boss. □ Received helicopter safety training. □ Knowledgeable of ICS organization concepts and is familiar with aerial ignition operations. 	<p>The firing boss works directly for the burn boss.</p>
<p>Slide #12</p> <p>Firing Boss - Responsibilities</p> <ul style="list-style-type: none"> ■ As requested by Burn Boss, directs the aerial firing operation. ■ Instructs pilot as to the plan and firing sequence. ■ Observes helitorch operations and adjusts firing patterns by communicating with pilot and Burn Boss. 	<p>Discuss how an operation should successfully be coordinated with ground ignitors and Helitorch ignition, by the firing boss:</p> <ol style="list-style-type: none"> 1. Maintain control of ground resources at all times 2. Ensure communications are being received 3. Ensure safety of ground personnel 4. Know the unit boundaries 5. Understand the prescribed fire prescription
<p>Slide #13</p> <p>Helitorch Manager - Qualifications</p> <ul style="list-style-type: none"> □ Helicopter Manager <ul style="list-style-type: none"> □ Exclusive-use □ CWN □ Project □ HTMM qualified □ Aerial ignition annual re-certification □ Minimum HEB2(T) 	<p>Refer to the most current Wildland Fire Qualifications Guide. Look for supplements as well.</p> <p>Courses Required:</p> <ul style="list-style-type: none"> ○ IS-700 ○ ICS-100 ○ RT-130 ○ N9012 Helitorch Training ○ A-110 <p>Physical fitness:</p> <ul style="list-style-type: none"> ○ HTMG-None, HTMM-Light, HTPPT-Moderate <p>Be sure to reference your agency specific requirements.</p> <p>To Become Qualified:</p> <ol style="list-style-type: none"> 1. HMGB Qualified 2. HEB2 Trainee 3. Qualified as HTMM 4. Minimum 1 assignment to complete task book

Slide #14

Helitorch Manager - Responsibilities

- Provides technical assistance to Burn Boss/Firing Boss.
- Assigns qualified personnel and monitors all helitorch operations.
- Assures all required equipment is on site, tested and operational.
- Provides technical assistance on helibase location and operation.
- Briefs pilots and helitorch base personnel.

Document, Document, Document...**Helitorch Manager**



1. Supervises and monitors the overall helitorch operations on the helibase.
2. Supervises all helitorch/helibase operation and assigns qualified personnel to positions and identifies trainees.
3. Ensures Aerial Ignition PASP and checklists are completed, approved, posted, and followed.
4. Maintains Helitorch Maintenance log and ensures proper cleanup of equipment prior to storage (reference maintenance in Appendix B).
5. Provides technical assistance to RXB 1/2 or FIRB on helibase location and operation.
6. Ensures all required equipment is on-site and operational.
7. Ensures communication link between helitorch base/helibase, dispatch, RXB 1/2 or FIRB/Operations Section Chief, and designated personnel is operational.
8. Conducts briefing and provides technical advice and information to involved parties.
9. Conducts and documents a risk assessment. Identifies hazards and safety requirements at operations briefing.
10. Ensures safety precautions have been completed prior to mixing.
11. Ensures that fire shelter is on board aircraft and accessible to the pilot, and that pilot is familiar with use.

Slide #15

- Identifies hazards and safety considerations at operational briefing.
- Aviation Safety Plan and Go/NoGo checklist is approved/posted & followed.
- Establish communications between helitorch base, dispatch and firing personnel.
- Utilizing only one helitorch helicopter the HTMG may also serve as the Helicopter Manager.

Discuss other duties a Helitorch Manager may be doing:

- All the duties associated with HMGB
- Planning ahead for change of mission:
 - ❖ PSD operations if results not being met
 - ❖ Initial attack
 - ❖ Medevac

<p>Slide #16</p>  <p>Helitorch Mixmaster – Qualifications</p> <ul style="list-style-type: none"> ▫ Helicopter Crewmember ▫ Helitorch Parking Tender ▫ Helitorch Mixmaster ▫ Aerial Ignition annual re-certification 	<p>Refer to the most current Wildland Fire Qualifications Guide. Look for supplements as well.</p> <p>Courses Required:</p> <ul style="list-style-type: none"> ○ IS-700 ○ ICS-100 ○ RT-130 ○ N9012 Helitorch Training ○ A-110 <p>Physical fitness:</p> <ul style="list-style-type: none"> ○ HTMG-None, HTMM-Light, HTPT-Moderate <p>Be sure to reference your agency specific requirements.</p> <p>To Become Qualified:</p> <ol style="list-style-type: none"> 1. Minimum 3 successful assignments 2. Completion of task book 3. One additional assignment for model specific 4. Qualified as a HECM
<p>Slide #17</p>  <p>Helitorch Mixmaster – Responsibilities</p> <ul style="list-style-type: none"> ▫ Reports to the Helitorch Manager. ▫ Attends briefings. ▫ Supervise mixing/filling operation and manages time frames to maintain availability of gel. ▫ Assure bonding procedures are followed. ▫ Places equipment and assures it is operational. 	<p>HTMM should be the subject matter expert with the system being utilized.</p> <p>This individual can make or break an operation.</p> <p>Mixmaster</p> <ol style="list-style-type: none"> 1. Reports to the HTMG. 2. Attends Helibase briefings. 3. Supervises mixing/filling operation, manages time frames to maintain availability of gel, assuring bonding procedures are followed. 4. Determines quantities of fuel, gelling agent, etc., needed and manages time frames between mixing systems. 5. Oversees hookup of helitorch to helicopter and preflight tests of helitorch with pilot. 6. Supervises the helitorch fire protection organization. 7. Places equipment and ensures it is operational; conducts drills prior to operations to ensure mixing and filling operations are coordinated between all personnel. 8. Performs maintenance and cleaning of all helitorch equipment.

Slide #18

- Conduct drills and assure coordination prior to operation.
- Oversees hookup of helitorch to helicopter and preflight tests of helitorch with pilot.
- Perform maintenance and cleaning of all helitorch equipment daily.
- Supervise helitorch fire protection.

The HTMM works directly with the HTPT and comes up with the plan of action on how the operation will work the most efficiently.

Slide #19**Helitorch Parking Tender - Qualifications**

- Helicopter Crewmember
- Helitorch Parking Tender
- Aerial ignition annual re-certification

Refer to the most current Wildland Fire Qualifications Guide. Look for supplements as well.

Courses Required:

- IS-700
- ICS-100
- RT-130
- N9012 Helitorch Training
- A-110

Physical fitness:

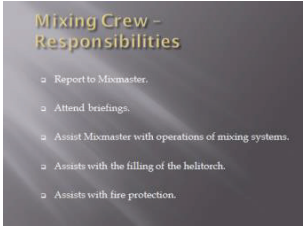

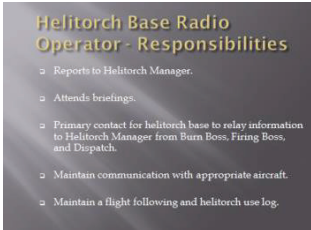
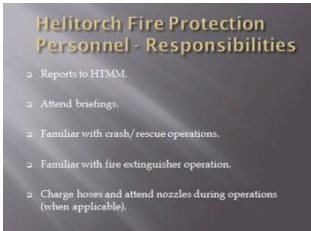
- HTMG-None, HTMM-Light, HTPT-Moderate

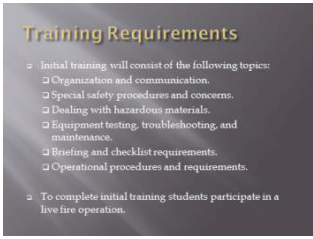
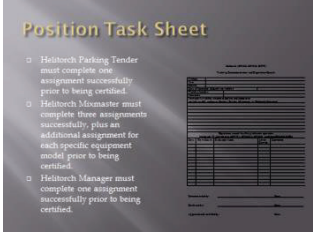
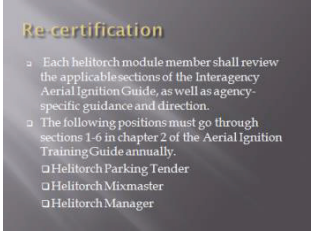


Be sure to reference your agency specific requirements.

To Become Qualified:

- 1. Qualified as a HECM**
- 2. Minimum of 1 successful assignment**

<p>Slide #20</p> <p>Helitorch Parking Tender - Responsibilities</p> <ul style="list-style-type: none"> ▫ Reports to the Helitorch Manager. ▫ Attends briefings. ▫ Directs all movements of personnel and equipment around the helicopter. ▫ Checks hookup of helitorch to helicopter. ▫ Must have a radio equipped headset and hardhat or ALSE approved flight helmet with a remote transmit switch during takeoffs and landings during helitorch operations at the landing pad. 	<p>Discuss within your unit who fills the helitorch, the HTPT or the HTMM.</p> <p>Parking Tender</p> <ol style="list-style-type: none"> 1. Reports to the HTMG. 2. Attends briefings. 3. Directs all movements of personnel and equipment around the helicopter. 4. Checks hookup of helitorch to helicopter; accomplish checkout procedures. 5. Must have a radio equipped with headset and hardhat or ALSE approved flight helmet with a remote transmit switch during takeoffs and landings during helitorch operations at the landing pad. 6. Has fire protection/crash rescue responsibility for the primary helitorch helipad (staff fire extinguisher during all fueling, reloading/filling operations, and during takeoffs and landings, per IHOG). 7. Ensures electrical switches are “on” prior to takeoff and “off” after landing and inspects discharge valve, propane pressure, cam lock, drum hardware, and suspension cables prior to takeoff. 8. Ensures all personnel/equipment are clear of safety circle during takeoff/landing. 9. Maintains communications with helicopter while within the area of helitorch base, turns communication over to RXB 1/2 or FIRB /Operations Section Chief when helicopter departs helitorch base area.
<p>Slide #21</p> <ul style="list-style-type: none"> ▫ Has fire protection/crash rescue responsibility for the primary helitorch helipad. ▫ Ensures electrical switches are “on” prior to takeoff and “off” after landing and inspects helitorch. ▫ Ensures all personnel/equipment are clear of safety circle during takeoff/landing. ▫ Maintains communications with helicopter while within the helitorch base. 	<p>Cover these practices in your stations when instructor completes the units.</p>
<p>Slide #22</p> <p>Mixing Crew - Qualifications</p> <ul style="list-style-type: none"> ▫ Must attend B-3 (basic aviation safety training) and/or S-271 (helicopter crewmember training). ▫ Helitorch operations instruction - can be on the job training. 	<p>This position is also referred to as the cotton boy. There is not an IQCS qualification for this. This is very beneficial during a busy operation.</p>

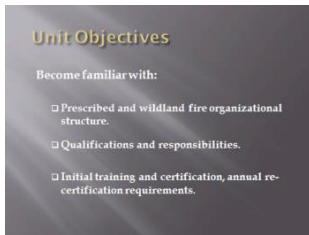
<p>Slide #23</p> 	<p>Qualified personnel within the Helitorch operation need to ensure they properly brief the mixing crew on their duties, and provide oversight since they are not required to have this training (N9012).</p>
<p>Slide #24</p> 	<p>For a simple operation discuss who will be assuming the responsibility of communications for the Helitorch operation.</p> <ul style="list-style-type: none"> ○ Do not utilize the HTMM for this, they should not have a radio on them due to the potential hazard with the fueling process.
<p>Slide #25</p> 	<p>The Helitorch Base Radio Operator (optional):</p> <ol style="list-style-type: none"> 1. Reports to HTMG. 2. Attends Helibase briefings. 3. Receives orders from RXB 1/2 or FIRB /and relays to HTMG. 4. Maintains communication with appropriate aircraft. 5. Provides communication between HTMG, parking tender, Helicopter Pilot, RXB 1/2 or FIRB and dispatch and/or operations. 6. Maintains a flight following log.
<p>Slide #26</p> 	<p>If utilizing Helitorch crew for this discuss responsibilities and what your actually going to do under certain circumstances:</p> <ul style="list-style-type: none"> ○ Helitorch catches fire ○ Helicopter catches fire ○ Fire on the Helibase <p>Have the same discussions if utilizing an engine for fire protection.</p> <p>If utilizing an engine ask the following questions:</p> <ul style="list-style-type: none"> ○ Is there training with aircraft related incidents? ○ Are they carrying the proper foam capability?

<p>Slide #27</p>  <p>Training Requirements</p> <ul style="list-style-type: none"> ▫ Initial training will consist of the following topics: <ul style="list-style-type: none"> ▫ Organization and communication. ▫ Special safety procedures and concerns. ▫ Dealing with hazardous materials. ▫ Equipment testing, troubleshooting, and maintenance. ▫ Briefing and checklist requirements. ▫ Operational procedures and requirements. ▫ To complete initial training students participate in a live fire operation. 	<p>As an instructor how are you dealing with performing a live fire operation to be able to give full credit for this course?</p> <p>Options:</p> <ol style="list-style-type: none"> 1. Do a live fire exercise 2. Do a completion memo that needs to be signed off once they do a live fire operation, to then officially become a trainee <ul style="list-style-type: none"> ○ This will need to be discussed within your agency
<p>Slide #28</p>  <p>Position Task Sheet</p> <ul style="list-style-type: none"> ▫ Helitorch Parking Tender must complete one assignment successfully prior to being certified. ▫ Helitorch Mixmaster must complete three assignments successfully, plus an additional assignment for each specific equipment model prior to being certified. ▫ Helitorch Manager must complete one assignment successfully prior to being certified. 	<p>Task sheets are no longer applicable. Attach partially filled out task sheets to task books to show experience.</p> <p>Task books can be found at: www.nwcg.gov</p>
<p>Slide #29</p>  <p>Re-certification</p> <ul style="list-style-type: none"> ▫ Each helitorch module member shall review the applicable sections of the Interagency Aerial Ignition Guide, as well as agency-specific guidance and direction. ▫ The following positions must go through sections 1-6 in chapter 2 of the Aerial Ignition Training Guide annually. <ul style="list-style-type: none"> ▫ Helitorch Parking Tender ▫ Helitorch Mixmaster ▫ Helitorch Manager 	<p>Course #9012 must be entered into IQCS.</p>
<p>Side #30</p>  <p>Certification Authority</p> <ul style="list-style-type: none"> ▫ Certification is the responsibility of the applicable Regional / State Aviation Manager or designee. 	
<p>Slide #31</p>  <p>Currency Requirements</p> <ul style="list-style-type: none"> ▫ Must perform in the position at least once every three years to maintain currency and remain eligible for re-certification training. ▫ If individual does not meet the currency requirement, they must repeat the completion of the initial certification and training. 	<p>Refer to the most current Federal Wildland Fire Qualifications Supplement.</p>

Slide #32







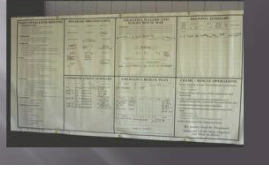
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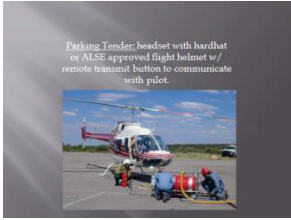
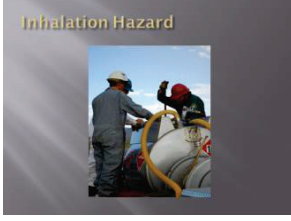


Questions?

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<p>Est. Instruction Time: 30 min</p>	<p>Unit 3: Safety Procedures</p>
<p>PPT Unit 3 Slide #1</p> 	<p>Introduce the unit/topic: Helitorch operations can have a significant cost savings, and reduce the risk to ground personnel.</p> <p>Risk is transferred to the Helitorch module and the pilot performing the operation.</p> <p>It is our job to ensure safe practices and procedures are followed to limit exposure and reduce the potential for an accident to occur.</p>
<p>Slide #2</p> 	<p>Objective(s) After completing this module, participants should be familiar with:</p> <ol style="list-style-type: none"> 1. Briefings – pre-operational and post operational 2. Communications 3. Hazardous Material Safety Data Sheets 4. Mixing hazards and PPE standards 5. Static Bonding Procedures 6. Hazardous materials transportation 7. Spill response procedures
<p>Slide #3</p> 	<p>Objectives Continued</p> <ol style="list-style-type: none"> 8. Job Hazard Analysis/Risk Assessments 9. Operational Safety, Go/No Go and Equipment checklists 10. Fire Protection 11. Emergency Contingency Plans
<p>Slide #4</p> 	<p>Typically there are multiple briefings:</p> <ol style="list-style-type: none"> 1. Agency Administrator 2. Personnel involved with the burn (the operational briefing) 3. Helibase briefing <p>It is important that you have the helibase briefing separate from the other briefings.</p>

<p>Slide #5</p> <p>Briefing Board Example</p> 	<p>Briefing board may be utilized. Important to cover if operating out of a helibase with multiple aircraft.</p>
<p>Slide #6</p> <p>Pre-operational Briefing</p> <ul style="list-style-type: none"> □ Pilot pre-flight briefing, including load calculation, fire shelter use, flight hazards & mission objectives. □ Pre-operational briefing will include the pilot, fuel truck drivers, Operations/Burn Boss, Firing Boss, Helitorch/Helibase, and fire protection personnel. □ Review burn plan objectives and sequence of events. 	<p>Pre-operational briefing should be led by the HTMG and the Burn Boss.</p>
<p>Slide #7</p> <ul style="list-style-type: none"> □ Review the Aviation Safety Plan, Helitorch Operations Checklist & Job Hazard Analysis. □ Helitorch Manager will brief helitorch personnel on: <ul style="list-style-type: none"> □ Hazards and safety requirements □ Emergency procedures □ Personnel assignments □ Inform pilot of helibase operation procedures and alternate emergency landing areas. 	<p>Review each element of the briefing in the presentation.</p>
<p>Slide #8</p> <p>Orientation Flight</p> <ul style="list-style-type: none"> □ Burn Boss/Ignition Specialist shall brief the pilot separately about: <ul style="list-style-type: none"> □ Unit orientation □ Terminology/commands □ Firing patterns □ Fire Behavior □ Unit control lines/boundaries □ Equipment and personnel locations □ Hang-fire flight procedures □ Alternate landing areas identified 	<p>Determine if Burn Boss/Firing Boss will be dropped off at an alternate location to observe operations:</p> <ul style="list-style-type: none"> ○ If landings will occur during this flight, ensure HMGB is onboard aircraft to approve sites identified.
<p>Slide #9</p> <p>Communications Plan</p> <ul style="list-style-type: none"> □ Discreet tactical frequency between pilot, Parking Tender, and Burn/Firing Boss. □ All aircraft and ground personnel must have assigned tactical frequency. □ Air-to-Air frequency assigned. □ Flight following communications established. □ Helibase must maintain a communication link to activate emergency services. 	<p>Discrete frequency recommended if working out of a helibase with multiple aircraft.</p> <p>Test all frequencies prior to commencing operations.</p>

<p>Slide #10</p> 	<p>This is policy per the Aerial ignition guide.</p>
<p>Slide #11</p> <p>Hazardous Material Safety Data Sheet</p> <ul style="list-style-type: none"> □ MSDS - provides information to work safely with hazardous material. □ MSDS explains proper ways to use, handle, and store chemicals, health hazards, precautionary measures to follow, and emergency procedures for spills, fire, and first aid. □ All employees will receive information regarding hazardous materials. 	<p>Users should consult the specific product manufacturer's site for the current version of specific MSDS information.</p>
<p>Slide #12</p> <p>Mixing Hazards</p> <ul style="list-style-type: none"> □ Mixing requires working with chemicals that may cause physical harm when PPE is not used and procedures not followed. □ Review the fire and explosion, health hazard, and special precautions sections of MSDS. □ Portable eyewash station required on-site. 	<p>Dependent on which mixing agent is being utilized PPE standards may vary.</p> <p>Eye wash stations shall have a flow of 15 minutes. The American National Standards institute (ANSI) outlines what a 15 minute continuous flow is.</p> <p>NO SMOKING and NO CELL PHONES OR RADIO signs to be posted.</p> <ul style="list-style-type: none"> ○ Ensure this is briefed on and include the vapor removal outlets.
<p>Slide #13</p> <p>Inhalation Hazard</p> 	<p>You should be wearing an approved dusk mask:</p> <ul style="list-style-type: none"> ○ When dispensing or handling powdered gelling agent
<p>Slide #14</p> <p>Mixing PPE Standards</p> <ul style="list-style-type: none"> □ Ensure all procedures are followed to reduce exposure. □ Hard hat with chinstrap. □ Chemical splash goggles. □ Ear protection. □ Fire resistant clothing labeled as non-static or 100% cotton clothing. □ Nitrile gloves are required during mixing. □ Cotton/leather gloves, non fuel handling. □ NIOSH approved dust mask. 	<p>This is to ensure your health and safety for the future.</p> <p>For Mixing crew clothing:</p> <ul style="list-style-type: none"> ○ Clothing labeled as non-static ○ 100% cotton <p>Clothing must be labeled with Nomex IIIA, or 2% Carbon Core, or 3% Conductive Fiber</p>

Slide #15

Static Bonding

- Bonding is the process of joining equipment with conductive wire to neutralize the potential static discharge.
- Federal, State and Local regulations require bonding connections during gravity transfer of flammable liquids.
- All fuel handling equipment must be bonded.

Discuss how and why we test for continuity.

CAUTION: Before testing helitorch with the helicopter, disconnect pear link from the aircraft cargo hook. Failure to follow this procedure can result in damage to the helicopter wiring if polarity is incorrect.

After the helitorch has been bench tested, it shall be tested with the helicopter while both are on the ground. At this point it is essential that you have conducted a pre-operational briefing with the pilot and crew. This briefing must include communications, any identified hazards, and associated mitigations, aircraft performance, and emergency procedures.



Ensure the desired nozzle tip is installed on the helitorch, that there are no cables over the skids, and have a fire extinguisher staffed with a trained person.

A. Ignition Test



1. Ensure the pump switch is off and turn the ignitor switch on.
2. Have pilot activate the helitorch control switch to test for proper ignition.
3. Have pilot release helitorch control switch and turn ignitor switch off.

B. Pump Test


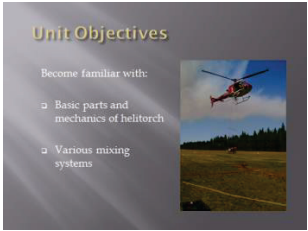
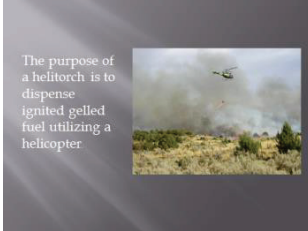
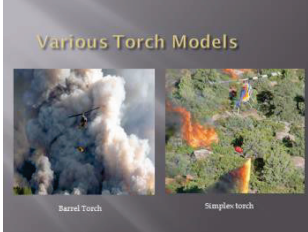
1. Check dry break connection and open hose valve.
2. Insure ignition switch is off and turn pump switch on.
3. Have pilot activate the helitorch control switch after having placed fuel catch vessel under fuel nozzle. Gelled fuel should flow through the nozzle tip. At this time all lines should be bled to insure fuel flow. If you hear the motor turning and no fuel flows, check for clogging, vapor lock, or polarity reversal. If the polarity is reversed, simply reverse the input wires or use a "backward wired pigtail." When polarity is correct, reconnect pear link to the aircraft cargo hook.
4. Check that the positive shutoff valve does not allow fuel to leak from the nozzle and that it operates freely.
5. Make sure both switches are off.
6. The torch is ready for operation.




<p>Slide #16</p> <p>Static Bonding</p> 	<p>Refer to Appendix F in the Aerial Ignition Guide.</p>
<p>Slide #17</p> <p>Static Bonding</p> <ul style="list-style-type: none"> ▫ All hoses used in helitorch operations shall have bonding built into their structure. 	<p>Discuss all components that need to be bonded:</p> <ol style="list-style-type: none"> 1. Fuel truck to Mix System 2. Mix Transfer between barrels 3. Mix System to helitorch
<p>Slide #18</p> <p>Bonding Components and Testing</p> <ul style="list-style-type: none"> ▫ Use only approved 1½" or 2" gasoline transfer hose. ▫ Use only approved 2" vapor hose. ▫ All hardware and equipment will be bonded prior to contact with mixing system (bare metal). ▫ Continuity testing shall be done on all fuel transfer and vapor hoses and bonding cables prior to use. 	<p>Demonstrate or discuss how to use a continuity tester.</p>
<p>Slide #19</p> <p>Hazardous Material Transportation</p> <ul style="list-style-type: none"> ▫ Drivers must follow DOT requirements when transporting hazardous materials. ▫ Federal regulations concerning the transportation of flammable liquids are listed in the Code of Federal Regulations, Title 49, Parts 100-180. 	<p>Drivers must know what the DOT hauling and regulations associated with the equipment are.</p> <p>Transportation of barrels:</p> <ul style="list-style-type: none"> ○ Must be DOT approved and meet the STANDARDS and GUIDELINES. Must be located in a protected area on the vehicle and securely fastened to prevent moving within the vehicle in case of accident or rollover. ○ Must contain less than 1 gallon of residual fuel. ○ Must comply with local and state Highway Patrol Hazmat regulations.
<p>Slide #20</p> <p>Employer Responsibility</p> <ul style="list-style-type: none"> ▫ Employer must ensure drivers meet DOT Regulations and are current with a CDL with Hazmat Endorsement, prior to transporting materials over 119 gallons/1001 lbs: ▫ General awareness ▫ Function specific ▫ Safety ▫ Driver training 	<p>If there is potential to backhaul HAZMAT back from a burn, be prepared to properly adhere to DOT regulations.</p> <p>Loads greater than 119 gallons or 1000 pounds automatically require a commercial driver's license with a hazardous materials endorsement, and extensive drivers training which may include the requirement for a tank endorsement.</p>


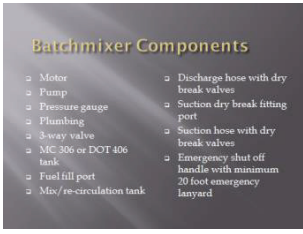

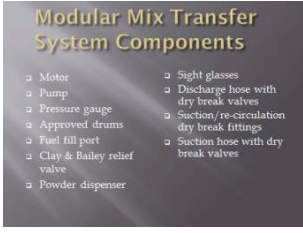

<p>Slide #21</p> <p>Fuel Spill Procedures</p> <ul style="list-style-type: none"> □ Ensure on site personnel safety. □ Remove any ignition source. □ Notify Agency Dispatch/Hazmat Coordinator of spills in excess of 5 gallons. □ Use appropriate PPE during cleanup. □ Spill cleanup: soak up with absorbent material. □ If spill exceeds on site capabilities notify Agency Dispatch/Hazmat Coordinator. □ Disposal must be in accordance with applicable Federal, State, and Local regulations. 	<p>In the event of a spill, scene safety is #1 priority.</p>
<p>Slide #22</p> <p>Job Hazard Analysis</p> <ul style="list-style-type: none"> □ A required document outlining the primary tasks, identifying hazards, and describing methods to mitigate or reduce risks associated with helitorch operations. 	<p>Review this during your briefing and have all participants sign the JHA.</p>
<p>Slide #23</p> <p>Operational Safety & Equipment Checklists</p> <ul style="list-style-type: none"> □ Go No/Go checklist must be completed prior to commencing a helitorch operation. □ Checklists are a reminder of elements, items, and inspections which are required prior to initiating helitorch operations. □ Stop operations if all checklist items do not remain a Go. 	<p>What are all the checklists to be completed? Information may be contained in the IAP, Prescribed fire plan, or PASP and may be utilized in lieu of the following Forms:</p> <ol style="list-style-type: none"> 1. Go/No Go 2. Helitorch Inspection 3. Helitorch Mix System checklist 4. Project Aviation Safety plan 5. Job Hazard Analysis 6. Organization chart 7. Aviation Risk Management Tools-reference IHOJ Appendix J 8. Position task books
<p>Slide #24</p> <p>Fire Protection</p> <ul style="list-style-type: none"> □ Four 40-B-C dry chemical fire extinguishers at operation minimum, one extinguisher at each landing pad. □ And/or, 3 gallon class B CAF or engine with class B foam capability. □ Helitorch personnel should be trained on fire extinguisher use. □ D.O.T. regulations require Batchmixer and fuel trucks have a 40-B-C fire extinguisher on unit when transporting. 	<p>Discuss the proper utilization of fire protection equipment.</p> <p>Train employees on how to use equipment.</p>




<p>Slide #25</p> <p>Trimax Extinguishers</p> 	<p>Trimax extinguishers can be effective, but are limited in mobility and need additional inspections.</p>
<p>Slide #26</p> <p>Parking Tender will staff fire extinguisher at all times.</p> 	<p>Have additional fire extinguisher strategically placed around your mixing system.</p> <p>Discuss when to use them and when to walk away.</p>
<p>Slide #27</p> <p>Emergency Contingency Plan</p> <ul style="list-style-type: none"> □ Establish and follow approved crash rescue plan. □ Establish and maintain a communication link to Dispatch/ICP. □ Establish escape routes and a safety zone. □ Maintain accountability. □ Identify and brief suppression, extraction, and first aid personnel. 	<p>Train for the “What if Event!”</p>
<p>Slide #28</p> <p>Unit Objectives</p> <ul style="list-style-type: none"> □ Become familiar with: □ Briefings - pre-operational and post operational □ Communications □ Hazardous Material Safety Data Sheets (MSDS) □ Mixing hazards and PPE standards □ Static Bonding procedures □ Hazardous material transportation □ Spill response procedures 	<p>Questions?</p>
<p>Slide #29</p> <p>Unit Objectives</p> <ul style="list-style-type: none"> □ Job Hazard Analysis/ Risk Assessments □ Operational Safety, Go/No Go and Equipment checklists □ Fire Protection □ Emergency contingency plans 	


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<p>Est Instructor Time: 45 Min.</p>	<p>Unit 4: Helitorch, Batchmixer, and Modular Mix Transfer Components</p>
<p>PPT Unit 4 Slide #1</p> 	<p>Introduce the unit/topic:</p> <p>All aerial ignition systems must meet Occupational Safety and Health Administration (OSHA), Department of Transportation (DOT) requirement, and National Fire Protection (NFPA) standards, as well as the required safety modifications outlined in the Aerial Ignition Guide Appendix D, E, and F.</p> <p>Refer to Chapter I in the Aerial Ignition Guide for:</p> <ol style="list-style-type: none"> 1. Approved systems 2. Agency manufactured or modified devices 3. Manufacturer modifications 4. Aerial ignition systems approval process
<p>Slide #2</p> 	<p>Discuss what mixing system and Helitorch(s), you will be training on.</p> <p>Training and certification is model specific</p>
<p>Slide #3</p> 	<p>Gel may be mixed by using the following products:</p> <ul style="list-style-type: none"> • FIRETROL Firegel (also known as Sure Fire) • FIRETROLPetro Gel • Flash 21 • Halliburton MO85 and MO86 <p>Only gelling agents with a current MSDS sheet are approved for use.</p>
<p>Slide #4</p> 	<p>What are the approved Helitorches?</p> <ul style="list-style-type: none"> • Simplex Model 5400 • Fire Spec 2000 • Isolair • Western Helicraft • Northern • T & T • MTDC Helitorch(to be approved in 2016)


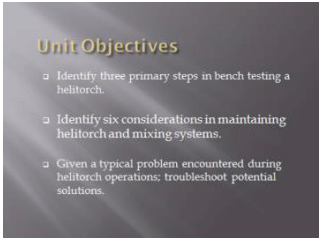

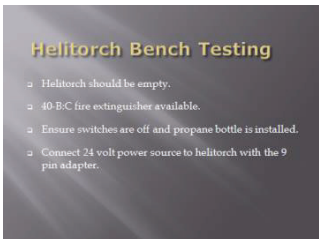
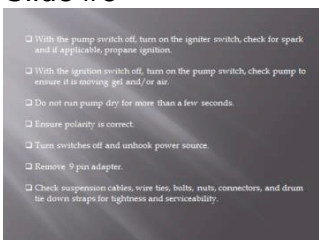
<p>Slide #5</p> <p>Helitorch Primary Parts</p> <ul style="list-style-type: none"> □ Frame □ Fuel tank with sight glasses, (no sight glass on barrel torch) □ Ignition system □ Pump and positive shut-off nozzle □ Clay & Bailey relief valve (exception barrel torch) □ Cam-lock and dry break fittings □ Single point suspension with adjustable attachment point and electrical cable 	<p>All Helitorch systems have similar parts as listed in this Slide.</p> <p>Inspection of these parts prior to each use are important to success. Refer to Helitorch inspection Checklist (Appendix E).</p>
<p>Slide #6</p> <p>Simplex 5400 & Isolair Torches</p> 	<p>Simplex 5400</p> <ul style="list-style-type: none"> • Propane assist • Large frame system • Frame protects system • May have 24 volt pump or belt driven pump • Mix gel with mixing system <p>Isolair</p> <ul style="list-style-type: none"> • Propane assist • Tip folds up • Mix Gel with mixing system
<p>Slide #7</p> <p>Barrel & Spec 2000 torches</p> 	<p>Fire Spec 2000</p> <ul style="list-style-type: none"> • Electrical ignition • Tip Folds up • 24 volt pump • More exposed • Mix Gel with mixing system <p>Barrel Torch (Western, Norther, T&T)</p> <ul style="list-style-type: none"> • Propane assist • Assembled on site • Utilized in remote locations • Mix Gel manually
<p>Slide #8 Same as Slide #7</p>	
<p>Slide #9</p> <p>Mixing Systems</p> <ul style="list-style-type: none"> □ Basic function of mixing system is to combine fuel with a gelling agent to create a thickened mixture, then transfer it to the helitorch. 	<p>Two types:</p> <ol style="list-style-type: none"> 1. Batchmixer 2. Mix Transfer

<p>Slide #10</p>  <p>Batchmixer</p> <ul style="list-style-type: none"> ▫ Designed to mix, pellet, agitate and fuel to a truck, consistent mix ▫ Tank designed to meet U.S. DOT regulations ▫ Capable of mixing large quantities of fuel & pumping to helitorch drums 	<p>Discuss the advantages and disadvantages of:</p> <ul style="list-style-type: none"> • Capable of mixing 4 barrels • Still does have ability to mix one at a time • Hazmat/CDL requirements
<p>Slide #11</p>  <p>Batchmixer Components</p> <ul style="list-style-type: none"> ▫ Motor ▫ Pump ▫ Pressure gauge ▫ Flaming ▫ 3-way valve ▫ MC 306 or DOT 406 tank ▫ Fuel fill port ▫ Mix/re-circulation tank ▫ Discharge hose with dry break valves ▫ Suction dry break fitting port ▫ Suction hose with dry break valves ▫ Emergency shut off handle with minimum 20 foot emergency lanyard 	<p>Tank must be inspected annually.</p> <p>Refer to Appendix E for Batchmixer inspection.</p>
<p>Slide #12</p>  <p>Modular Mix Transfer System</p> <ul style="list-style-type: none"> ▫ Same purpose as a batchmixer ▫ Not hard plumbed to a mix tank ▫ Pumps pulled fuel from one drum to another ▫ Less costly to purchase/manufacture ▫ Easier to comply with DOT regulations for public highway transportation. 	<p>Does not need annual DOT inspection.</p> <p>Usually stored in enclosed trailer.</p> <p>If enough equipment is available could support 2 operations.</p>
<p>Slide #13</p>  <p>Modular Mix Transfer System Components</p> <ul style="list-style-type: none"> ▫ Motor ▫ Pump ▫ Pressure gauge ▫ Approved drums ▫ Fuel fill port ▫ Clay & Bailey relief valve ▫ Powder dispenser ▫ Sight glasses ▫ Discharge hose with dry break valves ▫ Suction/re-circulation dry break fittings ▫ Suction hose with dry break valves 	<p>Refer to Appendix E for Mix Transfer checklist.</p>
<p>Slide #14</p>  <p>Transfer System Components</p>	<p>There are many variations of transfer pumps:</p> <ul style="list-style-type: none"> • The pump, in picture shown, has the ability of not disconnecting the hose from the bottom of the barrel (suction) to mix another barrel.

<p>Slide #15</p> <p>Helitorch Support Kit Contents -PPE</p> <ul style="list-style-type: none"> ▫ Nitrile , leather and cotton gloves ▫ Cotton or non-static clothing ▫ NIOSH approved dust masks ▫ Chemical splash goggles ▫ Ear plugs 	<p>Dusk masks are for a one time use, and a new one should be used daily.</p>
<p>Slide #16</p> <p>Helitorch Support Kit Contents (cont) -Mixing Equipment</p> <ul style="list-style-type: none"> ▫ Scale ▫ Aluminum container for powder measuring ▫ Non-ferrous mixing paddle ▫ Commercial gelling agent ▫ Fuel thermometer 	<p>Extra fuel for mixing/transfer pump.</p> <p>Have enough mixing agent/powder for duration of the operation.</p>
<p>Slide #17</p> <p>Helitorch/Mixing System Misc. Supplies and Parts</p> <ul style="list-style-type: none"> ▫ Extra drums ▫ 24 volt system for bench testing equipment ▫ Extra parts: spark plug, drive belts, solenoid valve, single pole guarded electrical switch, propane regulator, dry break (male and female) ▫ Propane bottles ▫ O-ring ▫ Grease Gun w/ grease ▫ 5 gal. of diesel or jet A ▫ Cotton rags, hand cleanser, steel wool, duct tape, wire brush, wire ties, garbage bags, etc. ▫ Cubes of water ▫ Tools and 2 large non-ferrous pipe wrenches ▫ Spare drum seal(s) 	<p>Discuss and explain how to utilize/change out parts for minor maintenance.</p>
<p>Slide #18</p> <p>Non-ferrous Pipe Wrench With Brass Teeth</p> 	<p>Non-ferrous tools are utilized due to Non-sparking.</p> <p>Many metals are non-ferrous:</p> <ul style="list-style-type: none"> • Aluminum, Copper, Lead, Nickel, Tin, Titanium, Zinc, Brass
<p>Slide #19</p> <p>Static Bonding Equipment</p>  <ul style="list-style-type: none"> ▫ Bonding cables with clamps and clips ▫ Approved transparent vapor hose ▫ Approved gasoline transfer hose ▫ Both the vapor and fuel transfer hose should have wire braid and be continuity tested prior to use 	<p>All items that have fuel or transfer fuel needs to be bonded.</p>

<p>Slide #20</p> <p>Helitorch Base Equipment</p> <ul style="list-style-type: none"> ▫ 40-B-C fire extinguishers ▫ Pad marker w/ nails ▫ Wind indicator, wind meter and thermometer ▫ Helibase, No Smoking and Flammable signs ▫ Barrier flagging with stakes ▫ First Responder Medical Kit w/ burn blankets and eye wash ▫ Crash Rescue Kit ▫ Evacuation Kit ▫ 3 Gallon Class B foam w/ inducator (optional) ▫ Fiber tape ▫ Fire shelters (pilot) 	<p>Portable eye wash station with a 15 minute continuous flow:</p> <ul style="list-style-type: none"> • Should be filled immediately once on site
<p>Slide #21</p> <p>Unit Objectives</p> <p>Become familiar with:</p> <ul style="list-style-type: none"> ▫ Basic parts and mechanics of helitorch ▫ Various mixing systems 	<p>If time permits, show class your equipment.</p>

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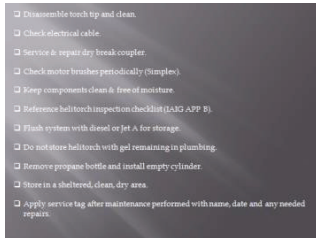
<p>Est. Instructor Time: 30 min</p>	<p>Unit 5: Bench Testing, Maintenance, and Troubleshooting</p>
<p>Slide #1</p> 	<p>Introduce the Unit/Topic.</p> <p>Being familiar with your Helitorch prior to operations is important for if/when issues arise.</p> <p>Helitorches that are kept clean and maintained will avoid operational delays.</p>
<p>Slide #2</p> 	<p>Instructor:</p> <ul style="list-style-type: none"> This unit may be taught either using power point, or all hands on adhering to objectives being met.
<p>Slide #3</p> 	<p>Bench testing is required prior to operation, and may be done multiple times throughout an operation if problems arise such as:</p> <ul style="list-style-type: none"> Gelled Fuel dispenses during operation with no ignition Gelled fuel does not dispense
<p>Slide #4</p> 	<p>During Bench testing ensure:</p> <ol style="list-style-type: none"> Fire Extinguisher is readily available Remember what position does the bench testing? <ul style="list-style-type: none"> Typically HTPT
<p>Slide #5</p> 	<p>Following correct procedures is very important to ensure safety.</p>

Slide #6



Discuss the importance of maintenance and how to properly store equipment.

Slide #7



Disassemble torch tip and clean:

- Use non-ferrous tools
- Use steel wool to clean

Check Electrical cable:

- Check for breaks or hard bends in cord
- Check plug-in for cracks or bent prongs

Service and repair dry break:

- Clean off any residual gel
- Ensure valve works properly

Check motor brushes periodically:

- Only on the 24 volt pump

Keep components clean and free of moisture:

- Proper storage, in a clean dry area

Reference helitorch inspection checklist:

- Good to do post and pre-season prior to sending into the field

Flush system with diesel or Jet A for storage:

- Not required to do a flush, gel acts as a sealant, but the powder mixing agent could thicken and cause future issues.
- A mixed flash 21 will store over winter
- Suggest adding a little diesel or Jet A into system to break down gel

Do not store helitorch with gel remaining in plumbing:

- Add either diesel or Jet A into the system to break down gel

Remove propane bottle and install empty cylinder:


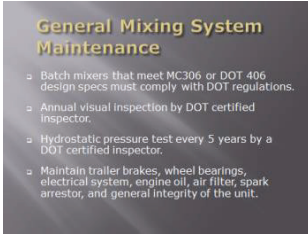
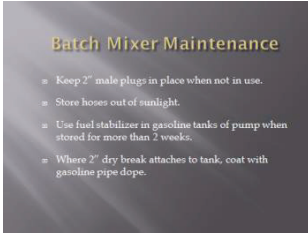
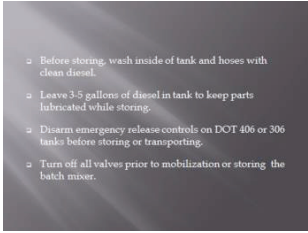

- Have a designated bottle labeled "EMPTY" to install

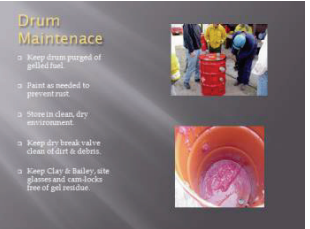
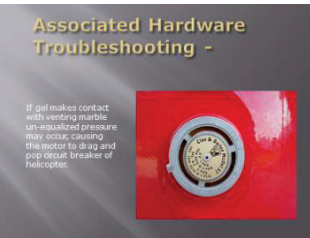

Store in a sheltered clean dry area:

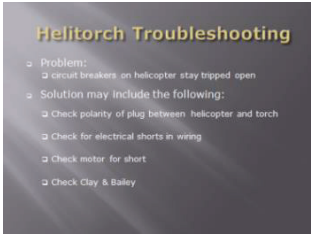
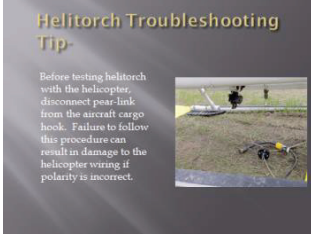

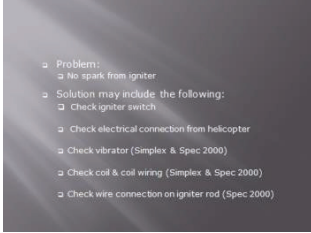
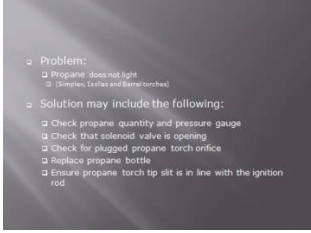
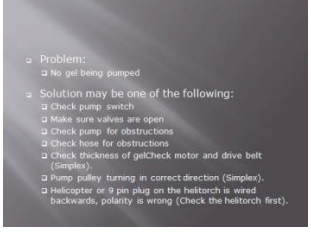
- Either indoors, or a moisture free environment
- Flash 21 should not be frozen, but will work if it has been froze

Apply Service tag after maintenance performed:

- System should have a log book that stays with system

<p>Slide #8</p> 	<p>Typically requires CDL to transport system to and from locations:</p> <ul style="list-style-type: none"> • Refer to state DOT requirements
<p>Slide #9</p> 	<p>Trailer or Truck typically dedicated to the system.</p>
<p>Slide #10</p> 	
<p>Slide #11</p> 	<p>Store batchmixer in a secure location:</p> <ul style="list-style-type: none"> • To prevent vandalism • To limit exposure to animals <p>Store in a well ventilated area.</p>
<p>Slide #12</p> 	<p>Systems are typically stored/housed in a enclosed trailer.</p> <p>The best maintenance is using the system yearly.</p>

<p>Slide #13</p> <p>Drum Maintenance</p> <ul style="list-style-type: none"> ➤ Keep drum purged of gel/fuel. ➤ Paint as needed to prevent rust. ➤ Store in clean, dry environment. ➤ Keep dry head valve clean of dirt & debris. ➤ Keep Clay & Bailey site planned & free of gel residue. 	<p>If gel is left in the barrel, suggest breaking it down with diesel or Jet A.</p> <p>Have extra parts available to be able to do field maintenance if needed.</p>
<p>Slide #14</p> <p>Associated Hardware Troubleshooting -</p> <p>If gel makes contact with venting marble an imbalanced pressure may occur, causing the motor to drag and poor overall breaker of helicopter.</p> 	<p>The venting marble in the Clay & Bailey should move freely. The purpose of the Clay & Bailey is to allow venting of the barrel. If it is not working properly:</p> <ol style="list-style-type: none"> 1. Replace with one that works properly 2. Clean venting marble with cloth material and gasoline
<p>Slide #15</p> <p>Associated Hardware Troubleshooting -</p>  <p>2" female cam-lock with Clay & Bailey inserted for more clearance</p>	<p>When removing the Clay & Bailey:</p> <ul style="list-style-type: none"> • Wear proper PPE • If pump is running be aware of splash potential • Ensure valve is properly seated before operations resume
<p>Slide #16</p> <p>Vapor Hose Maintenance</p> <ul style="list-style-type: none"> ➤ Store hoses in dry location away from sunlight. ➤ Keep 2" cam-lock on hose while being stored. ➤ Perform continuity test. ➤ Replace brittle/cracked hoses. ➤ Clean all vapor recovery hoses of any gel residue. 	<p>If Gel/Fuel enters vapor hose cleaning is very difficult</p> <ol style="list-style-type: none"> 1. Dispose of Gel/Fuel properly by putting it back into the tank or approved canisters 2. Flush hose out with water 3. Let air dry before use <p>Expect hoses to break down shortly after gel/fuel enters hose.</p>
<p>Slide #17</p> <p>Mixing Agents</p> <ul style="list-style-type: none"> ➤ Keep all gelling agents in a cool non-freezable dry storage area. ➤ Ensure MSDS requirements are met. 	<p>Use only approved mixing agents:</p> <ul style="list-style-type: none"> • FIRETROL Firegel (also known as Sure Fire) • FIRETROL Petro Gel • Flash 21 • Halliburton MO85 and MO86 <p>Once mixing agent is introduced into mixing system, utilize same agent for best results. If agents are switched' flush system completely.</p>

<p>Slide #18</p>  <p>Helitorch Troubleshooting</p> <ul style="list-style-type: none"> ▫ Problem: <ul style="list-style-type: none"> ▫ circuit breakers on helicopter stay tripped open ▫ Solution may include the following: <ul style="list-style-type: none"> ▫ Check polarity of plug between helicopter and torch ▫ Check for electrical shorts in wiring ▫ Check motor for short ▫ Check Clay & Bailey 	<p>Ensure aircraft vendor personnel are involved with a problem like this. The mechanic can be a good resource.</p>
<p>Slide #19</p>  <p>Helitorch Troubleshooting Tip:</p> <p>Before testing helitorch with the helicopter, disconnect pear-link from the aircraft cargo hook. Failure to follow this procedure can result in damage to the helicopter wiring if polarity is incorrect.</p> 	<p>After all testing is complete don't forget to hook up the pear link, and perform hook checks #1 and #2.</p>
<p>Slide #20</p>  <ul style="list-style-type: none"> ▫ Problem: <ul style="list-style-type: none"> ▫ No spark from igniter ▫ Solution may include the following: <ul style="list-style-type: none"> ▫ Check igniter switch ▫ Check electrical connection from helicopter ▫ Check vibrator (Simplex & Spec 2000) ▫ Check coil & coil wiring (Simplex & Spec 2000) ▫ Check wire connection on igniter rod (Spec 2000) 	<p>Instructor: Consider having a helitorch or pictures to be able to point out specific parts to the class.</p>
<p>Slide #21</p>  <ul style="list-style-type: none"> ▫ Problem: <ul style="list-style-type: none"> ▫ Propane does not light ▫ (Simplex, Torches and Flame torches) ▫ Solution may include the following: <ul style="list-style-type: none"> ▫ Check propane quantity and pressure gauge ▫ Check that solenoid valve is opening ▫ Check for plugged propane torch orifice ▫ Replace propane bottle ▫ Ensure propane torch tip slit is in line with the ignitor rod 	<p>Quiz: How many barrels will run off 1 propane tank?</p> <ul style="list-style-type: none"> • 3 – change bottle out after 3 full barrels. Propane bottles are way cheaper than flight time and unnecessary exposure
<p>Slide #22</p>  <ul style="list-style-type: none"> ▫ Problem: <ul style="list-style-type: none"> ▫ No gel being pumped ▫ Solution may be one of the following: <ul style="list-style-type: none"> ▫ Check pump switch ▫ Make sure valves are open ▫ Check pump for obstructions ▫ Check hose for obstructions ▫ Check thickness of gel/Check motor and drive belt (Simplex). ▫ Pump pulley turning in correct direction (Simplex). ▫ Helicopter or 9 pin plug on the helitorch is wired backwards, polarity is wrong (Check the helitorch first). 	

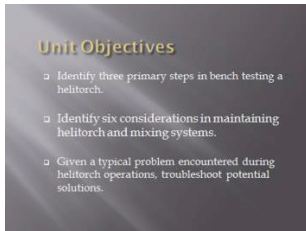
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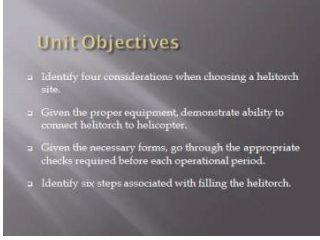
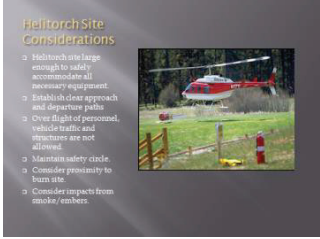
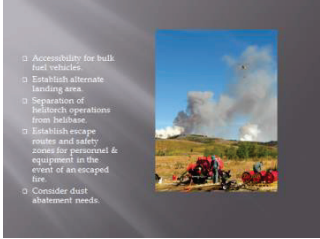
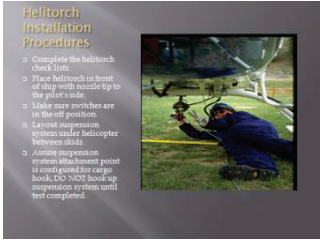



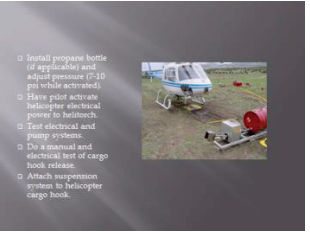


Have a student discuss what he/she would do.

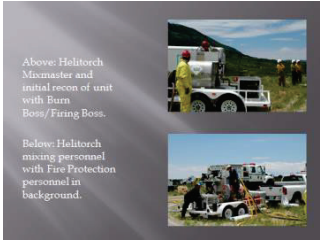

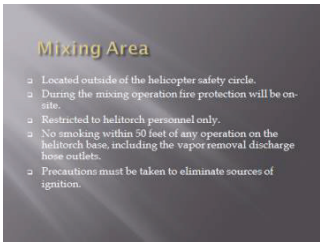
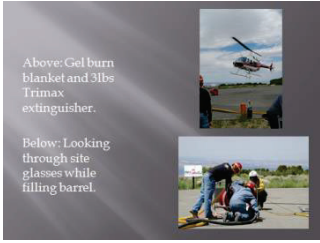

Discuss other problems you have encountered and share with the class.




Slide #24







<p>Est. Instructor Time: 45 min</p>	<p>Unit 6: Helitorch Operations/Exercises</p>
<p>Slide #1</p> 	<p>Introduce the Module/Topic</p> <p>Being familiar with your equipment is essential to an efficient operation. Having a module that is competent and capable of operating equipment is a must to ensure a safe and reliable aerial ignition operation.</p>
<p>Slide #2</p> 	<p>Instructor:</p> <p>This unit may be taught by utilizing the power point or refer to Appendix A for stations that meet the unit objectives, or create your own stations adhering to unit objectives.</p>
<p>Slide #3</p> 	<p>Pre planning is key when selecting a mixing site:</p> <ul style="list-style-type: none"> • Consider Land use agreements <p>Helispot size needs to be larger than the minimums:</p> <ul style="list-style-type: none"> • 75 feet is the IHOG standard for a type 3
<p>Slide #4</p> 	<p>Bridge Limitations for bulk fuel vehicle.</p> <p>Separation of helitorch operation from helibase:</p> <ul style="list-style-type: none"> • Consider utilizing additional frequency
<p>Slide #5</p> 	<p>Hookup of the Helitorch is the responsibility of the HTPT:</p> <ul style="list-style-type: none"> • Don't forget the hook checks #1 and #2 (after the Helitorch tests are complete in preparation for hookup to the aircraft).

<p>Slide #6</p> 	<p>During this step the Helitorch switches should all be in the off position.</p> <p>Ensure Helitorch tip is on the pilot side of the aircraft.</p>
<p>Slide #7</p> 	<p>Which test is completed first? The Ignition or pump?</p> <p>Ignition is tested first, if pump is tested first residual gel may be on the tip and hang fire will be present during ignition test causing a fire.</p>
<p>Slide # 8</p> <p>Helicopter - Helitorch Test</p> 	<p>Let's review the entire process: (Steps listed in order)</p> <ol style="list-style-type: none"> 1. Complete Helitorch Checklist 2. Place Helitorch in front of aircraft 3. Layout suspension cables 4. Ensure Helitorch is in the off position 5. Hookup electrical to aircraft 6. Ensure propane is on and bottle is full 7. Test electrical (turn on switch and have pilot activate) 8. Turn off electrical 9. Test pump (turn on switch have pilot activate switch): <ul style="list-style-type: none"> o Have rubber bucket under the tip with splash guard in place o Check gel consistency and show to pilot 10. Hookup up pear link when the pilot says it ok to do so
<p>Slide #9</p> <p>Torch Base Operations</p> <p>Mixing Area</p> 	<p>Discuss good mixing site locations.</p>

<p>Slide #10</p>  <p>Above: Helitorch Mixmaster and initial recon of unit with Burn Boss/Firing Boss.</p> <p>Below: Helitorch mixing personnel with Fire Protection personnel in background.</p>	<p>Not required for any Helitorch personnel to go on recon unless:</p> <ul style="list-style-type: none"> • Helispots will be identified, HMGB must be onboard, and all personnel must be in flight helmets first time into helispot • Pertinent to the mission
<p>Slide #11</p>  <p>Helitorch Mixmaster and Trainees at mix transfer site</p>	<p>Utilize trainees whenever possible for the future of the program:</p> <ul style="list-style-type: none"> • Highly recommended trainees have class prior to task book initiation
<p>Slide #12</p>  <p>Mixing Area</p> <ul style="list-style-type: none"> ▫ Located outside of the helicopter safety circle. ▫ During the mixing operation fire protection will be on-site. ▫ Restricted to helitorch personnel only. ▫ No smoking within 50 feet of any operation on the helitorch base, including the vapor removal discharge hose outlets. ▫ Precautions must be taken to eliminate sources of ignition. 	<p>All Helitorch personnel are responsible for monitoring the mixing area and non-essential personnel.</p>
<p>Slide #13</p>  <p>Above: Gel burn blanket and 3lbs Trimax extinguisher.</p> <p>Below: Looking through site glasses while filling barrel.</p>	
<p>Slide #14</p>  <p>Avoid Static Electricity</p> <p>NO PLASTIC of any kind should be used in mixing powder getting operations.</p>	<p>Other precautions:</p> <ul style="list-style-type: none"> • No radios/cell phones with mixing personnel • Proper PPE • Use non-ferrous wrenches

<p>Slide #15</p> <p>Bonding Sequence</p> 	
<p>Slide #16</p> <p>Bond to bulk fuel source</p> 	<p>Bond mix transfer barrels to each other.</p>
<p>Slide #17</p> <p>Bonding Mixing Systems, Helitorch & Bulk Fuel Source</p> <ol style="list-style-type: none"> 1. Connect bonding cable from bulk fuel nozzle to the mixing system or a common bonding point 2. Connect vapor removal hose 3. Open fueling port and begin fueling 4. When fueled remove nozzle, close port 5. Remove bonding cable <p>• Note: The goal is to provide bonding continuity</p>	<p>No bonding cables, NO GO!</p>
<p>Slide #18</p> <p>Helitorch Filling Procedures</p> <ol style="list-style-type: none"> 1. Parking Tender marshals helicopter to filling pad 2. Parking Tender/Mixmaster ensures helitorch switches are turned off 3. Parking Tender is positioned between torch and helicopter with fire extinguisher 	<p>Note: Have a pad marker for the Helicopter pilot to land the Helitorch each time to ensure hoses will reach the Helitorch.</p>
<p>Slide #19</p> <ol style="list-style-type: none"> 1. Connect vapor recovery hose. 2. Connect fuel transfer hose. 3. After filling disconnect fuel transfer hose. 4. Remove vapor recovery hose. 	<p>Have a process. Start at one end of the Helitorch and work your way to the other end. Then reverse operation after fill is complete.</p>

<p>Slide #20</p> <p>Helitorch Filling Procedures</p> <ol style="list-style-type: none"> 1. Mixmaster turns on helitorch ignition and pump switches. 2. Parking Tender console switches are turned on and completes visual inspection. 3. Parking Tender marshals helicopter off filling pad. 	<p>Discussion: Who is currently running the pump at the mix transfer or batchmixer?</p>
<p>Slide #21</p> <p>Helitorch Filling Visual Inspection</p> <ul style="list-style-type: none"> o Suspension and frame visual check o Cam lock caps secured o Visual check of Drum straps o Propane pressure check (if applicable) o Dry break valve open (duct taped open) o Ignition and tip components properly adjusted & cleaned 	<p>Remember: If applicable switch propane bottle out every 3 barrels.</p>
<p>Slide #22</p> <p>Mixing Systems</p> 	<p>Two approved types:</p> <ol style="list-style-type: none"> 1. Mix Transfer 2. Batchmixer
<p>Slide #23</p> <p>Mixing Systems</p> 	<p>Both systems can operate smooth if personnel are trained and equipment is maintained.</p>
<p>Slide #24</p> <p>PAY ATTENTION !!</p> 	<p>If an incident occurs, results could be catastrophic!</p>

Slide #25

Unit Objectives

- Identify four considerations when choosing a helitorch site.
- Given the proper equipment, demonstrate ability to connect helitorch to helicopter.
- Given the necessary forms, go through the appropriate checks required before each operational period.
- Identify six steps associated with filing the helitorch.

Questions?

APPENDIX A:

Example of Stations to be utilized in Lieu of Unit 6

STATION #1 Bench Testing/Helitorch Hookup/Checklists-

Required Equipment: 2 helitorch's (Torches that you are utilizing at your unit), 1 helicopter simulator (or power box), propane if required, helitorch checklist, bucket with splash guard, 1 maintenance kit, Aerial Ignition Guide/Burn Binder.

Bench Testing

- Basic Bench Testing

Forms

- Discuss Appropriate Forms to be used:
 - Helitorch inspection etc.
 - Ref. Burn Binder Or AIG guide for forms

Helitorch Hookup

- Visually inspect helitorch for abnormalities
- Complete helitorch checklist:
 - During checklist procedure remove cover, disassemble tip, and any other components that would help with your inspection procedures

Helitorch#2 (positioned in front of helicopter)

- Have group position helitorch for hook up
- Deploy suspension cables
- Insert propane bottle if applicable
- Plug electrical into aircraft (not pear link)
- Perform electrical and pump test
- Hook pear link to helicopter and discuss different types of cargo hooks
- Disconnect and package helitorch for next group

STATION #2 BATCHMIXER

Required Equipment: 1 FireCon Batchmixer and additional equipment, 1 Helitorch, and Associated CAF Fire Extinguishers.

Batchmixer

- Discuss mixing site
- Set up mixing equipment with additional equipment i.e. fuel truck
- Discuss HAZ/MAT containment
- Describe filling, mixing and connections prior to operation
- Attach ventilation, filling, and bonding cables for transfer to helitorch
- Discuss communications and emergency procedures:
 - Hand signals
 - Radio communication
 - Fuel spill
 - Crash Rescue
- Discuss troubleshooting for helitorch and mixing system

Forms/RX plans

- Cover required positions and responsibilities. Utilize:
 - Helitorch organization chart for Prescribed Fire
 - AIG personnel responsibilities Page IV-3
- Cover Prescribed fire communication plan

STATION #3- MIX TRANSFER SYSTEM/ MIXING PRODUCTS

Required Equipment: 1 complete Mix Transfer system, 1 Helitorch, Associated Fire Extinguishers, Spill containment, PPE, and maintenance kits. Flash 21.

Mix Transfer Mixing Site

- Discuss mixing site
- Set up mixing equipment with additional equipment
- Discuss HAZMAT containment area

Forms

- Hand-out and Cover Inspection Form

Operation

- Describe filling, mixing and connections prior to operation
- Attach ventilation, filling, and bonding cables for transfer to helitorch
- Discuss communications and emergency procedures:
 - Hand signals
 - Radio communication
 - Fuel spill
 - Crash rescue
- Discuss Troubleshooting for helitorch and mixing system
- Discuss differences in pumps

Mixing Products

- Discuss Mixing Ratio's and process
- Hazards associated and with product

EXTINGUISHERS

- Discuss inspection and maintenance:
 - Check pressure valve "O" ring's
 - Inspection Dates:
 - Static pressure inspection date
 - Inspection Tag and date
 - Inspect pressure gauge
 - Inspect and discuss all other components
- Discuss Filling Procedures for CAF
- Discuss P.A.S.S.