

# **FIRESCOPE NIGHT FLYING GUIDELINES**



**April 2013**



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## **I. Summary**

**Purpose:** Provide guidelines for the use of Inter-agency aircraft for both night initial and extended attack operations on emergency incidents to enhance safety, operational effectiveness, and fiscal prudence.

**Scope:** This document provides guidelines for Pilots, Agency Aviation Managers, and Incident Command Personnel.

**Authority:** This document is designed to be a component of the recommendations from the Governor's 2004 Blue Ribbon Commission Section 1: Jurisdictional and Operational Barriers; Multi-Jurisdictional Recommendations; Item 5. The Commission recommends that all federal, state and local forest firefighting agencies review their aircraft operation cut-off time and determine if there can be a window of flexibility to expand incident operational times, while at the same time taking into consideration flight crew safety. Additionally, these agencies should review technological capabilities to extend available aerial emergency response capabilities.

**Background:** Lives, property, and natural resource values are threatened on a 24 hour basis. In specific situations, night vision image technology can be applied to aviation missions performed by public safety and natural resource agencies. Risk assessment and risk management principles coupled with the use of night vision image technology can reduce the risk factors and increase the mission effectiveness of night flying aircraft. It is the intent of this document to provide operational and informational guidelines and recommendations in order to best determine the safety and effectiveness of night flying operations.

Risk assessment and risk management guidelines are provided in order to assist in mission go/no-go decisions. The material and reference sources contained in this guideline will assist agencies in supporting night flying operations

Operational guidelines are provided to aid in ensuring that risk mitigation is in place, specific operational procedures have been briefed and all parties have a clear understanding of the parameters of the operation.

**Recommendations:** **A comprehensive evaluation of the need to conduct night flight operations should be performed by the agency having jurisdiction (AHJ).** The intent of this document is to serve as a guideline(s) for Inter-agency night flying operations. If a night flying operation can be justified, the information contained in this document is recommended to be used for both evaluation of a need to perform these operations and the implementation of the operations contained within the scope of this document. It is the recommendation that all Inter-agency night flying operations be conducted within the guidelines set forth in this document.



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## **II. Night Vision Technology Standards**

### **A. Aircraft Lighting Modifications.**

- Modification of aircraft lighting should be compatible with the class of Night Vision Goggles (NVG) used. See [NFG Informational Appendix 1 Spectral Sensitivity](#).
- All work performed should meet the STC Standards.
- Aircraft lighting modifications must meet the guidelines of the Radio Technical Commission for Aeronautics (RTCA) DO-275 Minimum Operational Performance for Integrated Night Vision Imaging Systems RTCA DO-275 is available at [RTCA.org](http://RTCA.org).
- Military Federal Excess Property aircraft that have been modified for NVG will need to have Military Specification (MILSPEC) compatibility with the class of NVG being used.

### **B. Night Vision Goggles. (NVG)**

- Technical Standards
  - The RTCA technical standards contained in DO-275 are used by the FAA for the NVG. FAA Technical Standard Order TSO-C164 discusses the issue of NVG technical standards. (See [NFG Informational Appendix 2 FAA Technical Standards Order TSO-C164](#))
- Maintenance Procedures.
  - Typically a six month maintenance interval is standard. Maintenance should follow manufacturer's recommendations and comply with current FAR standard.



### **III. Pilot and Crewmember Training Standards.**

#### **A. Pilot Experience Standards:**

	<u>Minimum Hours:</u>
Pilot in Command Helicopter:	1,500 hours
Helicopter preceding 12 months	100 hours
Weight Class/ICS Type preceding 12 months	100 hours
Make and Model (With manufacturer's flight school)	25 hours
Make and Model (Without manufacturer's flight school)	50 hours
Rough terrain flying or mountain flying	200 hours
* Previously Fire Carded	
Helicopter Night Flying Hours	250 hours
Helicopter Night Flying Hours in Type	50 hours
Night Vision Goggle Flight Training	8 hours
Night Vision Goggle Ground School	8 hours
* Night Currency Training Requirements per FAR 61.31/61.57 (K)	

#### **A. Night Vision Goggle (NVG) Initial Training**

Pilot and crewmember initial ground training should be done to FAR standard to include the following as a minimum:

- Crew Resource Management
- Aero Medical Factors
- Night Vision Goggle Operations
- Aircraft Lighting Systems
- NVG Night Terrain Interpretation
- Agency Specific Procedures

Initial NVG pilot flight instruction should be performed by a FAA authorized instructor pilot with an NVG endorsement.

Pilot initial flight instruction should include the following as a minimum:

- Pilot Basic Flight Maneuvers.
- Pilot Emergency Procedures
- Agency Specific Missions.
- Pilot Check Flight.

#### **B. NVG Recurrent Training.**

Training for currency and recurrent training must be conducted according to FAR standard

For current NVG and equipment standards go up the FAA web site [www.faa.gov/library/manuals](http://www.faa.gov/library/manuals). Select the 2004 Flight Standards Handbook for Air Transportation (HBAT). HBAT 04-02A amended 10-02-06 is current at the time of this writing.

It is recommended that Helicopter Pilot NVG training standards conform to the FAA Commercial Pilot Practical Test Standards for Rotorcraft FAA-S-8081-16.



## **IV. Night Operations**

### **A. Pre-Planning (Policy Recommendations)**

Agencies need to evaluate and implement a night operations program that adheres to their individual approach to night flying in order to fulfill their mission statements and to ensure their jurisdictional authority is not compromised.

However, it should also be the understanding of the AHJ that once Inter-agency aircraft are requested, FIRESCOPE recommends that the Inter-agency guidelines be utilized to improve safety and increase efficient Inter-agency operations. This will most likely occur during the “Extended Attack” phase of an incident.

The primary issue to resolve is how agencies will safely and effectively work with each other when there are differing policy and procedural issues such as:

- Geographic responsibilities that may result in aircraft night flying over another agency’s jurisdictional area due to initial action zone overlap.
- Functional responsibilities that may be overlapping. (Such as emergency medical night flight provided by a county in federal land) This may occur away from initial action zones.
- In federal and state lands, significant legal issues may be created.

It is recommended that night flying policy and procedural conflicts be resolved by executive staff members with input from agency legal departments. Night flight policy and procedural issues should be codified with cooperating agencies so incident operations are not impaired. Methodologies that can be considered are:

- Pre-Attack Plans.
- Memorandums of Understandings.
- Letters of Agreement.
- Changes in agency policy and procedure manuals.
- In Section E of this guideline, Night Operations Position Checklist for the Field Operations Manual ICS 420-1 is provided to help resolve issues during incident operations.

### **B. Initial Attack (Policy Recommendations)**

Night time aerial initial attack operations should not occur before verification that at least one of the Night Flying Operational Assessments has been met:

- Lives are or will be threatened
- Structures are or will be threatened
- Resources of significant value are, or will be threatened
- Excessively high suppression cost will be prevented



Flight crews (pilots) shall not be expected to fly at night over terrain with which they are not intimately familiar. Individual agencies need to define what they will consider as flight crew/pilot familiarity.

Agencies that cover large geographic areas may find it necessary to require their flight crews/ pilots to perform a detailed daylight reconnaissance of the operational area prior to night operations.

**C. Extended Attack (Policy Recommendations)**

Night time aerial operations conducted in the second and subsequent operational periods shall meet the Night Flying Operational Assessment criteria:

- Lives are or will be threatened
- Structures are or will be threatened
- Resources of significant value are, or will be threatened
- Excessively high suppression cost will be prevented

Flight crews (pilots) shall not be expected to fly at night over terrain with which they are not intimately familiar. Individual agencies need to define what they will consider as flight crew/pilot familiarity.

Agencies that cover large geographic areas may find it necessary to require their flight crews/ pilots to perform a detailed daylight reconnaissance of the operational area prior to night operations.

Extended attack night time air operations will require additional flight crew, maintenance, and logistical support to maintain an adequate work/ rest ratio.

Pilot flight time and duty hour limitations should not be exceeded.

NVG flight hours should be limited per the agency's individual MOU.



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## **V. Risk Assessment**

### **A. Overview**

This risk assessment model is based upon the United States Coast Guard, Green-Amber-Red risk assessment tool. This model allows for a time critical risk assessment for the Incident Commander(s) to plan, organize, staff, direct, control, and evaluate the actions necessary to conduct safe and effective aerial night operations. This shall be the process to identify those inherent risks measured against the appropriate mitigations in place. This model can be applied in a variety of situations, from program to pre-mission risk assessment. It is not intended to replace pre-mission planning, briefings and debriefings, or post action follow-up, but provide an efficient risk management tool for dynamic environments.

Making risk decisions at the appropriate level establishes clear accountability. Those accountable for the success or failure of a mission must be included in the risk decision process. The higher the risk the more mitigation may be necessary. If significant differences in the same rating categories are identified, all team members will re-evaluate the mission and address any mitigation prior to continuing with the mission.

Risk assessment provides a more general analysis of the operational system and provides a qualitative rating scale for each of the categories that correspond to the identified areas of risk. It is important to remember that risk management is a process that continues throughout the mission and each assessment model allows management to set the acceptable risk standards as they apply to each mission.

Discussion is critical to understanding the risks and how they will be managed. Additional information on risk management can be found in Chapter 3 of the Interagency Helicopter Operations Guide.

#### **Application:**

Compute the total level of risk for each hazard identified below.  
Assign a risk score of zero (0) (No Risk) through ten (10) (maximum Risk) for each element. Add the individual risk scores to come up with a Total Risk Score.

Note: This is a subjective estimate of risk.

Risk is rated 1 - low, through 10 - high, for each category.  
Additional mitigations should be considered for any category rated higher than 5.

#### **Supervision:**

Supervisory Control considers how qualified the supervisor is and whether effective supervision is taking place. Even if a person is qualified to perform a task, supervision acts as a control to minimize risk. The higher the risk, the more the supervisor needs to be focused on observing and checking. A supervisor who is actively involved in a task is easily distracted and should not be considered an effective safety observer in moderate to high-risk conditions.





Planning:

Planning and preparation should consider how much information you, and other resources that you may be interacting with, have; how accurate it is, and the amount of time available to plan for and evaluate the existing and emerging conditions.

Contingency Resources:

What contingency is in place if the plan experiences failure? Backup resources that can assist if needed should be identified. An alternate plan to meet the incident objectives shall be evaluated.

Communication:

Evaluate how well all personnel involved in the operation are briefed and communicating (Crew Resource Management). An evaluation of the communication systems that are available should include; the technical capability, infrastructure, operational reliability, and organizational culture.

Required Condition:

The selection of individual resources, including key Air Operations overhead positions, should evaluate the character and competence of the individuals used; specifically addressing their experience and qualifications in night operations. Individuals may occasionally need to be replaced during the operation. Replacement will require an assessment of any new team members and how they will be able to interact with those already engaged.

Mission Effectiveness:

Does a high degree of success in achieving incident objectives exist without burdensome procedures or other external factors?

Environment:

Consider factors affecting the performance of personnel, equipment, and the organization, including; time of day, wind and other weather conditions, topography, temperature and altitude. Evaluate specific factors such as narrow canyons, urban infrastructure, forest canopy, and site selection. These factors should be eyed with caution as the operational environment is very dynamic.

Incident Complexity:

Evaluate the experience level of the crews. Determine how many aircraft are involved. Understand that the longer one is exposed to a hazard, the greater the risks. The situation evaluation includes considering how long the environmental conditions will remain stable and a determination of the complexity of the work.



**B. FIREScope: Night Operations – Helicopter Risk Assessment Worksheet**



**FIREScope: Night Operations – Helicopter Risk Assessment Worksheet**

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Operation: \_\_\_\_\_ Operational Period: \_\_\_\_\_

Objective(s): \_\_\_\_\_ Date: \_\_\_\_\_

Supervision		
Supervisor has perfect knowledge about the mission, personnel, capabilities and limitations, and is able to apply the appropriate control to minimize risk.	< 1 2 3 4 5 6 7 8 9 10 >	Supervisor has little knowledge about the mission, personnel, capabilities and limitations, and lacks skill, knowledge or ability to apply the appropriate control to minimize risk.
Planning		
There is a well-designed plan that is reviewed and revised as needed to meet the demands for safety and efficiency and to account for adaptation. Time is well managed.	< 1 2 3 4 5 6 7 8 9 10 >	There is no plan or the plan doesn't address many current adaptations made in response of demands for efficiency. Time constraints have a strong effect on ability to plan.
Contingency Resources		
Reliable alternative equipment and personnel are available, easily accessed and informed about the mission requirements.	< 1 2 3 4 5 6 7 8 9 10 >	The outcome depends on the equipment and personnel assigned completing the mission perfectly. Failure is not an option.
Communication		
There is a high level of trust in the organization and communications plan. This shall include known, accepted procedure in use of the equipment applicable to incident and aerial resources.	< 1 2 3 4 5 6 7 8 9 10 >	There is low trust in the organization or the personnel/communication equipment is unreliable based on the expected needs for the mission.
Required Condition		
Personnel with the requisite knowledge, skill and ability are available and in place. Selection and preparation completed well in advance.	< 1 2 3 4 5 6 7 8 9 10 >	Limited personnel available; the success of the mission depends on individuals juggling many responsibilities.
Mission Effectiveness		
High degree of success in achieving incident objectives.	< 1 2 3 4 5 6 7 8 9 10 >	External factors preclude operational effectiveness.
Environment		
Weather and visibility are conducive to the best possible chance for success in the mission. Operational tempo is appropriate for the mission.	< 1 2 3 4 5 6 7 8 9 10 >	Winds are unpredictable, temperature is extreme, low ceilings and visibilities, precipitation, sun angle creates strong shadows, etc. Mission tempo is too low or high.
Incident Complexity		
A single agency is involved with personnel from the same unit who regularly work together. Mission is straight forward and covered by standard operating procedures.	< 1 2 3 4 5 6 7 8 9 10 >	Multiple agencies are involved in a mission that defies definition or has ever been attempted. Personnel are new to each other and come from different cultures. Many leaders are emerging and working toward different objectives.

**Mission Total:**

**Benefit Statement:**

Operation Approved by: \_\_\_\_\_ Title: \_\_\_\_\_ Date: \_\_\_\_\_



Risk		Score / Mitigations
Supervision	0-10	
Planning	0-10	
Contingency Resources	0-10	
Communication	0-10	
Required Condition	0-10	
Mission Effectiveness	0-10	
Environment	0-10	
Incident Complexity	0-10	
<b>Total</b>	<b>0-80</b>	

**Total Score**

Green	Amber	Red
Score: 0-35	Score: 36-60	Score: 61-80
Low Risk Proceed with Mission	Moderate Risk Proceed with Caution	High Risk Implement Measures Prior to Proceeding




## **VI. Night Operations Position Checklists**

Potential conflicts can arise when State or Federal Incident Management Teams operate on incidents where local agencies have jurisdictional authority to conduct a night flying operation. Therefore this section has two goals:

1. Provide Incident Management Teams guidelines on how the strategy, tactics, and incident objectives can be managed in context of a night flying operation by employing the Inter-agency guidelines contained within this document.
2. Provide agency personnel guidelines on additional responsibilities that ICS positions may have to perform when night operations will be conducted.

### **A. FIRESCOPE: Night Operations Positions Checklist**

	<b>FIRESCOPE: Night Operations – Position Checklist</b> <b>ICS 420-1 Supplement</b>	Page 1 of 2
<hr/>		
<b>Incident Commander</b>		
<input type="checkbox"/> Approve night flying operations within jurisdictional authority.		
<b>Information Officer</b>		
<input type="checkbox"/> Obtain information on the night flying operation such as number and type of aircraft, areas of operation, and mission objectives.		
<input type="checkbox"/> Disseminate information as required.		
<b>Safety Officer</b>		
<input type="checkbox"/> Ensure that the night flying operation is justified in risk versus gain and will be essential in the accomplishment of the incident objectives.		
<input type="checkbox"/> Address safety concerns of participating agencies.		
<b>Liaison Officer</b>		
<input type="checkbox"/> Coordinate with Command and General Staff personnel on procedural and operational issues of the night flying operation.		
<input type="checkbox"/> Resolve inter-agency policy issues that arise from night flying operations by consultation with agency representatives.		
<b>Agency Representative</b>		
<input type="checkbox"/> Advise Liaison Officer of agreement with, or objection to, a night flying operation.		
<input type="checkbox"/> Coordinate night flying issues with home agency personnel and the Incident Command Staff.		
<b>Operations Section Chief</b>		
<input type="checkbox"/> Approve night flying operations in conjunction with the Incident Commander.		
<input type="checkbox"/> Advise Branches and Division of night flying missions.		
<input type="checkbox"/> Ensure that Division/Branch Checklist/Worksheets are completed.		
<input type="checkbox"/> Confirm that policy and procedural issues between agencies have been resolved by consultation with the Liaison Officer and the Air Operations Branch Director.		
<input type="checkbox"/> Ensure that the night flying missions are justified and essential to accomplishing the incident objectives.		



**FIRESCOPE: Night Operations – Position Checklist**  
**ICS 420-1 Supplement**

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**Air Operation Branch Director**

- Advise the Operations Section Chief if night flying operations are available.
- Perform risk assessment and risk management as the situation dictates.
- Confirm that compatible night flying policy and procedures are being applied by the agency (ies) that intend to fly at night. This may include Go/No-Go checklists and/or clearly defined areas of operation.
- Coordinate and resolve inter-agency policy/procedural issues with the incident staff prior to commencing night flying operations.
- Ensure the quality completion of the Water Point Checklist/Worksheet.

**Air Support Group Supervisor**

- Develop a shift plan for the aircraft and helitack crews.
- Ensure that the aircraft have 24 hour logistical support.

**Air Tactical Group Supervisor/Helicopter Coordinator**

- Ensure that positive air traffic control can be maintained.
- Monitor air to ground and air to air for proper radio discipline.
- Keep ground unit expectations in touch with reality. Do not let high expectations pressure the pilots.
- If the night flying missions are not effective, coordinate with the Air Operations Branch Director/Operations Section Chief to change the mission operational area or terminate the night flying operation.

**Helibase Manager/Helispot Manager**

- Complete Go/No-Go checklist if required by agency policy.
- Ensure that the Takeoff and Landing Controller (TOLC) has communications with the assigned aircraft and is equipped with NVG.
- Provide for extra security at the Helibase/Helispot. This should include vehicle traffic, civilians and assigned personnel travel routes.
- Provide for Helibase/Helispot light controls. This includes landing pad marking and flashlight, headlamp, and headlight control measures.  
*(Reference NFG Informational Appendix 1 Spectral Sensitivity item A Headlights/Flashlights)*
- Conduct all operations at a slower more methodical pace. Be observant for signs of fatigue in personnel throughout the night time operational period.



**B. FIRESCOPE: Night Operations – Air Operations Branch Director Checklist**



**FIRESCOPE: Night Operations – Air Operations Branch Directors Checklist**

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The following checklist should be considered as the minimum requirements for this position. Note that some of the tasks are one-time actions; others are ongoing or repetitive for the duration of the incident.

- Confirm that night flying helicopters have been assigned and have “A” numbers attached.
- Obtain briefing from Operations Section Chief or Incident Commander.
  - Confirm need for night helicopter operations based on required conditions set forth in the Operating Agreement for Aided Low Level Night Operations Between Agency and Cooperator.
- Risk Assessment has been completed, hazards identified and mitigated for night operations, and approved by Agency Incident Commander.
- Establish line of authority and procedures for decision making.
- Go/No-Go Checklist completed and signed by Cooperator.
- Determine need for subordinate staff (ASGS, HEB1, etc).
- Consider needs for aerial supervision.
- Request declaration (or cancellation) of restricted air space area, (FAA Regulation 91.137).
- Determine coordination procedures for use by air organization with ground Branches, Divisions or Groups.
- Evaluate fill/fuel locations.
- Determine staffing needs with Cooperator(s) for fill / fuel locations.
- Establish procedures for emergency reassignment of aircraft, including air rescue.
- Coordinate with Geographic Area Coordination Center (GACC) through normal channels on incident night air operations.
- Inform the Air Tactical Group Supervisor of planned night operations.
- Consider requests for non-tactical use of incident aircraft.
- Consider nighttime air rescue needs. Coordinate with Medical Unit, Communications Unit, and Safety Officer.
- Resolve conflicts concerning non-incident aircraft / news media.
- Determine aircraft and support equipment available from cooperator in order to support night helibase.
- Security concerns
  - Helibase
  - Fill / Fuel sites
- Logistics
  - Land use and water agreements
  - Facilities
  - Subsistence
  - Fuel source
  - Ground support
- Brief subordinate staff:
  - Incident and work objectives, schedules, mission requirements, priorities, time schedules, and process for briefings and debriefings.
  - Work-site locations, status of aircraft, crews and equipment assigned or ordered.
- Debrief personnel and pilots and make assignment and staffing adjustments, as necessary.
  - Identify safety issues and hazards, and mitigate them.
- Determine aircraft status.
  - Identify pilot and aircraft mission capabilities (certification).
  - Initiate system to monitor flight/duty hour limitations and ensure they are not exceeded.
- Ensure completion of After Action Summary for Helicopter Night Operations, Helicopter Drop Evaluations, and ensure copies are sent to the Chief of Aviation, Aviation Management Unit.
- Obtain status and availability of aircraft and personnel for the next and future operational periods.



## VII. Night Operations Briefing Guidelines and Worksheets

### A. FIRESCOPE: Night Air Operations - Division / Branch Briefing Guidelines

	<b>FIRESCOPE: Night Operations - Division / Branch Briefing Guidelines</b>	Page 1 of 3
This document is intended to provide information and guidelines to assist in planning interagency night time air operations through the use of the FIRESCOPE: Night Operations - Division / Branch Briefing Worksheet Checklist.		
<b>Aircraft Assignment</b>		
Determine the number, types and call signs of helicopters assigned to night operations.		
<ul style="list-style-type: none"><li>• <i>A Helicopter Coordinator should be designated when using more than two helicopters at night.</i></li><li>• <i>Most agencies use Type II helicopters, some agencies may use Type I.</i></li><li>• <i>Helicopters used at night may not have been designated prior to distributing the IAP and the ICS-220 form.</i></li></ul>		
Identify the Divisions where helicopters will be assigned.		
<ul style="list-style-type: none"><li>• <i>Div. Supervisors must be made aware of night time helicopter operations occurring within their operational area.</i></li><li>• <i>On large multi-division incidents, night time helicopter operations should be limited to specific designated areas of operation in conjunction with the predetermined tactical objectives.</i></li></ul>		
Establish the time aircraft will become available and time when night air operations will conclude.		
<ul style="list-style-type: none"><li>• <i>Helicopters used during the day may require maintenance and/or inspection prior to being placed in service for night time operations and again before returning to service in the morning. This may affect start and stop times.</i></li><li>• <i>An Air Operations Briefing must be completed prior to any helicopters beginning night time operations.</i></li><li>• <i>Flying during the twilight hours immediately after sunset and before sunrise should be avoided due to the limited effectiveness of the night vision devices under those conditions.</i></li></ul>		
<b>Aircraft Tactical Objectives</b>		
Determine the type of missions to be flown during the night time operational period.		
<ul style="list-style-type: none"><li>• <i>FIRESCOPE Night Flying Guidelines designate the following acceptable missions for night time helicopter operations:</i><ul style="list-style-type: none"><li>○ <i>Water dropping from helicopters with fixed tanks</i></li><li>○ <i>Recon, mapping, detection</i></li><li>○ <i>Aerial ignition PSD</i></li><li>○ <i>Point-to-Point</i></li></ul></li></ul>		
Determine the suppression tactic(s) that will be used by helicopters during night time operational period.		
<ul style="list-style-type: none"><li>• <i>Suppression tactics need to be coordinated between the ground and air resources.</i></li><li>• <i>Flight crews need to know the tactical objective of the ground resources in the operational area.</i></li><li>• <i>Flight crews should be assigned a coordinated tactical objective such as:</i><ul style="list-style-type: none"><li>○ <i>Structure Protection</i></li><li>○ <i>Anchor and Flank</i></li><li>○ <i>Detection and Suppression of Spot Fires</i></li></ul></li></ul>		



### **Communications**

Determine appropriate frequency for Air-to-Ground communication.

- *Determine if the same Air-to-Ground frequency used during the day will be available at night.*
- *Be aware that frequency changes made at the end of a daytime operational period may affect your night time communication planning.*
- *Air to ground communication may be conducted on the division tactical frequency if the complexity of the incident permits and the volume of traffic is manageable.*

**Determine who may communicate directly with the helicopters, HLCO or ATGS.**

- *Division Supervisors are responsible for ensuring effective communication from ground units to helicopters assigned within their operational area.*
- *Division Supervisors may delegate the authority to communicate directly with the helicopters, Helicopter Coordinator or Air Tactical Group Supervisor.*

### **Crew Member Accountability**

**Establish a method for identifying all personnel in the area of night time air operations.**

- *All fireline personnel should utilize headlamps at all times in areas where air operations may be conducted at night.*
- *Colored chemical light sticks may be used to identify specific crews or key personnel.*
- *Blue chemical light sticks emit a spectrum of light that is not visible to night vision goggles (NVG).*
- *Never shine a light directly at a close by aircraft.*

**Address the appropriate use of strobe lights as a means to identify a particular crew or individual.**

- *Small emergency strobe lights may be used as a means to identify a particular crew or individual.*
- *Flight crews must be advised as to who will be using strobe lights and for what purpose they will be used.*
- *Ground personnel must be advised why and when to activate strobe lights.*

### **Target Description**

**Address the use of GPS coordinates for target description.**

- *GPS coordinates are best used in the long range phase of target description to direct aircraft to the general area of the target.*
- *GPS coordinates are of limited value when attempting to describe a target once an aircraft is circling the area.*
- *Use degrees/decimal minutes (N dd.dd W mmm.mm) when expressing GPS coordinates*

**Identify obvious landmarks that can be used as reference points for target description.**

- *Man-made landmarks such as roads, developed areas, isolated structures, vehicles, etc.*
- *Natural landmarks such as peaks, outcroppings, rivers, streams, lakes, etc.*
- *Landmarks such as lighted roads, freeways and buildings are preferable because they can be seen by personnel on the ground as well as from the air.*





*Target Description (Continued)*

**Address the use of strobe lights as a means for target description.**

- *When planned appropriately, strobe lights may be used at night as a means to identify a particular location as a reference point in medium and short range target description.*
- *Flight crews must be briefed on the intended use of strobe lights.*
- *Ground personnel must exercise discipline in only using strobe lights at the appropriate time and only when in communication with the pilot of the aircraft they are attempting to signal.*

**Address the use of, or restriction of the use of laser pointing devices.**

- *When planned appropriately, laser pointing devices may be used at night as a means to assist in medium and short range target description.*
- *Flight crews must be briefed on the intended use of laser pointing devices.*
- *Ground personnel must exercise discipline in only using laser pointing devices at the appropriate time and only when in communication with the pilot of the aircraft they are attempting to signal.*
- **NEVER** *point a laser device at an aircraft at any distance.*

*Drop Zone Safety Precautions*

**Establish a method for verifying that the drop zone is clear of personnel before each drop.**

- *Verification of a clear drop zone may be accomplished by radio or by a visual inspection from the air.*
- *Radio verification requires good communication and positive crew accountability.*
- *Visual verification from the air may be difficult due to smoke and vegetation canopy.*
- *Visual verification from the air is made easier when all ground personnel are using headlamps.*

*Aircraft Reassignment*

**Establish a method and level of authority for reassigning aircraft during the night operational period.**

- *The locations and tactical assignments of aircraft engaged in night time firefighting operations must be closely monitored in order to stay within the risk assessment criteria.*
- *Reassignment of aircraft to missions outside of the risk assessment criteria must be properly evaluated and approved at the appropriate level.*
- *A new risk assessment may be necessary prior to reassigning aircraft to new locations or tactical operation.*

**Establish a Rescue / Med-Evac Response Plan for the night time operational period.**

- *If a helicopter assigned to night time tactical firefighting operations is also designated as the night rescue/med-evac aircraft, the risk assessment should reflect the potential EMS mission as well.*
- *Non-incident helicopters (Military, CHP, and Sheriff) designated as the night rescue/med-evac aircraft that are not assigned to night time firefighting operations must be advised of the night time aerial firefighting plan.*
- *All incident personnel must be briefed on the night time rescue/med-evac response plan.*
- *Briefing all personnel on the night time rescue/med-evac response plan may be difficult due to the plan being developed after publication of the daily IAP.*



**B. FIRESCOPE: Night Air Operations - Division / Branch Briefing Worksheet Checklist**



**FIRESCOPE: Night Operations - Division / Branch Briefing Worksheet Checklist**

This document is intended as a tool to provide guidance in conducting a comprehensive briefing for fire-line personnel assigned to branches and divisions where helicopter operations will be conducted at night. Each of the items on this checklist must be determined, addressed and/or established in coordination with the Air Operations Branch Director prior to commencing interagency night time air operations. Branch Directors and Division Supervisors shall ensure that all affected fire-line personnel receive a "Night Air Operations Briefing" in order to ensure that personnel from every agency involved understand the details of the process and controls being used during that operational period.

Date: \_\_\_\_\_

Incident Name: \_\_\_\_\_

Operational Period Start: \_\_\_\_\_ End: \_\_\_\_\_

***Aircraft Assignment***

- Determine the number, types and call signs of helicopters assigned to night operations.

- Identify the Divisions where helicopters will be assigned.

- Establish the time aircraft will become available and time when night air operations will end.

***Aircraft Tactical Objectives***

- Determine the type of missions to be flown during the night time operational period.

- Determine the suppression tactic(s) that will be used by helicopters during night time operational period.



**FIREScope: Night Operations - Division / Branch Briefing Worksheet Checklist**

*Communication*

Determine appropriate frequency for Air-to-Ground communication.

Determine who may communicate directly with the helicopters, HLCO or ATGS.

*Crew Member Accountability*

Establish a method for identifying all personnel in the area of night time air operations.

Address the appropriate use of strobe lights as a means to identify a particular crew or individual.

*Target Description*

Address the use of GPS coordinates for target description.

Identify obvious landmarks that can be used as reference points for target description.



**FIREScope: Night Operations - Division / Branch Briefing worksheet Checklist**

*Target Description(continued)*

- Address the use of strobe lights as a means for target description.

- Address the use of, or restriction of the use of laser pointing devices

*Drop Zone Safety Precautions*

- Establish a method for verifying that the drop zone is clear of personnel before each drop.

*Aircraft Reassignment*

- Establish a method and level of authority for reassigning aircraft during the night time operational period.

- Establish a Rescue / Med-Evac Response Plan for the night time operational period.



## C. Night Air Operations Water Point Briefing Guidelines



### FIRESCOPE: Night Operations – Water Point Briefing Guidelines

Page 1 of 3

#### *Helispot Conditions*

Determine the size, surface conditions, ground hazards and dust abatement precautions at the helispot.

- *Helispots must be constructed as per the Interagency Helicopter Operations Guide IHOG Chapter 8.*
- *The entire helispot and surrounding area must be carefully examined for potential ground hazards and each identified hazard must be mitigated prior to approving the helispot.*
- *Whenever possible, water point helispots should be established in areas with hard packed surfaces that require little to no dust abatement.*
- *Dust abatement efforts should extend well into the approach and departure corridors and be sufficient to maintain safe conditions during takeoff and landing.*

Establish a method for identifying the landing pad and the lighting configuration to be used.

- *Numbered pad-markers that correspond to the helibase diagram should be used whenever possible.*
- *Lighted areas such as athletic fields, parking lots or airfield should be used whenever possible.*
- *Landing areas should be marked, when necessary, with chemical glow sticks by securing four amber colored lights at each corner of the touch down pad and a white light approximately five feet from the pad on the side from which the wind is blowing.*
- *Red high intensity chemical glow sticks are the most visible to night vision goggles.*
- *White, amber and green chemical glow sticks are all sufficiently visible to night vision goggles.*
- *Blue lights are not visible to night vision goggles.*

Establish safe approach and departure paths, identify aerial hazards and identify useful landmarks.

- *Helispot approach and departure paths should be established as per IHOG Chapter 8.*
- *Approach and departure paths must be safely inspected to identify potential aerial hazards.*
- *All potential aerial hazards should be depicted on a Hazard Map and communicated to the flight crews.*
- *Land marks that are visible to the pilots should be identified for use as potential reporting points.*

Establish wind-shift decision points and change of direction procedures.

- *Wind shifts during night operations should be anticipated.*
- *Wind vector limits across the helispot should be established.*
- *Vehicles, hose and personnel may need to be repositioned when wind vector limits are exceeded.*

#### *Communications*

Identify radio frequency(s) and protocol to be used for air-to-ground communication with the water point helispot.

- *Reliable radio communication must be established with the water point helispot.*
- *A separate takeoff and landing frequency for the water point should be considered when increased radio traffic on the air-to-ground frequency is anticipated.*

Identify reporting points to be used in order to manage spacing and sequencing into and out of the water point.

- *Highly visible landmarks that are easy to recognize under night vision goggles should be identified as reporting points.*
- *Reporting points should be selected that provide the water point personnel enough reaction time to communicate effectively with the approaching helicopter.*



**FIREScope: Night Operations – Water Point Briefing Guidelines**

**Communications (Continued)**

Determine the hand signals to be used by personnel at the water point helispot.

- *Although cooperator helicopter crews use standardized helicopter hand signals, slight variations exist between different agencies.*
- *In general, the hand signals used by the cooperator agency supervising the water point will most likely be used.*
- *Each hand signal to be used at the water point should be predetermined, reviewed and agreed upon by each of the cooperator flight crews.*

**Ground Fill Hose Lay**

Determine the configuration of the supply line to be used for helicopter ground fill operations.

- *Although most cooperator helicopter crews use a standardized hose lay for water point operations, slight variations exist between different agencies.*
- *Some agencies may be capable of setting up and operating two water points, side by side, on the same helispot. This is known as a dual fill water point.*
- *Two and a half inch or three inch hose should be used to supply water from the engine to the helicopter in order to provide the appropriate GPM and pressure at the connection.*
- *Anticipate a change in wind direction and the possible need to move the supply line.*

**Identify the location of the supply line Shut-Off Valve relative to the aircraft.**

- *Although most cooperator helicopter crews use a standardized hose lay for water point operations, slight variations exist between different agencies.*
- *Some agencies locate the shut-off valve under the rotor disk, while other agencies locate the valve outside the rotor disk.*
- *In general, the location of the valve will be determined by the cooperator agency supervising the water point but must be reviewed and agreed upon by the cooperator flight crews.*

**Determine the appropriate GPM flow rate for helicopter ground fill operations.**

- *Although most cooperator helicopter crews use a standardized flow rate of **360 GPM** for water point operations, slight variations exist between different agencies.*
- *Flow rates higher than 360 GPM could result in damage to some types of tanks.*
- *Flow rate should be calculated to achieve the appropriate GPM at the connection point to the helicopter's fixed tank.*
- *In general, the flow rate will be determined by the cooperator agency supervising the water point but must be reviewed and agreed upon by the cooperator flight crews.*

**Tank Refilling Procedures**

**Establish approach procedures for helicopters into the water point helispot.**

- *Determine a traffic pattern into the water point helispot.*
- *Determine a reporting point for contacting the water point on approach.*
- *Determine a holding procedure for aircraft waiting to approach the water point when it is occupied.*



**FIREScope: Night Operations – Water Point Briefing Guidelines**

*Tank Refilling Procedures  
(Continued)*

**Identify the positioning of each person at the water point during approach, landing, take-off and departure.**

- *Although most cooperator helicopter crews use a standardized procedure for personnel placement during water point operations, slight variations exist between different agencies.*
- *Some agencies locate personnel under the rotor disk during takeoff and landing, while other agencies locate all personnel outside the rotor disk during takeoff and landing.*
- *In general, the location of personnel will be determined by the cooperator agency supervising the water point but must be reviewed and agreed upon by all of the cooperator flight crews.*

**Determine a method for the pilot to signal helispot personnel approval to approach the aircraft.**

- *Although most cooperator helicopter crews use standardized signals to approve approaching the aircraft, slight variations exist between different agencies.*
- *Signals used by flight crews during the day may not be visible to water point personnel at night.*
- *Aircraft external lights, such as a step light, search light, or hoist light, may be flashed to signal approval to approach the helicopter.*
- *In general, the signaling method will be determined by the cooperator agency supervising the water point but must be reviewed and agreed upon by all of the cooperator flight crews.*

**Determine a method for signaling to helispot personnel the desired amount of water.**

- *Although most cooperator helicopter crews use standardized signals to indicate the desired amount of water, slight variations exist between different agencies.*
- *Signals used by flight crews during the day may not be visible to water point personnel at night.*
- *Radio transmissions may be used to communicate the desired amount of water.*
- *In general, the method used to signal or communicate the desired amount of water will be determined by the cooperator agency supervising the water point but must be reviewed and agreed upon by all of the cooperator flight crews.*

**Establish departure procedures for helicopters out of the water point helispot.**

- *Predetermined hand signals may be used to coordinate safe departures from the water point.*
- *Radio communication may be used to coordinate safe departures from the water point.*
- *In general, the procedures used to coordinate safe departures from the water point will be determined by the cooperator agency supervising the water point but must be reviewed and agreed upon by all of the cooperator flight crews.*

**Establish emergency procedures for response to incidents or accidents at the water point helispot.**

- *Determine a "Point of Contact" for emergency communication to and from the water point.*
- *Identify the nearest available engine or truck company and make arrangement for immediate response to an accident on or near the water point.*
- *Assign responsibilities, and outline the actions to be taken by each of the assigned personnel in the event of an incident or accident on or near the water point.*



**D. Night Air Operations Water Point Briefing Worksheet Checklist**



**FIRESCOPE: Night Operations – Water Point Briefing Worksheet Checklist**

This document is intended as a tool to provide air operations personnel guidance in coordinating methods and conducting a comprehensive briefing on the procedures to be utilized to conduct ground fill operations of tanked helicopters at night. Each of the items on this checklist must be *identified, determined, addressed* and/or *established* prior to commencing operations in order to ensure that personnel from every agency involved understand the details of the environment and processes that are to be used during that operational period.

Date: \_\_\_\_\_ Incident Name: \_\_\_\_\_

Operational Period Start: \_\_\_\_\_ End: \_\_\_\_\_

***Helispot Conditions***

- Determine the size, surface conditions, ground hazards and dust abatement precautions at the helispot.

- Establish a method for identifying the landing pad and the lighting configuration to be used.

- Establish safe approach and departure paths, identify aerial hazards and identify useful landmarks.

- Establish wind-shift decision points and establish change of direction procedures.





**FIREScope: Night Operations – Water Point Briefing Worksheet Checklist**

*Communications*

- Identify radio frequency(s) and protocol to be used for air-to-ground communication with the water point helispot.

- Identify reporting points to be used in order to manage spacing and sequencing into and out of the water point.

- Determine the hand signals to be used by personnel at the water point helispot.

*Ground Fill Hose Lay*

- Determine the configuration of the supply line to be used for helicopter ground fill operations.

- Identify the location of the supply line Shut-Off Valve relative to the aircraft.

- Determine the appropriate GPM flow rate for helicopter ground fill operations.



**FIRESCOPE: Night Operations – Water Point Briefing Worksheet Checklist**

*Tank Refilling Procedures*

**Establish approach procedures for helicopters into the water point helispot.**

**Identify the positioning for each person during approach, landing, take-off and departure.**

**Determine a method for the pilot to signal helispot personnel approval to approach the aircraft.**

**Determine a method for signaling to helispot personnel the desired amount of water.**

**Establish departure procedures for helicopters out of the water point helispot.**

**Establish emergency procedures for response to incidents or accidents at the water point helispot.**



## VII. Night Helicopter Operations Go-No-Go Checklist

The FIREScope Night Operations – NVG Helicopter Go/No-Go Checklist must be completed prior to conducting night time helicopter operations. The Go/No-Go Procedures are the last step in formally documenting the mitigation of operational risks.



### **FIREScope: Night Operations – NVG Helicopter Go/No-Go Checklist**

Page 1 of 2

The NVG Go/No-Go Checklist must be completed and signed by the pilot of each Cooperator aircraft, the Helibase Manager, and the Air Operations Branch Director prior to commencing night time aerial firefighting operations. If any box is unchecked (the item is NOT accomplished), the entire night time aerial firefighting operation is a No-Go. A check mark inside a box indicates that all aspects of the required procedures are applicable and have been satisfied.

#### Operational Planning

- All night time aviation missions have been subjected to the risk assessment process and have been approved by the Air Operations Branch Director and the Incident Commander.
- All applicable aviation positions are assigned to fully qualified personnel.
- Pilots, aircraft and support personnel meet agency requirements for night time aerial firefighting operations.
- An organization chart has been prepared and distributed, showing applicable functions and the name of the person responsible.
- Temporary Flight Restriction (TFR) is in place when appropriate.
- All pilots meet duty day and flight hour limitations.

#### Communications

- A night time communications plan has been prepared and approved to include the following:
  - Air-to-Air
  - Air-to-Ground
  - Take Off and Landing
  - Command

#### Briefings

- Ground personnel assigned to work in areas of the incident where night time aerial firefighting operations will occur have been briefed. (*Night Time Air Operations Branch / Division Briefing Guidelines & Worksheet*)
- Flight crews and Helibase personnel have been briefed on specifics of night time helibase operations.
- Flight crews and personnel assigned to the Water Point have been briefed on specific procedures for night time water point operations. (*Night Time Helicopter Water Point Briefing Guideline & Worksheet*)

#### Helibase Operations

- A Cooperator-Qualified Crewmember has been assigned to the helibase
- Procedures have been established for night time helicopter movement around the helibase.
- Procedures have been established for maintaining aircraft separation in the airspace surrounding the helibase.
- Procedures have been established for flight following of assigned aircraft.
- Procedures have been established to control the movement of personnel and vehicles around the helibase.
- Procedures have been established to provide dust abatement measures during night time helibase operations.
- Emergency procedures have been established for response to incidents or accidents at the helibase.



**FIRESCOPE: Night Operations – NVG Helicopter Go/No-Go Checklist**

Water Point Operations

- Helispot used for water point operations is of adequate size with acceptable surface conditions and free of ground hazards.
- Procedures have been established to provide dust abatement measures during night time water point operations.
- Procedures have been established for identifying the landing pad and the lighting configuration to be used.
- Safe approach and departure paths have been identified.
- Reporting points have been established to manage spacing and sequencing into and out of the water point.
- Potential aerial hazards have been identified.
- Wind-shift decision points have been established and change of direction procedures are in place.
- Specific hand signals have been identified to be used by personnel at the water point.
- Supply line configuration and Shut-Off Valve location has been established.
- Appropriate GPM flow rate for helicopter ground fill has been established.
- Positioning of personnel at the water point during landing and take-off has been established.
- A method has been established for pilots to signal water point personnel approval to approach the aircraft.
- A method has been established for pilots to communicate or signal to helispot personnel the desired amount of water.
- Emergency procedures have been established for response to incidents or accidents at the water point.

**Approval & Review:** The following personnel shall sign prior to commencing night time aerial firefighting operations:

Prepared By _____	Helibase Manager (Print Name)	_____ (Signature)	Date _____	Time _____
Approved By _____	Air Ops Branch Director (Print Name)	_____ (Signature)	Date _____	Time _____
Reviewed By _____	Pilot (Print Name)	_____ (Signature)	Aircraft _____ (Agency & ID)	Date _____ Time _____
Reviewed By _____	Pilot (Print Name)	_____ (Signature)	Aircraft _____ (Agency & ID)	Date _____ Time _____
Reviewed By _____	Pilot (Print Name)	_____ (Signature)	Aircraft _____ (Agency & ID)	Date _____ Time _____
Reviewed By _____	Pilot (Print Name)	_____ (Signature)	Aircraft _____ (Agency & ID)	Date _____ Time _____
Reviewed By _____	Pilot (Print Name)	_____ (Signature)	Aircraft _____ (Agency & ID)	Date _____ Time _____



## **VIII. Night Flying Sources of Information**

1. **Spectral Sensitivity** (Display of the light spectrum and NVG sensitivity. The graph is related to operational issues that result from spectral sensitivity)
2. **Federal Aviation Administration Technical Standards Order TSO-C164 For Night Vision Goggles** (Contains the minimum standards for Night Vision Goggles. The information can be used to develop purchase contract technical standards)
3. **Training Syllabus** (Sample of Los Angeles County Fire Department NVG training syllabus)
4. **Federal Aviation Administration Order 8400.10 Accident Avoidance Programs** (This document contains information on Helicopter Emergency Medical Services Loss of Control and Controlled Flight into Terrain Accident Avoidance Programs. The information can be used to develop night flying policy, procedures, and training manuals)
5. **Guidance for Helicopter EMS Safety Inspections** (This notice provides updated Guidance for aviation safety inspectors. The information can be used to help develop night flying policy, procedures, and training manuals)
6. **Helicopter Emergency Medical Service Safety Alert** (Summarizes safety issues relating to night flight. Also contains a good list of internet source material for safety programs)