A-205
Risk Management I
Operational Risk Management

Participant Workbook

Prepared by Office of Aviation Services Training Division
and Interagency Aviation Training Partners
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A-205
Risk Management I

Revision History

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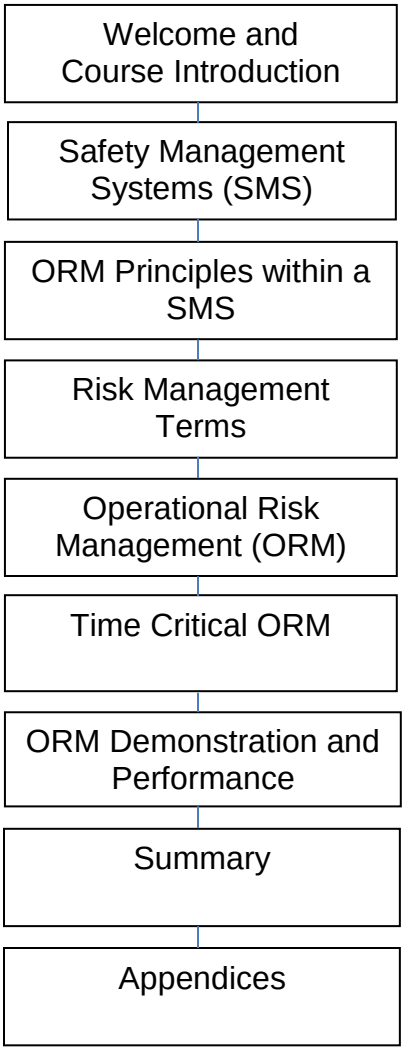
A-205
Risk Management 1

Course Map



Welcome and Course Introduction

Get to Know Your Classmates

Be prepared to share:

- Their name?
- Position?
- How long have they been involved in aviation?
- What do they hope to get from this course?

Course Purpose

The purpose of the A-205 is to provide a basic introduction to Risk Management, Safety Management Systems (SMS), and Operational Risk Management (ORM); and be able to apply those principles in a Bureau/Agency environment.

Objectives

At the conclusion of this course, you should be able to:

1. Define a Safety Management System (SMS).
2. Define key risk management terms.
3. Recognize Operational Risk Management (ORM) principles utilized within a given SMS.
4. Define the five steps of the ORM process.
5. Identify the three levels of ORM.
6. Recall three time-critical ORM techniques.
7. Explain the decision making process and how time-critical techniques could be applied when given a scenario and working as a team.

Module 1: Safety Management Systems (SMS)

Notes

Objective:

1. Define a Safety Management System (SMS).

Key teaching points to accomplish module objective:

- The scope of SMS encompasses activities in our organizations.
- SMS must start from senior management, and safety must be considered at all levels of the organization.
- SMS aims to make continuous improvement to the overall level of safety.
- All levels of aviation users have a role to play in SMS.
- SMS focuses on the safety, human and organizational aspects of an organization (i.e. safety satisfaction).

SMS is a quality management approach that integrates the practices of controlling risk and safety-related processes into an organized safety culture and business management model. Risk management is a tool under Safety Management.

Cultivating a safety culture in an organization is imperative to a successful SMS.

The Four Major Pillars of Safety Management

Safety Management consists of four major pillars. They are:

- Policy
- Safety Assurance
- Safety Promotion
- Risk Management

These pillars are essential building blocks for a safety-oriented management system. It is important to understand the role that Safety Risk Management plays in Safety Management to best understand the functions of each pillar.

Notes

Policy: Policy guides aviation safety doctrine, philosophy, principles and practices. Policy is the framework for aviation plans and assists in the development of local standard operating procedures.

Safety Assurance: Monitors and evaluates programs and provides standards for evaluations and feedback.

Safety Promotion: Training and communication to all levels.

Safety Risk Management: Risk is identified and managed.

A safety culture that promotes learning from mishaps AND best practices will empower the application of Safety Management Systems.

Interaction/Activity: Safety Management Systems

Take 2-3 minutes to discuss and write down the answers to the following questions:

What are the four major pillars of Safety Management?

_____

_____

_____

_____

Does your bureau/agency have an SMS?

_____

_____

How do you apply safety management in your organization?

_____

_____

Module 2: Risk Management Terms

Notes

Objective:

2. Define key risk management terms.

Key Risk Management Terms:

Hazards: A hazard is a present condition, event, object, or circumstance that could lead to or contribute to an unplanned or undesired event such as an accident.

Example: Pilot fatigue is a hazard because the pilot may not realize he or she is too tired to fly until serious errors are made. Humans are very poor monitors of their own mental condition and level of fatigue. Fatigue can be as debilitating as alcohol usage, according to some studies.

Risks: Risk is the potential impact of a hazard that is not controlled or eliminated. It can be viewed as future uncertainty created by the hazard. If it involves skill sets, the same situation may yield different risks.

Example: If the aircraft is not properly bonded and grounded, there is a build-up of static electricity that can and will seek the path of least resistance to ground. If the static discharge ignites the fuel vapor, an explosion may be imminent.

Controls: Policies or devices that work to mitigate or

eliminate risk to assets, lives, or mission completion.

Example: Using the two examples above organizations can implement a rule of 12 hours of "crew rest" prior the start of a duty day that includes flying, and limiting the length of that day to 12 hours. The other example of a control would be a post flight checklist completion requirement before the aircraft can be signed in for the day and the crew allowed to go home.

Probability: Sometimes referred to as "vulnerability," the level of possibility of occurrence of something that may impact people, property or resources.

Example: When departing for a flight in weather condition that are "Ceiling and Visibility (CAVU) OK", which is pilot speak for "clear skies" the probability of a weather related incident are low. Conversely departing when the CAVU is 1000ft and lightning has been spotted within 10nm has a significantly higher probability of a weather related event.

Types of Risk

- **Total Risk:** The sum of identified and unidentified risks.

- **Identified Risk:** Risk that has been determined through various analysis techniques. The first task of system safety is to identify, within practical limitations, all possible risks.

  Example: The route chosen by a pilot requires them to be fairly close to the edge of their operational range. They realize this in the planning stages and take steps to manage the risk.

- **Unidentified Risk:** Risk not yet identified. Some unidentified risks are subsequently identified when a mishap occurs. Some risk is never known.

Example: Unforeseen weather changes, clear air turbulence, hazards not properly identified on a hazard map.

- **Unacceptable Risk**: Risk that cannot be tolerated by the managing activity. It is a subset of identified risk that must be eliminated or controlled.

  Example: A Visual Flight Rules rated pilot deciding to fly in Instrument Flight Rules conditions.

- **Acceptable Risk:** Acceptable risk is the part of identified risk that is allowed to persist without further mitigation or management action. Making this decision is a difficult yet necessary responsibility of the managing activity. This decision is made with full knowledge that it is the user who is exposed to this risk.

  Example: Leaving the ground in an aircraft carries with it a certain amount of risk. When the skill and training of the pilot reach a level that sufficiently overcomes the risk, then the level of risk is acceptable.

- **Residual Risk:** Residual risk is the risk remaining after system safety efforts have been fully employed. It is not necessarily the same as acceptable risk. Residual risk is the sum of acceptable risk and unidentified risk. This is the total risk passed on to the user.

  Example: Once again leaving the ground in an aircraft carries with it a certain amount of risk that is known, and a certain amount that could arise during the flight that wasn't planned for.

Interaction/Activity: Scenario

You are assigned to assist the local outdoor recreation planner with a backcountry project to transport trail maintenance equipment to five different locations in a remote area of the forest. It has been determined that delivering these supplies will most efficiently be completed by helicopter external load delivery. A project aviation safety plan and risk assessment has been completed and approved. The outdoor recreation planner is helicopter manager qualified and is the project manager.

The day of the project a cold front is predicted to transition over the area around 2:00 pm bringing with it the potential for erratic winds gusting to 45 mph. The early morning forcast is for clear skies, calm winds and a temperature of 72 degrees Farenheit. The predicted flight time to complete the delivery of supplies is approximately two hours. The mission is scheduled to begin at 7:00 am from the main helibase.

On the drive over to the helibase to begin the project the van with the qualified helicopter and aircrew members experiences engine trouble and breaks down. Eventually a mechanic arrives and corrects the problem, but they aren't expected to arrive at the helibase until 12:00 pm.

Please take a minute to discuss what risks you have identified and whether they are acceptable. What are possible mitigation actions?

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Module 3: Operational Risk Management (ORM) Principles within an SMS

Notes

Objectives:

3. Recognize Operational Risk Management (ORM) principles utilized within a given SMS.

Key teaching points to accomplish module objective:

- The ORM Principles/Processes are all part of the SMS process.

ORM is a process of identifying and controlling hazards. The goal of ORM is to manage risk so the mission can be accomplished with minimum loss.

Managing risk is something we all do every day. Whether it is judging an acceptable speed to navigate a curve in the vehicle you are driving, or making a judgment call on flying in marginal weather conditions, managing risk is something every one of us is familiar with. Applying an operational aspect to risk management while working within the parameters of your organizations SMS is ORM.

ORM is also a decision-making tool to systematically help identify operational risks and benefits and determine the best course of action for any given situation. When it comes to aviation safety, ORM is the vehicle that saves lives.

The Four Principles of Operational Risk Management:

1. Anticipate and manage risks by disciplined prior planning:
   - Risk assessment should begin during planning.
   - Risk discovered later in the operation can be more expensive and time-consuming.
2. Accept no unnecessary risks:
   - Accept no risk that carries no commensurate return in terms of benefits or opportunities.
   - Strive for an operation that accomplishes all requirements with minimum acceptable risk.
3. Accept risks when benefits outweigh costs:
   - All identified benefits are compared against all identified risks.
   - The balance can be subjective process, but done with the appropriate decision maker.
4. Make risk decisions at the appropriate level:
   - Decision maker has the resources to reduce risk and implement controls.
   - Decision maker must be authorized to accept levels of risk typical of the operation.

Interaction/Activity: Scenario

A pilot accepts an addition to his flight schedule the following day. He has been working/flying 10–12 hours a day for 10 days straight. He will finish up his last flight at 6:00 pm today and is set to begin his preflight in the morning at 6:00 am for a 7:00 am departure. The additional flight is to pick up three Bureau employees and take off at 1:00 pm local after two early morning flights that are scheduled to end about 12:00 pm. The flight is scheduled for one hour, but they need to be at a meeting that will not finish until about 5:00 pm local. He plans to stay there and wait on them, and then return.

How do the four principles of ORM apply in this scenario?

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Module 4: Operational Risk Management

Notes

Objectives:

4. Define the five steps of the ORM Process.
5. Identify the three levels of ORM.

Key teaching points to accomplish module objective:

- The primary goal is to manage risk so the mission can be accomplished.
- It provides a decision-making tool that can reduce mishaps and improve operational effectiveness.
- It increases the ability to make informed decisions.
- ORM is a systematic approach to reduce operational risk to acceptable levels.

Operational Risk Management (ORM) is a process of identifying and controlling hazards. The goal of ORM is to manage risk so the mission can be accomplished with minimum loss.

ORM is also a decision-making tool to systematically help identify operational risks and benefits as well as determine the best course of action for any given situation.

For example, an ORM assessment might be performed before each flight. This risk management process -- as other safety risk management processes -- is designed to minimize risks in order to reduce mishaps, preserve assets and safeguard the health and welfare of personnel.

In general, careful determination of risks, along with analysis and control of the hazards they create, results in a plan of action that anticipates difficulties that might arise under varying conditions and predetermines ways of dealing with these difficulties. Managers are responsible for the routine use of risk management at every level of activity; starting with the planning of that activity and continuing through its completion.

The Five-Step Model of ORM is sometimes referred to as "I AM IS," an mnemonic for Identify, Assess, Make Decisions, Implement, Supervise.

1. **Identify the Hazards:**
   Hazards identified can cause mission degradation, injury, death, and damage or loss of equipment.

   A hazard can be any real or potential condition that can cause mission degradation, injury, death, and damage or loss of equipment. Experience and common sense are helpful to identify all possible hazards, and situational awareness is the key to recognizing hazards during the operation.

2. **Assess the Hazards:**
   The hazards should be assessed in terms of probability and severity to determine the risk level.

   The hazard should be assessed in terms of probability and severity to determine the risk level that an encounter with this hazard will cause. When making this assessment, it is important to use good judgment. This will provide an estimate of each risk, and when combined with all risks of an operation, yields an overall risk of the operation by hazards that cannot be eliminated.

3. **Make Decisions and Develop Controls:**
   Prioritize the risk and select controls that will reduce risk to acceptable levels. Ensure benefits of the operation outweigh the risks.

   Prioritize the risk and select controls that will reduce risk

to acceptable levels. With selected controls in place, decide if the benefit of the operation outweighs the risk. If risk outweighs benefit or if assistance is required to implement other controls, a decision-maker with higher authority may be needed.

4. **Implement Controls:**
   These are methods used to eliminate hazards or reduce the degree of risk, properly resourced and supported by all.

   These are methods used to eliminate hazards or reduce the degree of risk; they must be clearly understood, properly resourced, and supported by all. Several types of these controls include engineering design, warnings, markings, SOPs, policies, training, limiting exposure, etc. Documentation and communication must also be maintained while monitoring results and subsequent risk management decisions.

5. **Supervise/Evaluate:**
   Throughout an operation, controls must be monitored for effectiveness, expected mission results are achieved, and new hazards are detected.

   The risk management process continues through the whole life cycle of an operation. Controls must first be checked to ensure placement, and then be monitored to determine their effectiveness, and if needed, altered to adequately minimize risk. Situational awareness must be maintained to identify new hazards that may arise. Benefits from the operation must also be checked to guarantee expected results and ensure that controls do not interfere.

Interaction/Activity: Scenario

You are an aircrew member for a survey of feral cattle in the backcountry of the Upper Missouri River Breaks National Monument. A project aviation safety plan and risk assessment has been completed and approved. The survey involves two flights a month for the months of June, July, August and September. Five landing areas have been identified in the monument for refueling needs and for the purposes of gathering data on the feral cattle.

As the project progresses over the course of the summer, the cattle move out of the original area included in the project aviation safety plan. The rangeland management specialist asks you to continue the gather data on the cattle as they move from the area.

Apply the 5-Step ORM process to identify the risks and controls for this situation.

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Three Levels of ORM:

Time Critical: An "on-the-run" mental or verbal review of the situation using the basic risk management process without recording information.

Deliberate: Planning for operations conducted on a daily level, where there is an opportunity to address hazards before beginning the actual mission. This level may be more likely to utilize some form of documentation.

Strategic: Deals in long range planning for complex missions or program development and review.

Tools for Assessing Risk:

There are several models that may be used to assess risk. Some of the more commonly used one in our bureaus and agencies include:

Green/Amber/Red (GAR) Model

- Most commonly used with time-critical risk assessment
- All team members have direct input in final risk score and indirectly, the go/no go decision
- Scores multiple organizational and operational categories from 1-10 (corresponding to 1-3 green, 4-6 yellow and 7-10 red)

Risk Assessment Matrix (RAM)

- Commonly used with deliberate and strategic ORM
- Key part of the Safety Management System (SMS) approach
- Assesses probability of encountering a hazard vs. the likely outcome if it is (4-7 categories for each)

Severity/Probability/Exposure (SPE) Model

- Commonly used with deliberate and strategic ORM
- Similar to RAM above, but also addresses exposure as a third factor

These are covered in more depth in A305 where you will develop the Risk Management section of a Project Aviation Safety Plan (PASP).

Interaction/Activity: Scenario

A couple of Bureau employees were conducting Wildlife survey flights in a northern tier state when their aircraft crashed and both were killed. The pilot and observer were experienced and familiar with the area they were flying in. The weather conditions were less than favorable and they were flying VFR. Before they left the airport they took off from, the weather was closing in, but the pilot thought he could beat the next wave of weather and get the 75 miles or so to their originating destination before it rolled in. The pilot knew that the temperatures and incoming weather were conducive to fog conditions, but once again thought he could beat the conditions and land before they were unmanageable. The aircraft descended into a layer of fog and impacted several large trees and crashed killing both occupants. Both crew members were found to have been properly strapped in and wearing all appropriate PPE.

Instructions:

Perform a risk assessment on the below scenario using the GAR Model in the Appendix. Be prepared to share your result with the class and why you scored it that way.

Which of the three levels of ORM was at play here?

_____

_____

_____

Module 5: Time Critical ORM Techniques

Notes

Objective:

6. Recall three time-critical ORM techniques.

Time-Critical Decision-Making Techniques:

Real life decision-making challenges include complex and confusing situations with scarce or inconclusive information and where time is short and stakes are high. In these circumstances, the decision-making process is based on intuition.

There are three techniques of time-critical decision making. These include intuition, heuristics, and recognition:

- **Intuition:** That "gut" instinct
- **Heuristics:** The ol' "rule-of-thumb" principle
- **Recognition-Primed Decision Making:** If it makes sense

What is Intuition?

- Instinctive knowledge of or belief about something without conscious reasoning or in-depth analysis.
- Intuition grows out of meaningful experience.
- Intuition is the way we translate our experiences into judgments and decisions.

Solid training and education adds to intuitive thinking, but nothing takes the place of experience. Experienced professionals "just know" what to do when split-second decisions need to be made.

An example would be an experienced pilot evaluating a weather report and choosing to cancel a flight rather than "brave" the weather and get into a situation that is beyond their ability to safely accomplish the mission.

What are Heuristics?

- Rules of thumb; informal reasoning strategy; educated guesses; instinctive judgments; mental simulation; or simply common sense.
- A rapid decision that is hoped to be close to the best possible answer or the optimal solution.

Many of these "rules of thumb" decisions can actually reduce our chances of making good decisions. This is often used to make a rapid decision for a solution that is hoped to be close to the best possible answer – an "optimal solution."

"Availability Heuristic" is the ability to judge an event as either frequent or likely to occur if it is easy to imagine or recall. An engine that begins to sputter in cold weather may lead a pilot to believe instantly that he's encountering carburetor icing, since he's experienced it before, so he will immediately take steps to fix the problem assuming that is the solution.

"Representativeness Heuristic" is based on the fact that we tend to judge events by how much they resemble other events with which we are familiar.

The problem with judging by only resemblance is that we may ignore relevant facts that should be included in our decision-making process.

What is Recognition-Primed Decision-Making?

- Utilizes experience to identify a reasonable solution as the first one considered.
- Recognizing a situation as typical, you recognize a course of action likely to succeed.
- Focus is on situational awareness, not courses of action.

Example: Pilots train on emergency procedures. They run checklists over and over and over again until they know each situation and exactly what their course of action should be when they encounter that situation. An engine fire light means they follow a procedure to cut fuel to the engine and if an internal fire bottle is installed, to activate the fire bottle to hopefully extinguish the fire. Then they take the next steps to get the aircraft safely on the ground.

Don't let overconfidence cloud your view of assessing all symptoms of the risk. A time-critical assessment requires attention to all the details.

Interaction/Activity: Time Critical Decision Making Techniques

Take 2-3 minutes to discuss and write down the answers to the following questions:

- What are the three time-critical decision-making techniques?
- Give an example of any of the three.

_____

_____

_____

Module 6: ORM Demonstration and Performance

Notes

Objective:

7. Explain the decision-making process and how time-critical techniques could be applied when given a scenario and working as a team.

Exercise: ORM Time Critical Techniques

In a small group, evaluate the assigned scenario applying what you have learned today (i.e. Five-Step Process, GAR Model, time-critical decision-making techniques, etc.). Discuss how you might have prevented an accident.

Be prepared to discuss with the class.

Exercise Scenario 1

Some Bureau employees are at a campsite waiting to be transported back to their main base. They have plenty of gear and are anxious to return home after an extended stay in the field. Two aircraft are contracted to pick up the employees. On the day set for their return to base weather begins rolling in and blanketing the area. The two aircraft arrive. Both pilots are experienced, but one is fairly new to the area. The Bureau employees express concern over the weather and float the idea of waiting to see if weather conditions improve. The lead pilot lets them know he has another flight scheduled and he did not want to wait. The pilot new to the area decides to follow the lead pilots and the Bureau employees decide to go ahead with the flight. The load and takeoff of the aircraft is uneventful. As the flight proceeds the lead aircraft decides to backtrack due to the weather. The trailing aircraft follows, but then is told by the lead that they've spotted a hole in the cloudbank and are proceeding down through it. The trailing aircraft attempts to follow, but is unable to spot the hole in the clouds and decides to back track and take a longer route following

a coastline back to the main camp. The trailing aircraft arrives safely at the main base and asks if the lead aircraft has arrived yet. The lead aircraft had not been heard from and the FAA was notified.

FACTS:

- Weather was a factor.
- Automatic Flight following was not installed in the aircraft.
- 406 Mhz ELT was not installed in the aircraft.
- Three passengers and one crew member were fatally injured.
- The aircraft was a total loss.

Exercise Scenario 2

A commercially-rated, fixed-wing, single-engine, land-certificated pilot was receiving training to be qualified in float equipped aircraft operation. The pilot received several hours of training in a particular type of float equipped aircraft and felt he was ready for a check ride. The particular model of aircraft the pilot had been training in was unavailable that day so the pilot and certified flight instructor secured another type of float equipped aircraft. The weather was clear, but hot. The two pilots decided not to wear their PPE due to the heat. They also decided not to wear the life preservers that were required, due to the heat. The aircraft was we equipped with seatbelts and should harnesses, but the pilots chose not to wear them because they felt it would interfere with operating the flap and water rudder controls located on the floor between the seats. Also, neither pilot wore personal floatation devices although they were available. Floatation devices were packaged and installed in the aircraft. The aircraft entered the training area and a high level reconnaissance was performed to make sure the desired landing area was clear of debris. The left seat pilot made the approach with the CFI observing from the right seat. The aircraft touched down on the water with an incorrect attitude which caused more of the float surface to impact the water. This caused a much faster deceleration force on the aircraft than anticipated. The aircraft pitched forward and flipped over. The aircraft was immersed in water immediately. The CFI was able to quickly release his restraints, exit the aircraft, and return to the surface. The left seat pilot was not spotted on the surface and the CFI tried to find him, but the murky water was extremely difficult to navigate. He motioned for help to a nearby surface craft. When the surface craft arrived a bystander made several attempts to locate the left seat pilot. The pilot was finally located, but had unfortunately already drowned.

FACTS:

- Proper PPE was available, but not used.
- CFI had current “water ditching” training.
- DOI pilot did not have “water ditching” training.
- Personal flotation devices were available but not used.
- Weather was not a factor.

- Aircraft damage was very serious.
- One fatality occurred.

Exercise Scenario 3

Several Bureau employees were set out on a mission to eradicate some local wildlife. The first half of the overall mission had been completed in a relatively flat area, while the second portion of the mission was located in tougher, more “hilly” terrain. The area was relatively unknown to the pilot and they planned to visually pick out a suitable landing site in the area they wanted to go. A total of 6 people lifted off safely in a helicopter and entered the area the eradication would take place and began looking for a landing site. They spotted a site they thought was suitable and began descending. As they touched the ground and lowered engine power all the way down, they could feel the aircraft shudder and shift slightly. They had entered what is called “ground resonance”. The pilot increased power and tried to lift off again to reposition, but when he did the ground resonance effect increased. The aircraft began shaking violently and pieces of the aircraft began flying apart. When the aircraft finally came to rest it the pilot and passengers began tending to the injured.

FACTS:

- The aircraft was a total loss.
- Four people were injured.
- All required PPE was used.
- The Project Aviation Safety Plan (PASP) stated that the landing sites would be pre-identified although unimproved.

Summary

You should now be able to accomplish the objectives for this course. If you have any remaining questions regarding them, ask the instructor for clarification at this time.

Objectives:

1. Define a Safety Management System (SMS).
2. Define key risk management terms.
3. Recognize Operational Risk Management (ORM) principles utilized within a given SMS.
4. Define the five steps of the ORM process.
5. Identify the three levels of ORM.
6. Recall three (time-critical) ORM techniques.
7. Explain the decision making process and how time-critical techniques could be applied when given a scenario and working as a team.

Evaluation

Please be sure to complete and submit the Course Evaluation Form OAS-111 provided by the instructor.

Appendix A

Aviation GAR Risk Assessment
Aviation Operations
(Green Amber Red)

The GAR model allows for time-critical risk assessment and generates communication concerning the mission risks. This communication then helps identify the risk and leads to the appropriate mitigation. The GAR model can be applied in a variety of situations. It can be used to help identify programmatic risk and is efficient enough to be utilized as a pre-mission risk assessment tool. The GAR model 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 difference 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.

It 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.

The GAR model should be applied to helicopter rappel missions as appropriate. All helicopter program managers shall receive training on the GAR model and its use. Helicopter program managers shall be responsible for implementing the GAR model with all members of the team at their base.

Additional information on risk management can be found in Chapter 3 and Appendix J of the Interagency Helicopter Operations Guide.

A GAR Risk Assessment, which creates a GO-NO, GO decision tool, will be conducted by involved personnel prior to a helicopter rappel mission.

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. This is your personal estimate of risk. Add the individual risk scores to come up with a Total Risk Score.

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

If the plan experiences failure what contingency is in place? Backup resources that can assist if needed. Contingency resource planning accomplished with cooperators. Evaluate shared communications plan and frequencies. Has alternate plan to rappel been evaluated?

Communication

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

Team Selection
The selection of individual resources should evaluate the character and competence of the individuals to be used. On occasion individuals may have to be replaced during the operation, which will require an assessment of any new team members and how they will be able to interact with those already engaged.

Team Fitness
Team fitness should consider the physical and mental state of the crew to include the rappellers, spotter, pilot, and helicopter. The amount and quality of duty/rest a team member has had as well as an evaluation of all internal and external stress are important factors to consider.

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, forest canopy, and site selection. However, they should be eyed with caution as the operational environment is very dynamic.

Incident Complexity
Evaluate the experience level of the team. Generally, the longer one is exposed to a hazard, the greater are the risks. The situation includes considering how long the environmental conditions will remain stable and the complexity of the work.

GAR Risk Assessment Worksheet

Risk		Score
Supervision	**0-10**	
Planning	**0-10**	
Contingency resources	**0-10**	
Communication	**0-10**	
Team selection	**0-10**	
Team fitness	**0-10**	
Environment	**0-10**	
Incident complexity	**0-10**	
Total	**0-80**	

Total Score

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

- The ability to assign numerical values or **"color codes"** to hazards is **not** the most important part of risk assessment.
- Team discussion is critical to understanding the risks and how they will be managed.

Operation: Scheduled
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 adaption. 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		
Interpersonal communications are clear and there is a high level of trust in the organization. Adequate personnel and technology are available to relay information accurately to those who make the decisions	< 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
Team Selection		
Multiple personnel with skill, knowledge and ability are available to fulfill the requirements of the mission. Selection and preparation are done well in advance so there is plenty of time for personnel to get personal and job related demands addressed.	< 1 2 3 4 5 6 7 8 9 10	Only one person is available and the success of the mission depends on that person juggling many responsibilities to squeeze this mission into the work schedule. Additional time will be donated to keep up with the workload.
Team Fitness		
Personnel are trained, proficient, healthy, and rested prior to starting the mission. Personal issues are addressed and little external stress is being exerted.	< 1 2 3 4 5 6 7 8 9 10	Personnel lack one or more critical component in their training. These persons have been squeezing in many additional duties as assigned distracting them from their proficiency or personal life.
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.
Mission 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:_____

Operational/Mission Risk Assessment Worksheet

Risk rated 1-10 for each category. (Mitigations should be considered for any category rated higher than 5)

Overall Mission Risk

1-35	36-60	61-80
Green	**Amber**	**Red**

	3
	3
	4
	4
	3
	3
	9
	9
Total	38