

## **APPENDIX J: → Risk Management Tools**

### Green Amber Red (GAR) Model Risk Assessment

#### Introduction

This risk analysis tool was briefly discussed in Chapter 3. This model differs from the Specific Probability and Effect model presented in that chapter in several ways. First it provides a more general analysis of the operational system, and second, it 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 through out the mission and each assessment model allows management to set the acceptable risk standards as they apply to each mission. The following categories comprise the GAR model;

#### GAR Categories.

##### Supervision

Supervisory Control considers; the experience, training, proficiency, other qualifications of the supervisor, whether that person's situations awareness, leadership, and communication are effective, and if the required supervision is actually taking place. Even if qualified to perform a task a person designated to provide supervision acts as a control for risk undertaken. This may as simple as someone checking that what is being done is conforming to the agreed standards for the operations. To effectively provide control the supervisor must;

- have the goals of the operation (planning),
- be able to affect the state of the system (leadership and communication),
- have a model (mental model or plan) of the system (decision making), and
- be able to ascertain the state of the system (situation awareness).

The higher the degree of risk, the more the supervisory demands need to focus on observing and checking. A supervisor can be easily distracted when actively involved in a task (doing something) and should be not considered to be an effective safety observer in 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.

##### **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 both physical and mental state of the team. The amount and quality of duty/rest a crewmember has had as well as an evaluation of all internal and external stress are important factors to consider. The stage of team development should also be assessed as this will have an impact on the level of complexity the team should be able to manage.

### **Communication**

An evaluation of the communication systems that are available should include; the technical capability, infrastructure, operational reliability, and organizational communication culture. Assess the barriers to communication and determine how they may be bridged, and identify the communication errors that may occur and how to trap them.

### **Contingency Resources**

Contingency planning should be a normal part of basic planning as well as planning for the unforeseen. These are the resources you would need should certain predetermined conditions occur or an emergency arise. Consider what is required to activate these resources, the expected time for them to respond, and how they would be implemented.

### **Environment**

Consider factors affecting personnel and how they will perform, as well as the capabilities and limitations of other assets and resources. Things such as the time of day, temperature, humidity, precipitation, wind and other weather conditions are dynamic and may change as the operation proceeds. Fixed objects and terrain affect wind and weather patterns and provide barriers to visual acuity, as well as mask or provide distractions from other hazards. A certain number of these features may also promote better performance; however, they should be eyed with caution as the operational environment is very dynamic.

The organizational environment also affects how people operate. The overt culture of an organization may appear to be one thing when below surface it is actually something completely different. Be realistic and truthful regarding the culture of the organization and provide the goals and expectations that are well understood by all.

### **Event or Incident Complexity**

Newly developing teams have many barriers to overcome and are equipped with a variety of individual skills. These teams are capable of handling simple non-complex operations without much preparation. Team selection is of key importance in bringing together individuals with the requisite character and competency. Time is needed for a team to develop and leadership must adapt as the team evolves. The complexity of the operation may require time to be set aside for training/

team interaction to develop the necessary trust and competency required for teamwork to function effectively under the demands of the situation.

### Calculating Risk Using GAR Model

To compute the total risk level, for each risk category previously identified, assign a number from 0 (For No Risk) to 10 (For Maximum Risk) for each of the eight categories. This is a personal estimate or starting point for the all important discussion that should included as many of the participants as practical. The discussion is more important than the actual number that is assigned. The individual risk category scores are then totaled. An assessment form containing descriptions of high and low risk can be developed similar to Figure 3-1.

<b>Supervision</b>	_____
<b>Planning</b>	_____
<b>Team Selection</b>	_____
<b>Team Fitness</b>	_____
<b>Communication</b>	_____
<b>Contingency Resources</b>	_____
<b>Environment</b>	_____
<b>Complexity</b>	=====
<b>Total</b>	

### Color Coding Risk

The mission risk is similar to the colors of a traffic light. If the total risk value falls in the GREEN ZONE (1-35), risk is rated as low. A moderate level of risk is indicated when the total risk value falls in the AMBER ZONE (36-60, and should the total value falls in the RED ZONE (61-80), you should insure that all risk control measures have been implemented and can be effective controls prior to starting the event or evolution. The Amber and Red risk levels must be evaluated at a higher level in the organization than the helicopter/helibase manager to ensure that the organizational risk acceptance levels are aligned with the expected benefit of the operation.

The GAR Model provides a general assessment of operations and allows management to set the standard for risk. Any concern for elevated risk levels in one or more of the categories, may require an in depth assessment using a more specific assessment.

Once again, assigning numerical values or “color codes” to hazards using the GAR Model is not the most important part of this risk assessment. The importance of this step is the team discussions leading to an understanding of the threats, how they will be controlled, and the standards that management expects the aircrew to maintain. These standards then provide a mental model for everyone involved in the operation that allows decision making and threat and error management to be properly aligned with the organization.

The following is an example of how the GAR Risk Assessment may be documented.

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Operation:		Scheduled Date:
Objective(s):		
<b>Supervision</b>	<b>Circle the number as appropriate</b>	
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.
<b>Planning</b>		
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.
<b>Contingency Resources</b>		
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
<b>Communication</b>		
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.
<b>Team Selection</b>		
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.

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<b>Team Fitness</b>		
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.
<b>Environment</b>		
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.
<b>Mission Complexity</b>		
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.
	<b>Mission Total:</b>	
<b>Benefit Statement</b>		
<b>Operation Approved by:</b> <b>Date:</b>	<b>Title:</b>	

<b>GREEN ZONE (1-35)</b>	<b>AMBER ZONE (36-60)</b>	<b>RED ZONE (61-80)</b>
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**SMS Assessment and Mitigation  
Assessment and Mitigation of:**

System-											
Sub-system	Hazards	Pre Mitigation			Mitigation	Post Mitigation			Mitigation Achieved ?	Additional Local Mitigation	Post Mitigation Value
		Likelihood	Severity	Outcome		Likelihood	Severity	Outcome			
<b>Final Assessment Value:</b>		<b>Prepared By:</b>			<b>Date:</b>			<b>Title:</b>		<b>Date:</b>	
<b>Operation Approved by:</b>											

Use additional sheets if necessary





<b>Risk Assessment Matrix</b>				
<b>Severity</b>				
<b>Likelihood</b>	<b>IV Negligible</b>	<b>III Marginal</b>	<b>II Critical</b>	<b>I Catastrophic</b>
<b>Frequent A</b>	-		<b>4</b>	
<b>Probable B</b>	-	<b>3</b>	-	<b>High</b>
<b>Occasional C</b>	-	<b>2</b>	<b>Serious</b>	-
<b>Remote D</b>	<b>1</b>	<b>Medium</b>	-	
<b>Improbable E</b>	<b>LOW</b>	-	-	-