



**UC DAVIS**  
Coastal and Marine  
Sciences Institute



<https://marinescience.ucdavis.edu/bml/about>



# James J. Fitzgerald: UC Davis ~Boating Safety Officer~



# Risk Assessment Using the G A R

## Helping Field Teams Manage Operational Risks



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**National Department of Response**

**Surface Operations Risk Calculation Worksheet**  
Calculating Risk Using the GAR Model  
(GREEN-AMBER-RED)

This Worksheet should be used for all surface operations unless other GAR forms have been mandated by local OIAs.

GAR IS BASED ON A TEAM DISCUSSION TO UNDERSTAND AND EVALUATE THE RISKS ATTENDANT TO A MISSION AND HOW THEY WILL BE MANAGED. RISK MANAGEMENT IS WHAT IS IMPORTANT, NOT THE ABILITY TO ASSIGN NUMERICAL VALUES OR COLORS TO RISK ELEMENTS.

Assign a risk code of 0 (For No Risk) through 10 (For Maximum Risk) to each of the six elements below. The discussion should start with the junior (least experienced) members first on each category.

|                                                                        |  |
|------------------------------------------------------------------------|--|
| <b>Supervision</b> - qualifications / experience / communications      |  |
| <b>Planning</b> - details / clarity / vessel selection and condition   |  |
| <b>Team Selection</b> - qualifications / experience                    |  |
| <b>Team Fitness</b> - physical / mental state                          |  |
| <b>Environment</b> - seas / visibility / wind / current / temperatures |  |
| <b>Event/Evolution Complexity</b> - details / tasks                    |  |
| <b>Total Risk Score</b>                                                |  |

GAR Evaluation Scale - Color Coding the Level Of Risk

|                     |    |                    |    |                    |    |
|---------------------|----|--------------------|----|--------------------|----|
| 0                   | 23 | 30                 | 40 | 50                 | 60 |
| GREEN<br>(Low Risk) |    | AMBER<br>(Caution) |    | RED<br>(High Risk) |    |

If the total falls in the green zone, risk is at a minimum. If the total falls in the amber zone, risk is moderate and you should consider adopting procedures to minimize risk.

IF THE TOTAL FALLS IN THE RED ZONE, YOU NEED TO IMPLEMENT MEASURES TO REDUCE THE RISK PRIOR TO STARTING THE EVENT/EVOLUTION.

THE GAR MODEL SHOULD BE USED AS PART OF PLANNING OPERATIONS, AND SHOULD BE CONTINUALLY REASSESSED AS WE REACH MILESTONES WITHIN OUR PLANS, OR AS ELEMENTS CHANGE.

# Today's Agenda

- *You will want to have a Pen/Pencil and Scratch Pad*
- **Review:** Principles for a Safe Learning & Operational Environment
- Background and History of the USCG implementing the GAR
- GAR Objectives: Facilitate Communication & Risk Management
- GAR Overview and Examples for Implementation
- GAR as a Mission Planning Tool
- Assigning GAR scores to the risk categories
- Discussing and implementing prevention and mitigation strategies
- The Go / No-Go decision
- Reassessing GAR risk factors during the mission
- Reviewing and Reevaluating the mission for lessons learned
- Summary Overview with Q&A



# Unified Messages for Field work

- Develop a written field plan **(Have an emergency plan in place)**
- Communicate the plan & logistics **(All hands - Engaged participation)**
- Provide a defined & clear leadership structure **(Leader & Co-leaders)**
- Shared respect for the groups safety **(Roles & Responsibilities)**
- Provide adequate resources **(Physical & Emotional Well-being)**
- Model expected behaviors **(Check the ego – Inclusive & Supportive)**
- Manage Conflict swiftly **(Confusion impacts Situational Awareness)**
- Check-in regularly with the Team **(Formal Briefing & De-brief)**

# US Coast Guard Implementation of the G<sup>A</sup>R

**Then:** You have to Go out but you don't have to come back.....

Doing our jobs with confidence and relying on your team for situational awareness!  
We don't damage equipment, or get people hurt, we prevent the loss of life and property....or data😊



**Now:** You Don't have to go out and you do have to come back!

# Objective:

During the mission planning phase use the **GAR** form to evaluate risk exposure, and to reassess risks as goals and milestones are achieved during the operational phases and manage the overall risk exposure.



# Enabling Objective:

Team members discuss the 6 elements of the GAR and communicate the perceived risks to determine individual, team and total mission risk exposure, to better implement logistical, protective and prevention measures that minimize and/or mitigate risk factors.

~**PREVENTING the RIPPLE EFFECT**~



- **Severity**- What is the potential loss or consequence?
- **Probability**- The likelihood of loss or consequence?
- **Exposure**- The amount of time, cycles, people or equipment involved?

**Training and Field Courses: Student / Instructor Ratios should factor the task**

**S/P/E**



# Using the “G.A.R.” Model for Mission Analysis and Operational Risk Assessment

GREEN / AMBER / RED

# Six Elements of the GAR Worksheet

1. Supervision
2. Planning
3. Crew Selection
4. Crew Fitness
5. Environment
6. Event/Evolution Complexity

(Risk Scores 1 through 10)

1=Low Risk / 10=High Risk

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| <b>Environment</b> - seas / visibility / wind / current / temperatures |  |
| <b>Event/Evolution Complexity</b> –details / tasks                     |  |
| <b>Total Risk Score</b>                                                |  |

GAR Evaluation Scale - Color Coding the Level Of Risk

|                     |                    |                    |    |    |
|---------------------|--------------------|--------------------|----|----|
| 0                   | 23                 | 44                 | 60 |    |
| 10                  | 20                 | 30                 | 40 | 50 |
| GREEN<br>(Low Risk) | AMBER<br>(Caution) | RED<br>(High Risk) |    |    |

If the total falls in the green zone, risk is at a minimum. If the total falls in the amber zone, risk is moderate and you should consider adopting procedures to minimize risk.

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### **GAR Risk Elements**

- **Supervision**
- **Planning**
- **Crew Selection**
- **Crew Fitness**
- **Environment**
- **Event/Evolution Complexity**

|                            |                                                                                                                                                                                |
|----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>GREEN</b><br>(Low Risk) | Risk level is acceptable and minimal, take measures to avoid complacency.                                                                                                      |
| <b>AMBER</b><br>(Caution)  | Risk level is moderate, alternate plans and contingencies should be identified to minimize risk exposure and to identify any changes that could elevate or reduce risk levels. |
| <b>RED</b><br>(High Risk)  | Risk level is HIGH, alternate plans and/or mitigating measures must be implemented, the mission stopped/suspended until the risk level is manageable and acceptable.           |



# GAR Scenario

## INSTRUCTIONS

1. You Need: *Pen & Scratch Pad*
2. Visualize yourself as the leader and a team of your colleagues.
3. Assign a risk score to each GAR element as we go along.
4. Apply your perceived risks based on the current **COVID-19 climate**.
5. Total your risk score and determine **GO/ NO-GO**.
6. Identify your risk mitigation steps.

## Normal Pre-COVID Project Tasking

- 3 Person Team / 3 day trip
- Depart Lab with supplies and equipment, 120 mile drive one way.
- Weather Calm conditions clear skies and favorable forecast.
- Kayak to a small island on a lake, ½ mile trip and set up Camp. (Tents)
- Service camera, solar panels and data logger batteries.
- Download data and collect water samples, record observations.
- Return to lab- catalog data, store samples and clean and stow gear.

# SUPERVISION

- Supervisory & Leadership controls should factor an individuals qualifications, experience level and communication effectiveness.
  - **Designated Leaders-** Provide management, guidance and resource support
  - **Functional Leaders-** Model expected behaviors, demonstrate performance

~Requires **ACTIVE ENGAGEMENT** with the **TEAM**~

- The higher the risk, the more active the Supervisor/Leader needs to be involved and focused on observing and checking-in with the team.
  - **Distractions-** The supervisor that is actively engaged in the tasks (doing something) can be easily distracted and may not be able to effectively moderate risks for the team.
  - **Task Loading-** Supervisors should delegate or minimize assigned tasks to prevent overload in order to maintain the teams situational awareness.



# PLANNING

~SAFE~LEGAL~EFFECTIVE~



- Is the plan in writing, is there an emergency action plan?
- How much information do you have in the plan?
- How clear is the information?
- How much time do you have for evaluating mission requirements?
- Is the plan understood by the entire team?
- Have you asked for input on the plan from the team or experts?
- Is there a contingency plan if things change?
- Is the plan approved or endorsed by supervisors / leadership?

# TEAM SELECTION

- What are the proper qualifications for team members?
- What is the training level of the team members?
- What is the experience level of the team members?
- What skills-sets can make the team stronger?



# TEAM FITNESS

- What is the physical state of the team members?
- What is the mental state of the team members?
- What is the emotional state of the team members?
- What can be done to monitor and prevent fatigue?
- How will the task load, schedule and elements impact team fitness?



# ENVIRONMENT

**The environment should consider ALL factors impacting personnel actions and the performance capability of the resources involved.**

- Time of day
- Temperature
- Visibility
- Precipitation / Lightning
- Wind
- Hazardous Terrain and/or Water Conditions
- Exposure: Toxicity / Bio Hazards / O<sub>2</sub> Deficiency
- External Hazards: Machinery / Trips & Falls / Sharp Objects



# EVENT & EVOLUTION COMPLEXITY

**Factor the amount of time and complexity of the tasks and situation, the longer the exposure the greater the risks.**



## **HOW DANGEROUS IS THE JOB?**



- With increased evolutions or iterations the probability and exposure generally increases.
- Repetition can increase proficiency or increase the likelihood of error.
  - Is the environment stable will it remain static or become dynamic?
  - Can the task loading be spread out to reduce complexity?
  - Can the mission be made safer with different resources; by adding or reducing personnel?
  - What can be done to minimize individual and team complacency?

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Environment - seas / visibility / wind / current / temperatures

Event/Evolution Complexity –details / tasks

Total Risk Score

GAR Evaluation Scale - Color Coding the Level Of Risk

0234460

1020

3040

50

GREEN  
(Low Risk)

AMBER  
(Caution)

RED  
(High Risk)

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| GO / NO-GO                                              |                                                                                                                                                                                |
|---------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Reassessing and Checking in with Color Code Assessments |                                                                                                                                                                                |
| GREEN<br>(Low Risk)                                     | Risk level is acceptable and minimal, take measures to avoid complacency.                                                                                                      |
| AMBER<br>(Caution)                                      | Risk level is moderate, alternate plans and contingencies should be identified to minimize risk exposure and to identify any changes that could elevate or reduce risk levels. |
| RED<br>(High Risk)                                      | Risk level is HIGH, alternate plans and/or mitigating measures must be implemented, the mission stopped/suspended until the risk level is manageable and acceptable.           |

# **BRIEF & DEBRIEF**

## **L.E.A.P.S.**

*Listen ~ Empathize ~ Ask ~ Paraphrase ~ Summarize Solutions*

### **Pre-Mission Briefing**

- Clarify roles & responsibilities
- Ask specific questions
- Establish a climate for learning
- Encourage / Accept input from the team
- Maintain a positive attitude
- Define success and accountability

### **Post-Mission Debriefing**

- Timely
- Specific
- Non-Punishing
  
- What was your experience?
- What went well?
- What would you do to make improvements?

***Thank You!***

**During the current times place extra emphasis on Team Fitness and Environmental Hazards to factor in the COVID-19 risks our teams, friends and family members must consider.**



**Implement bio-hazard precautions, make PPE and decontamination supplies accessible to keep one another safe and maintain situational awareness.**