2024 UC Field Safety Leadership Retreat

Bodega Marine Lab & Reserve

March 8-10, 2024

Welcome to Bodega Marine Laboratory & Marine Reserve




U.C. Davis Boating and Diving Safety Team

Boating Safety Officer: **James Fitzgerald** Boating@UCDavis.edu

Diving Safety Officer: **Jason Herum** Diving@UCDavis.edu

ABDSO's: **Greg Flederman & Abbey Dias**

UCD-BML Marine Operations Manager: **David Dann**

UC Davis
Boating & Diving Safety Program

"Dedicated to Providing a S.A.F.E. Learning Environment"

Supportive - Accepting - Focused - Engaging

Instructor Pledge:

We dedicate ourselves to delivering excellence and are motivated by learning with our students.

We are accountable for respectable and ethical conduct in the classroom and in the field.

We will conduct ourselves with honesty, integrity and personal responsibility.

We strive to create and maintain an environment that builds meaningful relationships among our students, staff and community partners.

We challenge ourselves to be innovative in our pursuits that will enhance and build a robust and rich learning environment, one that is built on quality communication, diverse experiences, acceptance of new ideas and creative solutions.

We strive to provide an optimal course setting and instructional support to help achieve your personal goals.
Our goal is to provide a S.A.F.E. Learning Environment that invites participation, values each individual's contributions and provides inclusive equity for ALL of our participants while serving their academic and vocational pursuits in spirit with the UC Principles of Community.

Our instructional commitment is to YOU. We value your input and ask that you share your individual needs and expectations to have success in the learning environment.

Please list and share the things you find important and helpful in providing you with a "S.A.F.E. Learning Environment" and which contribute to each participant's success!

Instructor Values = Student Values

INSTRUCTOR CREDIBILITY	POSITIVE LEARNING ENVIRONMENT
Professional Integrity	Safe Environment (Pyramid of Needs)
Engaging and Effective	Course Schedule and Learning Objectives
Open and Receptive	Clear Goals and Expectations
Respectful and Honest	Student Readiness and Preparedness
Trusting and Supportive	Relevant Climate for Course Content
Understanding and Accepting	Learner Participation is Optimized
Non-Judgmental	Activities Support Course Content
Qualified and Capable	Positive Reinforcement and Feedback
Advanced and Innovative	Objective and Fair Evaluations
Open to Learning from Students	Learning Outcome= Real World Expectations
Honor All Questions	_____
_____	_____
_____	_____

List and communicate any additional Essential Needs you may have:

Training Course Expectations
UC Davis Boating & Diving Safety Program

Courses offered by the UC Davis Boating and Diving Safety Program involve intensive (typically multi-day) training and evaluation components. Training courses incorporate classroom instruction, field demonstrations, and hands-on training opportunities. Arriving well-prepared will help you get the most from the training.

Arrive well rested.

Training courses tend to have an ambitious schedule that require long days (up to 12 hour days) during which you will either be in class, in the field, or having a meal. There is little down time during the training course.

Know the schedule.

Know the plan and what is expected of you prior to each classroom or field training exercise. You should bring a writing utensil, course books and binders and keep a copy of the schedule with you.

Be physically and mentally prepared.

Field exercises may cause fatigue especially when coupled with long training days. Physical fitness and prior experience in the field may be used to your advantage. Ensure you have reviewed pre-requisite course materials, have completed your homework, and flagged any questions you may have.

Training Course Expectations
UC Davis Boating & Diving Safety Program

Courses offered by the UC Davis Boating and Diving Safety Program involve intensive (typically multi-day) training and evaluation components. Training courses incorporate classroom instruction, field demonstrations, and hands-on training opportunities. Arriving well-prepared will help you get the most from the training.

Prepare your gear.

Make sure you have all required course gear (outlined in course syllabus) ready and accessible for training.
Make sure you have considered the optional/recommended equipment. Labeling your gear is also good idea.
Please contact an Instructor prior to training if you need to borrow any gear items.

Be flexible and use situational awareness.

Field portions of the course may require schedule changes or modification to accommodate weather/water conditions, vessel availability, and group progress.
Being flexible and situationally aware of your surroundings (environment, crew, vessel, mission), will be important for individual and team success in the field.

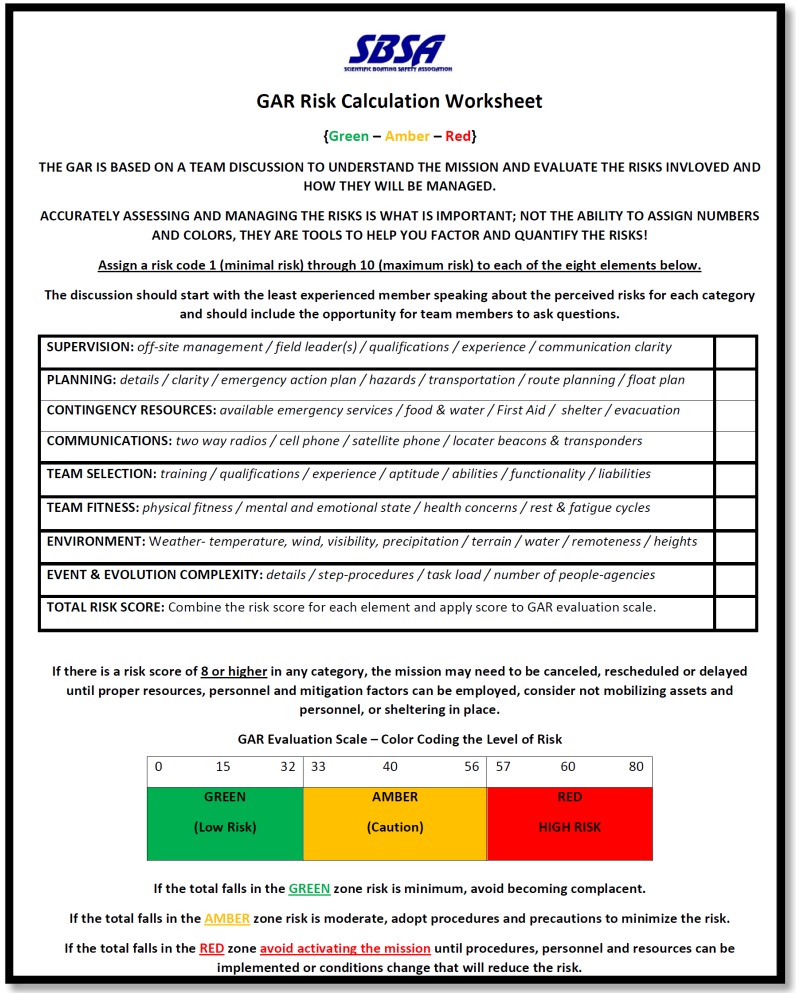
Self-assessment and care.

Communicate to Instructors how **you** feel with your progress and how **you** feel both physically and mentally.
Bring food, snacks and fluids for hydration, medications, supplemental clothing and Personal Protective Equipment/Items to class. Your safety and well-being is our primary concern.

This Afternoon
Using the GAR Tool & Coldwater Survival

Skills & Activities

- **When emergencies happen: Fire & Flooding**
- **Egress & Evacuation**
- **Sudden Cold Water Immersion**
- **1-10-1 Rule**
- **Moving Water -vs- Big Water**
- **Self-Rescue**
- **Survival Equipment**
- **Signaling Equipment**
- **Survival Strategies**



SBSA
SCIENTIFIC BOATING SAFETY ASSOCIATION

GAR Risk Calculation Worksheet

{Green – Amber – Red}

THE GAR IS BASED ON A TEAM DISCUSSION TO UNDERSTAND THE MISSION AND EVALUATE THE RISKS INVLOVED AND HOW THEY WILL BE MANAGED.

ACCURATELY ASSESSING AND MANAGING THE RISKS IS WHAT IS IMPORTANT; NOT THE ABILITY TO ASSIGN NUMBERS AND COLORS, THEY ARE TOOLS TO HELP YOU FACTOR AND QUANTIFY THE RISKS!

Assign a risk code 1 (minimal risk) through 10 (maximum risk) to each of the eight elements below.

The discussion should start with the least experienced member speaking about the perceived risks for each category and should include the opportunity for team members to ask questions.

SUPERVISION: *off-site management / field leader(s) / qualifications / experience / communication clarity*	
PLANNING: *details / clarity / emergency action plan / hazards / transportation / route planning / float plan*	
CONTINGENCY RESOURCES: *available emergency services / food & water / First Aid / shelter / evacuation*	
COMMUNICATIONS: *two way radios / cell phone / satellite phone / locater beacons & transponders*	
TEAM SELECTION: *training / qualifications / experience / aptitude / abilities / functionality / liabilities*	
TEAM FITNESS: *physical fitness / mental and emotional state / health concerns / rest & fatigue cycles*	
ENVIRONMENT: *Weather- temperature, wind, visibility, precipitation / terrain / water / remoteness / heights*	
EVENT & EVOLUTION COMPLEXITY: *details / step-procedures / task load / number of people-agencies*	
TOTAL RISK SCORE: Combine the risk score for each element and apply score to GAR evaluation scale.	

If there is a risk score of 8 or higher in any category, the mission may need to be canceled, rescheduled or delayed until proper resources, personnel and mitigation factors can be employed, consider not mobilizing assets and personnel, or sheltering in place.

GAR Evaluation Scale – Color Coding the Level of Risk

0 15 32	33 40 56	57 60 80
GREEN (Low Risk)	AMBER (Caution)	RED HIGH RISK

If the total falls in the GREEN zone risk is minimum, avoid becoming complacent.

If the total falls in the AMBER zone risk is moderate, adopt procedures and precautions to minimize the risk.

If the total falls in the RED zone avoid activating the mission until procedures, personnel and resources can be implemented or conditions change that will reduce the risk.

“The Normalization of Deviance”

M/V Conception & R/V Titan

~Industry Impacts & Lessons Learned~

UC Davis Boating & Diving Safety Officers: BSO-James Fitzgerald & DSO-Jason Herum
Boating@UCDavis.edu / Diving@UCDavis.edu

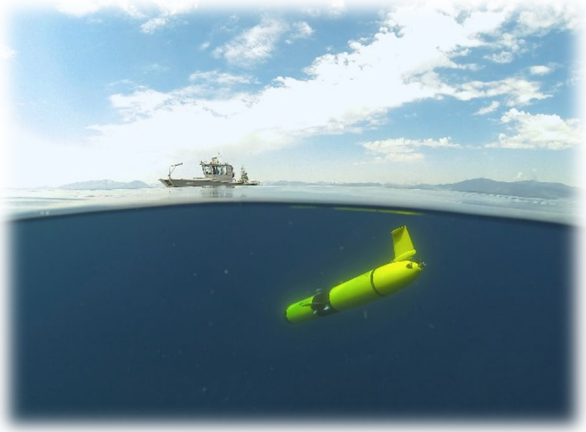
Topic Agenda and Objectives:

- **Objective:** Provided with a an overview of institutional and industry Mishaps, discuss how the "Normalization of Deviance" influences your acceptance of risk and the importance of **Informed Team Decision Making {I.T.D.M.)** to help you manage those risks, and your potential strategies for evacuation, survival and rescue.

- **References & Resources:** UC Mishaps / MV Conception / RV Titan / NASA Challenger / **GAR Tool**

- **Discussion:** Normalization of Risk and Contributing Human Behaviors

- **Individual Readiness:** Informed Assessments and Situational Awareness for Safety and Survival



A Recent Historical Reflection and Memorial
U.C. Maritime Incidents

UC Davis: 2000 Sea of Cortez Boating Accident ~ 5 lives lost

UC Santa Barbara: 2018 UCSB Rancho Marino NRS ~ 1 life lost

UC Santa Cruz: 2019 Glacier Bay NP Diving Accident ~ 1 life lost

U.C. Davis Chancellor Larry Vanderhoef, who flew to San Diego to accompany the group home, called the accident "the most tragic in the history of the university."

What are the common threads and similarities that link our UC incidents with other industry related incidents?

USGS
science for a changing world

U.S. Geological Survey

Serious Accident Investigation
Factual Report

Fatal Diving Accident at
Torch Bay, Alaska

Date of Accident
August 7, 2019

Location of Accident
In Glacier Bay National Park

FOR OFFICIAL USE ONLY

All personnel are reminded that information contained in this document is the same as "For Official Use Only" and is protected by the Privacy Act and exemptions within the Freedom of Information Act. Unauthorized use of this information may constitute an invasion of privacy. Information in this report is considered confidential. Persons viewing this report must be advised that findings, causes, recommendation, corrective actions, and witness statements are to be used for accident prevention purposes only. Even if released, these data may not be used for adverse administrative action, disciplinary purposes, or to establish pecuniary liability. Approval and consent of the U.S. Department of the Interior must be authorized prior to official release of this report.

Marine Safety Information Bulletin

Commandant
U.S. Coast Guard
Inspections and Compliance Directorate
2703 Martin Luther King Jr Ave SE, STOP 7501
Washington, DC 20593-7501

MSIB Number: 008-19
Date: September 10, 2019
E-Mail: CGCVC@uscg.mil

Passenger vessel compliance and operational readiness

On September 2, 2019, the small passenger vessel CONCEPTION caught fire and sank off the coast of Santa Cruz Island, California with loss of life. A Coast Guard Marine Board of Investigation (MBI) has been convened and will conduct a thorough and comprehensive marine casualty investigation to determine the causal factors that contributed to this tragic incident. The Coast Guard and the maritime industry do not have to delay until the MBI has completed their investigation before taking immediate and positive action.

This bulletin identifies regulations related to firefighting, lifesaving, preparations for emergencies, and means of escape that serve as a reminder for owner and operators to ensure the safety of the passengers and crew while onboard. It is recommended that owners, operators, and masters of passenger vessels immediately complete the following:

- Review the routes and conditions listed on the vessel's Certificate of Inspection (COI) including the number of passengers and overnight passengers permitted. Ensure crewmembers are aware of and clearly understand their obligations including any additional requirements detailed on the COI.
- Review emergency duties and responsibilities with the crew and any other crewmember in a safety sensitive position to ensure they comprehend and can comply with their obligations in an emergency to include the passenger safety orientation. Ensure emergency escapes are clearly identified, functional, and remain clear of objects that may impede egress.
- Review the vessel log book and ensure records of crew training, emergency drills, and equipment maintenance are logged and current. Additionally, it is recommended that the master complete log entries to demonstrate to the Coast Guard that the vessel is operating in compliance with routes and conditions found on the COI.
- Ensure all required firefighting and lifesaving equipment is onboard and operational.
- Reduce potential fire hazards and consider limiting the unsupervised charging of lithium-ion batteries and extensive use of power strips and extension cords.
- Review the overall condition of the passenger accommodation spaces and any other space that is readily available to passengers during the voyage for unsafe practices or other hazardous arrangements.

Owners, operators, or masters of passenger vessels that are unsure of the requirements placed on the vessel's COI or otherwise required by regulation are encouraged to contact their local Officer in Charge, Marine Inspection. Alternatively, questions may be forwarded to Coast Guard Office of Commercial Vessel Compliance, Domestic Compliance Division (CG-CVC-1) by email at CGCVC@uscg.mil.

-uscg

Why Do Accidents Happen?

Human Error / Mechanical Failure / Inadequate Resources / Lack of Training / Poor Planning
Time Crunch (Clock & Calendar) / Funding & Supervision

~ Industry Mindset & Complacency ~

What do We do when we recognize Unsafe Situations?

Who is responsible for Your safety?

Recognizing the Normalization of Deviance

Mike Mullane ~ NASA

https://www.youtube.com/watch?v=NcgeWkG1HCg

Write down your thoughts.

What are some causing factors for the Normalization of Deviance in the work place?

Normalization of Risk -vs- Normalization of Deviance

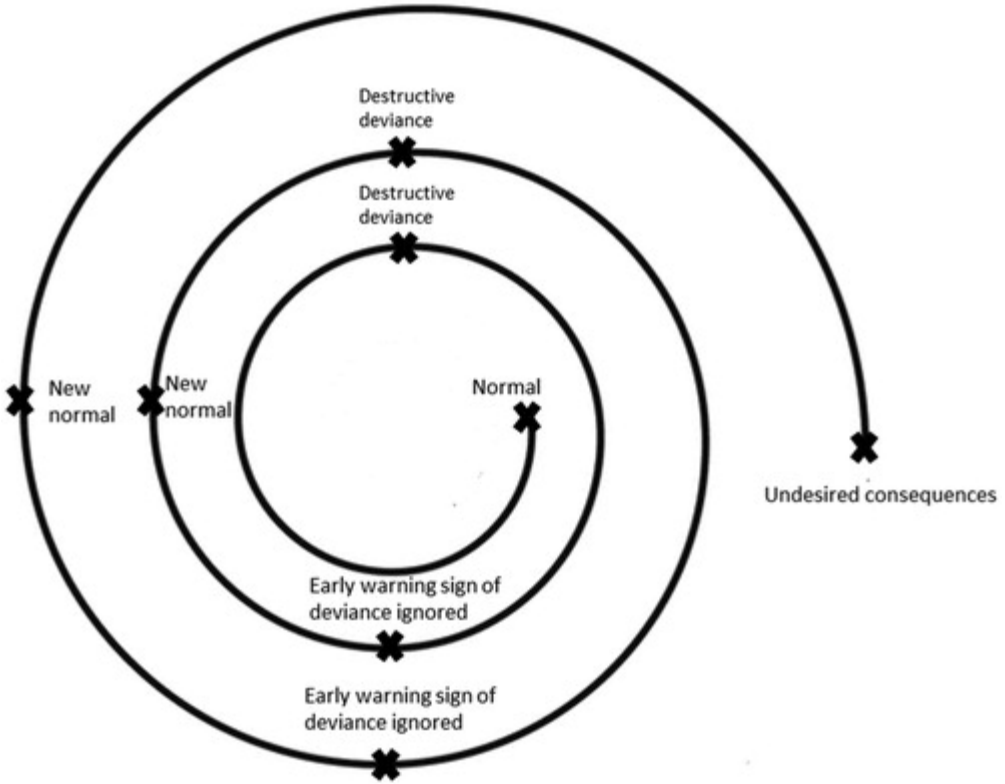
Risk normalization is the gradual process through which higher-risk or dangerous practices become accepted over time.

Normalization of Risk = Complacency

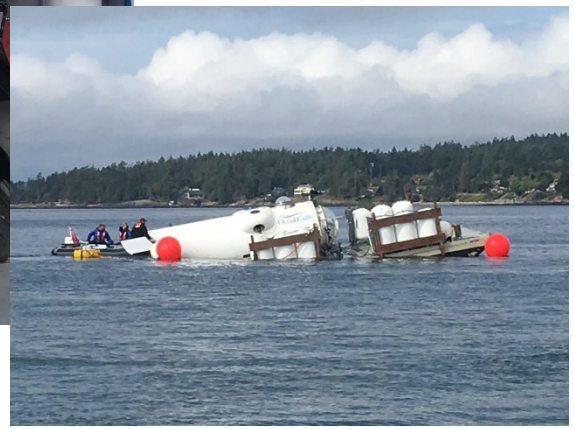
The **normalization of risk** encompasses gradually accepting risky behaviors in a broad sense.

Normalization of Deviance = False Sense of Security

The **normalization of deviance** specifically addresses *socially accepted* deviation from established best practices that increase the risk.



Similarities & Differences
R/V Cyclops & Titan Submersible -vs- Space Shuttle Challenger



<u>The Acceptance of the Risks and Potential Consequences</u>

{Is it…., Trust, Complacency or BLIND FAITH?}

Do you have enough information?

- Knowledge: System Design and Fabrication Facts
- Performance Inspections and Corrective Actions
- Mission Controls and Safety Thresholds
- Communications and Emergency “ALL STOP”
- **Trust & Faith in Human Systems**
  - Awareness & Detection
  - Alarms & Communication
  - Prevention & Mitigation Actions
  - Emergency Response Actions
  - (Terminate the Mission?)

A Fact about Submersibles:

Once you are underwater you have to accept that you may be beyond saving….

Ocean Gate Submersible

In 2018, OceanGate's director of marine operations, David Lochridge, composed a report documenting safety concerns he had about *Titan*.

OceanGate sued Lochridge for allegedly breaching his confidentiality contract and making fraudulent statements.

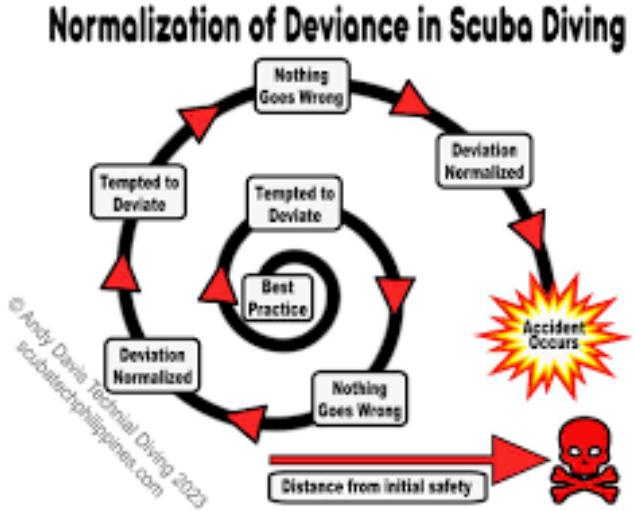
James Cameron, who directed the 1997 film *Titanic*, visited its wreckage site 33 times, and piloted *Deepsea Challenger* to the bottom of the Mariana Trench, said he was "struck by the similarity" between the submersible's implosion and the events that led to the *Titanic* disaster. He noted that both disasters seemed preventable, and were indirectly caused by someone deliberately ignoring safety warnings from others. Cameron expressed regret for not being more outspoken about concerns before the accident.

Submersible Research

What other less risky options and alternatives are available?

What about the What If's?

- What if the rules & laws don't cover it?
- What if the supervisor and plans don't cover it?
- What if the other participants aren't prepared?
- What if the environmental conditions are different than originally communicated?
- What if responsive emergency actions aren't ready or close by?
- What if it is up to You?



- **Do you have these options if you choose to go?**
  - Egress & Escape-Self Rescue
  - Evacuation Routes
  - Survival Strategies & Supplies
  - Signaling & Communications
  - Rescue & Recovery

M/V Conception

Figure 12. Small passenger vessel *Conception* at sunrise prior to sinking. (Source: VCFD)

Normalization of Risk and the Contributing Human Behaviors

- Ignorance?
- Arrogance?
- Negligence?
- Ego?
- Career Fear?
- Apathy?
- Fear of being Wrong?
- Not being Heard?
- Administrative Agendas?
  - Deadlines (Clock & Calendar)
  - Financial Constraints / Demands
  - Exposure- Press & Media
- Workplace Communications Climate?
- Fatigue?
- Other thoughts & ideas…….?

M/V Conception
~Fire Source: Alarms & Supression~

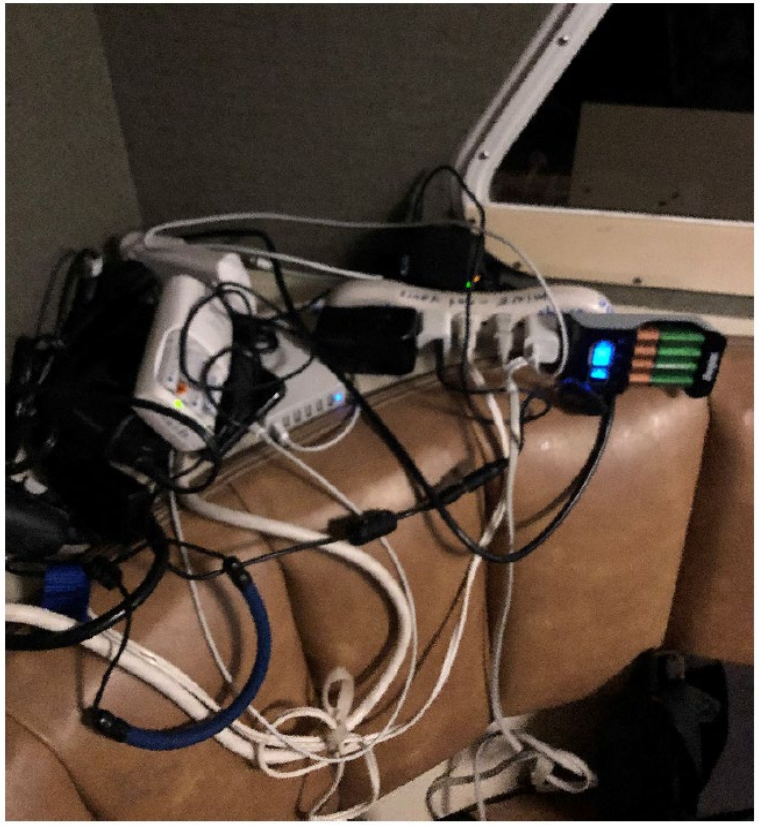


Figure 8. Photo taken during accident voyage (August 31, 2019) of devices plugged in to charge at the port side aft corner of the salon on the *Conception*. (Source: J. Dignam).

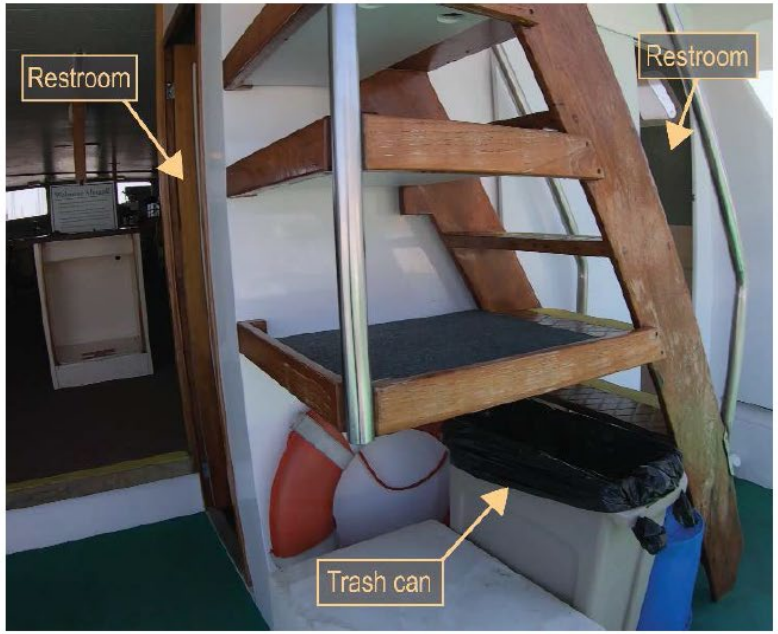
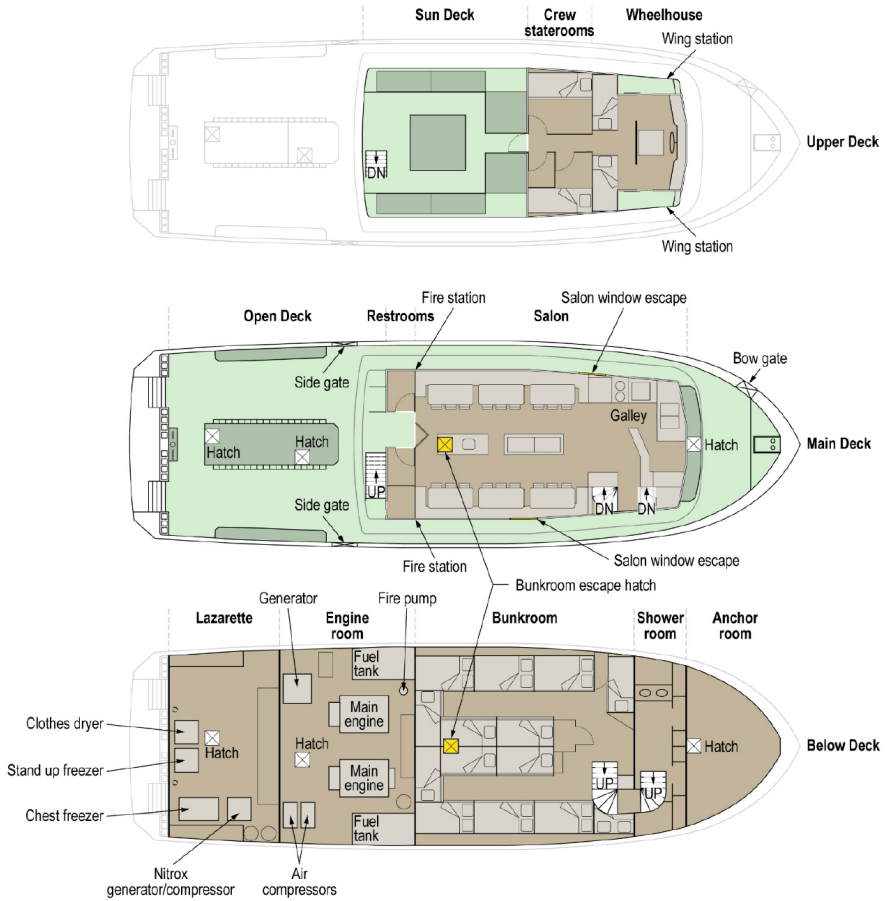
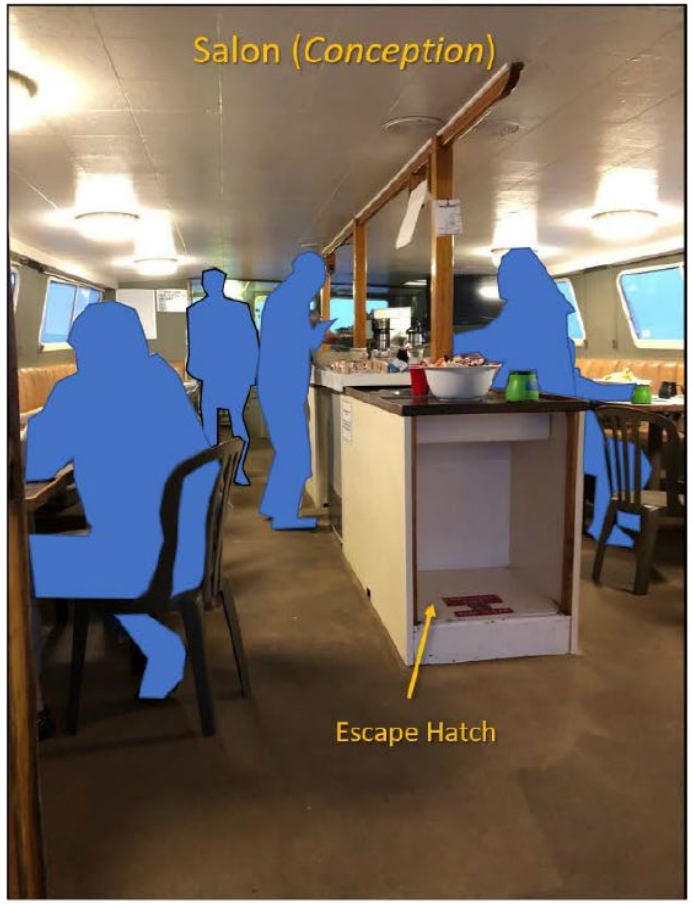


Figure 18. Left: Photo from a previous voyage of stairway to the upper deck and restrooms of the *Conception*. Note the regular stowage of a polyethylene trash can under the stairway aft of the salon. Right: Still image from a 2019 video taken of the stairway on board the *Conception* with shelving installed. (Source: M. Ryan [left], R. Clevenger [right])

M/V Conception
~Egress~

NTSB Marine Accident Report





M/V Conception
~Time until Rescue~

Figure 12. Small passenger vessel *Conception* at sunrise prior to sinking. (Source: VCFD)

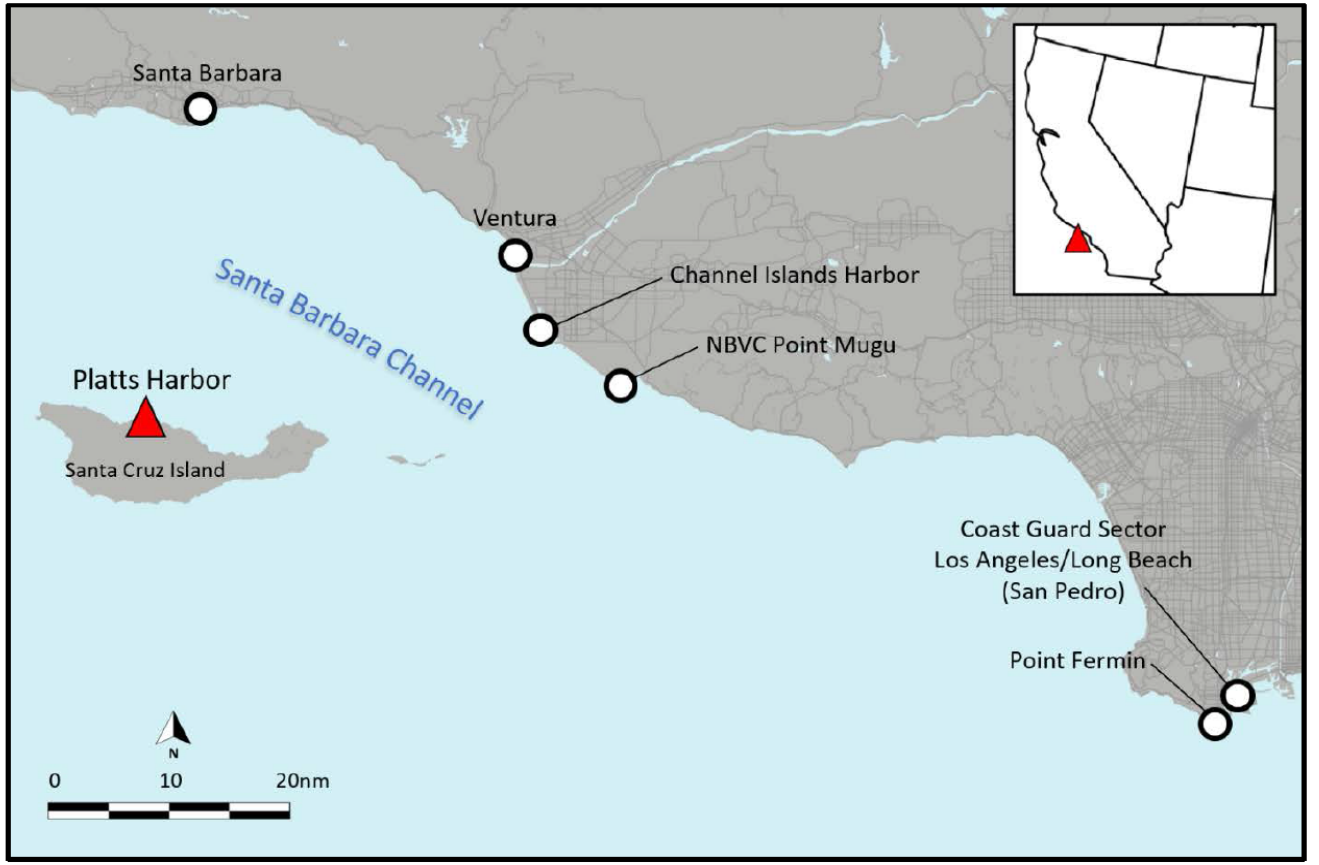
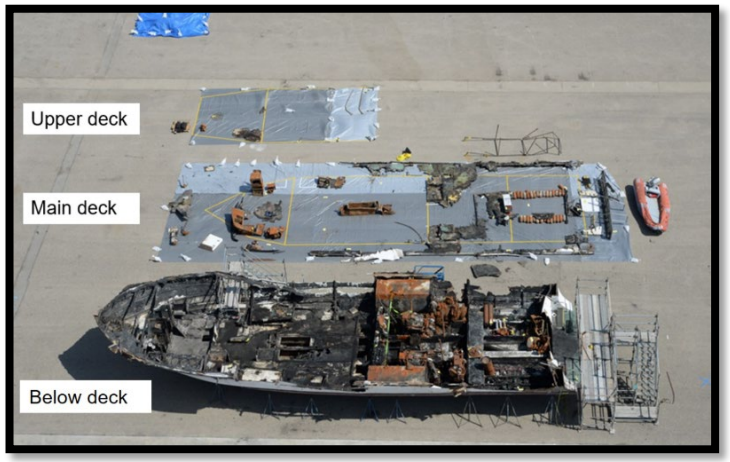


Figure 11. The accident site in relation to emergency response assets. The red triangle marks the site of the *Conception* fire. (Background: Google Maps)

Contributing & Causing Human Factors
Normalizing Unsafe Behaviors & Practices

- **Confirmation Bias:** Seeking out information that confirms existing beliefs.
- **Anchoring Bias:** Relying heavily on the first piece of information; it's inconsequential or a justified deviation.
- **Hindsight Bias:** After a deviation people can believe that it was less significant, normalizing the behavior.
- **Groupthink:** When group consensus and harmony are valued over critical evaluation. ~Self-Censoring~

Contributing & Causing Human Factors
Normalizing Unsafe Behaviors & Practices



- **Status Quo Bias:** Preferring the current state of affairs versus honestly evaluating and correcting behaviors.
- **Optimism Bias:** Underestimating the likelihood of negative outcomes; “its all going to work out fine.”
- **Authority Bias:** Unquestioningly following the lead of authority figures, even when leaders deviate from best practices.
- **Dunning-Kruger Effect:** Individuals with low competence and low experience may tend to overestimate their knowledge and abilities.

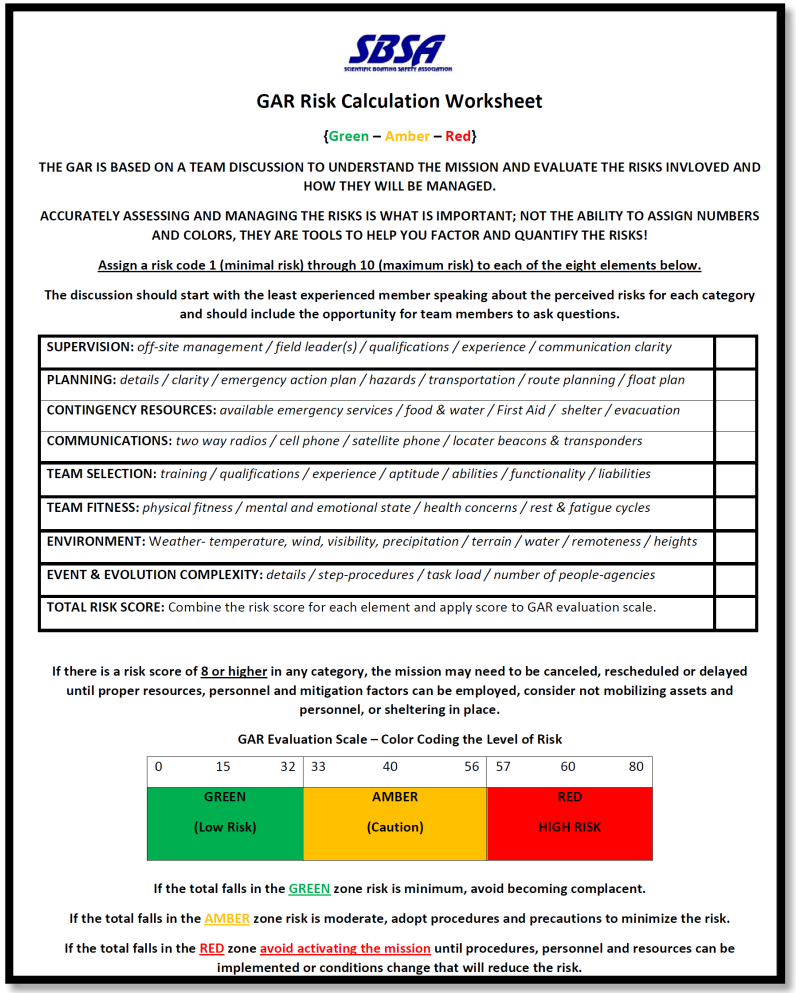
What about the What If's?

- What if the rules & laws don't prevent it?
- What if the supervisor and plans don't cover it?
- What if the other participants aren't prepared?
- What if the environmental conditions are different than originally communicated?
- What if responsive emergency actions aren't ready or close by?
- What if it is up to You, **are You Ready?**

This Afternoon
Using the GAR Tool & Coldwater Survival

Skills & Activities

- **When emergencies happen: Fire & Flooding**
- **Egress & Evacuation**
- **Sudden Cold Water Immersion**
- **1-10-1 Rule**
- **Moving Water -vs- Big Water**
- **Self-Rescue**
- **Survival Equipment**
- **Signaling Equipment**
- **Survival Strategies**



SBSA
SCIENTIFIC BOATING SAFETY ASSOCIATION

GAR Risk Calculation Worksheet

{Green – Amber – Red}

THE GAR IS BASED ON A TEAM DISCUSSION TO UNDERSTAND THE MISSION AND EVALUATE THE RISKS INVLOVED AND HOW THEY WILL BE MANAGED.

ACCURATELY ASSESSING AND MANAGING THE RISKS IS WHAT IS IMPORTANT; NOT THE ABILITY TO ASSIGN NUMBERS AND COLORS, THEY ARE TOOLS TO HELP YOU FACTOR AND QUANTIFY THE RISKS!

Assign a risk code 1 (minimal risk) through 10 (maximum risk) to each of the eight elements below.

The discussion should start with the least experienced member speaking about the perceived risks for each category and should include the opportunity for team members to ask questions.

SUPERVISION: *off-site management / field leader(s) / qualifications / experience / communication clarity*	
PLANNING: *details / clarity / emergency action plan / hazards / transportation / route planning / float plan*	
CONTINGENCY RESOURCES: *available emergency services / food & water / First Aid / shelter / evacuation*	
COMMUNICATIONS: *two way radios / cell phone / satellite phone / locater beacons & transponders*	
TEAM SELECTION: *training / qualifications / experience / aptitude / abilities / functionality / liabilities*	
TEAM FITNESS: *physical fitness / mental and emotional state / health concerns / rest & fatigue cycles*	
ENVIRONMENT: *Weather- temperature, wind, visibility, precipitation / terrain / water / remoteness / heights*	
EVENT & EVOLUTION COMPLEXITY: *details / step-procedures / task load / number of people-agencies*	
TOTAL RISK SCORE: Combine the risk score for each element and apply score to GAR evaluation scale.	

If there is a risk score of 8 or higher in any category, the mission may need to be canceled, rescheduled or delayed until proper resources, personnel and mitigation factors can be employed, consider not mobilizing assets and personnel, or sheltering in place.

GAR Evaluation Scale – Color Coding the Level of Risk

0 15 32	33 40 56	57 60 80
GREEN (Low Risk)	AMBER (Caution)	RED HIGH RISK

If the total falls in the GREEN zone risk is minimum, avoid becoming complacent.

If the total falls in the AMBER zone risk is moderate, adopt procedures and precautions to minimize the risk.

If the total falls in the RED zone avoid activating the mission until procedures, personnel and resources can be implemented or conditions change that will reduce the risk.

~Thank You~

Keep the Conversation Flowing!