

Table of Contents

	Page
Introduction	1
Scope	1
General Policy	1
Responsibilities for Safety Compliance	2
Corrective Action for Failure to Follow Procedures	2
Appendix A—General Safety Guidance for Making Measurements or Collecting Samples	
A. Wading Measurements	3
B. Ice (over bodies of water) Measurements	3
C. Cableway Measurements	3
D. Bridge Measurements	4
E. Boat Measurements ¹	4
Appendix B—Use of Personal Floatation Devices	
A. PFD Policy	5
B. Nevada State Requirements for PFDs when Boating	5
C. USGS Approved PFDs	6

¹ Additional safety guidance for the use of boats on DRI field projects is located in the DRI Safe Boating Guidelines

DRI Policy for Safety Associated with Measurements, Sampling, and Related Streamgaging

I. Introduction

There is inherent danger in the work in or over water performed by DRI employees. No stream measurement or sample is worth putting yourself or your fellow employees in danger. Safety must be the first consideration in deciding if, when, where, and how to take a measurement or collect a sample. When preparing to make a measurement or collect a sample, always consider the possible hazards, and prepare for the worst cases with regard to personal safety and the safety of others. Ensure you have an emergency action plan, including who you notify in every emergency situation.

II. Scope

Working near (on a stream bank) or in (wading) or over (bridge, cableway, ice, and boats) water can be very dangerous. A constant awareness and preparation must be maintained to cope with the dangers associated with stream depth, velocity, water temperature, debris, ice, and weather conditions. The general policy related to water safety is found in Section 3. Appendix A provides general safety guidance for making discharge measurements. (Project specific practices related to streamgaging activities should be developed by the field research project manager/supervisor.) Appendix B outlines the DRI personal flotation device policy.

III. General Policy -

- In addition to a Hazard Assessment and Mitigation Plan (HAMP) for the field project, a separate Hazard Assessment (HA) should be developed for each site where a discharge measurement is to be made. The HA must describe the site's unsafe conditions and the conditions, if any, for which the wearing of a Personal Flotation Devices (PFD) is not required at the site. The HAMP will identify the measurement method (i.e., wading, cableway, etc.) for different conditions and the hazardous conditions under which no measurements or sampling operations will be attempted. HAMPs must be approved by the first line supervision and reviewed by a supervisor or manager senior to the approving supervisor. DRI Environmental Health and Safety (EH&S) can assist in the preparation and review of the HAMP. The HAMP will be placed in the field folder and must be reviewed by all field workers prior to commencement of field work. The HAMPs will be also reviewed during the corrective (disciplinary) action reviews and when field safety evaluations (self assessments) are conducted. When working under another agency's supervision, following the provisions of their field safety plan is also required and it may substitute for a DRI plan provided it adequately covers all the hazards and compliance issues DRI employees working on the project may face.
- Field work on or over water requires a two person (minimum) team, both of whom are trained in first aid/CPR. Exceptions will only be allowed by written approval from the project manager, his/her supervisor and his/her Division Director.
- Personal flotation devices (PFDs) are required in all operations near, in, or over water except in those cases where an approved site-specific HAMP defines the conditions for an exemption. A properly fitting PFD must be worn when working near, in, or over water on a cableway, bridge, or water retention or control structure; on ice, in a boat, or wading streams. Suspender-type self-inflating PFDs may be worn in lieu of U.S. Coast Guard (USCG)-approved PFDs for working near, in, or over water on a cableway, bridge, on ice, on a water retention or control structure; or in wading streams. For work conducted in a boat, USCG-approved PFDs must be used. Appendix B contains detailed flotation device specifications.
- All parties wading or boating in moving water at depths greater than 1 foot are required to have in their possession a throw bag rescue rope during sampling, and the ability to use it.
- Protection against hypothermia is required when conditions warrant. Information on protection against hypothermia is available on the DRI EH&S website (needs to be developed or instead link to the OSHA web site that addresses this topic).
- If available, the sampling equipment used should eliminate the need for stretching or over-reaching from the bank/boat.

DRI Policy for Safety Associated with Measurements, Sampling, and Related Streamgaging

- If the individual is confident that he or she can conduct a self-rescue, or that others are in position, have the needed equipment, and can attempt to make a rescue, the measurement or sampling operation can proceed. If it is evident that rescue would be dangerous or difficult to execute the measurement or sampling must not be attempted. The intention of this item is to help insure that the sampler considers what will happen should s/he lose control and fall into the water.

IV. Responsibilities for Safety Compliance

- All employees need to consider safety first in the day-to-day conduct of work activities.
- DRI management is responsible to ensure that all safety policies are implemented and monitored at the field level. Both supervisors and employees will be held accountable if safety policies are not followed.
- Project supervisors/team leaders must ensure that employees are informed of safety policies; that the policies are integrated into field operations; and that they are carried out in a proper and consistent manner. Failure to provide adequate safeguards for yourself or those for whom you are responsible is considered a breach of duties.

V. Corrective (Disciplinary) Action for Failure to Follow Safety Procedures.

- Appropriate corrective (disciplinary) action in accordance with NSHE and DRI policies should be taken for employees who fail to follow safety requirements, including failure to use required protective equipment.
- Compliance with environmental and safety regulations, policies and programs is considered a condition of employment and adherence to them should be considered as an integral part of performance management.

DRI Policy for Safety Associated with Measurements, Sampling, and Related Streamgaging

Appendix A -- General Safety Guidance for Making Measurements or Collecting Samples

A. Wading measurements

- Never attempt the measurement if there is any doubt that you will be able to safely negotiate the stream.
- Any rule of thumb for expressing limiting flow conditions for wading, such as depth x velocity = 10, must be used with caution. Such criteria must take into account the many factors associated with the site conditions and the limitations of the individuals involved.
- Wear a USCG-approved Type II or III approved flotation device and depending on the air and water temperature, a float coat or survival suit for protection against hypothermia. (If the protective clothing serves as a USCG-approved Type III float coat or Type V PFD, a separate flotation device need not be worn.)
- Wear the personal protective equipment that will protect you from injury. No open-toed shoes are allowed. Footwear should be appropriate for the conditions, including steel toed boots and waders in some conditions.
- In addition to wearing a PFD, carry a throw bag rescue rope during sampling and know how and when to use it.
- Be aware of potentially dangerous conditions including ice, debris, or boats that may constitute a hazard both upstream and downstream of the measuring section.
- Do not attempt a wading measurement from a dam structure unless appropriate life saving equipment (such as a boat with a throw ring) is immediately available for rescue.

B. Ice measurements (over bodies of water)

- Do not attempt an ice measurement if there is any doubt that the ice will support your weight.
- Wear the proper flotation device such as a USCG-approved Type III float coat or Type V anti exposure work suit or approved auto-inflating suspender type PFD.
- When crossing an ice covered stream, test the ice continuously at each step using solid blows of a sharp ice chisel.
- At least two people must be involved in the operation. One person must have experience in ice cover measurements.
- An anchored lifeline or suitable alternative must be used in case of breakthrough.

C. Cableway measurements

- Prior to attempting cableway measurements, obtain the approval and training from the appropriate agency.
- Wear a USCG-approved Type II or Type III approved flotation device, and depending on the air and water temperature, a float coat or survival suit for protection against hypothermia. (If the protective clothing serves as a USCG-approved Type III float coat or Type V PFD, a separate flotation device need not be worn.)
- Do not attempt a cableway measurement unless a trained cableway inspector has inspected the cable in the last 12 months.

DRI Policy for Safety Associated with Measurements, Sampling, and Related Streamgaging

- Do not attempt a cableway measurement unless you have made a visual inspection of the cableway – both banks if possible.
- Do not attempt a cableway measurement if the cable anchors are under water and can not be inspected.
- Always use the appropriate breakaway device on the sounding reel cable and carry wire cutters for quick action should the need arise to cut the sounding cable in an emergency.

D. Bridge measurements

- Wear a USCG-approved flotation device, and depending on the air and water temperature, a float coat or survival suit for protection against hypothermia. (If the protective clothing serves as a USCG-approved Type III float coat or Type V PFD, a separate flotation device need not be worn.)
- Do not attempt a bridge measurement if there is no Department of Transportation or local transportation agency approved traffic control plan for the bridge or if the plan cannot be carried out for any reason such as the lack of personnel or equipment. Transportation warning signs stating “Survey Crew ahead” must be used to notify on coming traffic of the work being conducted on the bridge. Personnel must also wear reflective vests.
- Always use the appropriate breakaway device on the sounding reel cable and carry wire cutters for quick action should the need arise to cut the sounding cable in an emergency.

E. Boat measurements²

- Wear a USCG-approved flotation device, and depending on the air and water temperature, a float coat or survival suit for protection against hypothermia. (If the protective clothing serves as a USCG-approved Type III or Type V PFD, a separate flotation device need not be worn.)
- Carry a throw bag rescue rope during sampling and know how and when to use it.
- Do not attempt a boat measurement without a Department of the Interior certified boat operator who can assess whether the boat is safe to operate under the conditions that will exist during the measurement.
- Avoid boat measurements upstream of bridges or other obstructions that do not provide sufficient clearance for the boat, equipment, and passengers to safely pass under.
- Do not attempt a boat measurement if boat traffic will interfere with the tagline. Taglines must be flagged to warn other boaters of their presence.

² Additional safety guidance for the use of boats on DRI field projects is located in the DRI Boating Safety Guideline.

DRI Policy for Safety Associated with Measurements, Sampling, and Related Streamgaging

Appendix B--Use of Personal Flotation Devices (life jackets)

DRI PFD Policy

1. A USCG-approved floatation device (life jacket/personal flotation device (PFD)) is required when you are working in or over water on a cableway, in a boat, wading, or in other ways. The attached table describes the five types and their general use.
2. All occupants of DRI owned or operated watercraft 26 feet or less in length, shall wear life jackets, vests, or buoyant-type apparel.
3. Life jackets, vests, or buoyant-type apparel shall be worn by all DRI employees using cable cars, climbing over sides of bridges to gages on piers, and doing construction work over the sides of bridges and on piers. Employees wading streams, lakes, or other water bodies where the water is deep, the bottom is rocky, or currents swift, shall wear similar equipment.
4. Supervisors must require that our personnel use their PFDs, and employees should remind each other that by wearing their PFD, the life they save may be their own.

Nevada State Requirements for PFDs when Boating^{3,4}

1. All vessels, except sailboards, must have at least one USCG-approved Type I, II, or III PFD (life jacket) for each person on board or towed.
2. In addition to the requirement above, a vessel 16 feet up to 40 feet long must have on board one USCG-approved Type IV PFD. A vessel 40 feet or longer must carry two Type IV PFDs, with one device stored in the front and another stored in the rear of the vessel. Also, vessels 26 feet and longer must have 30 feet of throwing line (or rope) attached to each required Type IV PFD.
3. All PFDs must be in good condition, legibly marked with the USCG-approval number and readily accessible⁵. A personal flotation device is considered readily accessible if:
 - it is being worn; **or**
 - it is stowed where it is quickly reachable **and** is ready to wear, out of its original packaging, and not under lock and key.
4. Wearable PFDs must be of the proper size for the intended wearer. Sizing is based on body weight and chest size.
5. Children under 12 years old must **wear** a USCG-approved PFD whenever underway in a vessel, unless in a fully enclosed area.
6. Each person on board a personal water craft (PWC) or anyone being towed behind a vessel must **wear** a USCG-approved PFD. Inflatable PFDs are **not** approved for these activities.
7. A Type V PFD may be substituted other types if specifically approved by the USCG for the activity at hand. Type V hybrid PFDs (inflatables) must be **worn** while underway, except when the wearer is in an enclosed space.
8. Inflatable PFDs are **not** approved for use by persons under 16 years of age.





³ For out of state work, be sure to check for any additional state or local requirements.

⁴ See the DRI Boating Safety Guidelines for additional DRI requirements

⁵ DRI policy requires the PFD be worn.

DRI Policy for Safety Associated with Measurements, Sampling, and Related Streamgaging

Types of USCG approved PFDs

<p>TYPE I: Offshore Life Jackets</p> <p>These vests are geared for rough or remote waters where rescue may take awhile. They are excellent for flotation and will turn most unconscious persons face up in the water.</p>	 <p>Type I</p>
<p>TYPE II: Near-Shore Vests</p> <p>These vests are good for calm waters and fast rescues. Type II vests may lack the capacity to turn unconscious wearers face up.</p>	 <p>Type II</p>
<p>TYPE III: Flotation Aids</p> <p>These vests or full-sleeved jackets are good for calm waters and fast rescues. They are not for rough waters since they will not turn a person face up. This type of PFD is generally used for water sports. Some Type III PFDs are designed to inflate when you enter the water.</p>	 <p>Type III Inflatable</p>
<p>TYPE IV: Throwable Devices</p> <p>These cushions or ring buoys are designed to be thrown to someone in trouble. They are not for long hours in rough waters, non-swimmers or the unconscious.</p>	 <p>Type IV</p>
<p>TYPE V: Special-Use Devices</p> <p>These windsurfing vests, deck suits, hybrid PFDs and others are designed for specific activities, such as kayaking or water skiing. Some Type V PFDs are designed to inflate when you enter the water. To be acceptable, Type V PFDs must be used in accordance with their label.</p>	 <p>Type V</p>