Commonwealth of Pennsylvania
Fish & Boat Commission

WATER RESCUE & EMERGENCY RESPONSE

STUDENT WORKBOOK

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PENNSYLVANIA WATER RESCUE PROGRAM

Pennsylvania's Water Rescue Program is designed to train personnel in the most current techniques of boating and water safety. The program goals are to:

- Familiarize the rescuer with the proper procedures used in basic water safety and safe boat handling.
- Have the rescuer demonstrate a proficiency in water rescue relative to individual capabilities.
- Provide the rescuer with competency in dealing with on-the-water emergencies.

The program was developed for training fire and rescue department personnel. However, through appropriate adaptation, the course can be used in the water rescue training of police departments, park service personnel, or for members of any boating and water safety organization. Depending on need or geographic location, only one or a combination of courses may be necessary to fulfill your agency's training requirements. Students must be at least **18** years of age to participate. The Water Rescue and Emergency Response – 1670 Operations level courses require a minimum of two instructors per recommended class size of 12 to 16 students. In addition, logistics, medical and water safety personnel are essential. The chart below shows the minimum number of instructors required per number of students in the class.

Number of Students	Number of Instructors Required
0 – 16	2
17 – 24 maximum	3

WATER RESCUE and EMERGENCY RESPONSE – 1670 Operations Level

This 16 hour course covers planning for water emergencies, water terminology and dynamics, medical conditions, personal and team safety, and fundamental rescue techniques (self and shore based rescue). The course provides students with classroom and hands-on training. WRER is a prerequisite for all PFBC technician level training programs.

Note: Students must be prepared to engage in strenuous activities in extreme weather and water conditions. If a student has a known medical condition that could foreseeably jeopardize his/her safety during participation or be aggravated by participation, the student should not participate.

All rescues contained in this program are based on simple and effective techniques. A U.S. Coast Guard approved personal flotation device (PFD), water rescue helmet and appropriate mission specific personal protective equipment (PPE) for water and weather conditions must be worn by the student at all times when practicing or attempting any of the recommended rescues.

NFPA 1670 – STANDARD ON OPERATIONS AND TRAINING FOR TECHNICAL SEARCH AND RESCUE INCIDENTS

The Pennsylvania Fish and Boat Commission (PFBC) Water Rescue Training program has adopted as a reference the Standard on Operations and Training for Technical Rescue Incidents as outlined in The National Fire Protection Association (NFPA) 1670. The guidelines provide training levels and standards rescue personnel and Authorities Having Jurisdiction (AHJ) should meet.

NFPA 1670 guidelines are intended for AHJ, and not specifically directed at the individual rescuer. The guidelines identify minimum knowledge and skill requirements rescue personnel should have. The AHJ is responsible for: providing hazard assessment, training, appropriate equipment, maintaining documents, medical support on site during training, and actual operations. From NFPA 1670 – General Requirements:

The AHJ shall establish written standard operating procedures consistent with one of the following operation levels.

(a) ***Awareness.*** This level represents the minimum capability of a responder who, in the course of his or her regular job duties, could be called upon to respond to, or could be the first on the scene of, a technical rescue incident. This level can involve search, rescue and recovery operations. Members of a team at this level are generally not considered rescuers.

(b) ***Operations.*** This level represents the capability of hazard recognition, equipment use, and techniques necessary to safely and effectively support and participate in a technical rescue incident. This level can involve search, rescue and recovery operations, but usually operations are carried out under the supervision of technician-level personnel.

(c) ***Technician.*** This level represents the capability of hazard recognition, equipment use and techniques necessary to safely and effectively coordinate perform and supervise a technical rescue incident. This level can involve search, rescue and recovery operations.

AHJ must determine to what level(s) their organization will function.

In an effort to assist AHJ to meet NFPA 1670, the PFBC will provide the minimum recommended knowledge and training rescue personnel should receive. The PFBC will not oversee the AHJ to ensure that their organization has met NFPA 1670 requirements.

The PFBC has adopted as a reference NFPA 1670 recommendations.

Because our training program is progressive in design, meeting all levels of NFPA 1670 by an individual or team will depend upon the training program(s) an individual participates in and the AHJ. The Pennsylvania Fish and Boat Commission's Water Rescue program meets or exceeds the guidelines for Awareness, Operations and Technician levels of NFPA 1670 – Water.

PROGRAM OUTLINE

Estimated Time Requirements

Unit I – Planning	2 Hours
Unit II – Dynamics of Water	1 Hours
Unit III – Personal Equipment	1 Hours
Unit IV – Rescue Tactics and Techniques	2 Hours
Unit V – Medical Considerations	1.5 Hours
Pool Session	3 Hours
Outdoor Practical Session	5 Hours
Test/Wrap-Up and Critiques	.5 Hours
Total Time	16 Hours

NOTE:

Time will vary depending on size of group, student experience, number of optional video presentations, facilities (travel time to sites), length of breaks and number of instructors and weather conditions. Sequence of sessions may vary depending on available facilities.

The Student Workbook is a study guide for the student. The workbook format follows the training progression of the course.

PROGRAM COMPLETION REQUIREMENTS

To successfully complete and receive PFBC certification for this course, the student must complete all three legal forms, attend all course components (classroom, pool, and outdoor practical session), participate in and demonstrate all skills as detailed on the WRER skills sheet and score 80% or better on the written exam.

COURSE OBJECTIVES

UNIT I – PLANNING

- Identify drowning as a leading cause of accidental death in the United States.
- Cite five reasons why rescue personnel drown.
- Describe the core principles that lead to a SAFE RESCUE.
- List and describe five planning considerations a department should consider when preparing for water rescue emergencies.
- Discuss the importance of developing site surveys using the "River Hazard Survey Form" in your response area and establishing standard operational guidelines (SOGs).
- Analyze a water-related incident and discuss how planning was or was not involved.
- Identify the importance of National Incident Management System (NIMS).
- Cite the primary responsibilities and functions of the following ICS positons (Incident Command – Operations Section – Planning Section – Logistics Section)
- Explain the importance of why adequate backup must be established prior to engaging in a rescue operation.
- Identify three methods to determine point last seen (PLS) or last known point (LKP).
- Identify three specialized water rescue search resources.
- List four helicopter safety guidelines.
- Demonstrate recommended hand, paddle and audible signals.

UNIT II – DYNAMICS OF WATER

- Discuss how and why it is importance to scouting and reading water dynamics prior to entering the water.
- Identify river right and left.
- List and describe six common natural and urban water features.
- Describe the hazard(s) found at the base of a low-head dam or drop-off on a river.
- Cite the key water feature that identifies a low-head dam or drop-off when upstream looking downstream towards the dam.

UNIT III – PERSONAL EQUIPMENT

- Describe the principle of dressing in layers.
- Cite two medical concerns associated with dry suits and layering.
- Identify how the head, hands, and feet should be protected.
- List two essential items to customize a helmet for night operations.
- Properly don and burp a dry suit.
- List three essential items needed to customize a PFD.

UNIT IV – RESCUE TACTICS AND TECHNIQUES

- List the rescue sequence from safest to most dangerous.
- Demonstrate water entries (shallow water wading – stride – swifwater shallow planning).
- Swim 100 yards non-stop, fully clothed wearing a PFD and helmet in 8 minutes or less in a pool.
- Swim a designated moving water course using both defensive and aggressive swimming techniques to ferry and eddy hop to safety.
- Demonstrate how to avoid and self-rescue over a simulated strainer.
- Demonstrate single and multiple rescuer crossing techniques to reach and move a victim.
- List four types of equipment use for a shore based rescue.
- Accurately throw a throw bag 50 feet at a target.
- Accurately throw a heaving line 35 feet.
- Demonstrate belaying tactics and vectoring to pendulum a victim to shore.
- Establish and operate a double line floating tether system.
- Tie a water knot and a figure eight on a blight.

UNIT V – MEDICAL CONSIDERATIONS

- Describe the 1-10-1 principle.
- Cite four factors that can increase a person's chance of survival when in cold water.
- List three body substance isolation (BSI) protocols rescuers can employ for personal protection from blood borne pathogens or hazardous materials.
- Describe three methods of body heat loss.
- Discuss care guidelines for cold water shock and hypothermia treatment.
- Define drowning.
- List three medical concerns associated with water related emergencies

COURSE MATERIALS – STUDENT PPE (STUDENT SUPPLIES)

- Customized U.S. Coast Guard approved Type III or V rescue vest PFD with knife, whistle, and two locking carabiners. NOTE: The use of a Type V rescue vest without training is dangerous. It is recommended that the student remove the ring until they have the proper training and certification.
- Water rescue helmet (thermal liner highly recommended) must provide front, side, and back of head protection. Helmet should also have reflective tape and a mounted waterproof light.
- Dry suit - Note: Cold-water exposure, immersion, survival or ice rescue suit prohibited for moving water.
- Swim suit
- Clothing: Inner layer (silk, polypropylene or other combination) - Middle layer (wool, polyester pile (fleece), other combinations) - Outer layer (coated nylon or a breathable water and wind proof fabric)
- River shoes or boots
- Hand and feet warmth: tactical water rescue gloves (neoprene), socks (synthetic or wool blend/neoprene) – bring extra to training
- Straps for glasses
- Fluids (water or sports drink) and high energy foods
- Personal items (first aid kit, medications, sun screen, and personal hygiene supplies)

UNIT I – PLANNING

THEME

By focusing on planning and practice, rescue personnel can prepare for the dangers and difficulties associated with water rescue.

OBJECTIVES

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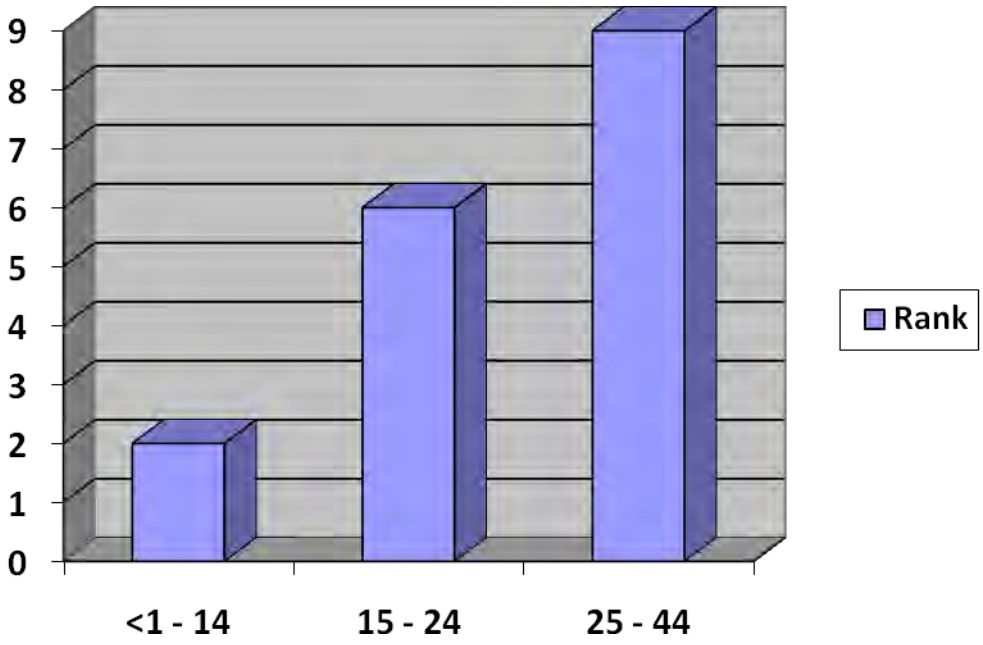
WHY WATER RESCUE

- People use and enjoy water for many reasons (swimming, boating, fishing and hunting, and commercial). Water can also be a source of emergencies and drowning due to use or natural disaster events such as flash flooding.
- Drowning is a leading cause of accidental death in the world and America. In 2014, the World Health Organization (WHO) cited that over 370,000 people drown each year worldwide. Over half of these deaths are to individuals under the age of 25. In the United States, according to the Centers for Disease Control and Prevention, from 2005 - 2014 there were 3,536 unintentional drowning/year (this number did not include boating-related incidents which adds an additional 332/year). The rate of drowning in the U.S. is approximately 10/day.
- Males accounted for nearly 80% of all drowning.
- Drowning is the second leading cause of unintentional injury-related death for children ages one to 14-years of age. Motor vehicle accidents are the leading cause of unintentional deaths for this age group. For every 14-year old and younger child who drowns, five (5) additional children will receive emergency care for non-fatal submersion injuries.



Hyperlink Web Sources:
Centers for Disease Control and Prevention, Unintentional Drowning: Get the Facts
World Health Organization - WHO highlights devastating global impact of drowning

- There are many reasons for the nearly 4000 drownings/year in the United States. Some common causes of drowning include:
  - Weak or no swimming skills
  - Overestimation of one's ability – individual assumes they have the skills and abilities to swim the distance, beat the current or surf, and handle the cold water.
  - Swimming in unsupervised areas, lack of supervision and no barriers around pools.
  - Failure to wear a PFD - According to the U.S. Coast Guard (USCG), almost 85 % of all boating deaths the victims were NOT wearing a life jacket.
  - Boating (capsizing, falls overboard, collision with fixed objects, fires, carbon monoxide poisoning, excessive speed).
  - Trauma (head, neck, and spinal cord).
  - Underestimating the effects of cold water (cold water shock leading to eventual hypothermia).
  - Use of alcohol or drugs - USCG in 2014 found that alcohol was a contributing factor in 21% (1 in 5 deaths) of fatal boating accidents. The CDC indicates that alcohol use is involved in up to 70% of deaths associated with water recreation among adolescents and adults.
  - Driving across flooded areas or walking next to flooded waterways.
  - Severe weather events leading to flash flooding.
- When rescue personnel drown attempting rescues, it is because they:
  - Do not wear a PFD.
  - Wear inappropriate personal protective equipment (PPE) such as heavy bunker gear.
  - Overestimate swimming skills and abilities.
  - Underestimate the power and dynamics of water.
  - Have little to no water rescue training.
  - Lack water rescue equipment or inappropriate equipment to accomplish the mission. An example would be using a flat bottomed aluminum boat in flash flooding.
  - Do not have sufficient backup.
  - Underestimate the effects of cold water (cold water shock leading to eventual hypothermia).
  - Do not have proper incident scene command and control. Water rescue is high risk and low frequency. Command leadership may have limited to no knowledge on how to manage the event.

SAFE RESCUE

- The PFBC core water rescue values are based upon the acronym SAFE RESCUE. For any rescue to be successful, rescue personnel must understand these core values.

- **S** – Self-rescue skill mastered
- **A** – Adequate backup critical
- **F** – Follow the rescue sequence (self-rescue, shore, boat, direct/go, helicopter)
- **E** – Equipment use practiced

- **R** – Rescue and recovery approached with distinction
- **E** – Evaluate personal and team ability
- **S** – Stress planning and practice
- **C** – Cooperation between everyone involved in rescue operation
- **U** – Understand the power of water
- **E** – Environmental conditions complicate a rescue

PLANNING FOR WATER RESCUE EMERGENCIES

- Planning is one of the most important components of a water rescue program. It is an ongoing process and should not be the responsibility of just one person.
- Proper planning will:
  - Provide safety for everyone involved.
  - Ensure proper equipment is used.
  - Identify potential accident sites.
  - Establish effective rescue techniques.
  - Provide training.
  - Establish mutual aid and backup.
- When planning for water related emergency, the following factors must be addressed:
- Personnel
  - Sufficient technician level personnel necessary to perform the rescue.
  - Adequate physical strength to perform the rescue – Establish fit for duty qualifications and minimum swim testing standards for team members and test annually.
  - Skilled in the use of the water rescue tools and techniques to perform the rescue.
- Equipment
  - Proper selection of equipment based upon AHJ needs and site surveys.
  - Sufficient equipment to perform self, shore, boat, ice and direct contact rescues.
  - Training with equipment by personnel.
- Training
  - Rescue personnel must have proper training before attempting any rescue. Training also determines what role(s) personnel perform at the scene. Note - Some personnel are not suited for specific rescue techniques and could jeopardize the entire rescue operation. The AHJ must document and evaluate their personnel. At a minimum, everyone should be trained at the awareness level. The AHJ determines the team typing and minimum number of trained personnel. Besides training, teams must hone their skills with regularly scheduled drills.
- Detailed standard operational guidelines (SOG's) that provide guidelines for the rescue response**.**
  - If an organization performs underwater dive search, rescue and recovery operations they must provide SOGs for the management of the dive personnel in the water.
- Survey waterways – Areas with a history of past accidents should be evaluated first. Use the **HAZARD SURVEY FORM** to document the site features, hazards and history.

- Many areas have high numbers of problems because of public use, low water crossings, natural feature hazard and rapidly changing water conditions due to flash flooding. Develop site specific plans for these areas first. Use the site(s) for mock simulation and training exercises.

- Seasonal and environmental changes
  - Ice or snow covered roads reduce response time and can be hazardous or impossible to drive on. Soft ground conditions can cause emergency vehicles to become stuck.
  - Challenging site access based upon terrain, vegetation, locked gates, poor road conditions that limit travel or are too dangerous for vehicular travel. Consider the use of ATV/UTV's – snowmobiles – boat – horse – helicopter.
- Agency cooperation
  - Establish interagency mutual aid agreements (typed water rescue teams (I – IV), public safety dive teams, side scan sonar, underwater camera and drone assets, human and dog SAR teams, animal rescue teams (A.R.T.), helicopter aquatic rescue teams (H.A.R.T.). Use the "**WATER RESCUE RESOURCE AND CONTACT LIST"** form to document asset information. Have specific call out protocols using the Emergency Response System in place.
  - Identify specialized rescue equipment and resources (side scan sonar - underwater cameras – dog teams – etc.).
  - Develop interagency training exercises and evaluate effectiveness.
  - Provide community water safety education programs and information. Refer media to the following PFBC web site (http://fishandboat.com/safety.htm) for additional information on water and ice and safety.
  - Report training to media to obtain coverage and provide a public information officer (PIO) to work directly with media representatives.
  - Contact specific user groups to provide water safety and rescue information (schools, civic organizations, recreation groups, etc.).
  - Establish and stage rescue equipment at specific hotspots: state parks, lakes owned by local government or by the PFBC. Promote the use of PFDs.
- Planning ultimately saves lives, time and resources.

RESCUE TEAM DEVELOPMENT

- A team is only as strong as its weakest link and should not rely on just one person.
- Properly trained water rescue team will:
  - Be efficient and respond quickly.
  - Know the skill strengths and limitations of its members.
  - Save lives and reduces risk.

NATIONAL INCIDENT MANAGEMENT SYSTEM (NIMS)

Hyperlink Web Sources: Federal Emergency Management Agency - National Incident Management System - http://www.fema.gov/national-incident-management-system

Federal Emergency Management Agency – Resource Management and Mutual Aid - http://www.fema.gov/resource-management-mutual-aid

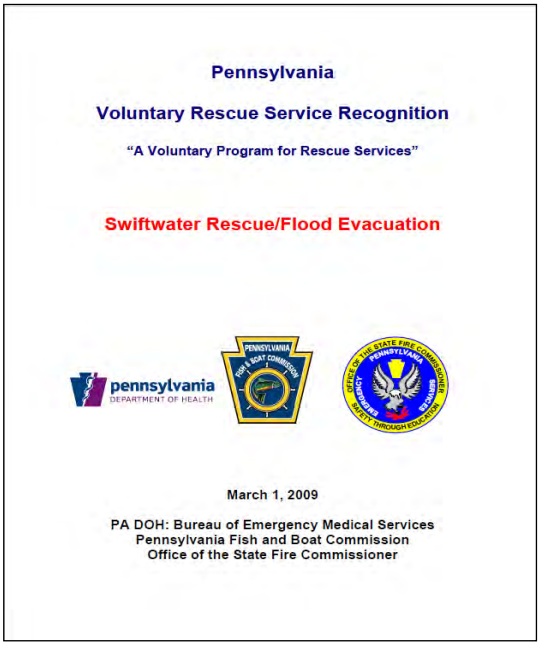
ICS and NIMS Courses - https://training.fema.gov/nims/

- Water rescue teams must establish adequate backup. During an incident, multiple teams and agencies will work together. To avoid problems at the scene, teams are encouraged to follow Incident Command Systems (ICS)/NIMS guidelines. Teams must work closely with EMS personnel to establish callout procedures and standard operational guidelines (SOGs). The scene of an emergency is not the time to determine who has jurisdiction or who makes decisions.

- NIMS was developed so responders from different jurisdictions and disciplines can work better together during natural disasters, emergencies and acts of terrorism.
- The benefits of NIMS include:
  - Unified approach to incident management.
  - Standard command and management structure.
  - Emphasis on preparedness, mutual aid and resource management.
- A critical component of NIMS is resource typing. Resource typing is categorization and description of resources commonly exchanged in disasters via mutual aid by capacity and/or capability. An example of this would be swiftwater/flood search and rescue teams.
  - Resources are classified as Type I (largest and most comprehensive tactical operational team – personnel, equipment, and resources) through IV (smaller team with limited personnel, equipment, resources and capabilities).
  - Each type is based on the assets, personnel and training of the rescue team.

VOLUNTARY RESCUE SERVICE PROGRAM (VRSR)

- The Commonwealth of Pennsylvania Voluntary Rescue Service Recognition (VRSR) Program is intended to recognize emergency service organizations in swiftwater rescue. The program takes into account the equipment and rescue hardware requirements, minimum personnel, training and education requirements for swiftwater rescue. The VRSR program provides guidance and recommendations for Pennsylvania swiftwater/flood evacuation including but not limited to:
  - Organizational development.
  - Resource identification and categorization.
  - Training and equipment.
  - Recommendations development for staffing, training and equipment based on applicable standards.


Pennsylvania

Voluntary Rescue Service Recognition

"A Voluntary Program for Rescue Services"

Swiftwater Rescue/Flood Evacuation

pennsylvania
DEPARTMENT OF HEALTH

March 1, 2009

PA DOH: Bureau of Emergency Medical Services
Pennsylvania Fish and Boat Commission
Office of the State Fire Commissioner

- To be a typed VRSR team, review the VRSR document and compile the required documents. Review and obtain the minimum equipment required based upon the typed team. Equipment will be checked and validated by VRSR inspector as part of the process. Identify and validate the minimum number of personnel needed and provide the training records, PFBC water rescue certificates, and other certificates required. All training records and certificates will be reviewed and authenticated as part of the process. Upon successful meeting all VRSR standards, the team will be typed and be entered into the Pennsylvania Emergency Management Agency data based as a credentialed team.

Hyperlink Web Source: Pennsylvania Voluntary Rescue Service Recognition Program Guide
http://www.fishandboat.com/Boat/PennsylvaniaWaterRescue/Documents/VRSR_General_Administrative.pdf

Additional information can be found on the PFBC Pennsylvania Water Rescue page
http://www.fishandboat.com/Boat/PennsylvaniaWaterRescue/Pages/default.aspx

SIZE AND SCOPE OF THE RESCUE RESPONSE

- Depending upon the size and scope of an incident, a response could include:
  - Local AHJ response.
  - County response – multiple departments or a county wide water rescue team.
  - Regional response – assets requested from multiple counties working together.
    - Example: Region 13 Task Force – 13 counties in Western Pennsylvania
      Link – http://pa-region13.org/
  - State response – a large scale event that overwhelms the assets and capabilities of a jurisdiction. Significant assets are mobilized and moved to provide assistance.
    - Pennsylvania Emergency Management Agency
      PEMA link – http://www.pema.pa.gov/Pages/Default.aspx#.V2AUBVHD9fQ
  - Federal response – a large scale event, such as a hurricane, that overwhelms the assets and capabilities of a state or a large geographic area. Significant assets are mobilized on a federal level and moved to provide assistance.
    - Federal Emergency Management Agency
      FEMA link – http://www.fema.gov/

RESCUE TEAM POSITIONS

- Roles assumed during a rescue will depend upon the situation. Teams must:
  - Evaluate skills, experience and cross train members.
  - Train and practice skills development, confidence and teamwork.
- Use the Incident Command System (ICS) or develop a structure that ensures team positions are addressed. Use the FEMA ICS Resource Center for detailed information and forms needed to manage an incident.

Hyperlink Source: Federal Emergency Management Agency – ICS Resource Center
https://training.fema.gov/emiweb/is/icsresource/jobaids.htm

- The ICS positions listed below are in no way a complete and comprehensive list. Only a few key job titles, brief duties and responsibilities are listed. For smooth running of any incident, rescue personnel must take ICS courses to understand how the system functions.
- Incident Commander
  - Oversees, manages and directs the rescue.
  - Should not become directly involved with rescue.
- Operations Section Chief – implements and directs the tactical operations of an incident. Manages rescue personnel (shore based, boat based, and go/direct contact rescues). Requests typed teams and specialized resources from the Logistics Section Chief. Provides status updates to the Planning Section Chief and Incident Commander for planning and decision making.
- Planning Section Chief – gathers data on the size, scale and scope of the incident from multiple resources and develops the incident action plan (IAP). An IAP provides the framework for the smooth running and documentation of the incident.
- Logistics Section Chief – obtains the needed resources and coordinates communication for the operation.
- Finance/Administration Section Chief – deals with the financial and administrative tasks associated with the incident.
- Safety Officer – responsible for all aspects of scene and personnel safety. Can stop an operation based upon risk assessment.
- Public Information Officer – the main designated person who provides information to the media regarding the status of the operation.
- Additional resources at an incident include:
- Medical personnel
  - Provide care for victims and if necessary rescuers.
  - Understand the medical conditions associated with water.
  - Help develop the ICS 206 medical plan for the incident.
- Back-up personnel
  - On-site staged rescue technicians for back-up to primary team similar to a Rapid Intervention Team (RIT). Back-up personnel's primary function is safety control should something go wrong. They are positioned up and downstream of the incident location.
  - Do not assign weakest team members to these positions, especially for downstream backup.
  - Team members must watch out for one another and be prepared to deal with a self-emergency.

ACCIDENT SCENE CONSIDERATIONS

- Factors to consider before any rescue attempt begins includes:
  - Evaluate scene, safety and control

  - Wear mission specific PPE in the warm and hot zone. Anyone working 10 feet or less away from the water is considered in the HOT ZONE. Wearing personal protective equipment (no

turn-out gear) provides protection should the rescuer end up in the water. Minimum PPE includes:
  - PFD
  - Helmet
  - Appropriate PPE that meets the situational requirements
- Establish an incident commander and safety officer.
- Establish an accountability system.
  - All rescue personnel must sign in and out.
  - Establish protocols for personnel accountability during rescue (i.e. tag systems – every team contact base every 15-30 minutes via radio)
- Assess the scene and complete a GAR model risk assessment. GAR stands for Green (low risk) – Amber (caution) – Red (high risk) and uses criteria (supervision – planning – team selection – team fitness – environment – event or evolution complexity) to score the risk of the operation. It is a useful tool to determine go and no go response by a team.

Hyperlink Web Source: U.S. Coast Guard Risk Calculation Worksheet – Calculating Risk Using GAR Model (Green – Amber – Red)
https://www.uscg.mil/hq/nsfweb/foscr/ASTFOSCRSeminar/Presentations/Safety/ORM-GAR.pdf

- Assess the victim's condition and location – can influence or determine the type of rescue tactic employed. Examples include a victim who is alert and oriented and in a safe location verses a victim clinging to a tree in flash flooding who is not responding to verbal commands.
- Assess water conditions.
  - Obtain data on current and projected conditions - dynamics and speed - contamination – hazards and dangers. The U.S. Geological Service (USGS) and other river flow data apps can provide real-time and project flow data used to make critical operational decision.
  - Establish upstream lookouts with communication to alert command of floating hazards and to stop boating traffic.
- Control bystanders – keep bystanders out of the hot zone - utilize police to manage, control and restrict access through road closures into area.
- Follow body substance isolation and hazardous materials exposure protocol.
  - Dry suits reduce exposure to hazardous materials in the water (sewage, petroleum products and chemicals). Use BSI precautions (gloves – masks – and eye protection) when providing care or body recovery operations. Establish decon protocols and procedures to clean equipment and PPE. Document any exposure to hazardous materials or blood borne pathogens to supervisors.
  - Before storing equipment or moving to another site prevent the spread of nuisance aquatic species (zebra mussels, didymo, etc.) by decontaminating all equipment.
  - This could include, but is not limited to, hot soapy water (hydro-spray), bleach solution (do not use bleach on personal gear like dry suits, PFDs, ropes).

SEARCH CONSIDERATIONS

- Before any rescue attempt begins, the victim must be located. Fundamental search considerations include:
  - Establish command, accountability, base of operations and communications.
    - **Incident commander** – individual who manages and directs the overall operation
    - **Planning section officer** – gathers and analyzes data
    - **Operations section officer** – puts plans together to carry out mission
    - **Logistics section officer** – coordinates communications, crowd control and obtain necessary resources to accomplish the mission
    - **Establish a base of operations**.
    - **Communications** – phone, radio and night operations (helmet lights, colored light sticks, strobe lights attached to PFD)
  - Identify and mark the **point last seen** (PLS – an exact location – the victim submerged here) or **last known point** (LKP – example would be a vehicle at an access or someone providing information regarding where they last saw the person earlier on the water) – This information is critical to narrow the search area and too focus on high probability areas. Do the following:
    - Detain and separate witnesses and obtain names, addresses, phone numbers and detailed account of the incident. Use the **MISSING PERSON DESCRIPTION REPORT FORM**. Ask if photos or video were taken of the incident. This can be a great source to identify an exact location.
    - Contact family members or friends of an overdue party to see if they have had any contact with the missing person or party. Did the missing party file a float plan? The USCG app provides a simple means to create a float plan and email to responsible friends and family (hyperlink: http://www.uscg.mil/mobile/). Additional boating safety information is available on the app as well.
    - Mark PLS/LKP location with boat, marker buoy, GPS, mark on shore-line (use high-visibility tape), take photos, etc.
    - Be aware this may also be a "Bastard Search" meaning the individual is not in or left the area without telling anyone.
    - Secure scent articles and avoid contamination from others. Scent items are extremely useful for SAR dog teams to track and locate the victim.
  - Obtain victim description and details – Reference **MISSING PERSONS DESCRIPTION FROM** at the end of the Student Manual, to assist and provide critical information to the Operations and Planning Section Chief for tactical and planning purposes.
    - Number of missing persons (Multiple Casualty Incident)
    - Physical characteristics
    - Clothing worn
    - Mental and physical health status (diabetic – dementia – suicidal – etc.)
    - Type of water craft (color – shape – propulsion -registration)
    - Vehicle (type – description - registration and license number)
    - Float plan if left with agency or family member
  - Establish hasty search teams to search areas of high probability
    - Identify and designate areas to be searched (examples: river right and left hasty teams, on-water hasty team, etc.). Create a box on a map showing the top (PLS or LKP), sides, and bottom (point were victim would not be beyond) of the search area. As information comes

in, details are added to the map to narrow and refine the search area. Identify any high probability areas such as debris piles, undercuts, eddy's, etc.
    - Check access points, parking lots, roads, and trails, interview individuals in the area, commercial and residential facilities, and the water body. Search can be accomplished by foot, boat and aerial surveys.
    - Post lookouts downstream on bridges or other vantage points.
  - Determine search area size.
    - A person who disappears under the water will normally sink to the bottom near the PLS. The length of time a submerged victim takes to float is dependent upon many factors, such as: what they ate (gases are released in the body cavity and will cause the body to float), water temperature (the colder the temperature the longer it takes for the gases to release – a number of float chart sources indicate that water temperatures below 40 degrees will not float the body), body composition, type of clothing worn, actions (suicidal or criminal – weights attached to victim), water depth, obstructions or debris in the water, type of water (fresh or salt) and numerous other factors. The warmer the water, the faster the victim will float back to the surface. Once this occurs, the body can be carried from the PLS by wind or current.
    - For moving water searches, the area size can also be determined by multiplying current speed times the length of the time person is missing. (Example: 6 miles per hour current times 2 hours or 6 X 2 = 12 miles distance). This method gives the team some idea of the size of the search area; many other factors must be considered. This can be useful in flash flooding where individuals may be swept away.
    - Secure roads and trails.
    - Mark with GPS the PLS/LKP - use markers to identify PLS or LKP (buoy, jugs with light sticks, dye markers).
    - Develop a working map (aerial/topographic) to identify the search area with GPS coordinates.
    - Identify on a map potential sites the victim may be located (strainer, undercut rock, eddies, debris piles).
- Crime scene
  - Always consider every emergency as a crime.
  - Establish procedures to protect and preserve evidence.

SEARCH RESOURCES

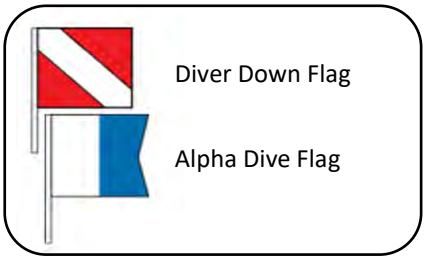
- Side scan sonar – a devise that sends a beam to the bottom and reflects the bottom profile image back to the unit. Systems can be extremely expensive or relatively inexpensive (high grade fish finders). Side scan units allow for surface based searching verses a dive operation.
  Once a high probability site has been identified and marked, an underwater camera can be deployed to confirm the object. If the object is the victim, the body can be retrieved with a reaching devices (depending upon water depth) or public safety divers.

Features of units can include: color HD images, freeze and capture screen image, water depth and temperature readings, GPS waypoints storage, autopilot boat control, preloaded maps and charts, beam control allowing for a wide or narrow bottom profile scan. Devices can be GPS enabled and track a line. Specific locations identified can be marked in the unit as waypoints.

- Underwater video cameras are another useful tools for search and recovery operations. Depending on depth, they can be attached to a pole and extended to the bottom or be lowered by their tether and towed. Features to consider when purchasing include: video and still image capture and quality – data memory storage (internal or external) – power source (portable or connected to the boats electrical system) lighting (infrared or LED) – hand or remotely operated vehicles (ROV's) – maximum depth of operation (determines housing and length of cable).

- The use of side scan, underwater cameras and drones require training and practice to develop proficiency and competence.

Public safety dive teams – know their capabilities, response time (rescue vs. recovery), training and experience prior to using. Dive SAR operations can be extremely dangerous due to current, water clarity, depth, hazards and obstruction, water temperature, night operations, and numerous other factors. Onsite medical personnel is critical when dive operations are occurring. Restrict boats in the area. Use diver down flag for location of divers in the water and the Alpha flag for the dive boat.



Search dogs, like all other SAR resources, have different capabilities. Dogs can be trained as air scent, trailing, tracking, disaster, cadaver, avalanche, and water. Water scent dogs are trained to detect gases released from a submerged victim. They can work from the shoreline or boat. Like all other resources in the hot zone, the handler and dog must have appropriate PPE and rescue technicians assigned to work directly with the team for safety and support. Water rescue teams are strongly encourage to establish mutual aid trainings with SAR dog teams to understand their capabilities and how to work with them.

Scent articles MUST be protected from contamination. Establish SOGs and inform all involved in the operation on how to secure the article until the dog team can work it. When on the water, the dog will alert once on the scent. Boat teams will need to have multiple dive markers to mark the boundaries of the scent cone to narrow the potential site to the submerged victim. Side scan sonar, underwater cameras, or a dive team can then search the high probability location.

Helicopters can be used for: aerial scene evaluation, transportation of personnel/equipment, moving assets and providing supply drops, scene illumination and hoisting operations. A specialized helicopter aquatic rescue team (i.e. Pennsylvania HART) has hoisting capabilities.

The Pennsylvania Helicopter Aquatic Rescue Team (PA-HART) is a joint partnership between the Pennsylvania Army National Guard (PANG), the Pennsylvania Fish and Boat Commission (PFBC), and the Pennsylvania Emergency Management Agency (PEMA) along with credentialed civilian rescue technicians. This highly trained aerial search and rescue team provides an air asset for the Commonwealth of Pennsylvania and the nation to respond to natural and manmade disasters incidents. Team members receive technical training that prepares them to engage in hostile environmental conditions in both the urban and wilderness setting. PA-HART members risk their lives so others may live.

PA-HART can respond at the request of a local emergency management coordinator. The coordinator must notify the Commonwealth Response Coordination Center (CRCC)

- If the mission request is valid, PEMA provides a mission request number and forward the information to the Joint Force Emergency Operation Center (JEOC) / State Army Aviation Officer (SAAO).
- Providing as much information as possible on the PA-HART mission request form will better prepare the enroute resource to effect a safe and efficient rescue. At a minimum, the requesting agency must provide an incident location and contact information.
- Technician credentialing: All PA-HART technicians are Proboard Surface Water I and II certified and credentialed by PANG, PFBC and PEMA. The process is outlined in the PA-HART SOGs and Training Manuals. Documentation is maintained and signed off in the Helicopter Rescue Technician Position Task Book.

- Helicopter safety
  - Know operational protocols, capabilities and limitations.
  - Establish air to ground communications.
  - Identify site and landing zone hazards.
  - Landing zones (LZ) designated and secured.
  - Fire suppression resources available at LZ.
  - Only approach by direction of pilot or flight crew personnel.
  - Be aware of elevations – approach on down slope side.
  - Never shine lights directly at helicopter.

SCENE COMMUNICATIONS

- Communication at a water rescue incident can take many forms. They include: direct verbal communications, written (IAP's – text – email – whiteboards), two-way radios, smart or satellite phones, lights (colored cyalume light sticks and strobes), hand, whistle and paddle signals. As with all forms of communication, there is a sender, message, mode of transmission, receiver, and feedback. Prompt and effective communication is critical to the smooth operation of the incident.

- Communication at the rescue scene can be difficult. Sometimes the incident is in remote locations where radio and cell service may be limited. Noise from the water may require rescue personnel to use hand, paddle and whistle signals to communicate. The PFBC has established common hand, paddle, and whistle signals to indicate emergency and physical status, actions to operate a line systems, recovery and termination of activity.

COMMON SIGNALS INCLUDE:

Signal	Visual	Audible
Help/Emergency	 Wave arms (paddle or helmet) back and forth above head.	Three (3) whistle blasts
OK/Attention	 Tap hand on head Respond back to sender – If no signal returned in kind a problem is indicated	One (1) whistle blast
Direction	 Point with hand or paddle toward specific direction.	One (1) whistle blast
Stop	 Arms raised in "touchdown" position with fist clenched. Paddle held horizontally.	One (1) whistle blast
Lengthen Line	 Move hands from center of body outward. Speed of movement indicates how fast to let out line.	One (1) whistle blast
Tension Line	 Clinch fists and move hands up and down directly in front of body. Speed of movement indicates how fast to bring in line.	One (1) whistle blast
Release Line	 Move arm in cutting motion across body from shoulder to hip. This may indicate allow line to pay out or cut system free with knife.	One (1) whistle blast
Wrap it Up	 Hand above head rotating in a large circle.	One (1) whistle blast
Victim Recovered	 Cross (X) arms in front of body.	One (1) whistle blast

UNIT II – DYANAMICS OF WATER

THEME

Rescuers must have experience and a comprehensive knowledge of water to understand the power, dynamics, risks and hazards. Proper training in a variety of water conditions improves the rescuer's ability to manage the risk.

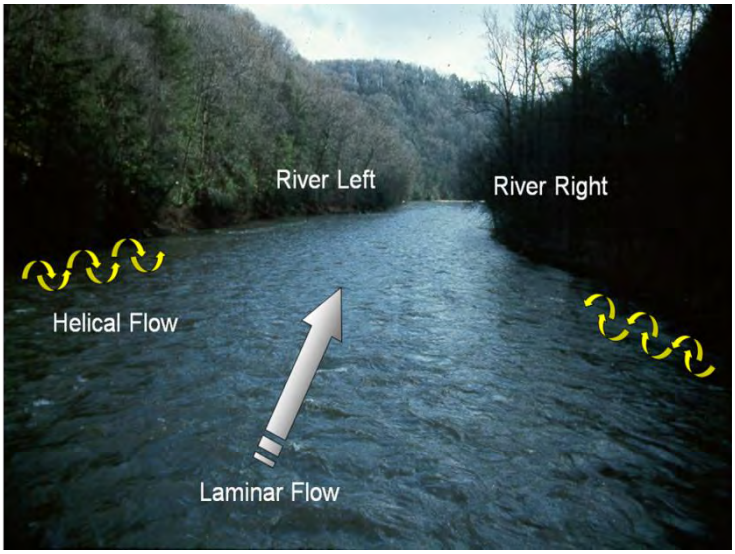
OBJECTIVES

- Discuss how and why it is importance to scouting and reading water dynamics prior to entering the water.
- Identify river right and left.
- List and describe six common natural and urban water features.
- Describe the hazard(s) found at the base of a low-head dam or drop-off on a river.
- Cite the key water feature that identifies a low-head dam or drop-off when upstream looking downstream towards the dam.

WATER DYNAMICS

- Water is a powerful and dynamic force. Rescuers must have a comprehensive knowledge of water to understand its power, dynamics and dangers. Proper training in a variety of water conditions improves the rescuer's ability to manage or mitigate the risk.
- The ability to scout and read water dynamics is an essential skill and can be accomplished from:
  - Shore, boat or helicopter
  - In water (lowest visibility and vantage point)
  - Use binoculars and night vision to enhance detail and in poor visibility situations.

WATER TERMINOLOGY



- Laminar flow
  - Water flowing down the center of a moving river. It moves at different velocities depending on level.
- Helical flow
  - Spiral (cork-screw) flowing action of water. Water piles up and rolls like a spring along the river banks and pushes objects out and away from the shore.
- River currents
  - Created by gravity, gradient, width, volume, natural and manmade features.
  - River flow is commonly referred to as Cubic feet per Second or CFS which is a measurement unit. A gallon of water weighs approximately 8.35 lbs. A cubic foot of water (12" height x 12" wide x 12" depth = 1,728 cubic inches - volume) contains approximately 7.5 gallons and weighs approximately 62.4 lbs. If water is flowing at 100 cfs, it would be approximately 750 gallons x 8.35 lbs. /gallon = 6262.5 lbs. or 3.1 tons. Gradient and speed of water increases the force exerted on objects in the water. According to the National Weather Service, "it takes just 12 inches of flowing water to carry off small car; 18-24 inches for larger vehicles.
  - The National Weather Service has many flooding resources at the following link: http://www.nws.noaa.gov/om/water/tadd/ The "Turn Around Don't Drown ®" program provides outreach information to inform the general public on the hazards and dangers of flash flooding and the power of water on the move.
- River right
  - Always refers to right shore side of river looking downstream.
- River left
  - Always refers to left shore side of river looking downstream.
- Inside bend
  - Slower current than an outside bend.

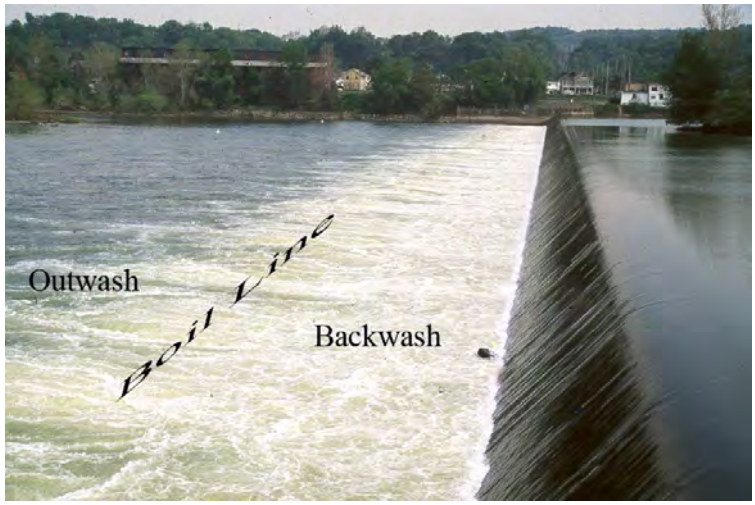
- Will form an eddy, be shallow and hold debris. At high water it can develop strong and dangerous eddies.

- Outside bend
  - Faster and deeper water than an inside bend. Will tend to push objects (rescuer, victim, boat, and debris) into the bank. The bank will normally be undercut, have exposed tree roots and create entrapment situations. Tree support is eroded causing the trees to fall into water forming strainers.
- Strainers
  - Manmade or natural obstructions (such as a tree, root system, fence, guiderails) that allows water to pass through but stops and holds object such as boats and people. Always scan downstream looking for variations at the surface (horizontal line, pillow feature) and dancing branches that can indicate a partially submerged strainer.

- Sweepers
  - Low hanging branches, utility lines, or other fixed object just above the surface of the water. Feature can snag, sweep, pin or capsize a boat and rescue personnel.
- Undercut
  - Can be a rock, bank, or manmade features such as a vehicle. On the upstream side of the object, there will be little or no pillow (cushion of water). Water will appear to be going down and under feature and a dark shadow may be present. Undercuts trap victims, debris and are extremely hazardous. Many rivers (i.e. Youghiogheny River – Dimple Rock) have well known undercut features that have been the site of multiple river fatalities.
- Eddy
  - Form on the downstream side (behind) of a rock, bridge pier, house, vehicle, or other obstruction in moving water. The current circulates and flows in the opposite direction to the main current. In swift water, it can be powerful, violent and trap swimmers, boats, and debris. Exiting a powerful eddy can be challenging and difficult if swimming or in a boat.

  - Eddies can also be safe targets to swim or boat into to exit the main current. By eddy hopping (swimming or boating) from eddy to eddy, one can navigate in a controlled, methodical method up or down the river or to a safe location.

- Eddy line
  - A distinct line which separates an eddy from main current. Try to cross or exit an eddy at the top where the eddy line is narrow.
- Pillow
  - Water piles (pillows) up on the up-stream side of a solid obstruction. This feature may deflect people and boat away from obstruction.
  - To reduce the risk of broaching (pinning) or capsizing a boat when encountering an obstruction:
    - Lean into **(NOT AWAY)** the object creating the pillow. Leaning away will cause the upstream boat gunwale (edge) to dip under water immediately swamping and capsizing the boat.
  - Lack of a pillow on the upstream side of an obstruction may indicate an undercut.
- Upstream "V"
  - Formed by an obstruction in water that creates a "V" that points upstream. Think of it like the tip of an arrow being shot directly at you. It is a feature to avoid. The "V" is not directly under the obstruction, but downstream of the submerged object. The distance downstream is determine by depth (shallow vs. deep) and speed of the water going over the object.
- Downstream "V"
  - Formed when water passes between two obstructions and creates a "V" which points downstream. Think of it like shooting the arrow downstream. A downstream "V" usually indicates a path that is clear of hazards.
  - Standing waves may form in the point of "V" and usually indicate the deepest channel. One single wave may be a rock in the chute.
- Low-head dam ("Drowning Machine")
  - Fixed obstructions across a stream or river. Water drops over the crest and creates a hydraulic at the base. This recirculation of water flows back towards the obstruction and can trap and re-circulate objects.
  - The feature is identified from upstream by a horizontal (-----) line going across river. Signs and buoys may also be up and downstream of the dam. If LHD's exist in your jurisdiction, preplanning, SOG's and rescue techniques to be employed need to be established and practiced.



  - Has the following features:
    - Outwash – water that flows downstream beyond the boil line
    - Boil line – division between the outwash and backwash. The feature looks like boiling water on a stove.
    - Backwash – recirculation of water that flows back towards the dam. Water can be highly aerated making it a challenge to float and stay on the surface.

        - Retaining walls at each end prevent escape.
    - NEVER UNDERESTIMATE THE POWER OF A LOW-HEAD DAM – THEY ARE CALLED DROWNING MACHINES FOR A REASON!
- Hydraulic/hole
    - Recirculation of water at base of low-head dam or a drop (rock, bridge, guardrail, etc.)
    - Escape is difficult without assistance.
    - Looking downstream
        - Smiling hole is easier to escape vs. frowning hole which will carry the rescuer to the center of the hydraulic.
    - Has the following features:
        - Outwash
        - Boil line
        - Backwash
        - Aeriated water

- Standing wave
    - Stationary wave on the river formed by a drop or underwater obstruction. A series of continuous standing waves may indicate deepest channel
- Lake waves
    - Caused by wind moving across the water surface. Waves can develop quickly and become large and dangerous.
    - In a boat, slow down and quarter the waves to avoid being capsized or swamping. Have personnel in the boat stay low and hold on. Secure all loose items.
- Hazmat and pollution
    - Chemicals, sewage, water borne bacteria and viruses pose a risk to rescuers. Dry suits provide barrier protection from hazmat in the water. Ensure immunizations are up-to-date (hepatitis and tetanus).
    - Water particles atomized from airboats fans can create an inhalation hazard to rescuers who may breathe in these particles.
- Urban hazards
    - Include, but are not limited to:
        - Fixed objects (fences, meters, homes, vehicles, signs, wires, mail boxes, other)
        - Utilities (gas and electric)
        - Man holes, drainage removal systems, in-take pipes, culverts and storm drains
        - Guiderails and Jersey barriers
        - Floating debris
        - Hazmat and pollution from homes and industry - floating tanks and barrels (LPG – chemical – unknown)
        - Roads and bridges

UNIT III – PERSONAL EQUIPMENT

THEME

Rescue equipment must be durable and provide maximum protection for the rescuer.

OBJECTIVES

- Describe the principle of dressing in layers.
- Cite two medical concerns associated with dry suits and layering.
- Identify how the head, hands, and feet should be protected.
- List two essential items to customize a helmet for night operations.
- Properly don and burp a dry suit.
- List three essential items needed to customize a PFD.

INTRODUCTION

Rescue personnel must select durable personal protective equipment that provides maneuverability and thermal protection for the user. By wearing proper mission specific PPE for the weather and water conditions and temperature, the rescuer can stay comfortable, dry and reduce the risk of cold or heat related emergencies.

Dressing in multiple clothing layers allows the wearer to regulate body temperature by either removing or adding clothing as needed. A variety of performance wear clothing materials are available for outdoor use. These materials provide thermal insulation and protection from the elements. Each clothing layer performs a specific task and can be used individually or in combination.

LAYERING

Base - inner wicking layer

- Material - silk, polypropylene or other combinations. Polypropylene and other garments are available in light, medium or heavy weights. Use - provides some insulation but main fabric function is to transport and draw (wick) moisture away from the body.

Middle insulation layer

- Material – fleece (polyester). Use – are light weight, traps air to provide insulation, comes in a variety of thicknesses (micro 100 – 200 – 300), maintains insulating properties when wet better than natural materials (i.e. cotton), also designed to absorb and transport moisture outward from the wicking layer.

Outer protection - water and wind-proofed fabric (breathable preferred)

- Material - coated nylon is wind and waterproof but does not transport moisture away from the body. Breathable fabrics are designed to transport water vapors through the material while providing a water and windproof exterior barrier (discuss examples).

SPECIALIZED CLOTHING

Dry suits

- Material – coated nylon or water and windproof breathable fabric. Design and durability vary greatly as well as price. Cost of product is based on features (material, zippers (entry and relief), reinforcement (elbows, knees and tailbone), gaskets, integrated socks, pockets, protective padding, reflective material, and use).
- Use - designed to keep water away from body. Dry suits reduce exposure to hazardous materials in the water (sewage, petroleum products and chemicals). Although dry suits keep water away from the body, they are not designed to provide thermal protection. Rescue personnel must determine what thermal clothing to wear under the suit. In cold conditions, multiple thermal layers are worn to provide insulation and warmth. In high heat conditions, only a wicking layer or swim suit is worn under the suit.
- "Burp" suits before going into the water. This involves crouching and pulling the neck gasket away from the neck to release the air. Rescuer may also have to "burp" suit again when entering the water. Too much air in the suit will make it difficult to swim and stay vertical during a rescue.

Layering Medical Precautions:

Gaskets on dry suits can be made of latex. Some people have severe allergies to latex, which can trigger an anaphylaxis reaction requiring the immediate administration of epinephrine. Ask and validate that anyone provided a dry suit **DOES NOT** have latex allergies before donning suit.

Gaskets must be properly cut to provide adequate circulation. A neck gasket that is too tight can cause a dizziness due to restricted blood flow. Signs of a tight neck gasket include: distended neck veins and flashed (red) face. Tight gaskets around the wrists and ankles will restrict blood flow causing tingling, numbness in the extremities, distended veins, swelling and capillary refill reduction. Gaskets will have to be cut for proper fit. A knowledgeable person must cut the gaskets to proper size. **Read and follow ALL manufactures guidelines for sizing and cutting gaskets.**

Heat related emergencies – Students can develop heat related emergencies (cramps, exhaustion and heat stroke) during training while wearing a dry suit. This can be caused by over exertion, excessive layers, lack of fitness, acclimation to environment, high temperatures and humidity. Use rest and hydration times throughout the practical sessions. Stop activity; doff the dry suit, layering and cool. Address and adjust over layering.

Cold related emergencies - Students can also develop cold related emergences (cold water shock and hypothermia) during training while wearing a dry suit. This can be caused by a dry suit failure (zippers not zipped, suit puncture and/or tears), over exertion, inadequate layering, lack of fitness, acclimation to environment, cold water and air temperatures.

If a medical problem occurs, contact the water rescue instructor immediately.

Exposure/immersion or ice rescue suits

- **These suits are dangerous and should NOT be used in moving water application due to the buoyance and reduced maneuverability making swimming extremely difficult.**

Head – helmet and liner

- Design – must provide front, top, back and side head protection. Factors to consider when purchasing include: head size, side or full cut, high visibility color with reflective tape, mounting capabilities (rail systems can be used to attach lights and night vision goggles), fit tensioning system (straps or BOA ® closure system), ventilation and drainage ports, and communication systems used. Thermal synthetic or neoprene liners can be worn under the helmet to reduce heat loss and provide additional thermal protection in cold conditions.
- Use – All rescue personnel involved in the rescue operation must wear a helmet. Helmets are critical because they provide protection should the rescuer slip and fall.

Eye Protection – ANSI Z87.1 protective eyewear

- Provides protection from the elements, flying debris and reduces sun glare. When operating a boat in cold conditions, goggles combined with a balaclava (close fitting head, face, and neck garment) provides complete protection from the elements. Polarized lens are recommended to reduce sun glare.

Ear Protections

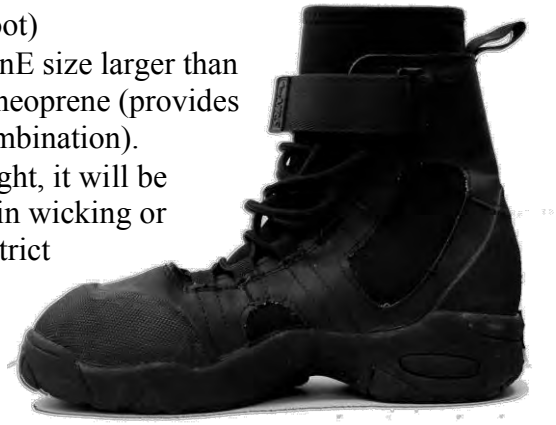
- Used to reduce noise and protect ears from damage when working near or around machinery (i.e. rescue equipment, boat motors and helicopters).

Hands – insulated gloves (neoprene, titanium, fleece, armored palms)

- Some glove designs allow for thin thermal liners to be worn under the glove to provide additional warmth. Have multiple pairs to switch out. Prewarm on way to call by placing over heater vents in vehicle.
- Gloves vary in thickness and are designed for warm and cold conditions.

Feet – footwear (sturdy boot (shore support) – water rescue boot)

- Design – factors to consider when purchasing: size (add onE size larger than your normal size), drainage ports, ankle support, traction, neoprene (provides warmth), ease of donning and securing (tie, zip, clip or combination).
- Circulation to feet is essential. If boot and socks are too tight, it will be uncomfortable and cause cold feet. Consider wearing a thin wicking or polyester sock for under the dry suit. Thick socks may restrict circulation.



PERSONAL FLOATATION DEVICES (PFDs)

Rescuers around water must always wear a United States Coast Guard (USCG) approved personal flotation device (PFD). A Type III or V PFD is used in rescue situations. Inflatable PFDs are **not** appropriate for water rescue.

- PFDs must be properly sized to wearer and customized (whistle, knife, and two locking carabineers). They should be brightly colored with light reflective tape. Have pockets for storage (avoid excessive attachments on outside of vest). Include a light for night operations and increased visibility in low light conditions. Additional items can include: prussic loops, webbing, universal-kill switch keys for boat operators.
- Rescue vests (Type V – Special Use Device) – **Follow all manufacturers' guidelines for the use and application. - THE USE AND APPLICATION OF THESE VESTS ARE TECHNICIAN LEVEL SKILLS AND REQUIRE ADVANCED TRAINING BEYOND THE SCOPE OF THIS PROGRAM.** Rescue vest training and application is included in the Advanced Line Systems Rescue – NFPA 1670 Technician level course.
- These PFD's are designed for specific water rescue applications both in and around water. Use and applications of vests have the potential for serious risk.
  - Rescue personnel using a rescue PFD must assess their skills before utilizing the device.
  - Practice on land before practicing in a controlled water environment.
  - Must have an immediately accessible knife as a means of escape should a component (quick release tether system) of the vest fail, become tangled or secured to a fixed object.
- High-risk applications using the vest include:
  - Tethered swimmer rescues
  - Swimmer lowers
    - V-lowers – team on river right and left control and lower rescuer.
- Features of a rescue PFD
  - Meet all guidelines listed for general purpose PFD.
  - Are high float – meet NFPA 1952 guidelines (minimum buoyancy of at least 9.9 kg (22 lbs.).
  - Integrated belt with a quick release buckle system.
  - O-ring in back of belt to attach tow tether or rope.
- Vest must be threaded properly through metal tri-glide system.
- Plastic quick release buckle must be snug and secured to prevent it from rolling (preventing the quick release system from releasing).
- The toggle must be accessible to release (blow) the system.
- Strap length cut to a little more than the length of a hand when wearing full PPE.
  - Too long of strap may bind or not release when blowing out of the system.

- Rescue vest applications include:
  - Poor footing conditions – where the risk of falling into the water is reduced by another rescuer controlling a line attached to the O-ring on the vest.
  - Direct contact rescue – the rescuer swims to victim and they pendulum to shore.

- Hazards of vest
  - Tether catches on an object.
  - Using a non-locking or a locking carabineer that is unlocked to attach the tether system to O-ring.
    - Carabineer can clip to the loop or webbing on the vest causing the system to fail to release.
  - Threading the buckle wrong can cause the harness to fail to hold.
  - Webbing can twist and bind in the buckle causing a failure to pass through the quick release system.
  - In cold conditions the webbing may freeze, preventing the system from releasing.
  - Some vests include or have as an option an attached tow tether, also known as a cow tail. PFBC does not advocate their use due to their potential snag hazard.

UNIT IV – RESCUE TACTICS AND TECHNIQUES

THEME
Proper scene assessment is critical to determine the most effective method of rescuing a victim without exposing the rescuer to unnecessary risk.

OBJECTIVES
- List the rescue sequence from safest to most dangerous.
- Demonstrate water entries (shallow water wading – stride – swifwater shallow planning).
- Swim 100 yards non-stop, fully clothed wearing a PFD and helmet in 8 minutes or less in a pool.
- Swim a designated moving water course using both defensive and aggressive swimming techniques to ferry and eddy hop to safety.
- Demonstrate how to avoid and self-rescue over a simulated strainer.
- Demonstrate single and multiple rescuer crossing techniques to reach and move a victim.
- List four types of equipment use for a shore based rescue.
- Accurately throw a throw bag 50 feet at a target.
- Accurately throw a heaving line 35 feet.
- Demonstrate belaying tactics and vectoring to pendulum a victim to shore.
- Establish and operate a double line floating tether system.
- Tie a water knot and a figure eight on a blight.

INTRODUCTION

- With training, practice and proper equipment, rescue teams can approach a water rescue situation with confidence and efficiency.
- To address the risks associated with water rescue, follow these basic guidelines:
  - Scene assessment – Environmental site influences (access, terrain, weather, visibility) and water conditions (i.e. type of water (pond, lake, river, tidal), flood management or flash flooding, hazardous materials, temperature) will directly influence the extrication victims.
  - Assess victim's condition – Alert and oriented (able to help with their own rescue) or unresponsive, injured or medical condition, ability to communicate and understand directions.
  - Personnel available – Trained water rescue technician teams with backup personnel (for safety and support) to accomplish the rescue tactic employed.
  - Equipment available – PPE, shore and boat based resources, transportation of assets, specialized assets (i.e. side scan sonar, helicopter aquatic rescue teams, SAR resources)
  - Follow the rescue sequence
    - Self-rescue (aid the victim to assist themselves – rescuer must be capable of self-rescue and preservation) - There are no absolutes in water rescue; no matter what precautions are taken, the rescuer working in the hot zone must be prepared to deal with a self-emergency.
    - Shore-based techniques – lower risk rescue tactics (reaching, throwing, and shallow water crossings). These are foundation skills that everyone in the hot zone must be able to accomplish.
    - Boat-based techniques – high risk rescue tactic using a rescue boat to reach, transport, and use as a working platform. Skills are taught in the Emergency Boat Operations and Rescue – NFPA 1670 Technician Level course.
    - Direct contact – high risk rescue tactic where water rescue technicians employ techniques that place them in the same environment as the victim to reach, capture, and extract. Skills are taught in the Advance Line Systems Rescue and Ice Rescue and Emergency Response – NFPA 1670 Technician Level courses.
    - Helicopter – highest risk rescue tactic employed by highly skilled water rescue technician with advanced skills to travel, hoist to and extract victims from multiple high risk environments (i.e. wilderness, flash floods, steep slopes, buildings).
  - Implement and develop alternative rescue responses – never rely on one rescue tactic. Shore based rescue techniques may be employed while boat or direct contact resources are deployed.

RESCUE SEQUENCE

- In order to affect a rescue, the rescuer must first be trained in self-preservation. They will be exposed to same hazardous environment as victim. It is critical that adequate back up and safety is established and in place at every water rescue incident.
- The rescue sequence is a guide and should be followed whenever possible. Always attempt self and shore based techniques first. Sometimes, the situation my dictate a higher and more complex tactic to employ first. Moving through the rescue sequence levels increases the risk to the rescuer.

SELF-RESCUE TECHNIQUES

- Ensure victim safety - Do not move a victim from safe location without having them in a properly size PFD and helmet.
- Talk the victim into self-rescue by providing clear instructions (i.e. angle your body towards shore or me, backstroke and kick hard).
- All personnel in the hot zone should be prepared to deal with self-rescue should they end up in the water. By understanding the power, dynamics and hazards of water, rescue personnel can utilize this skill to deal with a self-rescue should they enter the water.
- Rescuer must make critical decisions when in the water. These include:
  - Quickly identifying water dynamics and hazards to be encountered
  - Using water dynamics to their advantage
  - Determining the fastest way to get out of the environment
  - Selecting the best swimming position for the situation and water (defensive and/or aggressive).

WATER ENTRIES

There will be times when a rescuer must enter the water. Prior to any entry, assess and evaluate water dynamics, look for obvious and hidden hazards (i.e. rocks just below the surface, partial submerged strainers), select an entry and exit point. To enter the water, a rescuer can do any of the following techniques:

- Shallow water wading – face upstream and wade to swimming depth or where adequate foot is no longer possible. Push out at an angle and swim aggressively into the current. Once in the current, remain in the aggressive position swimming or roll onto back and assume a defensive position ferrying to a target.

- Stride entry – water depth is important. From a position above the water, step out and lean forward. When entering the water, bring arms together like you are going to splash someone. At the same time scissor your legs together. When done correctly, the rescuers head will not go under water.
- Swiftwater shallow water planning entry – water depth is critical. From a position above the water, push out and up to avoid a deep water entry. The rescuer skims across the water surface and immediately begins to swim. The technique provides momentum when entering the current. The skill MUST be practiced in a controlled setting, like a pool first, to develop proficiency.

SWIMMING WITH PFD

- Common swimming strokes used when wearing a PFD include:
  - Crawl stroke (Freestyle) - self-rescue – aggressive swimming position
  - Backstroke - self-rescue – defensive swimming position
  - Breast stroke – not as powerful as the crawl stroke
  - Side stroke – used to tow (i.e. victim, boat)

SWIM TESTING STANDARDS FOR WRER: swim nonstop 100 yards fully clothed, PFD and helmet (should demonstrate all four strokes) – 8 minutes or less.

- The self-rescue defensive position involves the rescuer floating on their back with feet and toes pointed downstream and at the surface (nose and toes out of the water). This position allows them to see obstructions, evaluate hazards and determine a safe target point downstream. Feet and legs can be used as shock absorbers (not your head) to push away from obstructions (i.e. rocks). When encountering a wave(s), take a breath before the wave and tuck chin to avoid the inhalation of water. When going over a vertical drop, pull knees up to chest to form a ball. This positon will reduce the risk of an entrapment from undercut features at the base of the drop. Avoid standing in moving water until safety is reached to reduce the potential for a foot entrapment.
  - To move across the current, angle body towards the shore you want to reach, backstroke and flutter kick. Setting the ferry angle well in advance and adjusting angle and power as needed will make reaching the target easier than waiting to the last minute to make the move.
- The self-rescue aggressive (crawl stroke) position is an offensive technique. The skill is physically demanding. Knowing when to use and not use is critical. Roll onto stomach and swim aggressively to target. To move across the current, angle body towards the shore you want to reach, use the crawl stroke and flutter kick. Setting the ferry angle well in advance and adjusting angle and power as needed will make reaching the target easier than waiting to the last minute to make the move. Keep your eyes on the target by keeping your head out of the water.
- Eddy lines can be powerful and pull a rescuer underwater as they cross. When entering an eddy, aim for the top where the eddy line is narrow. Attempt to cross the eddy line with the upstream arm first and aggressively swim until well into the eddy.
- Rescuer personnel must be proficient in both defensive and aggressive swimming techniques.

STRAINER SELF-RESCUE

Strainers are extremely dangerous and must be identified quickly. There is no time for second guessing, the rescuer must make a decision on how to encounter and go for it. If possible, the best option is to completely avoid if at all possible. The key is to aggressively ferry away from the hazard.

- If the strainer cannot be avoid, it must be engaged. Look for low points to pull and crawl over or an open passages (sweeper type feature) to swim through. To swim over a strainer, transition from a defensive swimming position by pivoting at the surface and keeping feet up, rolling onto the stomach and swimming (crawl stroke) headfirst downstream at the target. Grab the strainer and pull self-up and over quickly to avoid being pulled under the strainer.
- Options once the strainer is engaged include:
  - Reentering the water and continuing to swim away from the strainer.
  - Staying on top of strainer and working self towards shore.
  - Staying on the strainer and waiting for help to arrive.

MOVING WATER CROSSINGS

- Moving water crossings are used for a variety of reasons. A rescuer may need to reach a specific location in the river or shoreline. It can be used to reach and assist entrapped victim(s).
- Moving water crossing considerations include:
  - Water depth – Look at water features to identify depth (i.e. inside bends, shoals (ripples on the surface), rocks). Water depth can change abruptly. Use of a paddle or pole for support and probing for depth.
  - Current speed - Shallow swift water can easily knock a person off their feet.
  - Rescuer strength and size – Once water depth reaches the bottom of a PFD, positive buoyance will occur and float the rescuer. When the rescuer can no longer move in a controlled manner and begins to be pushed backwards by the current, they must either retreat and select another route or immediately switch to swimming.
  - Hazards - Always scan and scout for hazards and plan for where you will self-rescue swim if the current sweeps you off your feet. When crossing, scan upstream for floating debris that can strike the rescuer. Position backup rescuers upstream with communications to warn of hazards and downstream with throw bags or a double line floating tether system for backup safety.
  - Foot entrapment - Any time rescuers perform moving water crossing there is always the potential for a foot entrapment!
- Two types of crossings: single and multiple rescuer
- Single rescuer crossing
  - Enter current facing upstream with a slight body angle. Grasp the paddle shaft and blade, positioning the “T” grip end of paddle in water. The paddle blade is off set away from the

rescuers face. The blade position must slice the water. Lean forward in current to maintain stability forming a tripod.
  - Move slowly (one foot at a time and then the paddle) constantly observing water dynamics and watching for debris from upstream. If swept away, immediately assume self-rescue position and ferry to safety. The paddle can be positioned to aid in swimming or tossed towards shore or into an eddy.
- Multiple rescuer crossing
  - The group enters the current facing upstream forming a tight triangle wedge. Place the strongest person in the front with a paddle or pole. Team members are positioned behind lead rescuer grasping the PFD high (shoulder area) and side of person providing support and stability.

  - Lead rescuer gives commands to move. Verify group is prepared to move prior to making first move. Commands must be clearly understood by entire group prior to moving. If swept away, immediately assume self-rescue position and ferry to safety.
- Assisting a victim using a moving water crossing
  - Ensure that the victim has a properly sized and secured PFD and helmet on prior to move. Designate the highest trained (technician level if possible) rescuer to be responsible for the victim should the group be swept away and have to self-rescue.
  - Options for moving include:
    - Placing the victim in the center of the group and having him move as part of the entire group. Victim grasps the PFDs of rescuers and rescuers do the same.
    - Planning a victim who is unable to walk by floating them in the supine position (on their back). Grasp the victims PFD at the shoulders and elevating the upper torso keeping their head up and out of the water. Constantly communicate with victim. Designate the highest trained (technician level if possible) rescuer to be responsible for the victim should the group be swept away and have to self-rescue.

SHORE BASED TECHNIQUES

- Commonly referred to as reaching and throwing rescues are used to rescue a victim while keeping the rescuer(s) out of the water. A variety of techniques can be employed, each having advantages and limitations.
- Reaching rescues are accomplished by using an extension device (i.e. paddle, tree branch, reach pole) from shore and extending to a victim. Reaching distances is the most significant limitation.
- Throwing techniques involve tossing a floatation device (i.e. a ring buoy or almost anything that floats) to the victim to provide positive buoyance and support. Limiting factors of throwing floating devices is distance, weight and bulk making it awkward to throw.

THROW BAGS AND HEAVING LINES

- One of the most common throwing rescue tools used is a throw bag or heaving line. Throw bags come in a multitude of designs, features (i.e. light stick holders, reflective material), rope type (polypropylene, spectra, other) length, size, strength and color. NFPA 1983 guidelines set the minimum breaking strength of not less than 13kN (2923 lbf).
  - Advantages
    - Safety for rescuer
    - Simple to use (with practice). To maintain skills, practice whenever possible wearing PPE to maintain proficiency.
    - There can be up to 75' of rope in the bag depending on size.
    - Other uses include: attaching devices (ring buoy for a double line floating tether), use for tethered swimmer rescues (must have ALSR training), support line and weighted tether system for foot or body part entrapments.
  - Limitation
    - Throw must be accurate.
    - Difficult for hypothermic victim to grasp.
    - Provides no flotation support.
  - Hazards of throw bags and heaving lines:
    - A coil throw can wrap around a body part (i.e. head). It can cinch around the part in a static belay. ALWAYS watch what the rope is doing during deployment. ALWAYS be aware of what the rope is doing if you receive it. Is it wrapped around your neck from a coiled loop or wrapped around your leg from kicking? Situational awareness is critical. Take immediate actions to resolve problems!
    - Do everything possible to never loss control of the rope and allow it to float downstream. Rope in the water is a significant hazard! It can wrap around boat props or swimmers in the water.
  - Throwing methods
    - Underhand (softball toss)– most common method
    - Overhand (football toss) – when impractical to throw underhand due to shoreline vegetation, overhanging low branches, etc. Some rescuers are more comfortable with this throwing technique.
    - Side arm (discus toss) – difficult to use with accuracy but may be necessary from a boat or vegetation.
    - Coil – used to throw line – there are a number of methods to coil, but the PFBC recommends a "butterfly" coil. This method allows the rope to pay out smoothly with minimal risk of a loop forming. A "circle" coil will form a loop, and potentially "lasso" a victim around the neck.
  - Throw to victim
    - Select a site to deploy and consider where victim will pendulum too. Alert the victim (blew whistle – yell rope – hold high for visibility) you are going to throw the device. When they are directly in front of you, throw the bag beyond the victim. The victim grasps the rope and places it on their opposite shoulder to the shore they will be pendulum. The rescuer places the rope on their downstream side and prepares for a static (stationary) or dynamic (moving down the shoreline) belay. Pendulum and pull the victim to shore. A second rescuer needs to be prepared to vector (grasp the rope and move down the line on shore) the rope to bring the victim to shore.

- Factors influencing throw bag and heaving line rescues:
  - Know personal throwing limitations (distance you can deploy the bag consistently).
  - Determine best location for throw. Space to throw the bag – minimal overhanging features (branches, wires, etc.) – adequate footing (maintain a wide and low stance for stability).
  - Strong currents or slippery banks cause the rescuer to be pulled into the water. If this happens, to immediate action by sitting on the ground or having a second rescuer grasp first by PFD for additional support. In poor footing conditions, a support line can also be attached to the "O" ring on a Type V rest vest tether system. The use and application of a Type V rescue vest is a technician level skill and is taught in the Advanced Line Systems Rescue course.
  - Rescuer must never tie, wrap, or attach the line to themselves or a fixed stationary object (such as a tree). If pulled into the water, the rope is attached. It can wrap and become stuck, immediately causing the rescuer to submerge. A readily accessible knife to cut the rope may be the only escape option.
  - Be aware of downstream hazards. A good throw is nothing if the victim is pendulum into a downstream hazard (undercut or strainer) that makes the situation worse.
- If the rescuer misses, pull the line in and butterfly coil the rope, make another throw. Always be aware of the potential of a coil throw to "lasso" the victim around the neck.
- Receiving line
  - Lie on back in a defensive self-rescue position.
  - Hold (never wrap) line across opposite shoulder and chest from the rescue thrower. Note: Rescuers will know how to do this but panicked victims will not.
  - If a miss occurs, rescuers in the water must make every effort to get to the rope. Clearly communicate to victims to instruct them on what to do. This may be both verbal and nonverbal.

DOUBLE LINE FLOATING TETHER (DLFT) SYSTEM

- The system can be used for: downstream backup at a rescue scene, rescuing a person floating downstream, moving items (i.e. PFD and helmet) to a victim's location.
- Advantages of the DLFT system
  - Safety for the rescuers.
  - Provides positive buoyance and support of victim.
  - Easy to grasp.
- Limitations:
  - Distance.
  - Buoy can bounce or sling shot and hit the victim.
- System set up and operation:
  - Two lines are attached to ring buoy (Type IV) or other floatable device. Additional lines can be added to each side to increase system length.

- Get line across river by throwing, boat, or use of line gun.
- Rescuers control and operate the system by working on river right and left and maneuvered the buoy into position.
- If a victim is on a rock or other stationary object, attach PFD and helmet to the system and instruct victim to properly don them.
- Keep system out of water but distance may make this impossible. With the buoy hovering above the water, a victim or rescuer will be able to see as they approach. Alert (whistle/yell) and instruct the victim to grasp the buoy and go under the system to be on the downstream side. Upon capture, line tenders immediately begin to slack one side of the system and pendulum the victim to shore. Rescuer must be prepared to vector the line as well. Position rescuers at the capture point to assist the victim.
- Victim on a stationary object
  - Determine if the victim can shelter in place, wait for a boat, or must use the system due to immediate danger.
  - Communicate with the victim so that they clearly understand what is about to occur when they enter the water. Have victim don PFD and helmet prior to entering the water. Victim enters the water on the downstream side (eddy) of stationary object. Entering the water on the upstream side of an object could cause a possible entrapment.
  - The victim grasps the buoy on the downstream side and assumes the self-rescue position. One line tending team will pays out slack, while the other pulls tension and pendulums to victim to shore.

ENTRAPMENTS – SUPPORT AND SNAG LINES

- With an entrapment situation occurs, rescuers must attempt to determine the point last seen (PLS) or last known point (LKP). Locations include strainers, root balls, vehicles, and undercut rocks.
  - Look for unique water dynamics (pillow effect or upstream "V" in moving water) and features (colors in water indication of PFD or clothing).

- To extricate a victim with a trapped body part (i.e. foot), use a stabilization (support) line and snag line.
  - Stabilization (support) line is used for a victim on the surface. The line is maneuvered to the victim from river right and left. The line is worked under the victim to the arm pits and chest region and tension applied. This will lift and support the victim in the water providing both physical and psychological support. Only provide enough tension to lift the patient, too much will cause the line to be pulled past the victim. Communicate with the victim to see if they can use the

support to now free the trapped body part. If they can, slack one side of the system and pull the victim to safety.

- Time is critical in entrapment situations. Both the support and snag lines need to be established at the same time. For the victim on the surface, the snag line does not have to be weighted. For a submerged victim with NO visible signs of being at the surface, use a "weighted" snag line. Fill the bags with rocks to help it sink below the surface. Maneuver the weighted bags above the water and just on the downstream side of the submerged victim. Lower weighted snag into the water and allow it to sink. Line tending teams move slowly upstream to snag the victim. Once snagged, rescuers pull and move upstream to dislodge the victim. A plan must be in place on how to capture the dislodged unconscious victim. Options include a positioned boat or a direct contact tethered swimmer rescue.

BOAT BASED RESCUE

- Boat used to access victim or as a working platform. Procedures to deploy, operate and recover watercraft require specialized training and are addressed in the Emergency Boat Operations and Rescue – NFPA 1670 Technician Level course. Components of the training include: boat selection, recommended equipment, boat handling, moving water tactics, and boat rescue techniques.

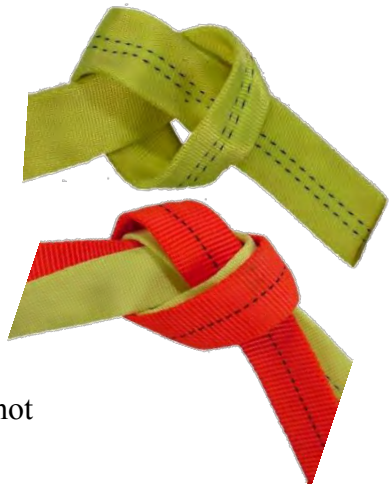
GO/DIRECT CONTACT RESCUE

- High risk rescue tactics that are complex and expose rescuers to potentially life threatening hazards. Techniques and systems should only be used when lower risk options have been exhausted and when the team has the training, equipment and skills.
- Requires technician level training addressed in the Advanced Line Systems Rescue – NFPA 1670 Technician Level course. Components of the training include: moveable control point (MCP) boat lowering system, tension diagonals (zip lines), and the use of Type V rescue vests for tethered swimmer rescues.

HELICOPTER BASED RESCUE

- Highest risk rescue tactic that employs highly trained aerial search and rescue technicians to respond to natural and manmade disasters incidents. Team members receive technical training that prepares them to engage in hostile environmental conditions in both the urban and wilderness setting.

KNOTS



- The overhand knot, water knot and figure eight on a bight are three common knots used in the WRER training. They are easy to tie and untie.

- Overhand knot – used as a backup knot and the foundation for the water knot. Form a loop and pass the running end through the loop.

- Water knot - used to join two pieces of webbing for anchors and the loop for the tag line system.
  - Form an overhand knot in the first running end.
  - Take the other running end and trace or follow through the overhand knot through backwards.
  - Dress the knot tight and flat when complete.

- Figure eight on a bight - used to form a loop or fixed point in a line
  - Take a bight of rope and pass it over, around, and behind the standing part.
  - Continue around and pass the bight up through the loop.
  - Knot will look like an “8”.

UNIT V – MEDICAL CONSIDERATIONS

THEME

Cold water shock, hypothermia, and drowning are common medical conditions associated with water emergencies that affect the victim and rescuer.

OBJECTIVES

- Describe the 1-10-1 principle.
- Cite four factors that can increase a person's chance of survival when in cold water.
- List three body substance isolation (BSI) protocols rescuers can employ for personal protection from blood borne pathogens or hazardous materials.
- Describe three methods of body heat loss.
- Discuss care guidelines for cold water shock and hypothermia treatment.
- Define drowning.
- List three medical concerns associated with water related emergencies

INTRODUCTION

- The rescuer needs to have knowledge of medical conditions associated with water related emergencies. The most common are cold water shock, hypothermia, and drowning.

Assignment – answer the following questions from the Cold Water Boot Camp video:

1. What are the cold hard facts and effects of cold water immersion?

2. Describe the 1-10-1 principles.

3. What factors increase surviving cold water immersion?

Each group will discuss the questions and provide answers to the entire group.

COLD WATER SHOCK AND HYPOTHERMIA

- Cold shock
  - Rapid development of a number of shock responses that can result in sudden drowning.
  - One of the first responses by the body upon sudden immersion in cold water is an involuntary gasp (torso reflex). Covering mouth and nose with your hands when falling into cold water reduces the chance of inhaling water. Water conducts heat from the body approximately 25 times faster than air at the same temperature.
  - Hyperventilation (rapid breathing) and breathlessness follow. Victim may feel claustrophobic and panicked. It may take a victim from 1 – 3 minutes to get their breathing under control.
  - Cold water vastly reduces the victim's ability to hold his breath. Loss of breathing control and reduced breath-holding ability will impair the victim's ability to swim.
  - The victim will have approximately 10 minutes of purposefully movement (the ability to potential rescue themselves).
  - The lowering of the body's core temperature begins around 30 minutes. The victim most likely will be in severe hypothermia after 1 hour.

- Survival factors in cold water include:
  - Use of PFD and clothing worn
  - Water temperature
  - Age and body type
  - Alcohol use
  - Pre-existing medical conditions
  - Overall fitness
  - Nutritional state – food is fuel
  - Acclimation and previous exposure to cold water
  - Attitude and will to survive
  - Movement in the water – unless safety (shoreline/boat) is near, assume the Heat Escape Lessening Posture or Huddle positions



- Prevention measure for cold water shock and hypothermia include:
  - Wearing a PFD and appropriate personal protective equipment to engage in the hostile environment.
  - Eating high energy foods and hydrate.
- Protecting areas of high heat loss and understanding how to reduce heat loss.
  - Conduction - transfer of heat by direct contact with water, air, or ground.
  - Convection - transfer of heat by air or water moving away from the body.
  - Radiation - loss of heat from unprotected body parts through energy transfer. High heat loss areas are the head, armpits, and groin area.
  - Evaporation - conversion of perspiration into water vapor, releasing heat from the body.
  - Respiration - exhalation of water vapor carrying with it heat from the body.
  - Recognizing the signs of cold water shock and hypothermia and take immediate action.
- Hypothermia is the lowering of the body's core temperature below 95º Fahrenheit. Prolonged exposure to the environment (air, water, and/or combination) will begin to reduce core temperature. Water conducts heat away from the body 25 times faster than air of the same temperature.

PLAN FOR EMERGENCIES

- Plan for emergencies by providing appropriate pre-hospital care at the scene ready for immediate transport of victims or rescuers.
  - Advanced Life Support (ALS) medical personnel must be dispatched to water related emergencies to provide care for the patient and potentially the rescuers. Have one ALS unit for the victim and one for the rescue team. Field treatment begins as soon as the patient is removed from the hostile environment.
  - Document patient data (assessment, vitals, illness or injury, history, and treatment) and provide to EMS personnel.
  - Follow body substance isolation protocols (hypoallergenic medial gloves, pocket or bag value masks, maintaining up-to-date immunizations, wearing dry suits, establishing HAZMAT and decontamination protocols, and taking water samples).
- Drowning victims have a chance of survival if rescue personnel are aware of the medical condition and ensure proper treatment.
- When dealing with any medical emergency, personnel must utilize PPE to reduce the risk of coming in contact with blood borne pathogens.
- PPE includes the use of:
  - Hypoallergenic medical gloves.
  - Pocket masks or bag valve masks.
  - Dry suits when in hazardous (chemicals and pollutants) water conditions. Gear may have to be disposed of after use, based upon type of chemicals or pollutants in the water.
  - Take water samples at the scene for analysis by hospital personnel. Samples are analyzed for treatment of the victim and protection of the rescuer.
- Establish HAZMAT and decontamination protocols.
- Rescue personnel must maintain up-to-date immunizations.
- Advanced Life Support (ALS) medical personnel must be dispatched to water related emergencies to provide care for the patient and potentially the rescuers.
  - Have one ALS unit for the victim and one for the rescue team.
  - First aid training (First Responder, EMT, etc.) provides the rescuer with the ability to initiate field treatment as soon as the patient is secured.
- Document patient data (assessment, vitals, illness or injury, history, and treatment) and provide to EMS personnel.

DROWNING

- The World Health Organization defines drowning as the process of experiencing respiratory impairment from submersion/immersion in liquid.
- Drowning victims have a chance of survival if rescue personnel are aware of the medical condition and ensure proper treatment. Individuals have been successfully revived after being under water for over one hour. Water rescue teams function in rescue mode during the "golden hour." After one hour of submersion the team transitions into recovery mode.
- Factors that increase survival are:
  - Age – younger the better.
  - Length of submersion – shorter the better.
  - Water temperature – colder the better.
  - Water quality – cleaner the better.
  - CPR – be aggressive.
  - Victim struggle – less is better.
  - Injuries complicate the chances for survival.

COLD WATER SHOCK – HYPOTHERMIA – DROWNING CARE GUIDELINES

- Remove the victim from cold environment and handle gently
- Follow CPR, drowning, and oxygen protocols
- Hypothermia patients:
  - Check for signs of circulation for one full minute.
  - Provide care based upon assessment.
  - Administer oxygen.
  - Follow Pennsylvania Department of Health or local approved protocols.
- Prevent further heat loss
  - Hypothermia field wrap.
  - Cover head with hat.
  - Wrap wet patient in plastic inner liner to keep water away from insulation layers.
  - Wrap patient in insulating layers (sleeping bag/blankets).
  - Wrap in plastic or tarp covering.
  - Handle gently.
- Transport to medical team and transport

OTHER MEDICAL CONDITIONS ASSOCIATED WITH WATER

Special note: Even though a rescuer may be going into very cold water, wearing an ice rescue/immersion or dry suit does not mean there is not a risk of a heat related emergency. Physical exertion and warm temperature can cause a rescuer to suffer heat related emergencies (heat exhaustion and heat stroke).

- Heat related emergencies (heat exhaustion and hyperthermia) - to reduce the risk of heat related emergencies, rescue personnel should:
  - Dress for conditions.
  - Maintain adequate fluid intake.
- Watch personnel for signs and symptoms:
  - Cramps (legs and abdomen).
  - Headaches.
  - Fatigue.
  - Nausea and vomiting.
  - Skin characteristics: exhaustion (pale, cool, moist from sweating) - hyperthermia (hot, red, dry with little to no perspiration).
  - Pulse and respiration rates: exhaustion (weak pulse, shallow rapid respiration) - hyperthermia (full rapid pulse, rapid shallow breathing).
  - Loss of consciousness (from both exhaustion and hyperthermia).
- Care – follow local protocols
  - Have patient stop activity.
  - Cool patient - remove from hot environment and get into cool environment (shade/air conditioning). Improve cooling by removing or loosing clothing (cold/immersion or dry suits should be removed since they hold in heat).
  - Exhaustion - apply moist cool water with towels.
  - Hyperthermia – cool in tepid (room temperature) water if transportation is delayed.
  - If conscious and alert provide fluids (water).
  - Administer oxygen.
  - Monitor vital signs.
  - Transport as soon as possible to medical facility.

- Dehydration
  - Proper hydration is critical.
  - Dehydration causes altered mental status (impaired judgment) fatigue, headaches, nausea and vomiting.
  - Hydrate (drink) often with either water. Use sports drinks only as a supplement**.**

- Sunburn
  - Wear sunscreen when working outside. Sunburns can occur without proper protection even in the winter.

- Hemorrhagic bleeding control
  - Be prepared to manage significant bleeding events from injuries sustained when working around water and watercrafts.
  - Follow local protocols for bleeding control methods and use of a tourniquets

- Head and spinal injuries
  - Follow local protocols for head and spinal immobilization.
  - Providing appropriate pre-hospital care at the scene is important.

PATIENT EVACUATION/TRANSPORTATION OPTIONS

- A patient may need to be transported from the incident. How a patient is evacuated and transported depends upon many factors:
  - Condition and type of injuries.
  - Terrain - access roads and trails.
  - Water conditions.
  - Weather (helicopter).
  - Access to boat/raft.
  - Number of personnel and training.
  - Equipment available.
  - Distance to hospital.

- Evacuation options:
  - Patient refuses/declines care at scene and walks/boats out on own.
    - Obtain appropriate refusal documentation.
  - Walking out with assistance.
  - Carried by a litter team.
  - Transport by boat to an access point.
    - When transporting by boat, don the patient with a PFD and helmet. Do not secure in a stretcher. If the boat capsizes, a patient secured to a stretcher will be trapped and unable to escape.
  - Transport by ambulance or helicopter.
  - Other (ATV, snowmobile, horse).

WATER RESCUE RESOURCE AND CONTACT LIST

RESOURCE TYPE

☐ WATER RESCUE TEAM			☐ HELICOPTER		
NAME			NAME		
STREET ADDRESS			STREET ADDRESS		
CITY	STATE	ZIP CODE	CITY	STATE	ZIP CODE
PHONE NUMBER 1 ( )	PHONE NUMBER 2 ( )		PHONE NUMBER 1 ( )	PHONE NUMBER 2 ( )	
☐ LOCAL			☐ SEARCH DOG TEAM		
NAME			NAME		
STREET ADDRESS			STREET ADDRESS		
CITY	STATE	ZIP CODE	CITY	STATE	ZIP CODE
PHONE NUMBER 1 ( )	PHONE NUMBER 2 ( )		PHONE NUMBER 1 ( )	PHONE NUMBER 2 ( )	
☐ COUNTY			☐ EMERGENCY MEDICAL SERVICES		
NAME			NAME		
STREET ADDRESS			STREET ADDRESS		
CITY	STATE	ZIP CODE	CITY	STATE	ZIP CODE
PHONE NUMBER 1 ( )	PHONE NUMBER 2 ( )		PHONE NUMBER 1 ( )	PHONE NUMBER 2 ( )	
☐ REGIONAL			☐ HAZMAT		
NAME			NAME		
STREET ADDRESS			STREET ADDRESS		
CITY	STATE	ZIP CODE	CITY	STATE	ZIP CODE
PHONE NUMBER 1 ( )	PHONE NUMBER 2 ( )		PHONE NUMBER 1 ( )	PHONE NUMBER 2 ( )	

☐ STATE			☐ SHELTER AND FOOD RESOURCES		
NAME			NAME		
STREET ADDRESS			STREET ADDRESS		
CITY	STATE	ZIP CODE	CITY	STATE	ZIP CODE
PHONE NUMBER 1 ( )	PHONE NUMBER 2 ( )		PHONE NUMBER 1 ( )	PHONE NUMBER 2 ( )	
☐ FEDERAL			☐ SPECIALIZED RESOURCES		
NAME			NAME		
STREET ADDRESS			STREET ADDRESS		
CITY	STATE	ZIP CODE	CITY	STATE	ZIP CODE
PHONE NUMBER 1 ( )	PHONE NUMBER 2 ( )		PHONE NUMBER 1 ( )	PHONE NUMBER 2 ( )	
☐ PUBLIC SAFETY DIVE TEAM			☐ MEDIA		
NAME			NAME		
STREET ADDRESS			STREET ADDRESS		
CITY	STATE	ZIP CODE	CITY	STATE	ZIP CODE
PHONE NUMBER 1 ( )	PHONE NUMBER 2 ( )		PHONE NUMBER 1 ( )	PHONE NUMBER 2 ( )	
☐ LAW ENFORCEMENT			☐ OTHER		
NAME			NAME		
STREET ADDRESS			STREET ADDRESS		
CITY	STATE	ZIP CODE	CITY	STATE	ZIP CODE
PHONE NUMBER 1 ( )	PHONE NUMBER 2 ( )		PHONE NUMBER 1 ( )	PHONE NUMBER 2 ( )	

CONTACT INFORMATION			
NAME		**EMAIL**	
STREET ADDRESS			
CITY		**STATE**	**ZIP CODE**
HOME PHONE NUMBER ( )	**CELL PHONE NUMBER** ( )		**WORK PHONE NUMBER** ( )

NIMS INFORMATION	
TEAM TYPE CLASIFICATION	**TEAM SIZE**
RESOURCE CAPABILITIES	
EQUIPMENT AND SPECIALIZED RESOURCES	
CALL OUT PROTOCOL	
MEETING DATES	
AGREEMENTS	

HAZARD SURVEY FORM

SITE INFORMATION

SITE NAME

SITE TYPE

☐ OCEAN ☐ LAKE ☐ RIVER ☐ STREAM/CREEK

☐ POND ☐ SWAMP ☐ DIKE/LEVEE ☐ LOW WATER CROSSING

☐ LOW-HEAD DAM ☐ INDUSTRIAL INTAKE ☐ OTHER: _____

IF RIVER: SELECT CLASS OF RIVER

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6

SITE DESCRIPTION AND HAZARDS (MANMADE AND NATURAL)

SITE SPECIFICATIONS		**TYPE OF MARKINGS**
WIDTH	**DEPTH**	**DAM CONDITION AND CONSTRUCTION**

GPS DATA POINTS

Google Earth Link – http://earth.google.com/ Microsoft Virtual Earth Link – http://maps.live.com/

ACCIDENT SITE HISTORY

GAUGE DATA

U.S.G.S. REAL TIME DATA FOR PENNSYLVANIASTREAM FLOW

http://waterdata.usgs.gov/pa/nwis/current?type=flow

SPECIFIC U.S.G.S. LINK FOR SITE

CFS/GAUGE HEIGHT – LOW	**CFS/GAUGE HEIGHT – MEDIUM**
CFS/GAUGE HEIGHT – HIGH	**CFS/GAUGE HEIGHT – FLOOD**

JURISDICTION

FIRE/RESCUE	**NAME**	**PHONE NUMBER** ( )	**EMAIL**
	STREET ADDRESS		
	CITY	**STATE**	**ZIP CODE**
LAW ENFORCEMENT	**NAME**	**PHONE NUMBER** ( )	**EMAIL**
	STREET ADDRESS		
	CITY	**STATE**	**ZIP CODE**
MUTUAL AID	**NAME**	**PHONE NUMBER** ( )	**EMAIL**

	STREET ADDRESS		
	CITY	**STATE**	**ZIP CODE**
OTHER	**NAME**	**PHONE NUMBER** ( )	**EMAIL**
	STREET ADDRESS		
	CITY	**STATE**	**ZIP CODE**

COMPLETED BY	
NAME	**DATE**

MISSING PERSON DESCRIPTION FORM

INFORMATION OBTAINED FROM

NAME		EMAIL
STREET ADDRESS		
CITY	STATE	ZIP CODE
HOME PHONE NUMBER ( )	CELL PHONE NUMBER ( )	WORK PHONE NUMBER ( )

RELATIONSHIP TO MISSING PERSON

☐ WITNESS ☐ VICTIM ☐ FAMILY MEMBER ☐ OTHER: _____

MISSING PERSON DATA

NAME		EMAIL
STREET ADDRESS		
CITY	STATE	ZIP CODE
HOME PHONE NUMBER ( )	CELL PHONE NUMBER ( )	WORK PHONE NUMBER ( )
FLOAT PLAN (IF YES, ATTACH TO THIS FORM) ☐ YES ☐ NO	PHOTOGRAPH (IF YES, ATTACH TO THIS FORM) ☐ YES ☐ NO	DATE REPORTED MISSING
TIME REPORTED MISSING OR LAST SEEN _____ AM/PM _____ MILITARY TIME		TIME WHEN VICTIM SUBMERGED _____ AM/PM _____ MILITARY TIME

POINT LAST SEEN/LAST KNOWN (BE SPECIFIC REGARDING DETAIL AND MARK/IDENTIFY LOCATION (MARKER BUOY, GPS, ANCHOR BOAT)

MISSING PERSON DESCRIPTION

GENDER ☐ MALE ☐ FEMALE ☐ UNKNOWN	AGE (5 YEAR SPANS – I.E. 25-30)	WEIGHT (10 LB. SPANS – I.E. 180-190)
HEIGHT (3 INCH SPANS – I.E. 5'-5'3")	BODY BUILD ☐ SLIGHT ☐ AVERAGE ☐ HEAVY	HAIR (COLOR AND STYLE)
FACE SHAPE	FACIAL HAIR	EYE COLOR

HEALTH STATUS

PHYSICAL LIMITATION(S)

MEDICAL CONDITION(S)	MEDICATION(S)
ALLERGIES	MENTAL STATUS

CLOTHING			
HAT	PFD COLOR _____ TYPE _____	JACKET	SHIRT
PANTS/SHORTS	SOCKS	SHOES TYPE _____ SIZE _____ THREAD PATTERN _____	

UNIQUE FEATURES/CHARACTERISTICS	
IDENTIFYING MARKS (TATTOOS, BIRTH MARKS, SCARS, PIERCINGS)	IDENTIFYING ACTIONS (MANNERISMS (WALK, STYLE, SPEECH, ETC.)

SWIMMING ABILITIES

SWIMMING

☐ NON-SWIMMER ☐ WEAK ☐ FAIR ☐ STRONG

BOATING/WATER SAFETY TRAINING

TRAINING (IF YES, PROVIDE DETAILS OF TRAINING (BOATING, DIVING, SWIMMING, WATER RESCUE, ETC.)

☐ YES ☐ NO DETAILS: _____

VICTIM BEHAVIOR	
CHECK ALL THAT APPLY ☐ DRINKING/DRUG ABUSE ☐ UNSAFE ACT ☐ DEPRESSED/SUICIDAL ☐ USE OF WEAPONS ☐ RUN AWAY ☐ OTHER	DETAILS

VICTIM ACTIVITY	
CHECK ALL THAT APPLY ☐ FISHING ☐ SWIMMING ☐ BOATING ☐ DIVING ☐ DRIVING ☐ HIKING ☐ ICE SKATING ☐ OTHER	DETAILS

VICTIM PERSONAL PROTECTIVE EQUIPMENT	
WAS VICTIM WEARING PFD ☐ YES ☐ NO	WAS VICTIM WEARING COLD WATER CLOTHING ☐ YES ☐ NO

SIGNALING CAPABILITIES

VICTIM HAS

☐ VISUAL DISTRESS SIGNALS ☐ MIRROR ☐ WHISTLE ☐ CELL PHONE (LIST NUMBER) _____

☐ RADIO (VHS OR WALKIE TALKIE) TYPE: _____ CHANNEL OF OPERATION: _____

CALL NUMBERS OR SPECIFIC NAME: _____

PROVIDE ANY OTHER DETAILS

VEHICLE INFORMATION			
MAKE	MODEL	YEAR	COLOR
LICENSE PLATE STATE _____ NUMBER _____	VEHICLE ID NUMBER (VIN)	UNIQUE CHARACTERISTICS	

LOCATED AT (ACCESS, BOAT RAMP, ALONG ROAD, PARKING LOT, ETC. – PROVIDE DETAIL)

BOAT INFORMATION					
TYPE					
☐ UNKNOWN	☐ AIR BOAT	☐ AUXILIARY SAIL	☐ CABIN MOTORBOAT	☐ CANOE	
☐ HOUSEBOAT	☐ KAYAK	☐ JET BOAT	☐ OPEN MOTORBOAT	☐ PWC	
☐ PONTOON BOAT	☐ ROWBOAT	☐ SAIL	☐ OTHER: _____		
MAKE	MODEL	COLOR			
REGISTRATION NUMBER STATE _____ NUMBER _____	HULL ID NUMBER (HIN)				
UNIQUE CHARACTERISTICS	LIVERY/RENTAL (IDENTIFYING MARKINGS AND BOAT NUMBER)				
LOCATED AT (BOAT RAMP, MARINA SLIP, ALONG SHORE, PINNED, ETC. – PROVIDE DETAIL)					
POINT LAST SEEN OR LAST KNOWN POINT					
UTILIZE MARKING SYSTEM OF POINT LAST SEEN OR LAST KNOWN POINT (BUOY, LANDMARK, ANCHOR, BOAT, ETC.)					
SEARCH AREA SIZE					
FOR WATER SPEED MARK 100' DISTANCE ON SHORE AND TIME THE SPEED WHICH IT TAKES A FLOAT TO TRAVEL THAT DISTANCE (EXAMPLE 10 SECONDS). TO CONVERT INTO MPH, DIVIDE 10 INTO 69 WHICH EQUALS 6.9 MILES PER HOUR. IN ONE HOUR, THEORETICALLY, THE VICTIM COULD HAVE TRAVELED DOWNSTREAM 6.9 MILES FROM THE POINT LAST SEEN OR LAST KNOWN POINT. THIS ONLY ACCOUNTS FOR A RIVER RUNNING IN A STRAIGHT LINE WITH NO OBSTRUCTIONS. THE CALCULATION PROVIDES A STARTING POINT FOR DETERMINING SEARCH AREA SIZE.					
WATER SPEED					

NAME: _____ ANSWER SHEET SCORE: ___/100

2 pts each – must score 80% or higher

1. _____
2. _____
3. _____
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48. _____
49. _____
50. _____

WATER RESCUE AND EMERGENCY RESPONSE SKILLS SHEET			
SKILLS ANALYSIS			
ADMINISTRATIVE	**NAME – PAR #**	**NAME – PAR #**	**NAME – PAR #**
COMPLETE FORMS	☐ YES ☐ NO	☐ YES ☐ NO	☐ YES ☐ NO
LECTURE ATTENDANCE	☐ YES ☐ NO	☐ YES ☐ NO	☐ YES ☐ NO
POOL SESSION ATTENDANCE	☐ YES ☐ NO	☐ YES ☐ NO	☐ YES ☐ NO
OUTDOOR PRACTICAL	☐ YES ☐ NO	☐ YES ☐ NO	☐ YES ☐ NO
SKILLS – POOL			
SWIM TEST WITH PFD	☐ PASS ☐ FAIL ☐ INC	☐ PASS ☐ FAIL ☐ INC	☐ PASS ☐ FAIL ☐ INC
HELP/HUDDLE	☐ PASS ☐ FAIL ☐ INC	☐ PASS ☐ FAIL ☐ INC	☐ PASS ☐ FAIL ☐ INC
THROWING AND REACHING	☐ PASS ☐ FAIL ☐ INC	☐ PASS ☐ FAIL ☐ INC	☐ PASS ☐ FAIL ☐ INC
MOVING WATER CROSSING	☐ PASS ☐ FAIL ☐ INC	☐ PASS ☐ FAIL ☐ INC	☐ PASS ☐ FAIL ☐ INC
DLFT & HAND SIGNALS	☐ PASS ☐ FAIL ☐ INC	☐ PASS ☐ FAIL ☐ INC	☐ PASS ☐ FAIL ☐ INC
SUPPORT AND SNAG	☐ PASS ☐ FAIL ☐ INC	☐ PASS ☐ FAIL ☐ INC	☐ PASS ☐ FAIL ☐ INC
STAINER SELF RESCUE	☐ PASS ☐ FAIL ☐ INC	☐ PASS ☐ FAIL ☐ INC	☐ PASS ☐ FAIL ☐ INC
SKILLS – OUTDOOR PRACTICAL			
SELF RESCUE DEFENSIVE AGGRESSIVE	☐ PASS ☐ FAIL ☐ INC	☐ PASS ☐ FAIL ☐ INC	☐ PASS ☐ FAIL ☐ INC
FERRY	☐ PASS ☐ FAIL ☐ INC	☐ PASS ☐ FAIL ☐ INC	☐ PASS ☐ FAIL ☐ INC
THROWING AND REACHING	☐ PASS ☐ FAIL ☐ INC	☐ PASS ☐ FAIL ☐ INC	☐ PASS ☐ FAIL ☐ INC
MOVING WATER CROSSINGS	☐ PASS ☐ FAIL ☐ INC	☐ PASS ☐ FAIL ☐ INC	☐ PASS ☐ FAIL ☐ INC
DLFT	☐ PASS ☐ FAIL ☐ INC	☐ PASS ☐ FAIL ☐ INC	☐ PASS ☐ FAIL ☐ INC
SUPPORT AND SNAG	☐ PASS ☐ FAIL ☐ INC	☐ PASS ☐ FAIL ☐ INC	☐ PASS ☐ FAIL ☐ INC
HAND SIGNALS	☐ PASS ☐ FAIL ☐ INC	☐ PASS ☐ FAIL ☐ INC	☐ PASS ☐ FAIL ☐ INC
STRAINER	☐ PASS ☐ FAIL ☐ INC	☐ PASS ☐ FAIL ☐ INC	☐ PASS ☐ FAIL ☐ INC
TEST SCORE (80% OR HIGHER)			
CERTIFY	☐ PASS ☐ FAIL ☐ INC	☐ PASS ☐ FAIL ☐ INC	☐ PASS ☐ FAIL ☐ INC
INSTRUCTOR COMMENTS			

ASSUMPTION OF RISK/RULES AND REGULATIONS

The Pennsylvania Fish and Boat Commission provide excellent state-of-the-art training for students. The Commission has an outstanding safety record and every reasonable effort is made to safeguard students during indoor and outdoor training sessions.

The Water Rescue Program is designed to develop the student's awareness, knowledge, and skills. The activities will expose students to a number of outdoor hazards (temperature extremes and inclement weather, cold and moving water, contaminated water, steep slopes, slippery rocky river banks, poisonous plants, animals, and human contact), which could lead to serious injury and/or death. These risks include the loss of, or damage to, personal property, heat and cold related emergencies (hypothermia and hyperthermia), drowning, broken bones, wounds/contusions, abrasions, bruises, muscle or tendon sprains/strains, infections, head/neck and spinal cord injury.

All reasonable precautions will be taken to provide a safe environment during training sessions. The instructor prior to training has evaluated all sites used. Also, to minimize the risk, personal and group safety is essential and the following rules must be followed to insure the highest degree of safety.

1. If any problems occur during the activity, the student should contact the instructor immediately.

2. No alcohol or drugs are permitted.

3. All participants will work on a "buddy" system – in at least teams of two.

4. Students are not permitted to leave the training site without the permission of the instructor or designated individual.

5. Participants must come physically and mentally prepared to engage in the activity.

6. Group dynamics are an important component of the activity. Each participant must understand the potential risks involved in the activity and work as part of a team for the well-being of the entire group.

7. Participants must dress appropriately for the outdoor environment and weather conditions. A Personal Flotation Device (PFD), helmet, protective foot wear, wet suit, polypropylene, polyester/wool top and bottoms, and nylon wind shell are required for both ice and moving water practical sessions.

8. Personal Flotation Device (PFD) and helmets must be worn at outdoor ice and moving water practical sessions. During ice rescue, PFDs will be worn at all times except when in cold water exposure suits.

9. Students are not permitted on the ice without a cold-water exposure suit, attached to a harness and line system.

10. Participants are responsible for equipment that is assigned to them. If the equipment is broken or damaged under normal use, the participant is not accountable. If the equipment is damaged due to willful abuse or negligence, the participant is responsible for replacement of the equipment.

11. Everything that is carried in will be carried out.

12. Each participant is responsible to bring a container of fresh drinking water and must refill only from designate areas.

13. Students who become lost or separated from the group should remain calm and remain where they are until help arrives.

14. All participants are expected to share in-group duties. This may include loading and unloading, cleaning and storing equipment, and assisting with assigned duties if an emergency arises.

15. Boisterous, immoral, or indecent conduct is not tolerated.

16. Headfirst diving is prohibited.

17. Because of the risk involved in water rescue training, students who do not understand direction(s) of the instructor or designated individual must stop the instructor and ask for clarification.

18. Students have the right to not participate in any aspect of the training program.

19. The lead instructor has the right to dismiss any student from the course for violation of any part of this agreement.

I have read and agree to the terms of the Assumption of Risk/Rules and Regulations

PARTICIPANT		
PRINTED FIRST NAME	**PRINTED MIDDLE**	**PRINTED LAST NAME**
SIGNATURE		**DATE**
WITNESS		
SIGNATURE		**DATE**

WAIVER AND RELEASE FROM LIABILITY and AGREEMENT NOT TO SUE

IN CONSIDERATION of being allowed to participate in any activity or program affiliated with the Pennsylvania Fish and Boat Commission, and intending to be legally bound hereby, the undersigned:

1. Agrees that, prior to participating, he/she will inspect the facilities and equipment to be used, and if the undersigned believes that said facilities or equipment are unsafe, the undersigned will immediately advise his/her supervisor or instructor of such condition and refuse to participate.

2. Certifies that he/she is in good health, is physically fit to engage in this activity and has no known medical condition that could foreseeably jeopardize his/her safety during such participation or be aggravated by such participation.

3. Acknowledges and fully understands that each participant will be engaging in activities that involve risk of serious injury, including the loss of, or damage to, personal property, heat and cold related emergencies (hypothermia and hyperthermia), drowning, broken bones, wounds/contusions, abrasions, bruises, muscle or tendon sprains/strains, infections, head/neck and spinal cord injury, including permanent disability and death, and severe social and economic losses, which might result not only from his/her own actions, inaction, or negligence, but also from the actions, inaction, or negligence of others, the condition of the premises or of any equipment used. Further, the undersigned acknowledges and fully understands that there may be other risks not known to the Commission or the undersigned or risks that are not reasonably foreseeable at this time.

4. Assumes all the foregoing risks and accepts personal responsibility for any and all damages of whatever kind, name or nature in any manner arising out of or in connection with the undersigned's participation in the activity or program.

1. Forever releases, acquits, discharges, indemnifies and holds harmless the Commission and all its agents, officers and employees, and if applicable, other participants in the program and owners and lessors of premises used to conduct the program, from any and all causes of action, including personal injury, and property damage, costs, charges, claims, demands and liabilities of whatever kind, name or nature in any manner arising out of or in connection with the undersigned's participation in the activity or program, even if he/she contends that such injury or loss is the result of negligence, recklessness, or other improper conduct of the Commission, its agents, officers, or employees and if applicable, other participants in the program and owners and lessors of premises.

6. Releases the Commonwealth of Pennsylvania, the Pennsylvania Fish and Boat Commission and their officers, employees, agents and assigns from any claims and demands arising out of the use of the photographs or videos. Understands that the photographs or videos will be copyrighted in the name of the Pennsylvania Fish & Boat Commission and may be used in conjunction with other photographs or videos, as part of a composite, or in any form whatsoever. Understand that the Commission may assign its rights or give permission to use the photographs to another party.

7. Acknowledges that he/she has read the above waiver and release and understands that he/she has given up substantial rights by signing it and does hereby acknowledge that he/she is signing it voluntarily

PARTICIPANT		
PRINTED FIRST NAME	**PRINTED MIDDLE**	**PRINTED LAST NAME**
SIGNATURE		**DATE**
WITNESS		
SIGNATURE		**DATE**

EMERGENCY CONTACT AND CONSENT FORM

PARTICIPANT INFORMATION

NAME		EMAIL
STREET ADDRESS		
CITY	STATE	ZIP CODE
HOME PHONE NUMBER ( )	CELL PHONE NUMBER ( )	WORK PHONE NUMBER ( )

EMERGENCY CONTACT INFORMATION

NAME		EMAIL
STREET ADDRESS		
CITY	STATE	ZIP CODE
HOME PHONE NUMBER ( )	CELL PHONE NUMBER ( )	WORK PHONE NUMBER ( )

MEDICAL CONDITIONS/MEDICATIONS

PLEASE CITE ANY MEDICAL CONDITIONS OR MEDICATIONS THAT YOU ARE CURRENTLY TAKING. IN THE EVENT OFAN EMERGENCY, THIS INFORMATION WILL ALLOW MEDICAL PERSONNEL TO MAKE PROPER DECISIONS.

ALLERGIES:_____

SWIMMING ABILITIES (CHECK ONE)

__ NON-SWIMMER __ WEAK __FAIR __ STRONG

MEDICAL INSURANCE INFORMATION

PARTICIPANT COVERED BY HOSPITALIZATION AND/OR MEDICAL CARE POLICY? ___YES ___ NO

_____ _____

INSURANCE COMPANY NAME **POLICY NUMBER**

I, the undersigned, give consent to medical treatment.

Participant:
Print Name _____ _____ _____
First **Middle** **Last**
Signature _____ **Date**____/____/____

Witness:
Signature _____ **Date**____/____/____

Send or email to:
PA Fish & Boat Commission
Attn: Ryan Walt
PO Box 67000
Harrisburg, PA 17106

INSTRUCTOR EVALUATION

Date of Course	
Type of Course	
Location	

PRINTED AND AUDIO VISUAL MATERIALS	Strongly Agree	Agree	No Opinion	Disagree	Strongly Disagree
Student workbooks were provided and beneficial					
Course record sheet and class roster completed					
LEARNING ENVIRONMENT	**Strongly Agree**	**Agree**	**No Opinion**	**Disagree**	**Strongly Disagree**
Course expectations, training requirements, safety, and objectives were made clear at the beginning of the course					
Classroom was comfortable					
Adequate equipment was provided for skills practice					
INSTRUCTOR(S)	**Strongly Agree**	**Agree**	**No Opinion**	**Disagree**	**Strongly Disagree**
Followed PFBC Water Rescue Program Guidelines					
Presented professional appearance and was enthusiastic					
Well prepared, knowledgeable, and organized					
Engaged students, encouraged participation, and answered questions					
Managed a positive learning environment that encouraged students to express ideas, opinions, and concerns both in the classroom and during the practical sessions.					
Used multiple teaching techniques to promote student learning (demonstrations, simulations, hands-on, q/a)					
RISK MANAGEMENT	**Strongly Agree**	**Agree**	**No Opinion**	**Disagree**	**Strongly Disagree**
Waiver and Release from Liability, Assumption of Risk, and Emergency Contact and Consent forms were provided at the beginning of the course, read by the instructor, and collected					
Students were assigned PAR numbers					
Environmental briefings occurred at the pool and moving water practical sites that identified risks and hazards, rules, and procedures to follow in the event of an incident during training					
Moving water site was challenging and provided the opportunity to improve water rescue skill proficiency					
Instructor(s) consistently managed, communicated, and provided appropriate safeguards to ensure safety of students throughout the entire course					
OVERALL COURSE	**Strongly Agree**	**Agree**	**No Opinion**	**Disagree**	**Strongly Disagree**
Moving water location was appropriate for the course					
Pool session was used efficiently					
Time management was efficient					
Instructor(s) worked well together					
Instructor(s) contributed to my knowledge and skills					
I achieved the specific course objectives					
Would recommend course to others					

NAME OF INSTRUCTOR(S)	Quality of Instruction (1) Lowest (5) Highest	COMMENTS
	1 – 2 – 3 – 4 – 5 **Poor ⟶ Outstanding**	
	1 – 2 – 3 – 4 – 5 **Poor ⟶ Outstanding**	
	1 – 2 – 3 – 4 – 5 **Poor ⟶ Outstanding**	
	1 – 2 – 3 – 4 – 5 **Poor ⟶ Outstanding**	

What do you believe has been done especially well in the teaching of this course? Please describe:
What do you believe could be done to improve the course? Please describe:
Additional comments:

Revised: 3/2012

The Pennsylvania Fish and Boat Commission is responsible for the PA Water Rescue program. Ryan Walt, the Commission's Boating and Watercraft Safety Manager coordinates and oversees water and ice rescue curriculum development, instructor training, and is the liaison with numerous local, state and national agencies regarding water rescue training opportunities and standards.

Chris A. Calhoun, lead water rescue instructor-trainer, is the primary author of the instructor's lesson plan and PowerPoint presentation for this curriculum.

Commission volunteer water rescue instructor-trainers assisted with the curriculum development, review and editing, instructor training, and ensuring the program meets and exceeds current national standards. They are: Len Basara, George Drees, Scott Grahn, Joel Koricich, Michael Kurtz, Michael McCarthy and Jeremy Speakes.