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COLD CALLS

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ICE RESCUES POSE UNIQUE CHALLENGES FOR RESPONDERS

by Gerald M. Dworkin
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The following incidents and places, as well as the circumstances surrounding them, are fictional.

On the Scene

Dispatch at 16:04 hrs: KGT-597 to Rescue 15, respond to Bakersville Pond off Cemetery Island for a report of a dog through the ice, approximately 100 yards from shore.

Upon receipt of this call, the fire chief contacts dispatch to say that his department's policies and protocols do not provide for response to domestic animal assistance or rescue, and the department will not put personnel at risk to save animals. Therefore, the fire department is going to scratch this call, and the chief recommends that dispatch contact New Hampshire Fish and Game or the Humane Society to respond to this incident.

Dispatch at 16:12 hrs.: KGT-597 to Rescue 15, Ambulance 20, Medic 19, and Dive Team 12, respond to Bakersville Pond off Cemetery Island for a report of two victims through the ice, approximately 100 yards from shore. The caller states that a child ventured onto the ice trying to save his dog, fell through the ice, and his father ran out onto the ice to save his son. Now, both victims are through the ice and in the water and reportedly holding onto the ice shelf and screaming for help.

Bakersville Fire and Rescue personnel respond to the station to pick up equipment and apparatus. Upon arrival at Cemetery Island, two firefighters don ice rescue suits and carry their rigid-hull, flat-bottomed boat onto the ice. As the firefighters make their way out to the victims, the ice gives way, and the firefighters and

their boat fall through the ice and into the water. One firefighter climbs into the boat, while the other firefighter continues to swim toward the victims. Upon reaching the father, the rescuer grabs him and tows him toward the boat; however, the firefighter in the boat cannot pull the victim into the boat, so he supports him over the rear transom while the first rescuer attempts to swim back out to the child. Becoming too exhausted to continue, the rescuer turns onto his back and floats motionless in the water while trying to catch his breath. The firefighter in the boat is unable to advance any further and watches as the child slips away from the ice shelf and submerges.

When the first rescuer is able to return to the boat, he holds on as shore-based rescue personnel manning the tether line pull the boat back toward shore. As they pull, the ice gives way, and the four firefighters serving as line tenders, who are wearing turnout gear, fall through the ice.

Dispatch at 16:29 hrs.: KGT-597 to Engine 20, Engine 15, Rescue 19, and Ambulance 13, respond to Bakersville Pond off Cemetery Island to assist in the rescue and extrication of two civilians and multiple rescue personnel through the ice.

Lessons Learned

Although this scenario is fictional, it has many similarities to incidents that have been caught on tape and aired through both local and national broadcast networks.

Based on the above incident, as well as analysis of other calls, we've identified 23 common errors associated with emergency response operations on and through the ice. (For the purpose of this article, "Go" rescuers, or those whose responsibility it is to make direct contact with the victim, will be referred to as primary and secondary rescuers).

01. Failure to provide adequate safety/tether lines

All rescue personnel functioning as primary and secondary rescuers should be tethered to shore with an appropriate safety/tether line. A 7/16" floating waterline is ideal for this purpose. For water-rescue operations, the safety/tether line is typically attached to the back of the rescue swimmer. However, for ice rescue operations, the safety/tether line should be attached to the front of the rescuer. If the safety/tether line is attached to the rescuer's back, when the line is retrieved back to shore, the rescuer may be injured when he is pulled back against the ice shelf. Therefore, the line should be attached to the front of the rescuer so he can protect himself from the ice shelf and assist in his extrication from the water onto the ice shelf. Sufficient lengths of line and appropriate storage bags, along with the appropriate hardware (i.e. locking carabiners), should also be available.

02. Failure to provide locking carabiners

Only locking carabiners should be used for rescue operations. If non-locking carabiners are used, the carabiner gate can be accidentally opened when pressure is placed on it by contact with the ice shelf, personnel, or equipment.

03. Failure to use an incident command system

An appropriate incident command system is absolutely necessary at all technical SAR operations. As part of the ICS, a safety officer should be appointed whose responsibility is to oversee all aspects of the operation

and ensure the safety of all rescue personnel engaged in the operation.

04. Failure to assess hazards and risks

No ice should ever be considered as 100% safe, regardless of its apparent thickness. If a victim has fallen through the ice, the strength and integrity of the ice should be suspect and it should be assumed that the ice has been compromised, regardless of its thickness. Assessments should also include the victim's physical and emotional condition, the closest point of safety, environmental conditions and equipment required, as well as the training and Personal Protective Equipment provided the rescue personnel.

05. Failure to provide head protection

All shore-based rescue personnel, as well as primary and secondary rescue personnel, should wear an appropriate helmet during the rescue operation in order to protect them if they slip or fall on the ice, or fall while using equipment. Vented helmets allow for drainage of water and prevent the helmet from acting as a sea anchor in moving water.

06. Failure to assess the victim's physical and emotional condition

Most victims who have fallen through the ice into frigid water are unable to assist in their own rescue due to cold exposure, hypothermia, injury, etc. Therefore, rescue personnel must treat the patient as a passive participant during the rescue operation.

07. Failure to protect the airway to prevent torso reflex

When people are suddenly immersed in cold water, they may experience a torso or gasp reflex as a result of the cold water hitting their chest and/or face. If water is aspirated into the airway, it may result in a temporary shutdown of the airway, referred to as a laryngospasm. This involuntary reflex prevents water from entering the lungs. However, as a result of the laryngospasm, the individual cannot cough or speak, and cannot get sufficient air and oxygen to support life. Due to hypoxia, the victim will deteriorate into respiratory and cardiac arrest. In order to prevent torso reflex, rescuers should immediately cover their mouths and noses when falling or entering the water, so when the gasp reflex occurs, their airways will be protected by a gloved hand. If rescue personnel have to enter the water, they should try to enter feet first, rather than head first.

08. Failure to develop and follow appropriate recommendations for donning ice rescue suits

Trying to don an ice rescue suit while standing can place the rescuer in a precarious position due to the slippery or wet conditions. Therefore, donning the suit should be done initially from a sitting position, then progress to a kneeling position once the rescuer has his feet and legs inside the suit. In addition, the zipper must be completely sealed, the hood up, and the neck and face flap secured appropriately. The integral chest harness must be hooked prior to attaching the safety/tether line.

09. Failure of line tenders to monitor the rescue operation

In addition to the primary rescuer, there should also be a designated primary line tender, whose job is to monitor the efforts and progress of the primary and secondary rescuers and to direct the line tenders. Oftentimes, when the primary rescuer signals the line tenders to retract and pull the safety/tether line, they pull the line as rapidly as possible, resulting in injury to the victim or rescue personnel and/or damage to

rescue equipment. At least one person should always be responsible for continuously monitoring the rescue effort and directing the line tenders if it is necessary to play out more line, pull in the line, expedite the recoil, etc. It is absolutely critical to not pull the victim and rescue personnel into the edge of the ice shelf until they have the opportunity to defend themselves from it.

10. Failure to establish hand signals

It is absolutely critical for the primary and secondary rescuers to communicate and coordinate their efforts with the line tenders. Since the rescue operation may be some distance from the shore-based line tenders, and because rescue personnel may have integrated face flaps on their ice rescue suits, oral communication may be physically impossible. Of primary importance would be understanding basic hand signals, to include the following signals to line tenders:

- * Go
- * Stop
- * Play out more line
- * Take up slack on the line

11. Failure to provide rescue suits, rather than immersion suits

Immersion suits are designed to provide extended hypothermia protection and buoyancy and are intended for survival rather than rescue. Typically, immersion suits do not provide foot protection and have Gumby-style feet, rather than the integrated rigid-sole boot found on rescue suits. In addition, rescue suits are designed with reinforced knee and elbow pads and have an integrated harness for attachment of the safety/tether line. Rescue suits should be regularly inspected for tears, leaks, etc. And, after use, they should be carefully cleaned and dried.

12. Failure to provide Personal Flotation Devices (PFDs), Anti-Exposure Suits, or Float-Coats for Line Tenders and Shore-Based Rescue Personnel

Anyone within 10' of the ice and everyone operating within the "hot zone" should be provided appropriate personal protective equipment (PPE), particularly a PFD, in order to provide buoyancy should a fall-through into the water occur. Anti-exposure coveralls or float coats are preferred, as they would provide not only buoyancy, but also extended hypothermia protection.

13. Failure to provide EMS intervention for both victim and rescue personnel

In addition to requesting sufficient EMS support to provide appropriate patient care for each victim, additional EMS resources are needed to assess and/or treat rescue personnel upon completion of the rescue operation. Upon termination of the rescue operations, each rescue provider should be treated as a victim until they can be assessed and cleared by EMS personnel at the scene or in the hospital.

14. Failure to provide foot traction for line tenders

Personnel serving as line tenders may need to use footwear to provide the traction necessary to secure and retract the safety/tether line. Strap-on footgear that can be quickly donned over winter boots, shoes, and/or fire boots should be considered.

15. Failure to provide ice picks/awls for rescue personnel

The use of ice picks/awls will assist rescuers in advancing across the ice toward the victim and these should be kept readily available at all times. Should the rescuer fall through the ice, ice picks/awls may be critical in his/her ability to self-extricate from the water and back onto the solid ice shelf.

16. Failure to assess physical and environmental conditions

If people or animals have fallen through the ice, it should be obvious that a compromised ice condition exists. While advancing across the ice, rescue personnel should distribute their weight and that of their rescue equipment as much as possible. Rescue personnel should advance across the ice on their bellies or on hands and knees, and should move slowly and carefully toward the victim.

17. Failure to develop SOPs prohibiting the use of ice rescue suits in moving-water conditions, and failure to provide appropriate swiftwater rescue personal protective equipment

Cold water and ice rescue suits are designed for use in static water and ice situations and should never be used in flood and swiftwater environments. When conducting a threat assessment within your community, if the danger of moving water or swiftwater exists, then drysuits with appropriate PFDs should be available for rescue personnel who are serving as rescue swimmers in the moving and cold water environment. A rescuer should never be tethered with a fixed safety/tether line. In a moving-water environment, he may have to remove himself from the safety/tether line to avoid entrapment.

18. Failure to conduct a threat assessment within the community

A comprehensive threat assessment should be conducted to determine the hazards and risks specific to any particular community. Operational standards, protocols, equipment and training of personnel should be based upon the results of this assessment.

19. Failure to develop standard operating procedures (SOPs) to guide/direct personnel when dealing with and responding to cold-water and ice rescue incidents

A comprehensive SOP manual should be developed with the expectation that rescue personnel will act within the scope of the written SOPs.

20. Failure to pre-plan operations and develop emergency response plans (ERPs)

Pre-plans should be developed as a result of the comprehensive community threat assessment and should take into account the hazards and risks that exist within the community.

21. Failure to develop SOPs and ERPs dealing with response to and rescue of domestic pets that have fallen through the ice

If the Authority Having Jurisdiction (AHJ) doesn't respond to assist domestic animals that have fallen through the ice or into cold water, then children and/or other family members will attempt to rescue their pets, thereby possibly resulting in a multiple-victim incident.

22. Failure to use rescue equipment that prevents direct person-to-person contact between rescuer and victim

Whenever possible, the rescuer should use some piece of equipment to secure the victim to and/or keep between the rescuer and the victim. Backboards, basket stretchers, rescue buoys, nylon webbing, etc., all make excellent extension devices for this purpose.

23. Failure to securely tether rescue equipment and rescue personnel

An in-line figure-eight, or comparable knot, should be tied into the safety/tether line and attached to the specific rescue equipment being used for the rescue operation. The bitter end of the same safety/tether line should then be attached to the rescuer. When the rescuer extends the rescue equipment to the victim or secures the victim to the equipment, as the line tenders place tension on the tether line, the victim will be brought to shore with the rescuer securely tethered as well. Should something go wrong with the rescue operation and the rescuer becomes separated from the equipment or the victim, the rescuer will still be effectively tethered to shore.

Summary

Providing training to First Responders in the principles and procedures of ice and cold water rescue operations will not only result in better preparation and response to emergency incidents, but will safeguard rescue personnel from the hazards and risks associated with this type of technical rescue operation.

The level of training required, as well as the type of rescue equipment needed, should be based on local community needs as determined through a comprehensive threat assessment and the development of SOPs and Emergency Response Plans.

NFPA 1670 provides guidelines to determine the levels of functional capability for conducting ice and cold water rescue operations safely and effectively, and is intended to assist the AHJ in assessing the technical rescue hazards within the jurisdictional response area; identifying the level of operational capability; and establishing operational criteria.

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