HAMILTON FIRE DEPARTMENT
NEILAN INVESTIGATION COMMITTEE
PRELIMINARY REPORT

May 30, 2007

The following report is a product of the Neilan Investigative Committee. The Committee was formed to ensure that all factors leading to the injuries of Firefighter Chris Gabbard and Firefighter/Paramedic John Hansbauer would be fully investigated and appropriate actions taken to lessen the chance of a similar occurrence. The data contained in this report has been compiled through interviews conducted in conjunction with the Ohio Department of Natural Resources, Division of Watercraft and the National Institute for Occupational Safety and Health (NIOSH) on May 8th and 9th, 2007, as well as investigative efforts of committee members. The contents of this report are the facts of the event as agreed upon by all members of the Committee. This report is the preliminary report and is only concerned with the events of and the factors contributing to the training accident at the Neilan Blvd Dam on April 17, 2007.

Various sub-committees within the investigation committee will generate a second, more comprehensive report. These sub-committees will be open to all Hamilton Fire Department members for their input and contribution. This comprehensive report will examine all standard operating procedures, training and experience levels of personnel, equipment and technology and many other factors that may be relevant to the injuries of Firefighter Chris Gabbard and Firefighter/Paramedic John Hansbauer. This report will also address the factors to prevent the death or injury to firefighters in the future. The investigation committee anticipates the comprehensive report may take a year to complete.

Respectfully Submitted,

The Neilan Investigative Committee

HAMILTON FIRE DEPARTMENT
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Committee Chair

Deputy Chief Steve Dawson	Fire Prevention Bureau

Committee Members

Deputy Chief Robbins	Training Bureau
Investigator Tom Angst	Fire Prevention Bureau
Lieutenant Mark Mercer	Fire Suppression
Lieutenant Ray Smith	Fire Suppression
Firefighter Matt Garland	Fire Suppression
Tim Werdmann	Law Department

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PRELIMINARY REPORT

ISSUED: May 30, 2007

SUBJECT: River Rescue Recertification Training Accident

BACKGROUND

1. Setting
   - Date
     - April 17, 2007
   - Time of Day
     - Approximately 1600 hrs
   - Weather conditions @ 15:53 (www.wunderground.com)
     - Air Temperature - 70º F
     - Wind speed - 3.5 MPH
     - Wind direction - Variable, prevailing winds for that day WNW (14:53) and NW (16:53)
   - River Conditions per USGS (http://waterdata.usgs.gov)
     - Water level - 9000 cubic feet per second (CFS)
     - Median daily statistic over 79 years - 3500 CFS
   - Attendees and Levels of Swiftwater Rescue Certification*
     - DC Pete Trauthwein (Awareness)
     - Captain Greg Brown (Instructor)
     - Lt Tracey Radford (Technician)
     - Lt John Faler (Technician)
     - FF Chris Gabbard (Technician)
     - FF John Hansbauer (Technician)
     - FF Dan Baumann (Technician)
     - PM Dan Bagley (Technician)
     - PM Tahied Oxley (Technician)
     - FF Joe Lorance (Technician)
     - FF Chuck Smith (Technician)
     - FF Joe Stamper (Technician)
     - FF Jason Cook (Technician)
     - FF Brandon Hudson (Technician)
     - Lt Dave Klinzing (Awareness)
     - FF Lori Hubbard (Awareness)

f. Responders to the scene.
   - FF Jeff Conn (Technician)
   - FF Bob Cepluch (Awareness)
   - FF Todd Schlenck (Awareness)
   - PM Tony Harris (Awareness)
   - PM Shawn Lair (Technician)
   - FF Rudy Grant (Awareness)
   - PM Bill Cox (Technician)
   - Chief Schutte (Awareness)
   - Deputy Chief Dawson (Awareness)

- Paramedic Coordinator Jennifer Mason (Awareness)

2. General Description of 2 Boat Tether
    a. See Attached SOG 2.27, Water Rescue
    b. See Attached detailed description of Two Boat Tether
    c. Reference Hamilton Fire Department Swiftwater Technician Course, 2004**

The Two Boat Tether is an operation where two boats are used to perform a rescue below a low-head dam. In this operation two boats are tethered by a length of rope. This technique provides back up for the primary boat working near the dam, should the primary boat need assistance or rescue. **

3. Events of the day prior to the accident
    a. Beginning of training session
        - Training began at 1315 hours.
    - First operations
        - The first operations included boat handling, setting up a static line* and moveable control point*. At the completion of these evolutions Deputy Chief Trauthwein returned to headquarters.
    - Following operations
        - After completing the above listed operations there were several evolutions of the two-boat tether by the first group of technicians. The second group of technicians ran through the drill once prior to the accident.

ACCIDENT NARRATIVE

During river rescue recertification training at the low level dam on Neilan Blvd. members were performing the two-boat tether for the sixth time. The primary rescuer tossed the ring buoy to a simulated victim and retrieved the buoy. At this time the primary boat crossed over the crest of the boil and into the backwash. The Incident Commander gave the signal to peel out on seeing the primary boat crossing the crest of the boil. The peel out was unsuccessful and in a matter of seconds the secondary boat crossed the boil into the backwash. Due to this fact, there was not enough time to swamp the boat. At this time Truck 10 called for a general alarm to assist in the rescue of the four members in the backwash.

RESCUE EFFORTS

At 1604 hours on April 17, 2007 while conducting River Rescue Recertification on the Great Miami River just below the low level dam, two HFD boats went into the backwash of the dam. The two firefighters in the primary boat maintained their position in their boat, while the two firefighters in the secondary boat were thrown into the water. Immediately upon notification of the firefighters in the water, Captain Brown called dispatch for a General Alarm to the dam noting that there were men in the water. At 1604, Car 15, Engine 4, and Medic 2 responded to the accident site. At 1605 Medic 3 responded to the dam. Car 15 and Medic 2 arrived on the scene at 1607.

Immediately after the boats went into the backwash, Lt Faler ran down to the remaining Avon boat and along with FF Stamper, readied it for a possible rescue effort. As this was happening, FF John Hansbauer was flushed out of the boil and was swimming downstream still wearing his PFD. FF Jason Cook waded out into the water and grabbed him while FF Lorance threw FF Jason Cook a rope, handed the other end to someone and then also waded out to help FF Jason Cook get FF Hansbauer over to the shore. Once on the shore, Medics began patient care and within a few minutes, transported FF Hansbauer to the Ft. Hamilton ER where he was admitted.

Lt Faler and FF Stamper proceeded to launch the remaining Avon boat and headed toward the dam. Captain Brown called for them to return to the shore and they returned. Captain Brown also assigned FF Hudson to be the spotter for FF Chris Gabbard in the backwash. Several members spotted FF Gabbard in the boil re-circulating for several minutes. After approximately four minutes his PFD and helmet came off and FF Gabbard continued to re-circulate for a few minutes until he was no longer seen.

At the same time, on the dam platform, a rope was thrown to the firefighters in the Primary Boat. The rope became entangled between the motor and transom of the boat. FF Bagley pulled himself, hand over hand on this rope, across the boil, dropped into the water and made his way to shore. FF Baumann followed FF Bagley in the same manner. Both firefighters from the primary boat then assisted with the care of FF Hansbauer.

The officers on scene decided to try and remove the primary boat using the rope that had become entangled. This was done to prepare for a tag line recovery. After several attempts to pull the boat out by hand the rope was attached to a Medic unit near the platform, and after re-positioning the rope the boat was pulled out of the backwash. (See notes, sec. C.)

Captain Brown talked with FF Lorance about assembling a team to conduct a Tag Line recovery. FF Lorance stated that he felt he could accomplish this task. FF Conn and FF Schlenk were also assigned to help. After getting the boat ready for a Tag Line recovery, both FF Conn and FF Lorance decided to have further discussion with Captain Brown about the recovery attempt.

At approximately 1629 the primary boat was pulled out of the backwash. As the boat was pulled to shore FF Gabbard was found to be entangled in the ropes attached to the back of the Avon, the primary boat. Multiple firefighters ran to the primary boat positioned on the shore to help. Lt Faler and FF Conn immediately started mouth-to-mouth resuscitation. Lt. Radford cut FF Gabbard from the rope. He was placed onto a backboard and carried to the medic unit where life saving efforts continued. He was transported to Ft. Hamilton Hospital. According to a review of the transcripts taken from the dispatch center Firefighter Gabbard was in the water for twenty-five minutes.

CONTRIBUTING FACTORS:

- Primary factors:
  - The primary boat was operating too close to the boil.
  - The distance between the primary and secondary boats was inadequate.

- Secondary factors:
  - There was an inconsistency with the identification of the boil line.
  - The IC was moved closer to the boil line than he was on the previous evolution.
  - Previous evolutions of that day and past practices have established an improper tether length.
  - The SBR* was pulling on the tether rope.

- General safety observations:
  - Training Outline for the Day
  - Safety Officer
  - Back-Up Positions
  - Communication Equipment
  - Personal Floatation Device

The primary boat was operating too close to the boil.

The position taught in river rescue training for the primary boat to make the rescue throw is for the nose of the boat to be at or below the "boil line*". In this position the inward draw of the boil toward the dam would not have an effect on the boat. Factors that can affect boat position near the boil line include the force of the backwash when the ring buoy is retrieved, a strong wind from the stern of the boat, improper initial positioning of the primary boat, and a decreased efficiency of the motor due to aerated water in the outwash. In this instance one or more of these factors may have affected the boat position near the boil. Thus the boat was drawn across the boil to be trapped in the backwash of the dam.

Several members during training that day commented to each other that they felt they were training too close to the boil during evolutions prior to the accident. Although this is a valid concern, perception of the boil line while on the water in a boat is not always accurate. These concerns were not discussed with the instructor. The boil line is more accurately determined by the IC from the observation deck.

It should be noted that since the inception of our river rescue training, we have operated in this fashion, putting the nose of the primary boat on the boil line. In the past there have been at least three other known occasions where the primary boat has crossed the boil going into the backwash. On these occasions the river was at a lower level and each time the boats were successfully pulled out of the boil without injury.

The distance between the primary and secondary boats was inadequate.

The tethered rope distance or separation between the primary boat and the secondary boat, as illustrated in the training manuals, is 100 to 150 feet. Reasons for the 100 to 150' distance are as follows:

- This distance allows a margin of safety.
- The distance allows room for the secondary boat to fully complete a turn downriver on the peel out to pull the primary boat to safety.
- This amount of rope in the water adds drag on the primary boat*.

Those participating in training that day differed on their estimations of the distance between the two boats on evolutions prior to the accident. Estimations ranged from 20 to 100 feet, with most stating 75 feet or less. On an earlier peel out attempt the secondary boat was close enough to the primary boat, that the primary boat was splashed by the wake of the secondary boat. Those in a position to observe the distance during the evolution of the accident estimate 75 to 100 feet of separation. Due to the varied estimations, it can be concluded that individual perception of distance is not completely objective. There was one measured distance for an evolution prior to the accident. This was set from a reference point on shore that was measured several days after the incident. The distance measured was no more than 50 feet.

Based on the above, it is concluded that the separation distance between boats at the time of the accident was no more than 100 feet and is suspected of being less than 75 feet.

On the accident evolution, the secondary boat attempted to peel out but was unable to turn down river. The boat did not have enough room or distance to complete a full turn to go downstream. Unable to turn, the boat swung parallel to the boil and then by pendulum action of the shortened tether rope slid into the boil, which caused the motor to cavitate. Losing the ability to maneuver, the secondary boat was drawn into the backwash of the dam. The fact that the secondary boat went into the boil is an indicator that the distance between it and the primary boat, and thus the boil, was too short.

It should be noted that in prior training when river levels are especially low that a separation of over 100 feet is difficult to attain. This is due to the water obstacles of gravel bars and other river debris. In relation, during low water the size and inward force of the backwash is not as strong. However on the day of the accident, the river conditions and water level would have allowed for 100-150 foot of separation.

There was an inconsistency with the identification of the boil line.

During the interviews with NIOSH, several members present at the incident were asked to identify the boil. They were given a marker; shown a picture of the training site including the dam, the backwash, the boil, and the outwash; and were to indicate the boil on the picture. The boil was identified differently by those asked to identify it. In all cases, it was identified as a line. The area indicated varied from the downstream side of the boil to a line within the crest of the boil.

The IC was moved closer to the boil line than he was on the previous evolution.

Both the IC and the officer assigned to observe stated to NIOSH and the ODNR that the IC was moved closer to the boil line after the first evolution involving the personnel involved in the incident. This was done without the knowledge of the instructor who was critiquing the previous evolution. This was the second evolution for that group and the one during which the accident occurred. This positioning is consistent with some training from the past.

Previous evolutions of that day and past practices have established an improper tether length.

All statements given to NIOSH and the ODNR cite a distance between the boats that day as less than 100' to 150' as stated in the training manual. Distances of 20' to 100' were the extremes of what was reported for that day. The reasons stated for the rope length varied. It was stated that the river bottom topography required a shorter rope. It was mentioned that the length of rope between boats was standard for what has been done in the past years. Based on statements, shortening of the distance between boats has become a routine practice over the past few years without taking into consideration changing river levels.

The SBR* was pulling on the tether rope.

During the interviews with NIOSH and in the written statements given to the ODNR, several members noted that the SBR was pulling on the tether line. It is unclear whether this was an attempt to pull slack line out of the water or to pull the primary boat out of the backwash. This would serve to shorten the length of the tether between the two boats. Since it has been established that the tether line was already shorter than 100' as recommended in the training manual, this action aggravated the situation.

Training Outline for the Day

At the beginning of each training operation a review of the scenario, safety, and the duties of each position should take place. This refreshes the ideas and goals of the operations to the participants, which may prompt questions about the operation before it begins. A review of the type of communication and signals, if any, should be reviewed during this time also. These reviews should take place with everyone that is to participate in the training as a group.

Safety Officer

There was not a Safety Officer assigned to oversee the training as outlined in the SOG 2.27 Water Rescue. The Safety Officer section of SOG 2.27 reads as follows:

Safety Officer: At technical rescue training exercises and in actual operations, the incident commander will assign a safety officer with the specific knowledge and responsibility for the identification, the evaluation, and, when possible, the correction of hazardous conditions and unsafe practices. This assignment will meet the requirements in Chapter 4 of NFPA 1521, Standard for Fire Department Safety Officer. The safety officer shall be readily identifiable.

Failure to consistently assign a properly trained Safety Officer is identified as a department wide issue in technical rescue training and operations.

Back-Up Positions

Back-up positions were not assigned. There are a specific number of people that are assigned to specific positions required to accomplish a rescue/training. All positions must be assigned before the training/rescue begins, including either shore based or boat based back-up rescue. While SOG 2.27 does not specify that, if available, the third boat be manned and in the water, the boat should be ready to be deployed if needed. This would include that the boat have a motor mounted on it, have been started and warmed up, and have all of the necessary equipment in it. Should a motor not be available, oars or paddles are an acceptable means of power. This would only benefit those involved in the operations at the river if something were to happen to require a back-up rescue.

Communication Equipment

The use of portable radios was not consistent during training. Statements revealed that some members had radios with them, but were relying on hand signals. Traditionally hand signals have been acceptable as the primary means of communication during this exercise. Whether it is training or an actual rescue, the use of radios along with hand signals can only enhance the communication and safety of the exercise. Radio holders are provided for ease of operation. In all instances, the IC and the Safety Officer must have radios.

Personal Floatation Device

During training or a rescue, SOG 2.27 states, "Any member within ten feet of the water's edge will wear a PFD." This was not followed during training that day. Based on the statements and pictures, several members in positions that required a PFD were not wearing them. After the boats went into the backwash, all members were suddenly operating in rescue mode. Some members engaged in rescue operations were not wearing PFDs. While this is not desirable, is it understandable, based on the circumstances.

Statements were made that there were not enough PFDs on site for everyone to be wearing one. While there may not be enough PFDs carried on the river rescue unit, every Engine and Ladder truck carries a minimum of three PFDs. Members without PFDs should have secured one from an engine or ladder truck.

Equipment

Boats- 2 Avon inflatable boats were available. The red Avon on the trailer at the time of the accident had a slow leak, which is not unusual for this type of boat, and would not render the boat unsafe**.** The gray Avon in use had no reported problems. The Jon boat in use had no reported problems that day. The Jon boat was destroyed and lost when the accident occurred.

Helmets- No helmets were recovered but all statements indicate they were in use and properly worn at the time of the accident.

Motors-A 25hp Honda was used on the Jon boat. A 20hp Johnson was used on the Avon. It was reported by several members that it was difficult to determine if the 20hp motor was in neutral. Examination of the motor by NIOSH investigators and HFD committee members found the motor does go into forward gear and back to neutral gear, but does so without a distinctive click. The motor during this evolution must be in forward to approach the boil. There were reports of these motors being difficult to start and stalling earlier in the day. There were no reports of motor difficulties during the accident evolution. The 25hp Honda was lost when the accident occurred. The 20hp Johnson was serviced immediately following the accident to prevent water damage.

PFD- The PFD worn by the SBR was recovered from the backwash approximately two hours after the accident. The zipper was partially unzipped. The waist buckle was fastened and the quick release buckle for the rescue strap was opened. It also contained several fishing hooks. This was explained by Bob Cepluch who stated that a fisherman hooked the PFD several times but his line kept breaking, in an attempt to retrieve it for HFD personnel on the scene. Several members had reported the SBR was properly wearing the PFD at the time of the accident.

Props- No reports of any problems with the props on the motors at the time of the accident**.** It should be noted that the props were changed on both Johnson 20hp motors prior to the training session. No one expressed any concern about the condition of the props used that day. The prop on the 25hp Honda used on the secondary boat was not changed.

Radios- Two radios were lost when the accident occurred. Although some members had radios in their possession, radios were not being used at the time of the accident.

Tether Line- The recovered line was measured and found to have a total length of 197 feet, sufficient line to perform the two-boat tether as prescribed by the training manual.

Throw Bags- The throw bag rope attached to the ring buoy was 80 feet in length. Two other throw bags found in the entanglement measured 64 feet and 58 feet.

IMMEDIATE INTERVENTIONS

This list of interventions will be implemented as soon as possible.

- Retraining of the whole Department on Swiftwater rescue techniques prior to training on the water. This training will include proper and consistent identification of the boil line and site-specific operations at the Neilan Dam.

- During two boat tether operations the primary boat will maintain a distance of one boat length from the downstream side of the boil line.

- During two boat tether operations the tether distance between the boats will be no less than 100' and preferably 150'. Distances less than this will have to be approved by both the Safety Officer and the Shift Commander.

- SOG #2.27 review by all members.

FURTHER CONSIDERATIONS

This list of recommendations to be evaluated is not all-inclusive and will expand as the Comprehensive Report and Investigation is completed.

- **Members' input:** As the comprehensive report is generated members will be given an opportunity to provide input through several means, either as a member of a sub-committee or by other means of communication.

- **Standardization and oversight of rescue training:** The Training Department should develop and implement a plan to standardize technical rescue training as well as other hazardous training throughout the Department. The Training Department should also develop a program to provide enhanced oversight and supervision of technical rescue training.

- **Technical rescue committee:** Consideration will be given to the formation of a technical rescue committee. The duties of this committee would be to evaluate all aspects of the Hamilton Fire Department's technical rescue program and make recommendations concerning equipment, techniques, training, and responses.

- **Injury/accident review committee:** Consideration will also be given to the formation of an injury/accident review committee. The duties of this committee would be to evaluate accidents involving members while on duty who suffer injuries. An investigative procedure would be developed and used as a guideline for these investigations.

- **Instructor development program:** Consideration will also be given to instituting an instructor development program beginning at the company level. This would aid in making sure everyone received the same information and help to maintain consistency across the three shifts. This would include internal and external educational opportunities. This program would also include an evaluation process to ensure quality.

- **Safety Officer Training:** The Training Department should conduct Safety Officer Training that complies with the NFPA 1521 standard.

- **PFD availability:** A minimum of four PFDs should be placed on all fire companies. Five PFDs should be carried on Truck 10. Car 15 should carry two PFDs. Medic units should carry three PFDs. There should also be a limited number of PFDs in the river rescue cache. A more restrictive policy for their use while training should be developed.

- **Risk Management:** A risk management plan should be developed for training.

- **Equipment records:** A program for improved record keeping for inspection and maintenance of boats and motors should be developed.

TWO-BOAT TETHER DISCUSSION

The Hamilton Fire Department's river rescue program was started due to an incident occurring in the late 1980s. At that time the department did not have any river rescue mechanisms to deal with the then new low-head dam on Neilan Boulevard. The incident involved a man on a raft trapped in the backwash under the dam. The make shift rescue utilized a news helicopter with unrestrained rescuers holding a rope by hand. The rescue was extremely unsafe for all those involved. A more suitable and safer method had to be found.

The two-boat tether technique was first introduced to The Hamilton Fire Department in 1989 during a river rescue course taught by the O.D.N.R.*, Division of Watercraft. It has been estimated since that time we have executed the technique during training exercises approximately 1000 times. We have successfully used the technique on at least two occasions to successfully extricate jet skis from the backwash of the dam. Out of an approximate 1000 times of completing the two-boat tether there have been four reports of the primary boat entering the backwash, the fourth being the accident on April 17, 2007. The river level on the day of the accident was 9000cfs*. River levels were unknown on the other three occasions however the primary boat was successfully pulled out of the backwash when the secondary boat performed a peel-out. One of these occasions was captured on 35mm film through a series of five photographs. Based on those pictures, the backwash was approximately 10 feet wide. There was some difficulty pulling the primary boat from the backwash due to an improper peel-out. Once the SBO corrected his position the primary boat was pulled through the boil.

There are some situations that merit the two-boat tether type of rescue. A viable victim trapped in the backwash perhaps on a floatation device is one. If the victim was close enough to the platform on either side of the river, a throw bag rescue could be attempted. The tag line method could possibly be attempted, but has it's own inherent limitations and is designed for bodies of water less than 350' wide. Simply put, in this type of situation, the best way to attempt a rescue is a two-boat tether. A body recovery would require a different course of action.

The two-boat tether rescue has several safety factors built in, such as the primary boat being inflatable, and the secondary boat being attached to the primary boat. The primary boat must be inflatable because it approaches the most dangerous part of a low head dam, the hydraulic. If the primary boat enters the backwash area of the hydraulic, it will remain afloat, because it is inflatable. Even if the boat has some water in it, it will stay buoyant. This was proven on April 17, 2007.

On June 12, 2007 the Neilan Investigation Committee participated in a tele-conference with members of the ODNR, Division of Watercraft. The critical points of discussion centered on the two-boat tether. The two-boat tether is still recognized and used by multiple state and international agencies as a rescue option. The two-boat tether is also taught by the Ohio Fire Academy in their swiftwater classes. The ODNR is not aware of any alternative rescue options to replace the two-boat tether. In discussing the two-boat tether with them, they emphasized an increased tether length directly improved the ability of the secondary boat to pull the primary boat using a peel-out.

In addition to discussions with the ODNR we also reviewed all the resource material referenced in the student manual that is distributed to each person who attends The Hamilton Fire Department Swiftwater Class. Several of these books and two of the videos referenced the two-boat tether and or the tethered boat technique as a valid rescue technique that can be used at a low head dam rescue. These references and others are as follows:

Videos

Swept Away, A guide to Water Rescue
- Produced by Alan Madison Productions

The Drowning Machine
- Produced by Hornbein Productions

Books

Swiftwater Rescue
- By Slim Ray
- Pages 163, 164, 165, 166

River Rescue
- By ODNR, Division of Watercraft
- Page III 8, III 9

River Rescue
- By Les Bechdel & Slim Ray ©1989
- Page 96

Whitewater Rescue Manual (1995)
- By Charles Walbridge & Wayne Sundmacher Sr.
- Page 169

Swiftwater Rescue Technician
- Ohio Fire Academy
  - Student Guide
  - Course # 1885 3/06
  - Pages 75, 76

Based on current information available and communications by the committee with ODNR, the two-boat tether remains a viable rescue technique. Of course, it remains incumbent for the department to continue to analyze river rescue techniques, make improvements as needed, and seek out other options that become available. As with any rescue, if a member feels that something is not safe or that an accident is about to occur, they should bring it to the attention of the IC and or stop the rescue.

RECOGNITION OF EFFORTS

Following the accident in which four firefighters entered the backwash of the dam, there were many actions that led to their successful rescues. As a group those who were involved in the training and those who responded to the scene are to be commended. Their combined efforts saved the lives of four firefighters, specifically resuscitating one who was unresponsive. There were several noteworthy efforts:

Captain Greg Brown
- Immediately called for a general alarm.
- Remained calm, established command and control.
- Developed a rescue plan.
- Ordered second Avon back to shore, possibly averting another accident.

Firefighter John Hansbauer
- Relied on his training to make every effort to self-rescue.

Firefighter Jason Cook
- At great risk of bodily harm, waded into the river without his PFD, to rescue John Hansbauer.

Firefighter Joe Lorance
- Threw a rope to Jason Cook and waded into the river without his PFD and assisted in rescuing John Hansbauer from the river.

Firefighter Jeff Conn
- Recognized the hazard of operating on the river without a backup.
- Performed mouth to mouth resuscitation on Chris Gabbard.

Lieutenant John Faler
- Assisted in removing Chris Gabbard from the river.
- Performed mouth to mouth resuscitation on Chris Gabbard.

Firefighter Dan Baumann
- Remained calm and relied on his training to assist in his own rescue.
- Upon being rescued from the Avon, immediately started helping in the treatment of John Hansbauer.

Firefighter Dan Bagley
- Remained calm and relied on his training to assist in his own rescue.
- Upon being rescued from the Avon, immediately started helping in the treatment of John Hansbauer.

GLOSSARY

- Avon: See "inflatable boat."
- Boil Line: The boil is that position where the water from below surfaces and moves either downstream or back toward the dam. A person who is caught in a low head dam struggles to the surface, where the backwash once again carries him to the face of the dam, thus continuing the cycle.
- CFS: Cubic feet per second. A standard measurement for describing river flows.
- Deputy Chief: There are six Deputy Chiefs in the City of Hamilton. One is in charge of the Fire Prevention Bureau, one in charge of Operations, one in charge of Training. Three of the Deputy Chiefs are shift commanders.
- IC, Incident Commander: The individual who commands the scene.
- Inflatable Boat: A boat made of fabric formed into several air bladders. When inflated the boat is extremely buoyant.
- Jon Boat: An aluminum boat with a flat bottom, a square bow and a transom on which a motor can be mounted. The boat has three seats, which contain foam for floatation.
- Levels of Certification: There are three levels of certification as stated by the National Fire Protection Association. They are "Awareness, Operations, and Technician."
- Low Head Dam: A perfectly engineered, self operated "drowning machine" which is usually less than ten feet high. It is dangerous because of the uniform flow of water, which creates a keeper hydraulic. Everything caught in this hydraulic gets re-circulated with little chance of escape.
- Moveable Control Point (MPC): A rope system which consists of a static line, a raising/lowering line, and two directional lines. A boat is attached to the system and is moved into position by personnel tending the lines on shore.
- NFPA: National Fire Protection Association.
- O.D.N.R.: Ohio Department of Natural Resources.
- PB: Primary Boat
- PBO: Primary Boat Operator
- SB: Secondary Boat
- SBR: Secondary Boat Rescuer
- Sea Anchor: Created by swamping the secondary boat. This effectively causes an increase in the drag on the primary boat in order to pull it out of the boil.
- Static Line: A fixed line or rope that is attached at both ends, which becomes part of a movable control point. (see "Moveable Control Point (MPC)")
- Tag Line: A rescue technique that may be either a shore based or a boat assisted rescue. A tag line rescue at the dam on Neilan Blvd would be a boat-assisted technique. A rope with a floatation device attached at the middle is extended across the river, from side to side. A crew moves the floatation device to the victim on one side of the river pulling the rope while a crew on the other side of the river lets out slack. Once the victim has the floatation device they can be pulled out of the water.

Appendices

A: SOG 2.27 WATER RESCUE
09/2006

2.27.1 Purpose:

To outline guidelines for operations at a swift water and/or open water rescue incident.

2.27.2 Policy:

During a water type rescue, the safety of the rescuers is our primary concern. All firefighters on the scene will continually evaluate conditions and take corrective action if safety is compromised. All on scene members will wear appropriate PPE as directed by this SOG and by the Incident Commander and/or Safety Officer.

2.27.3 Definitions:

a **Avon.** Inflatable rescue boat.

b **Back-up Rescue.** A person who backs up the primary rescuers either on shore with a throw bag or in another boat.

c **Boat Operator.** Person who operates the boat.

d **Commander.** The person who commands the rescue scene.

e **Hard Boat or Jon Boat.** Aluminum rescue boat.

f **Open Water.** A body of water such as a pond or lake.

g **PFD.** Personal floatation device. Life jacket.

h **PPE.** Personal protective equipment.

i **Primary Boat.** Lead boat or boat used in actual rescue.

j **Primary Rescuer(s).** Person who is assigned to rescue a victim. Person(s) who will make primary physical contact with the victim(s). All other members support this person.

k **Rescue PFD.** Personal floatation device designed to tether a rescuer. Attachment point is equipped with a quick release buckle.

l **Rescue Sequence:** Logical rescue order beginning with least dangerous to most dangerous to the rescuers. The "Rescue Sequence" is:

1. Self rescue
2. Reach
3. Throw
4. Row
5. Go
6. Helicopter

m **Risk/Benefit Analysis:** A decision made by a responder based on a hazard and situation assessment that weighs the risks likely to be taken against the benefits to be gained for taking those risks.

n **Safety Officer:** At technical rescue training exercises and in actual operations, the incident commander will assign a safety officer with the specific knowledge and responsibility for the identification, the evaluation, and, when possible, the correction of hazardous conditions and unsafe practices. This assignment will meet the requirements in Chapter 4 of **NFPA 1521**, *Standard for Fire Department Safety Officer.* The safety officer shall be readily identifiable.

o **Secondary Boat or Back-up Boat.** Boat which is used to back up the primary boat.

p **Swift water.** Water moving at a rate greater than one knot [1.85 km/hr (1.15mph)].

q **Tag Line.** Rope set up with a floatation device in the middle and designed to move back and forth on the surface of the water to assist a victim.

r **Throw Bag**. Rope bag containing 50 to 75 feet of rope which is designed to throw.

s **Two Boat Tether.** A system where two boats are tethered to each other to effect a low head dam rescue.

2.27.4 Response:

Response to a water rescue emergency will be three engine companies (one of them bringing the water rescue equipment), Truck 10, Car 15, and one paramedic unit. The water rescue equipment will be brought to the scene by Engine 2 or Truck 10 personnel. If this is not possible, the Shift Commander will assign another company to bring the unit to the scene. If, after arrival on the scene, it is discovered that there is an actual entrapment of more than one victim, the Incident Commander will request one additional medic unit for each known victim. The Training Chief or his designee will also respond to the scene for the purpose of providing technical assistance and for evaluation rescue procedures for future training.

Based on dispatch information if deploy equipment is unclear, then units should stage at the intersection of the Columbia Bridge and Neilan Blvd. (or Columbia Bridge and Hamilton Cleves Rd. before committing in either direction. After investigating, the incident commander can advise of the best deployment location.

2.27.4 Responsibility:

a First in unit.

- Establish and keep contact with the victim(s).
- Initiate incident command.
- Assess water conditions.
- If possible determine rescue or recovery.
- Assign locations for additional companies who are responding.
- Turn over command to shift commander or his/her designee upon their arrival.

b. River rescue unit.

- If this unit is first to arrive and they have made victim contact they will assign the next company in to take the boats where necessary until shift commander arrives.
- Position boats for launching at a point which will give the quickest and safest access to the victim(s).
- Wait for IC to give launch command.
- If a “GO” swimming rescue is chosen to be carried out, don proper PFD and assign a back-up rescuer with a throw bag.

c. Command.

- Assign a Safety Officer whenever boats are placed on the water.
- Assign rescue positions. One company should be assigned to assist the river rescue unit in getting a boat in the water.
- Assign personnel for back-up.

d. Medic Unit.

- Move necessary medical equipment in position to expedite patient treatment.

e. Boat operators.

- Operate boats in a manner consistent with individual's training. Ensure that before launching, have the necessary equipment (motor, gas, oars, paddles, extra throw bags, first aid kit, extra PFD's etc.) to operate the boat.

f. Rescuers (Primary and Secondary).

- Ensure you have the proper equipment (ropes, floatation, carabineers, etc,) in order to affect the job you are assigned to do.

g. Back Up.

- May be used for anything extra that needs done. May be used for gathering equipment or as a back up rescue person. Back up may be assigned to a company.

2.27.5 Safety Considerations:

The following safety rules will be adhered to during water rescues or water rescue training covered in this SOG. These rules apply to all members who respond to such emergencies.

a. Any member within ten feet of the water's edge will wear a PFD. PFDs are to be worn on the outside of street clothes. An exception to wearing a PFD would be if a member is wearing an exposure suit (cold water floatation suit) during an ice rescue situation.

b. If handling equipment or involved in the actual rescue, a whitewater or a climbing helmet will be worn when available. Fire helmets are not to be worn.

c. Bunker gear should not be worn around the water. An exception to this is the wearing of the bunker coat during cold weather. PFD is to be worn on the outside of any coat.

d. Anytime a rescuer is on the water, a back-up rescuer must be in place. A back-up rescuer can be on the bank with a throw bag or in the secondary boat. Each situation will dictate the method used for back-up rescue.

e. During a flood situation, two boats will be sent out together. They are to remain in contact with each other at all times. Radio contact will be kept with command. Extra PFDs (for victim safety), extra prop kit and wrench, first aid kit, ropes and some rescue equipment will be placed in the boats before launching in a flood situation.

f. No one is to attach themselves to a rope with the exception of attaching the rope to a "**Rescue PFD"** in the proper manner.

g. Use the following "Rescue Sequence" to determine type of rescue to be performed.

1. Self rescue. Talk victim into self rescue.
2. Reach. Use tools, sticks, ladders, etc. to reach victim.
3. Throw. Use throw bag to reach victim.
4. Row. Place boats on the water to accomplish rescue.
5. Go. Strong swimmer rescue.
6. Helicopter. Use of a helicopter for rescue. Special training is required.

NOTE: Proper PPE including wet suits, dry suits, gloves, shoes, etc will be worn in addition to PFDs and helmets.

B: Two Boat Tether Description.

The Two Boat Tether is a boat-based rescue. Boat-based rescues are fourth in the rescue sequence, which prioritizes considering the use of the least dangerous rescue option to the rescuer before using a more dangerous option. The sequence is Self Rescue, Shore Based Rescue, Boat Assisted Rescue, Boat Based Rescue, Go Swimming Rescue, and finally Helicopter Rescue.

The operation includes seven persons, typically, that are assigned to various positions, including a commander, primary and secondary boat operators, primary and secondary rescuers, primary and secondary back-ups. Their specific duties are:

1. Incident commander…Direct the operations and positioning of the boats
2. Primary back-up…Make initial contact with the victim and assess the possibility of less dangerous rescues, evaluate the victim as much as possible. After the commander is in place to direct the operation, this rescuer would be downstream on the command side.
3. Secondary back-up…Works on the opposite side of the river stream, etc. to rescue any floating victims that become free from the hazard.
4. Primary boat operator…check the gear in his boat, prepare motor, operate the motor to position the boat under the direction of the commander. This boat will approach the dam.
5. Primary rescuer…Operates within the primary boat and attempts to rescue the victim by throwing flotation device and retrieving the device and victim.
6. Secondary Boat operator… check the gear in his boat, prepare motor, operate the motor to position the boat under the direction of the commander. This boat is the safety for the primary boat.
7. Secondary rescuer…Operates within the secondary boat and handles the tether line between the 2 boats. He maintains the line so that there is not a lot of slack in the water.

In this operation, two boats are used. One is an inflatable, for the Hamilton Fire Department it is an Avon, which is the primary boat. This boat approaches the boil to attempt to rescue a trapped victim. The other boat is a Jon boat.* This secondary boat provides a safety for the primary boat. This safety is accomplished by tethering the two boats together. A rope is attached to the stern of the primary boat and passed through a carabineer either on the bow or attached to the middle of the secondary boat. After the rescue is performed, the primary boat will drift downstream, away from the boil, under the power of the current. If the primary boat is unable to extricate itself from the area of the dam, the secondary boat pulls the primary boat to an area downstream of the hazards created by the dam. This is accomplished by use of the tether line attached as described above. The desired distance between the boats is 100 feet to 150 feet. This distance is sometimes not possible due to obstructions in the river, especially a shallow water condition. The first method of pulling the primary boat from the backwash is, on the signal of the commander, to do a peel out, meaning turn the secondary boat to a downstream orientation, at least 45 degrees away from the dam (more if possible), and use the motor to pull the primary boat across the boil. If this fails the next step is to swamp the boat. This is done by securing the tether line to the boat by tying a knot that will not pass through the carabineer or otherwise securing it around a seat, etc, and then both the operator and rescuer would put their weight on the upstream gunwale (side) of the boat to allow water in over the side. This creates a sea anchor* and the drag will pull the primary boat from the hazards of the dam.

C: Notes.

During the rescue operation there was great difficulty in pulling the primary boat out of the backwash from shore. This may be attributed to one or more of the following factors:

- The weight of the boat and motor.
- The added weight of the water that filled the boat.
- The angle of the pull on the rope. Members attempted to pull the boat up and out from the platform.
- The friction loss on the rope caused by pulling it up and having it come in contact with the edge of the platform.
- The pressure caused by the backwash itself.
- The potential that the tether rope, which was still attached to the stern of the boat, was caught on debris or the structure of the dam itself.