Looking Back:

High Rise Rescue in Hickory, N.C.

With the construction of high-rise buildings, parking decks; above ground water tanks, bridges and multiple radio; power line, and cell phone towers, high-rise or elevated rescues are becoming more prevalent in today's society. The skills necessary for a positive outcome in these types of situations must be kept up-to-date, and an incident in Hickory shows how this training can expedite high-rise rescues.

INCIDENT DESCRIPTION

On Sept. 2, 2004 at around 12:38, the Catawba County Communications Center received a call of a man hanging off the side of the First Plaza building in Hickory. Upon arrival, the responders assessed the scene and found a worker suspended between the sixth and seventh floors on the west side of the building. In addition to the already responding unit — Hickory Fire C-7 and acting Battalion Chief Gary Stevenson; E-2, L-1, EMS Crew, EMS 301, Hickory Rescue Squad, and Engine 7 — additional units were called to the scene comprised of Hickory Fire S-11 and Captain Stephen "Tank" Townsend, C-5 and Battalion Chief Rick Davis, E-2, Catawba EMS crew 6, EMS 300 and EMS Manager Brian Blanton and the Catawba County Fire Marshal's Office Unit 2 and Mark Earle.

The structure, a local high-rise, was unique in its configuration made up of seven stories with 14 to 15-foot spacing between floors. The exterior of the building has windows recessed approximately four feet in from the exterior of the main supports of the exterior wall, which allowed for a four-foot ledge between every floor. This configuration was one of the main factors that led to the incident. A company was contracted to wash the windows of the building. Because of this type of construction the window washer had to use a hanging chair type system with a four-foot lanyard attached to the hanging chair. This would allow the worker to exit the chair and walk on the ledge to clean the windows while still being safetied off to the rope system. The worker could then walk back to the hanging chair and lower himself to the next floor. The incident happened when the worker walked back to the chair and missed the seat and fell several feet below the chair, was suspended by his harness and was unable to climb back up to the chair. The worker was suspended for about an hour before passerby's recognized the worker was in trouble and needed help. This time delay allowed the workers legs to become numb because of his weight hanging in the harness and cutting off the circulation to his legs.

THE OPERATION

EMS 301(Sigmon) assumed command and utilized the unified command structure with the assistance of C-7(Stevenson). A further assessment of the area showed that the configuration of the parking lot and the grounds surrounding the building did not allow for any type of aerial apparatus to be positioned close enough to perform an aerial rescue. After a short conference it was decided that a high angle rescue was the only option.

S-11 (Townsend) assumed command of the rescue group on the roof. Ladder 1 Crew and an EMS Crew were sent to the 6th floor (Division 6). E-7 Crew supported the command staff, securing the scene and the ground personnel for transporting equipment to the roof. E-2 and Hickory Rescue personnel were in support of the roof operations. C-5 (Davis) was assigned PIO.

On the roof the air handling units were used as the anchor points. A problem was that the units were all near the center of the roof. Because of this and the added height of the building, it would have taken between 250 – 300 feet of rope to reach all the way to the ground. The decision was made to lower the victim to the 6th floor, remove the window and pull both the victim and the rescuer in through the window. The windows were permanently mounted so the maintenance personnel were very helpful in the proper procedure to remove the window without damaging it. On the roof, anchor points were established on the bottoms of the air-handling units by the use of multi-wrap anchors. There were basically three anchor points established. Because of limited access to the roof area and the limited number of rescuers on the roof, the decision was made for the rescuer (Townsend) to rappel down to just above the victim, capture him with a pick-off strap to his existing harness, secure a ladder belt around the victim and attach a lowering line to him. One anchor was used for the lowering system, which consisted of a brake bar rack with a radium load release hitch and prussic back up. The other anchors were used for the rappel lines.

Victim contact was made as soon as the crew of Ladder 1 removed the window on the sixth floor. This allowed for verbal communication with the victim, whose only complaint was numbness in his legs.

Townsend rappelled over the side on dual lines to a point just above the victim where he was secured with a pick-off strap, a ladder belt attached and secured to a lowering line and his existing rope and harness could be lowered at the same time. At this point the lowering line was used to haul the victim up 1 – 2 feet just to release the tension on his original system and then the lowering system was used to lower the victim down 8 – 10 feet. This put the victim even with the window on the sixth floor that had already been removed. The crew of Ladder 1 then used a pike pole to pull the victim into the window. The personnel operating the pike pole were secured to a safety line as well. Once the victim was inside the room, EMS immediately began to assess the patient and start treatment. Townsend then rappelled down to the sixth floor and was pulled into the window as

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Hickory Fire Department personnel discuss rescue efforts.

Inspection Tips

Determining Water Requirements

Q: How do you figure out the usable gallons of water needed to be considered in determining the water requirement at the fire site during the operation?

A: To receive credit in the grading process when using a water-shuttle (tanker) operation, a fire department must be able to provide a minimum water flow, at the fire site, of 250 gallons per minute (GPM) for a minimum time duration of two hours. For example, a minimum a department would need 30,000 gallons of usable capacity (250 GPM X 120 minutes = 30,000 gallons).

When providing water for fire suppression efforts utilizing a water-shuttle (tanker) operation there are several considerations that must be taken into account.

Water Supply:

1. Is it a static source such as a lake, river, pond, impounded reservoir, underground storage tank or aboveground storage tank?
2. Is the source a flowing source such as a creek or river?
3. Is the source a recognized pressure hydrant from a municipal operation or private water company?
4. Can the source provide the needed minimum 30,000 gallons of usable volume?
5. What is the method of transfer of water from the source to awaiting tankers?
6. What is the travel distance from the water supply source to the fire site?

Fill Point Apparatus/Equipment Needs:

1. What are the apparatus/equipment and manpower needs for transferring water from the supply source, fill site, to awaiting tankers?
2. What is the travel distance and pumping capacity for engine apparatus, if used, at the water supply fill site?
3. What hose configurations are used for tanker filling operations?
4. What are the travel distances from their respective stations, and water carrying capacities of responding tankers?

Dump Site Apparatus Equipment Needs:

1. Pump capacity of fire site engine used for draft operations from the main portable water tank,
2. Travel distance of fire site pumping engine from its station to the fire site,
3. Number of portable water tanks to be utilized,
4. Apparatus for transporting portable water tanks to fire site,
5. Travel distance, by any apparatus transporting a portable water tank from its station to the fire site,
6. What are the capacities of the portable water tanks being used,
7. Method of connecting multiple portable water tanks,
8. Time required to establish an adequate water flow from subsequent portable water tanks to the main portable water tank used by the rire site engine for draft operations,
9. Time needed to dump individual tankers into the portable water tanks at the fire site.

Additional factors to consider in determining available water for fire suppression include:

1. If from a pressurized source, is the water transferred by direct fill to tankers?
2. If from a pressurized source, and supply transfer is supplemented by a fill site engine, what is the fill site engine pumping capacity?
3. If not pressurized, does the source utilize a dry hydrant w/fill site engine, a floating strainer setup w/fill site engine or other means (explain any other means)?
4. What is the calculated GPM output, as determined during actual flow tests, of any fill site engine used at a pressurized or non-pressurized water supply point?

To determine the available water supply volume, you must first identify a fire site, the type and location of the water point supplying the fire site and the pre-determined response of apparatus needed to establish and support a water-shuttle operation for the selected fire site.

When being rated by a method utilizing a tanker water-shuttle operation, there are four basic scenarios which must be demonstrated and timed by the Inspector: the fire site setup, tanker dump, fill site setup and tanker fills. Please refer to Handout number 25C in the pre-survey package form on the Inspections and Ratings Division section on the OSFM Web site, www.ncdoi.com/osfm.

Although there are numerous factors involved in the determination of actual available water volume at any fire site, the formula provided below may be used for a quick reference for determining available water at an identified site.

$$\text{Continuous Flow} = \frac{\text{Fill Time}^{**} + \text{Dump Time}^{**} + \text{Round Trip Travel Time}^{***}}{0.9 \times \text{Tanker Carrying Capacity in Gallons}^{*}}$$

*Only 90 percent of tanker capacity used in calculation due to spillage and failure to fully dump entire contents of tanker.
**Fill Time & Dump Time determined through actual demonstration.
***All travel times based on an average travel speed of 35 Miles Per Hour.

There are additional water supply calculators available online; one that works well in basic volume determinations is located at the following Web site: www.southern-fire.com/tankergpm.html.

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well. After several minutes the victim appeared to have no lasting affects from the ordeal and refused transport.

The actual operation took approximately 45 minutes with the total time on the scene being 69 minutes. Once the operation was complete, accountability of all personnel was completed and a debriefing was conducted. The incident command system worked extremely well in tracking the personnel and operations of the incident.

CONCLUSION/LESSONS LEARNED

One factor that led to the positive outcome of this incident was a strong incident command system that kept control and provided accountability of the personnel on scene. Also a factor, the mutual aid agencies and personnel that had completed training together, allowing them to work more efficiently and expediently. The use of tactical channels for the operation allowed for no interruption of communication between command and the groups operating at different locations on the scene.

Pre-planning of rescue operations in buildings and facilities is a common practice in the fire and rescue service. But what should be included in these pre-plans are areas in which aerial apparatus may not be effective in performing aerial type rescues because of the limitations of the aerial equipment or the ground area around the facility. Plans should also be made for areas in which extended length ropes may be needed such as high-rise buildings, large facilities with no windows or access points from the exterior, water tanks or towers, quarries, mines, etc. And don't forget to contact on-site maintenance personnel or workers. They may have valuable information on the design and construction of the facility that may help save time. As was in this case in Hickory, the maintenance personnel showed the rescuers the only access to the roof and showed the ladder crew the easiest technical way to remove the windows without damaging them.

Captain Stephen A. "Tank" Townsend is with the City of Hickory Fire Department Training Division.