



**Houston Fire Department
Emergency Response Internal Review
October 23, 2015**

May 26, 2015 - Incident No. 1505260728

- A Houston Fire Department Rescue Boat capsized during a Swift Water Rescue -Two Firefighters and Four Civilians entered the water resulting in three survivors and three deceased.

Executive Summary

The Houston Fire Department deeply regrets the loss of the three individuals that perished during the rescue attempt made on May 26, 2015. We will continue to dedicate our efforts in improving response and ensuring preparation for all future occurrences. During times of natural disaster, planning, training, and preparedness can never match the dangers faced by natural forces. The purpose for this document is to record the conditions encountered, review the actions taken, and learn from the tragedy.

On May 25, 2015, a weather system developed in and around the Houston Metropolitan area creating a "Historic" flooding event. As the storm remained stationary in the Southwest area of Houston, localized street flooding increased. Throughout the night, rain and thunderstorms continued creating a major impact on the Harris County Flood Control drainage systems (comprised of streams and bayous). Flooding quickly spread from the bayous into adjacent neighborhoods. Thousands of Houstonians suddenly became trapped in their vehicles and homes forcing the need for rescue.

The Houston Fire Department received thousands of calls for assistance during this event. Many of these calls resulted in rising water evacuations with services being performed primarily by Engine and Ladder companies. However, many others required the use of Evacuation boats, Swift Water rescue boats and Technical Rescue Teams.

This report will review the incident that involved Rescue Boat 42A, which resulted in the loss of three civilians and a rescue of one civilian and two Houston Firefighters. A swift water procedure is considered to be a High Risk/Low Frequency and High consequence event and as such, is inherently dangerous as is most firefighting services. However, this proved to be even more so, due to the number of calls for assistance, the accessibility to areas that were flooded and the limited resources available. Houston firefighters placed themselves between the victims and the hazards as they have done time and time again. On this day, they did more than that. The members on Rescue Boat 42A placed themselves in the hazard in an attempt to save lives.



Fire Department

The Houston Fire Department (HFD) employs 3,789 classified members and serves a population of over 2 million people in an area that covers 654 square miles. The daily minimum staffing for the Emergency Response Division is 845 personnel. The Emergency Response Division is further organized into two (2) halves – the North and South, and each managed by a Deputy Chief. The South Division - Deputy Chief (Shift Commander 37) is responsible for eleven (11) Districts and the North Division - Deputy Chief (Shift Commander 15) oversees the remaining eleven (11) Districts, which also includes the Safety District. In addition, Emergency Response directs a Special Operations Division. This division is comprised of three technically trained District; Aircraft Rescue Fire Fighting

(District 54), the Hazardous Materials Response Team (District 22), and the Technical Rescue Team (District 11).

Fire Department Technical Rescue Team (HFD-TRT)

The HFD Technical Rescue Team (HFD-TRT) staffing is based on National Fire Protection Association (N.F.P.A.) standards and operates with three front-line vehicles. There are two (2) 4-person 24 hour rescue vehicles [Rescue 10 and Rescue 42] and one (1) 5-person 24 hour Heavy Rescue vehicle [Heavy Rescue 11]. District 11 is administratively coordinated by three persons on staff who each work four (4) ten hour days (Monday – Thursday). Staff positions include a District Chief, Senior Captain, and Captain who can also respond to incidents off-duty when needed.

The Houston Fire Department Technical Rescue Team (HFD-TRT) maintains state of the art apparatus and equipment. All fifty-nine (59) members of the HFD-TRT have completed a one hundred and sixty (160) hour in-house technical rescue course which trains members on curricula that meets N.F.P.A. 1006 and N.F.P.A. 1670 (see; Appendix A).

The HFD-TRT response and deployment standards are based on Houston’s population density, potential for rescue, and previous dispatch history. All HFD-TRT resources are stationed throughout the city in a manner that equally protects three geographical areas of Houston. Rescue 10 is housed at Fire Station 10 (6600 Corporate) and responds to the West, South and Central parts of Houston. Heavy Rescue 11 is housed at Fire Station 11 (460 T.C. Jester) and responds in the Central regions of Houston. Finally, Rescue 42 is housed at Fire Station 42 (8675 Clinton Drive) and responds to the East, North and Central parts of Houston.

All three rescue units support one another throughout the day and one or all three teams may respond to a single incident depending on the nature, complexity, and extended efforts required to complete the event. An example of this would be the May 31, 2013 incident at the Southwest Freeway Hotel fire. Four Houston firefighters lost their lives due to a catastrophic collapse, but one member was successfully rescued by the combined efforts of the men and women in Suppression and all three (3) HFD-TRT units on scene that day.

Assets currently in service that support the HFD Technical Rescue Team include;

- 3 - Technical Rescue Response Apparatus (Rescue 10, Rescue 42 and Heavy Rescue 11)
- 2 - 530 Zodiac Rescue Boats
- 2 - 420 Zodiac Rescue Boats
- 3 - Inflatable Rescue Boats
- 10 - Evacuation Boats (Suppression Crews)
- 5 - Jet Skis
- 1 - Swift Water Strike Team Trailer
- 7 - Support Vehicles
- 1 - All Terrain Vehicle

In addition to basic firefighting, the HFD-TRT is prepared to respond to seven (7) additional principals of rescue, which include Confined Space, Trench Extrication, Structural Collapse, Motor Vehicle Extrication, Water Rescue, Wilderness Rescue, and High Angle/Rope Rescue. The HFD-TRT members frequently train on-shift to update team members with new techniques, tools, and skill sets as well as evaluate any training deficiencies. Through this training, they are also able to evaluate and update the HFD-TRT program as a whole.

Introduction

On May 26, 2015, a Houston Fire Department Swift Water Rescue Boat (RB042A) capsized during an active incident in the 10300 block of South Post Oak Road. An 85 year-old female civilian (Victim #1), 50 year-old male civilian (Victim #2) and an 87 year-old male civilian (Victim #3) perished after being thrown into a body of water that had swift current and carried downstream. All three victims were wearing Personal Floatation Devices (PFD's) upon entry into the water, however, the PFD's were no longer on their person at the time of recovery. In addition, a 55 year-old female civilian (Survivor #1), a 37 year-old male career fire-fighter (Rescuer #1) and a 33 year-old male career fire-fighter (Rescuer #2) were also thrown from the boat. Survivor #1 was soon located downstream and rescued by a second HFD Swift Water Rescue team operating in Rescue Boat 11 (RB011). The two fire-fighters were also rescued after being located holding on to a freeway feeder bridge.

This event occurred several hours into an unprecedented weather condition that actually started in the late night hours the day before on Monday May 25, 2015. On that night, the South Division Shift Commander - Deputy Chief (SC037) had been in contact with personnel at the City of Houston – Office of Emergency Management (OEM). OEM reported that a weather system had caused extreme flooding in the cities of Austin and San Antonio and was heading towards Houston. The storm was continuing to be tracked, but only expected to bring 1" to 3" inches of rain to Houston and surrounding areas. (This was one of two scenarios; the second one being if the storm stalled it would deluge the area.) By 2200 hours, Houston was under a severe thunderstorm warning which began to cause isolated flooding in some parts of the city. As the storm continued, freeways, primary and secondary streets, and neighborhoods began to flood. The Houston Fire Department also began receiving multiple calls for assistance for rising water events.

By 0225 hours on May 26, 2015, Shift Commander 37 had left a fire incident in Southwest Houston and was attempting to return back to Station 37 in Southwest Houston. While enroute, he encountered heavily flooded streets and had to seek high ground for refuge. SC037 was soon able to find a safe location at a Metro Park and Ride located in the S. Braeswood area. During this same time, Rescue 10 (RE010) and Rescue Boat 10 (RB010) were dispatched to this same location for reports of children and adults sitting on top of vehicles in need of rescue. **[Incident No.F1505260327 - 9200 W. Loop S]**. Heavy Rescue 11 (HR011) with Rescue Boat 11 (RB011) and Evacuation Boat 11 (EB011) heard this incident as they were going back in service from a previous call and asked OEC to be placed on the incident with Rescue 10. The Senior Captain on HR011 believed that Rescue 10 would have difficulties responding to this area and HR011, RB011 and EB011 would be able to get to

this location faster. All HR011 units were added to the incident and RE010 was placed back in service and did not respond.

When HR011 arrived on location near the Metro Park and Ride, they were able to establish a boat launching point on the north side of Brays Bayou along the W. Loop S. feeder road in front of Meyerland Plaza. The Senior Captain on HR011 assumed Mobile-Incident Command (M-IC) and immediately began initiating rescues. RB011 made their way to the location of SC037, still in the Metro parking lot, and then transported him to the High Ground Collection Area #2 near Bellfort and S. Post Oak Road (see; Rescue Incident AAR Map). The officer on HR011 recognized that more assistance would be needed. He then contacted Rescue 42 (RE042) by phone and advised them to respond to his location. The officer on RE042 made an additional decision to bring two rescue boats housed at the station, Rescue Boat 42 and Rescue Boat 542, in order to help facilitate more rescues.

Once RE042 arrived at the location and made contact with the Senior Captain on HR011 (M-IC), they were ordered to launch RB042 on the south side of Brays Bayou. From this point, RB042 began performing multiple water rescues throughout the early morning hours. After several rescues, the Senior Captain on HR011 (M-IC) decided that all resources would be better served on the south side of Brays Bayou. The Senior Captain on HR011 (M-IC) contacted OEC to advise that the incident would be moving to the south side of Brays Bayou. The original incident [**F1505260327 - 9200 Loop S.**] was closed, a new incident was created [**F1505260728 - 10300 S. Post Oak Road**], and operations were then conducted from this new location. The Senior Captain on HR011 (M-IC) also requested several more resources including a District Chief, more Evacuation Boats, High Water Rescue Vehicles, a Metro Bus for civilian shelter, and assistance from HPD.

The Rescue

At 0609 hours, [**Incident No. 1505260728 – 10300 S. Post Oak Rd**] was created and the following units were assigned to this incident: District Chief 21, HR011 with Rescue Boat 11 and Evacuation Boat 11, RE042 with Rescue Boat 42 and Rescue Boat 542, L021, E021, and M024. In addition, Emergency Response Command Staff were in the process of establishing three (3) Area Wide Commands and assigning additional HFD, Public Works, and mutual aid assets in the southwest and central portions of the city to systematically cover all of the calls for service. Suppression resources were also being sent to evaluate the immediate needs of the neighborhoods that were most affected.

At this point, the Senior Captain on HR011 (M-IC) and other swift water trained fire-fighters on RE011 determined that the water current and debris flowing in the bayou made it extremely hazardous to cross. Several attempts were made to notify all rescue boats on scene and advise that the bayou should not be crossed. It was also near to this same time that RB042 was given the address 5410 N. Braeswood Apt. 109B as a location requesting evacuation for rising water. Response to this location would mean that RB042 would have to cross the bayou from south to north. A member on RB042 stated that he was using the GPS on his personal cell phone to navigate the area and that the location was still difficult to locate due to extreme conditions. During this same time

and while en-route to the above mentioned address, RB042 also encountered several more unreported victims in need of rescue. RB042 completed several of the rescues, but had to tell many others that they would have to return or have another boat come to their aide. As they continued to work their way towards 5410 N. Braeswood, they came upon a house with three civilians positioned on the front porch. These people were all standing in water that was still rising from the bayou and needed assistance as well.

RB042 determined that they had to initiate a rescue and assist the three civilians on the porch. To begin operation, Rescuer #1 had to first enter the water and swim to the house while Rescuer #2 stayed with the boat. Rescuer #1 then brought the 85 year-old female (Victim #1) to the boat and helped lift her up to Rescuer #2. Rescuer #1 then returned to the house and assisted the remaining two people, the 87 year-old male (Victim #3) and the 55 year-old female (Survivor #1) to the boat. Once on the boat, all three civilians were donned with Personal Floatation Devices (PFD's). RB042A called Command on the radio and advised that they had three civilians on board and were bringing them to the command post. RB042 also requested a Basic Life Support ambulance (BLS) for patient evaluation.

Due to severe flooding, units assigned to this incident had extended response times. Ladder 21 arrived on scene at 0647 hours and Engine 21 arrived at 0649 hours. By 0654 hours, additional water rescue resources were returning to service across the city from earlier incidents and OEC had reassigned them to this incident. Booster 65 (B065) and Fire Rescue Boat 65 (FRB065) were dispatched at 0654 hours. M24 had also arrived on scene by 0654 hours.

At 0701 hours, District 21 had arrived on scene. District 21 met with the Senior Captain on HR011, conducted a face-to-face report, and assumed S. Post Oak Road Command. In his report, the Senior Captain stated that there were three (3) rescue boats (RB011, RB042 and RB542) all working along Brays Bayou trying to assist multiple citizens and that he had requested several more resources. The Senior Captain on HR011 was then reassigned to oversee Rescue Operations.

All crews on HR011 and RE042 had been on the boats working in the water since the beginning of this weather event (starting at approximately 2300 hours the night before). This accounts for approximately eight (8) continuous hours of work without any sustainable relief or rehabilitation. Citizens continued to request help and the Technical Rescue Team continued to respond.

As RB042 was transporting the three (3) civilians to the command post, two male civilians were located walking in chest deep, swift moving water. RB042 stopped to make contact and offered to take them to higher ground. One of the males declined assistance, but the second male (Victim #2) was visibly shaken and stated that he needed to get across the bridge to his dog. Rescuer #1 assisted this person into the boat and placed a PFD on him. RB042 then started crossing the bayou and proceeded to the area where command was taking place on the south side.

At approximately one third of the way across the bayou, RB042 reported that the boat struck an unknown object in the water. This situation then caused the motor to rise up out of the water, lock it into the up position, and then shut off. Immediately, the HFD members attempted to lower the

motor, get it restarted, and regain control of the boat. However, before control could be reestablished, the strong current in the center of the bayou caused the port side of RB042A to be pushed directly into the S. Post Oak Bridge. With no propulsion, the boat could not be turned. Water continued to push on the starboard side while the members tried to start the motor. Then, without warning, the boat capsized. Victim #1, Victim #2 and Victim #3 were all sent into the water almost immediately, forced under the bridge, and carried downstream by the current. Survivor #1 was also sent into the water, forced under the bridge, and carried downstream. She was able to swim to the side of the bayou and later rescued by RB0011. It should be noted that when she was recovered, she was also without a PFD.

Rescuer #1 and Rescuer #2 were each thrown from the boat. Both fire-fighters managed to self-extricate from the bayou by climbing onto a chain-link fence attached to the bridge. The vessel, radios, and all loose equipment on the boat were lost in the water and forced under the bridge. With no radio to call Command and request a MAYDAY, Rescuer #2 remembered he had his cell phone in his dry-suit. He called OEC to report that the boat had capsized, civilians were in the bayou and to request immediate assistance. Both fire-fighters were soon spotted by an HPD FOX (helicopter unit) holding on to a fence and rescued by RB011.

Recovery of Civilians and Rescue Boat 42 (RB042)

A. (Victim #1)

- 85 year-old White Female
- Recovered; May 26, 2015 – 0950 hours
- Location: Brays Bayou (approximately 8.26 miles from the incident)

B. (Victim #2)

- 50 year-old Asian Male
- Recovered; May 26, 2015 – 1630 hours
- Location: Brays Bayou (approximately 5.01 miles from the incident)

C. (Victim #3)

- 87 year-old White Male
- Recovered; May 28, 2015 – 2030 hours
- Location: Port of Houston (approximately 15.03 miles from the incident)

D. (Survivor #1)

- 55 year-old White Female
- Rescued; May 26, 2015 – 0715 hours
- Location: Brays Bayou (approximately 0.5 miles from the incident)

Body Location

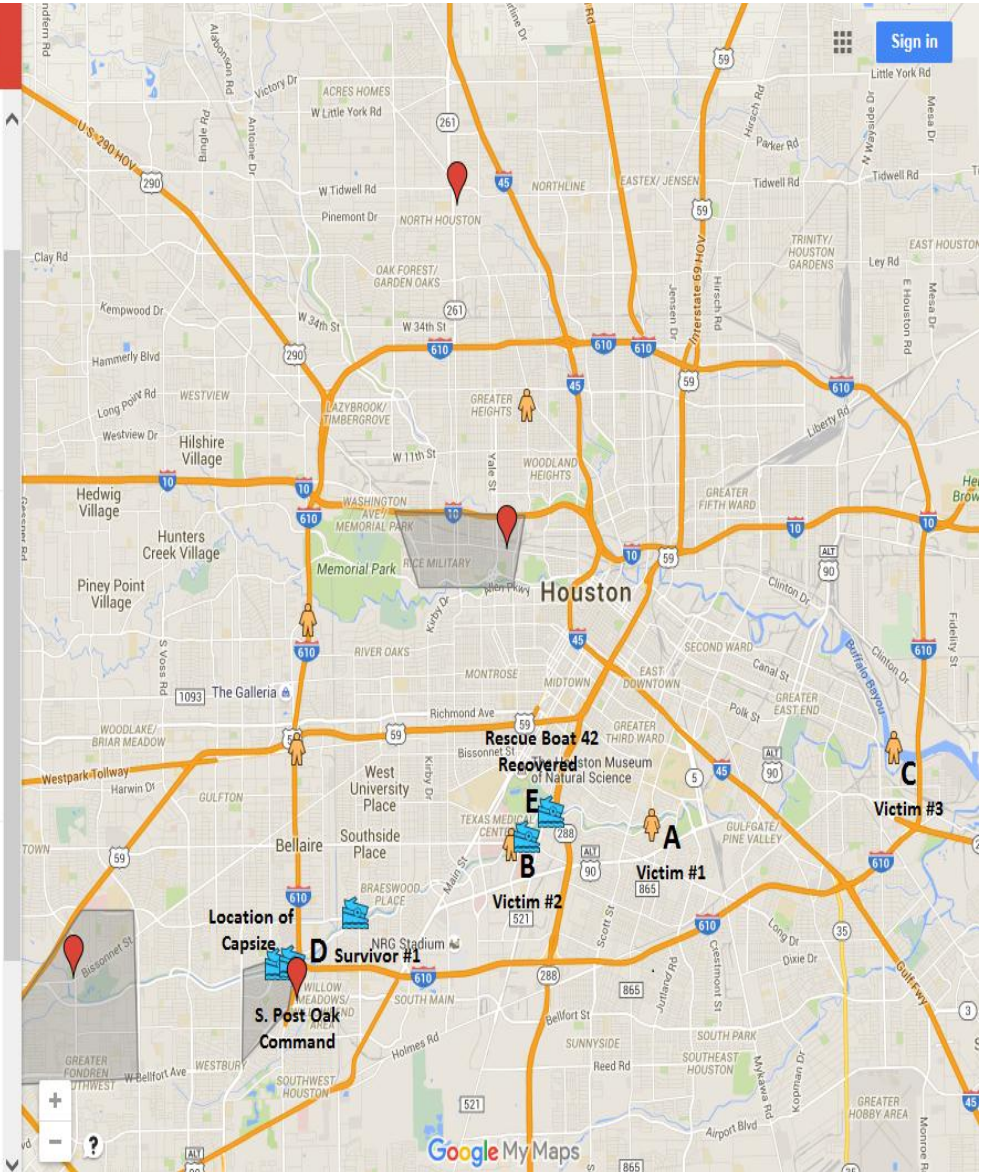
- Victim #1, 85yo/wf
- Victim #2, 50 yo/am
- Asian Female
- White Male
- White Male
- Hispanic Male
- Victim #3, 87 yo/wm

Rescue Boat 42 incident

- Original Evacuation location
- Location of capsize
- Rescue Boat 42 recovered
- HFD Lifejacket found
- HFD Lifejacket found

Area Commands

- S. Post Oak Command
- 68 Command
- Heights Command
- S. Post Oak Command A0
- D-68 Command A0
- Heights Command A0





E. (Rescue Boat 42)

Rescue Boat 42 was located several hours later near Highway 288 between North and South MacGregor. HFD Engine 17 was sent to this location at approximately 1500 hours and secured the inflatable portion of the vessel. Unfortunately, the Motor and Transom were never recovered.

Communications

The Houston Fire Department utilizes several means of communications at all incidents with the primary means being the Citywide-Public Safety (700-800 MHz) radio system. This equipment provides multiple Talkgroups for our members to communicate both emergency and non-emergency communications. The following is a brief description of how the radio system was utilized by fire department personnel during this incident.

Radio Talkgroup assignments on the day of the event

- Incident No. F1505260317 was dispatched at 0214 hours, on City Wide Dispatch (DISPCW).
- Incident No. F1505260327 was dispatched at 0219 hours, on City Wide Dispatch (DISPCW).
- All units on both of these incidents were assigned to the Southwest Radio Operator (SWRO 10) at the time of dispatch.
- At 0229 hours the Incident Commander for Incident No. F1505260317 (D028) requested a monitored "TAC-Channel" and was assigned to Southwest TAC 16 (SW TAC 16).
- At 0304 hours, the Incident Command (HR011) requested an **un-monitored** "TAC-Channel" for rescue operations and was assigned to Southwest TAC 15 (SW TAC 15).
- In addition, members assigned to the HFD Technical Rescue Team (HFD-TRT) used one of the dedicated Talkgroups assigned to the Special Operations Division (RESCUE3)

- At approximately 0615 hours, Incident Command (HR011) requested additional resources including a District Chief. The decision was also made to move the Command Post from the north side to the south side of Brays Bayou.

When this decision was made, Incident (F1505260327) was closed and a “New” Incident (F1505260728) was created. All communications for the “New” incident remained on the same “TAC-Channel” (SW TAC 15).

Another means for our members to communicate has become the cellular telephone, which are used throughout the day for administrative purposes. HFD has also found that cell phones have become invaluable by Incident Commanders to communicate with OEC and officers on scene. The cell phone played a vital role in the rescue and survival of the two fire-fighters and one civilian on the day of this event.

Cellular Telephone Usage on the day of the event

- Cell phones were used by Incident Commanders to contact Communications Officers at the Office of Communications (OEC)
- Cell phones were used by officers and members on scene to communicate with each other and update progress, relay addresses, and provide detailed information on flooded streets.
- Cell phones were used by HFD members operating on boats to contact evacuees who had called 9-1-1 and requested assistance. HFD members were able to contact the callers and verify what assistance was actually needed, their safety status, and to determine their exact location.
- Two (2) HFD firefighters on Rescue Boat 42 **had** to use a cell phone to call OEC to request assistance after their boat capsized. All equipment, including their radios, was lost in the bayou and a member carrying his personal cell phone was able to call OEC for help.

Houston Fire Department Office of Emergency Communication (OEC)

The Houston Fire Department Office of Emergency Communication (OEC) performs an important support role for the members in the field. This division is physically located at the Houston Emergency Communications Center (HEC) at 5320 N. Shepherd. There are 16 Communication Officers assigned to each shift that perform central communications for the Houston Fire Department. On the evening of May 25, 2015, the supervisors at OEC had been monitoring weather conditions and were in direct contact with staff members from the City of Houston-Office of Emergency Management (COH-OEM). COH-OEM suggested that reports from the National Weather Service indicated a system was moving towards the Houston area out of the Austin and San Antonio region and predicted 1 to 3 inches of rain.

OEC first felt the effects of the storm starting at 2300 hours with an increase of Automatic Alarm events beginning on the northwest side of town. Automatic Alarm calls were at such a great number due to lightning that supervisors decided to stop sending out Automatic Alarm Events and make them Advised Events. It was also at this time that all breaks for OEC members were canceled so that the full staffing of 16 members could respond to the high call volume throughout the remainder of the shift. Due to the increased work-load, supervisors from OEC also attempted to call in additional staffing to work

overtime. This was soon dismissed when they were informed that Shepherd drive was flooded and access to the HEC was not possible. At midnight, staffing was able to be increased to 17 when one (1) A-shift member, who had just gotten off work at his side job in Telemetry (HFD Medical Control located at the HEC), came to OEC and asked if they needed help. (Note: all of these members remained on duty at relief time to assist the on-coming shift with the expanded event).

Heavy rain began later that night and at approximately 0200 hours, the storm started to severely impact the Houston area. It was also at this same time, when lightning struck nearby which caused the building to lose power. The building's generator activated and services became dependent on back-up power.

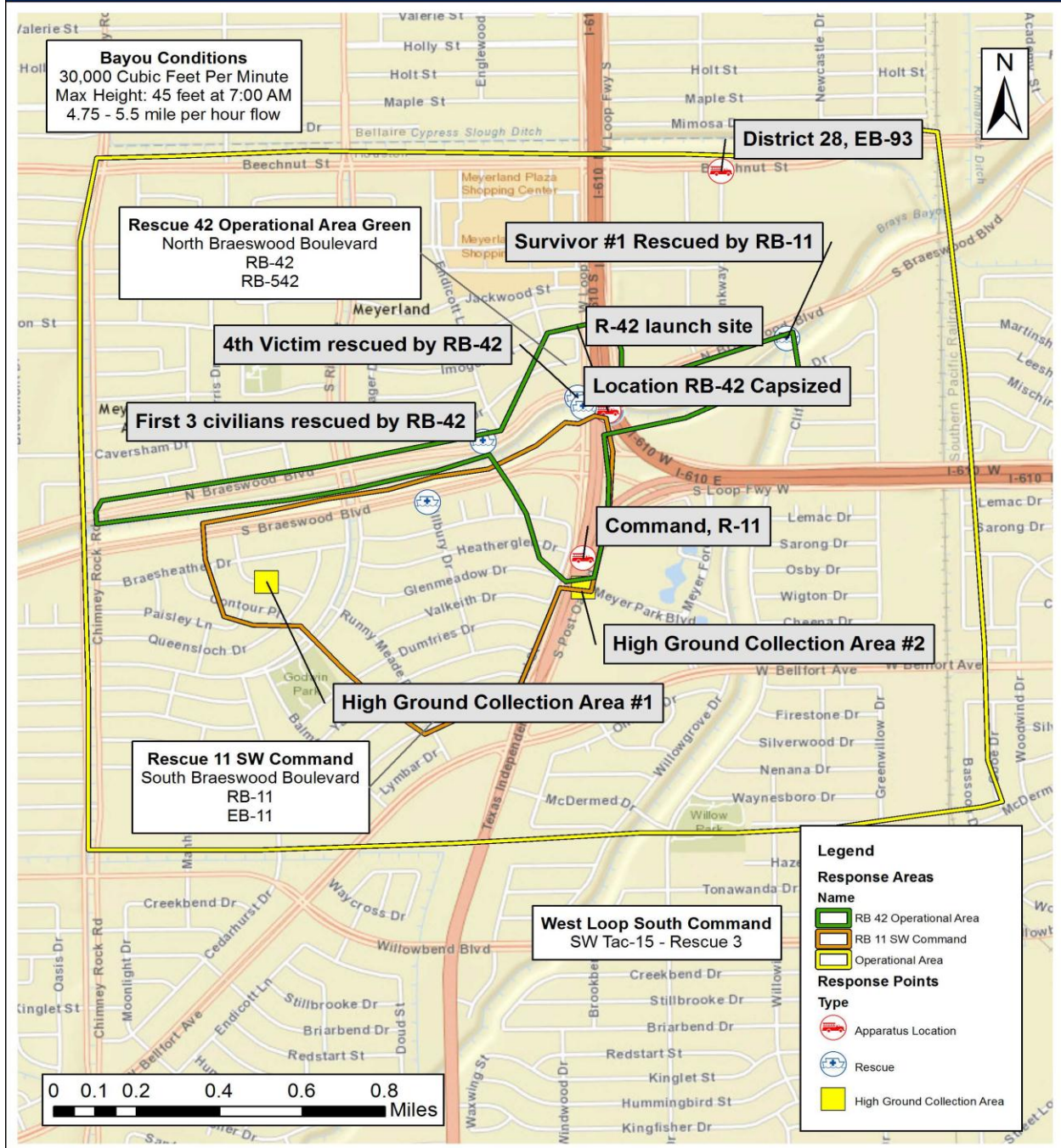
As the event progressed, supervisors at OEC attempted to contact members in the stations and ask that they notify OEC if there are problems with flooding in their response areas. In the 12 hour period from 2100 hours on 5/25/2015 to 0900 on 5/26/2015, HFD processed 1342 events. This is more than double the normal event volume for HFD in a 12 hour period. Every Communications Officer on duty was either monitoring a radio console or calling citizens via telephone to get additional information. These members were trying to determine which calls were life threatening and needing immediate assistance from those that were considered non-emergency. By 0400 hours, supervisors at OEC had been contacted by staff members from the City of Houston Office of Emergency Management. OEM advised that personnel from Public Works were not going to be able to staff dump trucks for high water access until day break.

Communications were also hindered prior to this time period when a radio tower that is located in the Southwest Quadrant was struck by lightning around 23:30 hours on Monday May 25, 2015. This is one of forty-eight (48) towers operated by the City of Houston Radio Communications Systems (RCS) that is used to broadcast communications on the City's digital radio system. Nine of these sites are for the Southwest Quadrant. This lightning strike caused the towers operating in the Southwest Quadrant to go into a back-up mode known as "Site-Trunking." Site Trunking is a redundant mode of communications when towers cannot communicate to each other. OEC gets a similar alert, and once OEC moves to their back channels, communications from the field to OEC can occur. The "Site Trunking" also signals users to call a technician to restore the primary means of communication. The Southwest Quadrant was restored to primary services at 0330 hours on Tuesday May 26, 2015.

A working structure fire was in progress at this same time, in District 83, which is also located in the Southwest Quadrant. Units on this scene had no communication capabilities with OEC for an unknown amount of time. The Northeast Quadrant appeared to be the least impacted from this storm and Communications Officers continued to assist crews working in the affected areas with all possible resources including those from other departments.



Rescue Incident AAR Map



Weather and Flood Conditions during the incident

Harris County Flood Control District (HCFCD)

May 25 – 26 RAINFALL

Duration – The heaviest rainfall occurred from the northwest side of the City of Houston from Heights Blvd. southwest to near Beltway 8 and I-10, and then southwest into Fort Bend County. All of the rainfall occurred within 12 hours, with the heaviest rates observed in the 3-hr to 6-hr time frame.

Total Amounts – Total rainfall amounts averaged 3.0 – 4.0 inches across much of Harris County with totals of 4.0 – 6.0 inches from Humble to Jersey Village to Katy, and eastward to Galveston Bay. Rainfall totals of 8.0 – 10.0 inches were recorded on the northwest side of the City of Houston southwest to Sugar Land. A maximum rainfall accumulation of 11.0 inches was recorded at Brays Bayou and Beltway 8. The rainfall intensity report and various rainfall distribution and flood information maps are attached.

ACoCoRAHS observer located 6.2 miles west of downtown Houston recorded 10.03 inches of rainfall. Another observer located 3.4 miles northeast of Richmond in Fort Bend County recorded 11.88 inches of rainfall.

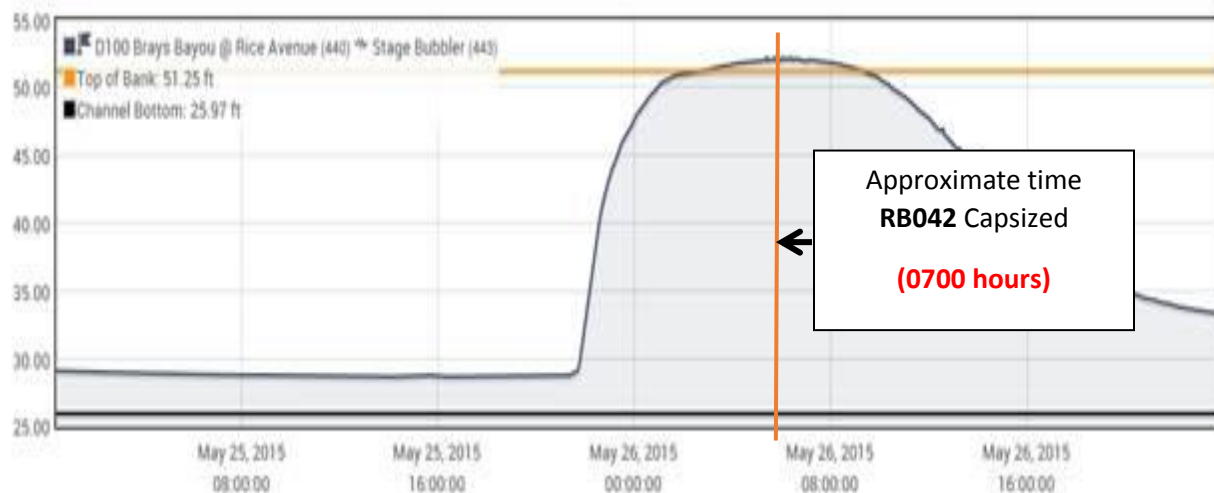
An average rainfall of 5.3 inches occurred across Harris County in a 12 hour period which equates to 162 billion gallons of water.

Exceedance Probability – Rainfall on Brays, lower White Oak, Keegans, and Buffalo Bayous ranged between the 50% (2-yr) frequency to well in excess of the 1% (100-yr) frequency for the time periods of 15-min to 12-hrs. The highest rainfall amounts occurred in the Buffalo and Brays watersheds for the 2-6 hr time periods and are between the 1% (100-year) and 0.2% (500-year) frequency. A rainfall map and rainfall, duration, frequency plot are attached.

A HCFCD water level sensor installed in the bottom of the Arthur Storey Park detention basin (D500-06-00) on Brays Bayou recorded a water level rise of 16.5 feet between 11:00 p.m. May 25th and 1:00 a.m. May 26th. The peak elevation in the basin reached 66.0 feet at 2:45 a.m. [1]

Brays Bayou Water Flow Levels

Note: Peak water flow 30.00 cfm at 4.75 to 5.5 mph



City of Houston – Office of Emergency Management

During the internal review process, the City of Houston-Office of Emergency Management (COH-OEM) was contacted and a staff member met with the Committee. The information shared during that meeting helped to provide some details as to the conditions and actions that took place on the night of the event.



Abridged Timeline

NOTE: All resources responding to incidents during this weather event updated their Mobile Data Terminals (MDT's) when going on location, however, members would then have to walk several blocks, sometimes in high water to actually reach a dispatched location. [2] [3]

On Scene and actual Arrival times may differ from the HFD Event History Times.

**9200 West Loop South, HOUSTON TEXAS
F#1505260327 - 5/26/2015**

A028, E059, SQ073, AS016, PG710, RE010, PG111, L059 (HR011, RB011, EB11)

TIME	UNIT	SOURCE	STATEMENT
02:15:56	HFD 053	HFD Event History	REC
02:16:25	HFD053	HFD Event History	LOCEVR
02:19:27	HFD059	HFD Event History	DSP A028, E059, SQ073, AS016, PG710, RE010, PG111, L059

02:19:15	SQ073	HFD Event History	ENR
02:19:29	A028	HFD Event History	ENR
02:21:15	RE010	HFD Event History	ENR
02:21:26	E059	HFD Event History	ENR
02:23:11	L059	HFD Event History	ENR
02:25:53	HR011	HFD Event History	DSP
02:25:53	HR011	HFD Event History	ENR
02:28:16	SQ073	HFD Event History	AOR (Unable to respond due to High Water)
02:31:16	AS016	HFD Event History	ENR
02:31:23	AS016	HFD Event History	AOR (Unable to respond due to High Water)
02:32:25	RE010	HFD Event History	AOR
02:40:00	A028	HFD Event History	AIQ
02:42:12	E059	HFD Event History	AOT
03:04:45	RADCHNL	HFD Event History	SWRO10 =>SWTAC15
03:18:51	L059	HFD Event History	ONS
03:35:12	HR011	HFD Event History	ONS
06:02:14	L059	HFD Event History	AOR
06:15:55	HR011	TRT AAR (Hurst) and HFD Event History	After determining that resources would be better served on the South side of Brays Bayou, the Command Post was moved from 9200 W. Loop S. to 10300 S. Post Oak Road and a "New" incident number was created by OEC.

10300 S POST OAK RD + 4900 W BELLFORT AVE, HOUSTON TEXAS			
F#1505260728 - 5/26/2015			
District 21, RE042, M024, L021, E021, B065, FRB065, A028, A021, AS082, M003, MD006, A051, E093, EB093, E066, B066, EB066, E080, B080, EB080, A033, RH017, M059, AS069, AMBUS8, MPR008, M006			
TIME	UNIT	SOURCE	STATEMENT
6:09:31	HFD051	HFD Event History	LOCVER
	OEC	Statement	D021 was contacted by OEC to establish an Area Command Post via telephone prior to dispatch
6:13:26	D021	HFD Event History	DSP
6:13:45	D021	HFD Event History	ENR
6:14:27	HFD050	HFD Event History	SWRO10==>SWTAC15
6:16:16	RE042 HR011	HFD Event History	DSP
6:16:22	HR011	HFD Event History	ENR
6:16:22	RE042	HFD Event History	ENR
6:16:23	HR011	HFD Event History	ONS
6:16:23	RE042	HFD Event History	ONS

6:17:33		HFD Event History	D021 RE042 HR011 - Command Post 21
6:22:02	M024 (*ALS*)	HFD Event History	DSP
6:23:15	M024	HFD Event History	ENR
6:37:14	L021	HFD Event History	ASST
6:38:38	E021	HFD Event History	ASST
6:47:37	L021	HFD Event History	ONS
6:49:05	E021	HFD Event History	ENR
6:54:30	B065 FRB065	HFD Event History	DSP
6:54:42	B065	HFD Event History	ENR
6:54:42	FRB065	HFD Event History	ENR
6:54:53	M024	HFD Event History	ONS
7:01:18	D021	HFD Event History	ONS
7:03:23	E021	HFD Event History	ONS
7:10:15	M024	HFD Event History	TRNS (Elderly male)
7:11:36	A028	HFD Event History	DSP
7:12:32	A028	HFD Event History	ENR
7:20:29		HFD Event History	A028 L021 E021 D021 RE042 HR011 M024 B065 FRB065
7:25:13	RB042	Administrative Call	1st call to OEC reporting boat capsized
7:26:09	RB042	Administrative Call	2nd call to OEC reporting boat capsized
7:28:01	RB042	Administrative Call	3rd call to OEC updating boat capsized
7:28:22	RB042	Administrative Call	4th call to OEC updating boat capsized
7:37:33	A021	HFD Event History	DSP
7:39:12	A021	HFD Event History	ENR
7:48:16	AS082 (AS)	HFD Event History	DSP
7:48:34	M003 (*ALS*)	HFD Event History	DSP
7:48:54	MD006 (MD)	HFD Event History	DSP
7:49:11	M003 (*ALS*)	HFD Event History	ENR

Contributing Factors

1. The City of Houston–Office of Emergency Management (COH-OEM) had been tracking this weather system earlier in the evening as it arrived from the north and traveled through the Austin and San Antonio region. All data and information received from the National Weather Service led officials to believe that this system would continue to track towards the south and predicted 1 to 3 inches of rain. (This was one of two scenarios; the second one being if the storm stalled it would deluge that area.)
2. The weather system stalled as it entered the Houston Metropolitan Area and eventually dropped over eleven-inches (11-inches) of rain in geographically isolated areas throughout the city during an approximate eight (8) hour period from 2200 hours to 0600 hours.

3. Calls for service started out, as most do during a rainstorm, as rising water events on the freeways, primary and secondary streets, and in some lower lying neighborhoods to the south. As the rain continued throughout the night, several bayous had eventually risen to a level causing them to over spill their banks (i.e., White Oak, Buffalo and Brays Bayous).
4. Over 2,000 calls for assistance were received by the Houston Fire Department through the City of Houston 9-1-1 Call Center during this event. This created a back-log of calls for HFD crews to mitigate. Citizens continued to call for help throughout the night which became more isolated in the southwest area of Houston especially near the bayous.
5. The Houston Fire Department has a directive in place instructing members that apparatus and EMS units should not be driven in high water (over apparatus axles). As a result, HFD assets were voluntarily taken out-of-service by members at the station and in the field due to excessive high water in and around their response territory. No provisions were made for the continued calls for service in these flooded areas that had apparatus out-of-service. Consequently, companies from outside the flooded areas were being dispatched and sent into the flooded areas that were originally deemed too deep to respond to by the area companies.
6. Due to the overwhelming number calls for assistance, the HFD Office of Communication (OEC) placed all suppression resources (Fire Assets) in "Fire Resource Management". This decision reduced the number of resources dispatched to an incident, which then increased the number of available resources to respond to additional calls.
7. A District Chief was not initially dispatched to this event with the rescue resources. A stationary Command Post (CP) was not initiated by officers on scene and the Senior Captain on HR011 had to establish a Mobile Command which directly affected his abilities to manage the Rescue Branch. The Senior Captain on Ladder 59 could have assumed command duties as the senior suppression officer on scene and established a stationary Command Post (CP).
8. HFD water rescue assets (Rescue and Evacuation boats) were requested and dispatched throughout the Southwest Quadrant of Houston starting at approximately 2200 hours. As units arrived, they had to navigate dark streets to find a safe place from which to launch their boats. In addition, heavy debris and unknown obstacles were frequently encountered as well as stalled out vehicles that blocked access to evacuees requesting assistance.
9. As HFD water rescue assets were dispatched to the Brays Bayou area, they responded from both the Northwest and Southeast Quadrants of town and eventually staged on both the north and south sides of Brays Bayou. Final staging locations were also dependent on the route taken to reach the incident due to flooded streets as well as where they were able to launch their boats.

10. HFD boat assets were assigned to operate on both the north and south side of Brays Bayou. Since a North and South division was never established, crews were being sent to locations based on the nature and severity of call. This caused crews to have to cross the bayou rather than being assigned to only operate on either the north or south side and stay out of the swift current of the bayou.
11. North and South Divisions should have been established. This would have organized the incident and maintained resource accountability. Several supervisory positions were not established due to the limited number of personnel actually on scene. (i.e., Safety Officer, Up-Stream and Down-Stream divisions etc.). Those units that were dispatched and attempting to respond, reported extended delays due to flooding and access problems. Company officers were needed for task level assignments such as manning boats rather than performing command functions.
12. Mobile Command (HR011) received multiple calls for assistance in three different ways.
 - a. Directly from OEC over the radio.
 - b. From Suppression units (Engines and Ladders) that were being dispatched to an incident in the general area, but unable to reach their dispatched location so they gave the address to Mobile Command (HR011).
 - c. The HFD Rescue and Evacuation boats operating in the flooded areas were being flagged down by individual citizens who were requesting immediate assistance.
13. Situational Awareness was compromised due to a number of human factors.
 - a. HFD-TRT units responded with additional boats that are normally housed at their stations. Once on scene, they discovered an overwhelming number of citizens needing rescued. Officers soon became separated from their crews when the decision was made to divide their crews and place these additional assets in-service to respond to the high number of requests for service. This meant that crew accountability was compromised when two (2) rescuers were operating in Rescue Boat 42 (RB042) rather than three (3) members as outlined in department operational guidelines. Officers also stated that additional suppression companies had extended response times due to wide spread flooding and access problems. This further caused delays in assistance and an increased workload on the members in the boats.
 - b. Crew fatigue and exhaustion set in due to the continued number of rescues performed and extended work hours of operation.
 - c. Members operating in rescue boats had limited swift water rescue experience and training in true swift water conditions.
 - d. Members crossed the bayou several times early and stated that they had struck unknown objects (debris) in the water losing control of the boats, but did not associate this as a potential hazard.
 - e. A single Evacuee Collection Point was only established on one side of the bayou.

- f. Members did not perform a continual, ongoing Risk / Benefit Analysis or recognize the hazard of crossing the bayou before moving the evacuees from a rising water event into a Swift water hazard.
 - g. Rescue crews failed to recognize that the S. Post Oak Bridge acted as a large impassable strainer as the water level in the bayou continued to rise. A NO-GO Zone should have been established.
 - h. Rescue crews failed to recognize alternative high ground locations available on the north side of the bayou to evacuate victims.
- 14. The severe weather created two major water evacuation incidents in the Southwest Quadrant near Brays Bayou at or near the same time. Each incident continued to escalate and operate on two separate Talkgroups (SW TAC 15 and SW TAC 16). The officers on scene at each incident were aware of the other's location and even communicated with each other throughout the event, however, an Incident Command System (ICS) Area Command structure was never established. An Area Command should have been established so that HFD water rescue assets (Rescue Boats and Evacuation Boats) could be coordinated to support the fire and EMS units that continued to respond to this area as calls for assistance were being dispatched.
- 15. Communication was compromised due to several issues that were both human error and equipment failure due to weather.
 - a. A Radio Communications Systems (RCS) radio tower in the Southwest Quadrant was struck by lightning around 2330 hours on Monday May 25, 2015. The Southwest Quadrant Talkgroups transitioned into Site-Trunking. This condition allows for members in the field to continue using the radio Talkgroups, but limits communications with the Office of Emergency Communications (OEC) to the predesignated back-up console channels. Members reported that radios were producing pre-designated alert tones to signal the end-user that the equipment was operating in "Site-Trunking".
 - b. Mobile Command (HR011) requested an unmonitored "TAC-Channel" from OEC. This eliminated a Communication Captain from being assigned to the "TAC-Channel" and remain in constant contact with the Incident Commander. This also affected accountability of members on scene due to 30-minute prompts for Personnel Accountability Reports (PARS) not being transmitted.
 - c. HFD Technical Rescue Team (HFD-TRT) members were operating on two separate Talkgroups at the same incident. The unmonitored "TAC-Channel" (SWTAC15) assigned by OEC was used for operations. Then, in addition, the HFD-TRT transmitted tactical communications on one of the dedicated Talkgroups normally used for non-emergency task level communications (RESCUE3) which created multiple problems;
 - i. The Incident Commander had to monitor and transmit messages on two different radios, so that he could communicate using two different Talkgroups:

- SWTAC 15
 - RESCUE3
- ii. Suppression personnel were not able to monitor RESCUE3 and only operated on the assigned “TAC-Channel” (SWTAC15). Suppression personnel were not able to hear essential strategic and tactical communications from Rescue Team members.
 - iii. OEC does not monitor the Rescue Talkgroup (RESCUE3)
- d. When Rescue Boat 42 (RB042) capsized, all department-issued radio equipment was lost in the water and direct communications with Command and OEC was immediately lost.
 - e. An HFD-TRT member trained in swift water rescue performed a Risk / Benefit Analysis in regards to crossing the bayou. This member deemed it to be unsafe and informed Command on the assigned “TAC-Channel” (SWTAC15), that boats should not attempt to cross the bayou. This message was also reportedly made face-to-face and on the Rescue Talkgroup (RESCUE3). Mobile Command (HR011) did not announce the message “for boats to not cross the bayou” on the assigned “TAC-Channel” (SWTAC15), or contact OEC and request an Alert Tone be sent announcing this extreme hazard.

16. After the decision was made to activate the Office of Emergency Management (OEM), street level flooding delayed the response of essential personnel from getting to the HEC. This included key people from OEM, HFD, HPD, PWE and the Mayor’s Office who were all attempting to establish a Unified Command for the City.

Committee Recommendations

A. Operations

Strategic Level:

1. The department needs to be in full compliance of training and equipment needs based on the National Fire Protection Association (NFPA) Standards.
 - a. NFPA Standard 1006
 - b. NFPA Standard 1670
2. Creation and/or designation of four additional District Chief positions so there is a 24-hour **Rescue-District Chief** (District 11) assigned to each shift. This member would be on a regular 24 hour shift work schedule and respond to all Technical Rescue Team (TRT) incidents.
 - a. The Rescue-District Chief would report directly to the Command Post and be assigned as the Rescue Branch Manager in the Incident Command System (ICS).

- b. The Rescue-District Chief (District 11) would function as a Subject Matter Expert (SME) for the Incident Commander and the Rescue Liaison for the HFD-TRT.
 - c. The Rescue-District Chief (District 11) would become the supervisor for the TRT district and responsible to perform all day-to-day administrative and operational functions for District 11.
 - d. The Rescue-Chief would oversee and manage consistent training among all three Rescue companies on duty each day.
- 3. The process of providing on-duty Shift Commanders (SC015 and SC037) with concise updates associated with severe weather threatening the City of Houston and surrounding areas needs to be reviewed and expanded to include all District Chiefs.
 - a. Forecasts for severe weather impacting the COH should be provided by the Office of Emergency Management (OEM) at repeated intervals each day (i.e., every 6 hours etc). This information would assist in developing Incident Action Plans and anticipating staffing needs.
 - b. Emergency Response needs to develop a process that provides HFD Incident Commanders with “real time” weather information from OEM.
 - c. Emergency Response needs to develop a process that provides HFD Incident Commanders with “real time” flood control conditions from the Harris County Flood Control District (HCFC) such as, small stream and bayou currents (speed), bayou levels, and reports of potential flooding.
- 4. Additional HFD water rescue assets need to be placed in service and staffed by off duty call-in personnel (Rescue Boats, Evacuation Boats, High Water Rescue Vehicles etc.). Decisions for additional staffing needs to be made prior to significant weather events impacting the Houston region (i.e., 6-12 hours). Current staffing guidelines for water assets need to be enforced.
 - a. Lead time needs to be established for off-duty personnel in order to be contacted so that ample arrangements can be made so that they can report to stations prior to severe weather and flood conditions impact the area.
- 5. The HFD Office of Emergency Communication (OEC) needs to develop a process of notifying Incident Commanders of multiple incidents operating in a specific corridor [Key Map Square(s)] so that Area Commands can be established.

Tactical Level:

- 1. Multiple Evacuee Collection Points need to be established during Rising Water and Swift Water Rescue events.

- a. Evacuee Collection Points should have resources available to provide adequate shelter and protect evacuees from the elements.
 - b. Evacuee Collection Points need to have EMS Triage, Treatment and Transport capabilities.
 - c. Evacuee Collection Points need to have transport resources available (i.e., AMBUS8 and METRO buses).
2. When bayous are affected, a River Left (RL) and River Right (RR) Evacuee Collection Point should be established so that Rescue Boats (Swift Water and Evacuation) do not have to cross a body of water with swift current.
 3. The HFD Swift Water Rescue Team needs to be re-established and a guideline created that details requirements, training, and operations.
 4. The four (4) Houston Fire Department Guidelines that address water rescue events should be reviewed and updated to ensure adequate preparation, response, and operations are met.
 - a. HFD Guideline I-01; Rules and Regulations
 - b. HFD Guideline II-06; Incident Command
 - c. HFD Guideline II-07; Evacuation and Rescue Boat Operations
 - d. HFD Guideline II-11; Water Rescue Incidents

Task Level:

1. Officers must provide direct supervision and maintain crew integrity and accountability during all Rising Water and Swift Water Rescue events.
 - i. A three (3) person crew should be assigned to and operate all HFD Evacuation and Swift Water Rescue Boats when placed in service. The three member team should consist of the following positions:
 - Officer (Supervisor/Rescuer)
 - Helmsman (Boat operator)
 - Bowman (Rescuer)

B. Equipment

1. All Personal Floatation Devices (PFD's), both Rescuer and Civilian, need to be inventoried, inspected, and replaced if needed.
 - a. PFD's should be assigned based on the nature of the event.
 - b. Type-V PFD's should be considered for every style of boat operated by HFD. At a minimum the following should be followed:
 - i. TYPE-II PFD's should be available and worn by every civilian placed on an HFD Evacuation Boat and or HPD High Water Rescue Vehicle.

- ii. TYPE-V PFD's should be available and worn by every Rescuer and Civilian placed on an HFD Swift Water Rescue Boat.
 - c. Design trailers for water rescue cache (i.e., Type-II Personal Flotation Devices - PFD's) that can be staged in areas of the city that are prone to widespread flooding.
- 2. All members assigned to and working on HFD Evacuation Boats or Swift water Rescue Boats should be equipped with a water proofing bag and chest harness to protect their portable radios.
- 3. The department needs to purchase multiple High-Profile Vehicles that can be used to collect, transport, or shelter evacuees during rising water events.
- 4. All HFD resources intended for use during a water rescue event needs to be evaluated and replaced or updated as needed. This includes all Water Rescue boats (Swift Water Rescue Boats and Evacuation Boats), lighting, and loose equipment. In addition, the department should evaluate additional assets for moving evacuees out of rising water areas (areas with no current).
 - a. Lighting needs to be evaluated on all department Evacuation Boats and upgraded to new standards (LED lighting).
 - b. HFD Evacuation Boats need to have a detachable ladder added for the side of the boat to aid in assisting people safely into the boat.
 - c. The department needs to evaluate the use of flat-bottom John boats with no motors to be used in neighborhoods with rising water. The deployment model would include;
 - i. A single axle trailer that carries 6 to 10 boats **with no motor** and 20 to 25 Type-II PFD's. This asset would be available for quick deployment in neighborhoods experiencing rising water (water with no current) requiring mass evacuations.
- 5. The Houston Police Department has recently acquired decommissioned military assets to be used as High Water Rescue Vehicles. These vehicles will be staged throughout the city and brought into affected areas. The Houston Fire Department needs to develop a guideline and multi-department training to be able to operate with HPD and assist in deployment.
 - a. The High Water Rescue Vehicle, operated by HPD, will be supplemented with HFD personnel for water evacuation assistance.

C. Training

1. The department needs to budget for classroom and field training for the following:
 - a. All Suppression personnel assigned to a heavy apparatus should be fully trained to the **Operational Level** when performing at swift and rising water events.
 - b. The Houston Fire Department Technical Rescue Team (HFD-TRT) should be fully trained to the **Technician Level** when performing at swift and rising water events.
 - c. Texas State Boater Operations training should be provided to **all** members assigned to suppression.

2. A department certification program needs to be implemented that outlines all positions within the department that require unique, advanced, and detailed training. An identification system should be established to assist officers in easily recognizing what members have completed the necessary training so that they can be assigned to or expected to operate in a specialized capacity.
 - a. Evacuation and Swift Water Boats
 - b. Swim evaluations (for self-rescue)
 - c. Cascade Vehicles
 - d. Command Van
 - e. Booster Trucks
 - f. Rehab Unit

3. The department needs to continue to develop and train all members in proper radio communications. Classroom and hands on training should include the following:
 - a. Situational Awareness and Best Practices
 - b. Condition-Action-Needs Reports (CAN reports)
 - c. The use and navigation of multiple Talkgroups at the same incident

4. Members assigned to Emergency Operations in Suppression and EMS need to cross train with the HFD-TRT in various technical training. Suppression members need to be prepared to support and supplement HFD-TRT members during extended operations.
 - a. Rising and Swift Water Rescue
 - b. Trench Rescue
 - c. Confined Space Rescue
 - d. Structural Collapse and Search and Rescue operations

D. Communications

1. During severe weather events, OEC should be trained to perform a brief assessment as to the caller needs and then provide a list of immediate actions that the caller can take to help moderate responses and allow assets to be available for the most severe emergencies.
 - a. Develop a rating to determine the nature and severity of water events.
 - i. Flooded area or Rising water 1 to 5 foot deep needing evacuation **(ROUTINE)**
 - ii. Swift Water Rescue (with current) or Medical Emergency **(ELEVATED RESPONSE)**
 - b. Instruct citizens in multi-level buildings to shelter in place on second and third floor levels.

2. Incident Commanders should request a monitored TAC-Channel at every water rescue incident so that strategic- and tactical-level communications can be transmitted to both suppression and HFD-TRT members. The following additional radio procedures should be followed:
 - a. All TAC-Channels used during water rescue events should be continually monitored by OEC. Vital communications with Incident Command include incident clock updates, PAR notifications, and transmissions of emergency messages.
 - b. Additional communications on alternate Talkgroups (RESCUE3) should not be used for strategic or tactical transmissions. **These Talkgroups should only be used for non-emergency communications.**

3. A workgroup should be established in Emergency Response that can develop common Unit Identification for HFD units based on National Standards (i.e., Engine 003, Swift Water Rescue Boat, Command Van, etc.). The workgroup should also work with staff members at OEC to design a document that defines all HFD assets available to HFD Incident Commanders and what resources are dispatched to all types of incidents.

Appendix A – Relevant NFPA Standards

National Fire Protection Association (NFPA) 1670, Standard on Operations and Training for Technical Search and Rescue Incidents, is an organizational training document which determines the organizational capability of a response organization. NFPA 1670 was developed to define levels of preparation and operational capability that should be achieved by any authority having jurisdiction (AHJ) who has the responsibility for conducting technical rescue operations. It does not apply to individuals. [4]

National Fire Protection Association (NFPA) 1006, Standard for Technical Rescuer Professional Qualifications was designed to establish the minimum job performance requirements necessary for fire service and other emergency response personnel who perform technical rescue operations. [5]

Appendix B - Department Training

To prepare for technical rescue incidents including water rescues, the Special Operations Division trains to perform at either the **1) Awareness, 2) Operational** or **3) Technician** level. HFD Suppression personnel should be trained to the Awareness or Operational levels.

- 1) **Awareness Level** - This level represents the minimum training a responder must have and provides a general knowledge about basic search and rescue techniques. This level allows for a member to provide limited assistance.
- 2) **Operations Level** - This level trains members to be able to respond to technical search and rescue incidents and identify hazards, use basic equipment, and apply limited techniques specific to NFPA standards. Members trained at the operation level are called on to support a technical rescue response.
- 3) **Technician Level** - This level represents the highest capability of an organization's response to technical search and rescue incidents, to identify hazards, use specialized equipment, and apply advanced techniques specific to NFPA standards in order to coordinate, perform, and supervise technical search and rescue incidents.

Due to current promotional laws and policies, members that are trained at a Technician Level may have to leave the team and wait for an opening to occur in his or her new rank before they can return to the HFD-TRT. The overall experience level of this division is hindered by the current transfer policy based on collective bargaining agreements. The policy prohibits more experienced members from returning because transfers are based on a combination of seniority in rank and experience. A change in this policy would increase the overall retention of highly trained members for the team.

HFD Technical Rescue Team Water Rescue Training (specific)

HFD Technical Rescue Team members are trained to operate boats during two specific types of water events. The first involves incidents that involve rising water with no current. These events find victims stranded in low to moderate depth water and removed by evacuation boats that are literally

pushed by firefighters to higher ground. The second is more technical and pertains to swift water events (water with current moving over 1.3 knots). For these events, Rescue Team members are trained to use inflatable Zodiac Boats that are powered by a 40 horse power motor. In order for a Rescue Team member to be trained at a level so that he or she can effectively respond to a Swift Water Rescue, that member needs to attend a Swift Water Rescue "Technician Level class". Training opportunities are available year round but the flat line budget constraints have prohibited planning or scheduling. FY2010 was the last year when specific training classes were identified in the budget process.

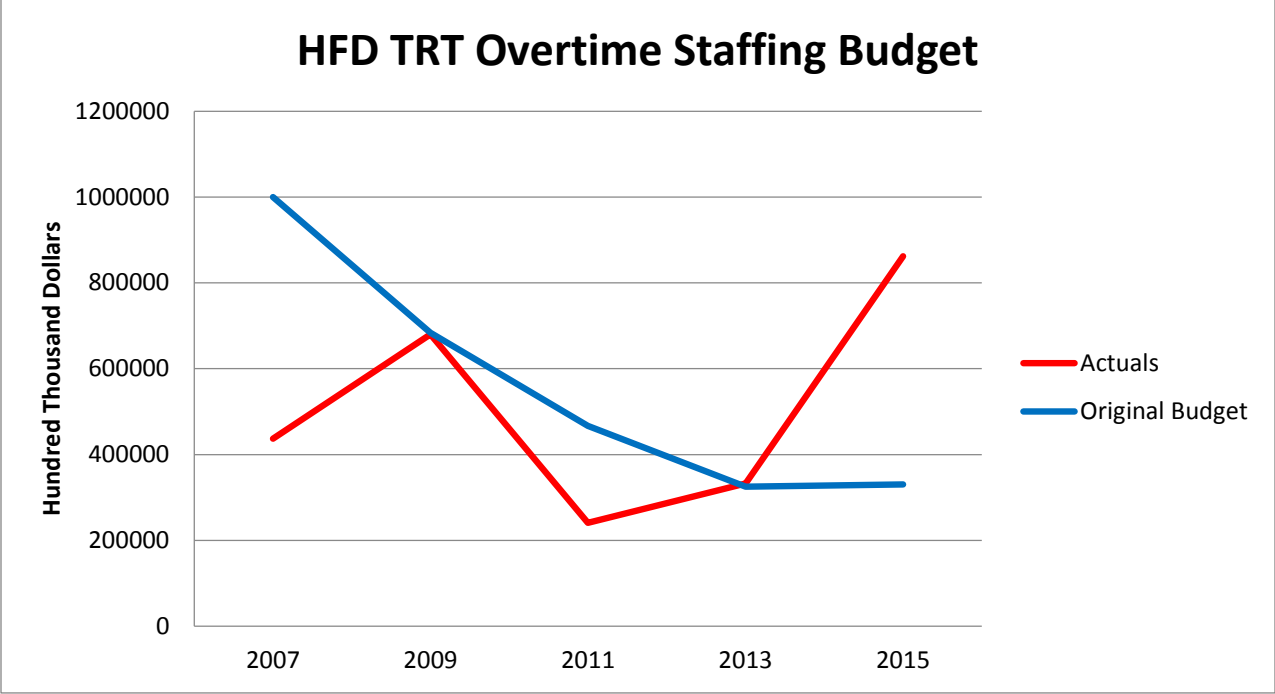
In addition, HFD-TRT members also need to attend a Swift Water Boat Operators class which teaches members advanced techniques in using the boat while conducting rescue operations and safely operating boats in swift water current. Due to attrition, promotions, open positions, and transfers, forty-seven percent (47%) of the current Rescue Team has never had a formal Swift Water Rescue or Swift Water Boat Operators Class.

HFD Swift Water Rescue Team (Non-Deployable)

Five years ago, HFD initiated a 20 member Swift Water Rescue Team that would assist members on the Rescue Trucks. The Swift Water Rescue Team (SWRT) would operate the Evacuation Boats during flood events and other extended water incidents. The members of this Water Strike Team have attended several classes over the past five years all on a voluntary basis. However, the team is non-deployable due to the inability to maintain current minimum training standards in competencies because compensation is not budgeted for training these members. Consequently, members of the HFD SWRT have lost interest and stopped volunteering for the training. This was seen last year when a training class was held in Galveston provided by Texas Task Force 1 and only three members attended. This team could be a tremendous asset during flood events by pre-deploying these members to stations with water rescue assets and having them respond with the HFD-TRT. (See; Recommendations)

HFD Technical Rescue Team Training Budget

There are only fifty-nine (59) members assigned to the HFD-TRT. Overtime funding is needed to "back-fill" positions so that members that would be on shift can attend comprehensive training courses. However, due to budgetary limitations, off-duty training requiring overtime or backfill of positions have not been possible. Therefore, HFD is faced with limited options to accomplish the necessary in-depth training while remaining in-service. This alternative presents difficult challenges. It is hard to develop consistent in-service training among four shifts on a daily basis. In addition, classes have to be stopped every time the team is dispatched to an incident which also causes a delay in response.



From 2007 to 2015 there has been a steady reduction in funding available totaling \$670,000.00 for overtime in the HFD-TRT Budget. In addition, the HFD TRT budget has been flat lined for the past four years in a row, therefore no training requests have been granted. In FY2015, the HFD-TRT overtime budget was reduced to just \$330,000 as shown above and this figure was only meant to cover daily minimum staffing levels for the entire year. The dramatic increase in Rescue Overtime actual expenditures over budget for FY14 and FY15 resulted from the need to “backfill” positions of those Rescue members that were seriously injured during the May 31, 2013 Southwest Inn Fire”. [7]

Appendix C - HFD Water Rescue Equipment

Personal Floatation Device - PFD

(Civilian and Rescuer)



Type-II PFD offers up to 22 lbs. of floatation and is most often used offshore in rough or remote waters. Type-II PFDs offer the most buoyancy, body coverage, and protection, particularly for unconscious wearers. This PFD is also available in child size which carries 11 lb. of floatation. This PFD carries a US Coast Guard Certification through testing by Underwriters Laboratories (UL). Though more bulky than other types, these Navy-style wrap-around jackets will turn a person face-up in the water so that he or she can still breathe even when unconscious. They can also keep a person floating for a long period of time until rescued. [8] NFPA does not make specific recommendations.



Type-V PFD provides 22 lbs. of floatation and offers adjustability to fit chest sizes from 30 to 58 inches. This jacket carries a US Coast Guard Certification through testing by Underwriters Laboratories (UL). This PFD also provides a Quick-release rescue belt, with stainless steel ring that can be used for "live bait" and other swift-water rescue techniques. [5]

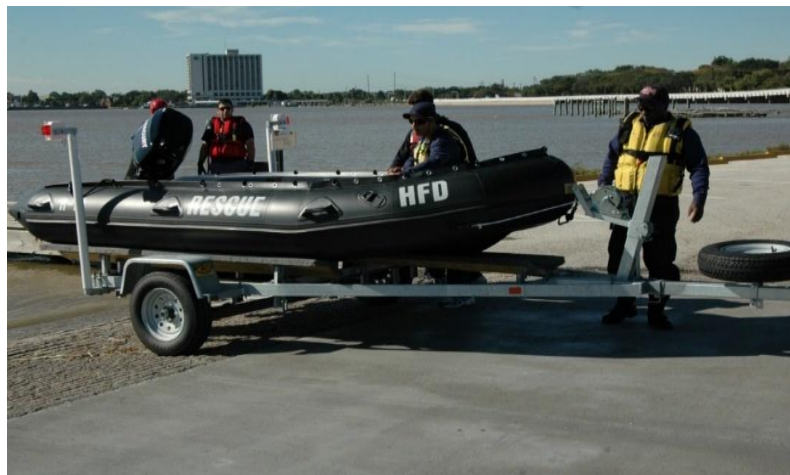
EVACUATION BOATS

The Houston Fire Department has ten (10) 18-foot aluminum flat bottom evacuation boats. These boats are equipped with ten (10) Type-II PFDs for civilians and children, and three (3) Type-V PFDs for rescuers. The maximum capacity is 12 persons. These boats are primarily designed to be used at rising water events and evacuate people who are stranded in their homes and neighborhoods. Members operating with Evacuation Boats load evacuees on the boat and then walk the vessels in non-moving water to areas of higher ground or to be loaded in High Water Rescue Vehicles.



SWIFT WATER RESCUE BOATS

The HFD Technical Rescue Team maintains five (5) Zodiac inflatable rescue boats ranging in size from 4.2 meters (420) to 5.3 (530) meters. The 420 deployment model is for one to two victims in swift current and the 530 deployment model is for more victims based on the conditions of the event. The 420 is now equipped with two (2) Type-V PFDs for civilians and the 530 is equipped with our (4) Type-V PFDs based on department deployment models. Rescuers don their Type-V PFDs, dry suits, and helmets that are carried on their apparatus prior to placing the boats in operation. The primary use for these boats are to rescue victims that are stranded in swift water.





HIGH WATER RESCUE VEHICLES

High Water Rescue Vehicles are used to evacuate civilians from rising flood waters that do not normally have current. Fire-fighters are trained to slowly walk evacuees in single file to a boat, High Water Rescue Vehicle, or to higher ground. To do so, members are taught to use firefighting equipment (long pike poles) to perform this task. The pike poles are needed to test the area in front of them and navigate around obstacles and debris which is usually hidden under the water. More importantly, and equally helpful, is to locate open man-hole covers that could cause a person to fall in and possibly drown. The City of Houston Office of Emergency Management (COH-OEM) has always assisted the Houston Fire Department when a request for this type of resource is made. These vehicles are provided by the City of Houston Public Works department and include dump trucks, flatbed vehicles, and other high water resources. It should also be noted that these vehicles are not immediately available and it can take upwards of 3 hours before they can be placed in service. The delay is mainly due to staffing requirements and safety modifications that must be made to the rear of these vehicles.



Appendix D - Actions taken by HFD since May 26, 2015

1. The HFD Technical Rescue Team Staff sent an Inter-Office Correspondence to all Rescue Captains detailing actions to take to better prepare their crews for future water rescue events. In addition, several points were provided based on Risk/Benefit Analysis (see; Appendix E).
2. The Houston Police Department has recently acquired decommissioned military vehicles through a Department of Defense excess property program available to law enforcement agencies. These vehicles have been converted to High Water Rescue Vehicles. (The example shown below is an actual High Water Rescue Vehicle available in HPD's fleet). These assets will be painted to match the HPD fleet and be used as High Water Rescue Vehicles throughout the city. Currently, the intent is for these assets to be stored at HPD facilities and driven by their officers into affected areas when needed. The Houston Fire Department is developing operational guidelines and training for its members, so they can work in a joint effort with HPD when they are placed in service. In addition, the HFD Technical Rescue Command has been working with HPD to equip these vehicles with additional PFDs and other loose equipment that will be needed for deployment.

Example (High Water Rescue Vehicle) [9]



3. The HFD Emergency Response Command is working to locate and identify the cost associated with Swift Water Rescue Technician classes. Suppression members have also been scheduled to take additional online Boater Safety Courses (see; Appendix F).

Appendix E–HFD-TRT Interoffice Correspondence (06-24-15)



CITY OF HOUSTON
Fire Department

Interoffice
Correspondence

To: All Rescue Captains

From: Keith Bobbitt
Senior Captain
Technical Rescue Team

Date: 6-24-15

This correspondence to be filed in Rescue
Correspondence binder

Subject: SWIFT WATER BOAT OPERATIONS

Internal Rescue Correspondence

A Shift _____ **B Shift** _____ **C Shift** _____ **D Shift** _____

All Captains and Acting Captains,

The Department is conducting an investigation of the recent flood event involving Rescue 11, and Rescue 42. In an effort to effect safe rescue boat operations in flood or rising waters please have all members review the following topics.

HFD guideline Evacuation and Rescue Boat Operations

HFD guideline on Water Rescue

HFD guideline on Hurricanes

Officers are reminded to do a risk vs benefit analysis when conducting any water operations to include:

- Follow HFD guidelines for Water incidents.
- Wear PFD's and PPE according to guidelines.
- Establish radio communication channels for incident.
- If radio communications are not reliable try to maintain line of sight communication.
- Man Evacuation Boats and Rescue Boats with 3 trained members.
- Evaluate personnel trained in Flood\Swift Water Operations.
- Assign a safety officer.
- Concur with Safety Officer that no HFD member on a water rescue scene wears bunker gear.
- Evaluate capability of on-scene boats.
- Consider ferry lines instead as an alternate to powered boats.
- Place PFD on every victim.
- Determine last seen entry points of possible victims.
- Establish upstream and downstream spotters.
- Establish plans to evacuate victims or shelter in-place.
- Determine collection points or high ground areas for victims.

Appendix F—HFD Special Bulletin No. 94 (08-07-15)

SPECIAL BULLETIN

HOUSTON FIRE DEPARTMENT
Promoting Excellence as the World's Largest Accredited Municipal Fire Agency
OFFICE OF EMERGENCY RESPONSE

STATION OFFICER:

A. _____ B. _____ C. _____ D. _____
AUGUST 7, 2015

SPECIAL BULLETIN NO. 94

TO: ALL OFFICERS AND MEMBERS

SUBJECT: Texas Boater Safety Education Course

Boater safety and training is an important element in the Houston Fire Department. Evacuation and Rescue Boat guidelines require that at least two members assigned to a rescue boat or evacuation boat must be Texas Boater Education Certified. The first step in becoming an evacuation boat or rescue boat operator you must complete the Texas Boater Education certification program. Members listed are required to take the online class by August 31, 2015. Members already possessing the Texas Boater Education certification are exempt but must provide a copy of their certification to their Station Captain. For those of you who already have the certification you may obtain a copy at the following website: <https://apps.tpwd.state.tx.us/theo/>.

The Texas Boater Education course can be accessed by using the interactive web-based course site at: <http://www.boatus.org/texas/> once registered, the required class can be accessed. The BoatUS Foundation's Texas Boating course consists of 6 lessons and a final exam. Each lesson has a 10-question quiz at the end to test your knowledge. The final exam is 75 questions and you must pass with a score of 80% or better.

Station Captain's will be responsible for ensuring personnel compliance in completing the course. It is the responsibility of the Station Captain to enter the class in the DC Staffing Training System in order to receive credit hours and for ease of tracking compliance. Enter training code **RE0077** and 6 hours of class time.

If there are any questions concerning this training course, please contact Captain Mark Miller, Rescue Division, via email at mark.miller2@houston.tx.gov or cell phone at 281-770-3400.



Richard Mann
Executive Assistant Fire Chief

Investigator information

The Houston Fire Department deeply regrets the loss of the three individuals that perished during the rescue attempt made on May 26, 2015. We will continue to dedicate our efforts in improving response and ensuring preparation for all future occurrences. During times of natural disaster, planning, training, and preparedness can never match the dangers faced by natural forces. The purpose for this document is to record the conditions encountered, review the actions taken, and learn from the tragedy.

This incident was reviewed by the following members of the Houston Fire Department and all comments and statements made herein, were established through a review process that included, but not limited to, reading statements, personal interviews, listening to audio, site visits, equipment evaluation, and research of professional publications.

District Chief Richard Cole – Station 21 D-Shift

District Chief Don Alexander – Station 21 C-Shift

District Chief David Swanson – HFD Technical Rescue Team – Staff

Senior Captain Keith Bobbitt – HFD Technical Rescue Team – Staff

District Chief Edward Llewellyn – Station 6 D-Shift

References

1. Harris County Flood Control – (Jeff Lindner; Meteorologist / Flood Watch Coordinator, Memorandum, July 20th, 2015).
2. Houston Fire Department – Office of Emergency Communication (OEC) – CAD System, HFD Event History Record Report [Event History Record: 1505260327]
3. Houston Fire Department – Office of Emergency Communication (OEC) – CAD System, HFD Event History Record Report [Event History Record: 1505260728]
4. NFPA [2009]. NFPA 1670, standard on operations and training for technical search and rescue incidents. Quincy, MA: National Fire Protection Association.
5. NFPA [2008]. NFPA 1006, standard for technical rescuer professional qualifications. Quincy, MA: National Fire Protection Association.
6. elaws – Fair Labor Standards Act Advisor, Retrieved from <http://www.dol.gov/elaws/esa/flsa/docs>
7. Houston Fire Department – Technical Rescue Team Budget (2007 – 2015)
8. United States Coast Guard-Selection, Use, Wear & Care, Retrieved from <http://www.uscg.mil>
9. Houston Police Department – Decommissioned Military Vehicle. Digital Image. COH Outlook Email; Captain Zera, Jonathan – HPD-CID.