310 UNIVERSITY BLVD WEST
POST-INCIDENT ANALYSIS

2 Alarm Church Fire
11 OCTOBER 2009

Completed by
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Introduction

On Saturday 11 October 2009 at 1218 hours the Emergency Communications Center (ECC) struck Box Alarm 16-10 for 310 University Blvd W. Eventually two alarms of apparatus were required to bring under control a fire in a church sanctuary. Before the fire was contained it had extended from the closet of origin into an interior overhead void. It appears that heat buildup in the void affected the underside of a metal deck roof, leading to a "running roof" fire consuming a significant portion of the metal deck roof. There were no exterior exposures, no water supply issues and weather was not a factor.

The fire began while the church was occupied. There are indications that the occupants of the structure did not immediately notice the fire and that notification of the fire department was delayed by attempts to control the fire. Searches of the church were negative.

In the end the fire on the inside was controlled with a single 1.75" hand line by the first due engine, with the second due engine and the first truck supporting the interior operation. Fire damage was limited to the room of origin and the roof decking; however smoke and water damage affected the vast majority of the structure.

Based on the assessment of the Fire Investigators the cumulative damage was estimated at $800, 000.

Alarms, Units and Initial Assignments

Incident F090106343 | Box Alarm 1610 | 310 University Blvd. W.

Run Order:
16, 19, 01, R2, 12, 54, 18, 02, 05, PG34, 24, 21, PG44, 07, PG41, 15

Box Alarm	E716, E719, E701, E712, E754
12:18:34	AT719, T701
	RS742B
	A716
	BC701, BC704
RID	AT718, RS715, M701
12:29:47	
Task Force	E715C, E724
12:40:04	T712
2nd Alarm (filled)	E718, E705B
12:46:23	T834

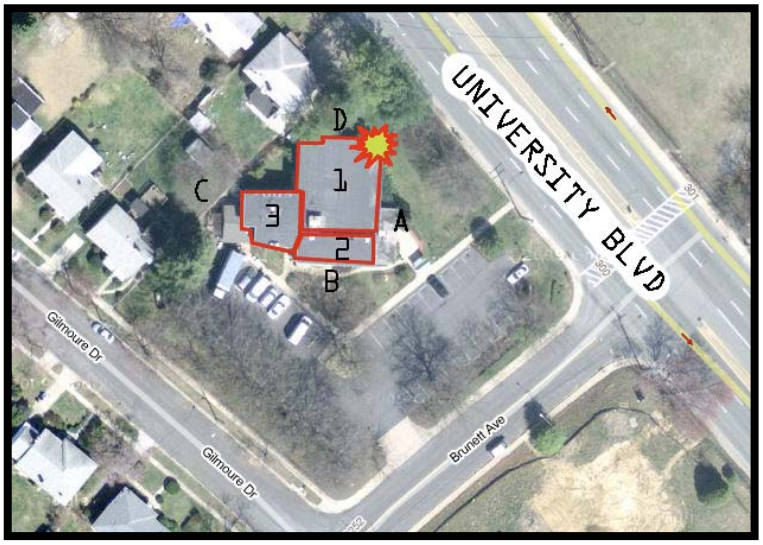
E716 officer establishes command in “investigative mode”, command later assumed by BC701.

Division 1	E716, E719, AT719***** C742**
Division 2	E701, K715E**
Search	RS742B**
Roof	AT719 driver, T701 driver, E702, T834, BC704**
ISSO	SA700
RIG	E712**, AT718, RS715, M701
Rehab	A716*, EMS702**

** initial supervisor*
*** permanent supervisor*

Building Structure/Site Layout

The structure is an active Buddhist Temple. From the address side the building is one tall storey (*a single storey of greater than usual height*). The main area of fire is outlined as (Area #1 in the graphic). Attached to this tall storey, but still integral to the structure was a two storey section used for a residence (Area #3 in the graphic) and a third section also attached and also two stories (Area #2 in the graphic).



The fire began in a first floor closet, marked on the graphic with a star.

Where the main body of the fire occurred there were masonry walls with wood studs and drywall. The overhead was drop ceiling below a metal deck roof with a composite roof covering that left a void space of about six feet between the bottom of the roof and the drop ceiling.

The building construction, more typically expected in strip malls or other commercial construction, allowed the fire to burn unnoticed in the building. The time delay between start of fire and initiation of fire department response allowed the fire to grow in intensity and to spread beyond the area of origin.

Fire Code History

Unknown

Fire Behavior[+]

Based on the reports of the fire investigators the fire began in a first floor closet. Being in the closet with limited ventilation the fire grew slowly, smoldering over a long period of time. Smoke and heat from the fire migrated upwards into the overhead void space and spread laterally across the underside of the roof deck.

Over time sufficient particulate matter entered the main body of the sanctuary to be noticed by the occupants. However, at this point it is likely that the smoke was still not visible. An occupant then noticed the fire in the closet and made an attempt to extinguish the fire. The closet door was opened as a part of the extinguishment effort creating a path for smoke travel directly into the sanctuary. People outside the building also notice smoke issuing from the building. As the occupants then began to evacuate the structure, opening and shutting doors on their way out, the fluid dynamics of the compartment had to change but it is

unclear what effect the opening and closing of doors had on fire growth and spread.

The latency between the fire starting and the onset of fire department operations cannot be determined with any accuracy but what there was sufficient heat build up in the overhead space to initiate what was essentially a second fire in the roof deck materials.

When fire department operations were initiated the fire was still ventilation controlled. Crews reported dense smoke inches off of the floor and high heat conditions inside the sanctuary. Sufficient heat and fuel remained to support flaming combustion. When the E754 accessed a door on the A/D corner of the structure (where the fire began) they introduced oxygen to the fire.[1] At this point the fire experienced rapid growth, supported by the now available oxygen, and breached the roof assembly, quickly becoming a fuel controlled fire.

The fire in the closet, once located, was controlled quickly with the application of a relatively small quantity of water from a 1.75" line with a combination fog/straight stream nozzle from a distance of about 30'.

The second fire in the roof decking was the result of the heating of the metal decking to a sufficient temperature to combust the tar, foam, and other roof products. Once initiated this fire was self-sustainable. Typically the most efficient tactic for controlling the spread of a metal deck roof fire is using streams from the underneath to cool the decking. However, the interior drop ceiling was not standard ceiling tiles, but rather drywall, slowing access from below. Roof crews were forced to pull up the roofing material and cool the decking from above. Working on such a fire from the roof requires a much larger commitment of manpower and material resources.

+ This discussion of fire behavior is a best guess based on available information and should not be confused with definitive assessments based on scientific modeling.

Communications

Montgomery clearly dispatched the correct address and provided adequate support to the incident. The communications issues present at the fire were the result of two main problems.

1. The first due engine officer had just changed the battery on her portable radio minutes before the alarm was sounded and unfortunately that battery died before she made entry to the building[2]. It was a few tense moments before the officer from AT719 spoke up on the behalf of E716's officer, averting the Mayday.

2. Because of the initial radio problem and the urgency of locating E716, both the initial engine and command failed to paint an accurate picture of the operational situation.[3]

Pre-emergency Planning
Pre-plans were never considered or consulted.

Support Functions
Rehab was established by A716, later supervised by EMS702 and supported by Canteen 5, the church membership, and AR716.

The electric and gas companies were present and secured utilities.

The County Police controlled traffic on University Blvd, re-routing it completely for several hours.

Ancillary personnel on the fire ground must be encouraged to check in at the command post to announce their presence prior to engaging in operations.[4] They should also refrain from interfering with fire ground operations via excessive chatter on the tactical talk group.

Safety Group
Safety was assigned to SA700 early in the incident. SA700 and other units continue to us the term IDLH in reference to CO concentrations that are well below scientifically established thresholds. I continue object to inaccurate use of the IDLH acronym as applied to CO. 1200 PPM is the IDLH not 35, 100, or even 200 PPM.[5] There is a difference between an IDLH being present and a policy based need to utilize SCBA.

Accountability
Accountability was maintained by Division/Group Supervisors and confirmed by command via a PAR.

Investigations
Investigations arrived, made contact with the command post and conducted an investigation. Fire Code Enforcement was also present.

On Scene Operations

When the box alarm was sounded the first due Battalion Chief was at Co. 2. Co. 2 is 8th due on the box card and as such there was significant amount of time between the dispatch and the arrival of the Battalion Chief.

Most, if not all, units due on the initial box alarm were on the scene and engaged in operations prior to the arrival of the Battalion Chief. Those units each engaged prior to being directed and they, with the exception of E754, operated within the standard operating procedure.

On arrival BC701 assumed the command and positioned on the Alpha side of the structure. The vantage point of command was blocked by a tree and throughout the incident command could only see the smoke and for a brief moment flames over the treetops.

The first arriving engine positioned on University Blvd, Side Delta of the structure. The second due engine saw this and dropped their crew off on side Delta, sending the driver back to complete the water supply for the first due engine.

The first arriving engine (E716) stretched a 300" 1.75" attack line to the Alpha side entrance of the building. As they stretched their line the second arriving engine (E719) was also stretching (a line from the first due engine) into the same entryway. AT719 parked inside the church complex, using Brunette Ave. to make entry into the facility parking lot on Side A. The driver of AT719 laddered the roof and placed multiple ground ladders to the two-storey portion of the structure. E701, third due and third arriving, laid a line on Gilmoure (E712 secured this line) and stretched to the rear. E701 provided a Side Charlie report and confirmed that there was no fire in the basement level.

E716 and AT719 entered the structure first, as E719 waited at the entryway for their line to be charged. Charging the second line took time because E716's driver, as we teach, was waiting for his supply line to be charged.[6] E719's driver had to drop off his crew, drive to the next intersection, and charge an initial lay that was over 1000' from the incident.

E754 laid a supply line from a hydrant on University Blvd and took a position on Brunette Ave. Their crew then stretched a line from E754 to the Delta side of the structure and began to force a door on the Delta side. This door led directly to the main area of fire involvement. As they were finally getting the door open, interior crews had just located the seat of the fire. They later relocated, without notifying command, to the roof and operated there.

As E716 and AT719 entered the structure they entered a long hallway perpendicular to University Blvd. This hallway had multiple entryways to the sanctuary where the fire was located. E716's officer, based on what she saw as she approached the scene, had an idea that she needed to "go right" once she got into the structure but did not realize the amount and type of space she would have to traverse to get there.

The interior crews opened the first set of doors on the right and had a smoke condition but no heat condition. They then moved to the second set of doors and found the same smoke condition along with higher heat conditions. What they did not know is that all the doors along that side of the hallway opened into the same space. As they tried to enter this space from the second set of doors they encountered physical obstructions on the floor level which they were able to identify as chairs. What they were not able to tell is whether they were heading into a closet or some other space not related to the fire. The officer was directly behind the nozzle person and was using her reports about obstructions encountered to determine the next course of action. So they went to the third set of doors which was only a few inches from the second set and the conditions were similar, including the floor level obstructions.

By this time the officer from AT719 had been assigned to the role of Division 1 Supervisor and had been given E716 and E719 to supervise. The officer of E716 decided that the best mode of attack would be through the first door they encountered. As they moved back towards that door E719, now with a charged line, was able to join them in the effort.

E701, after checking the basement moved upstairs, apparently not aware that there was a level of building above the sanctuary. E701's officer quickly located an entryway into the sanctuary and identified it as the area of fire involvement. He did not realize that the other crews were just a few feet away in the same hallway entering the same compartment space from the same direction. E701 wisely called command before initiating a fire attack and was told not to attack the fire.

At this point command, much like the interior crews, was not aware of how the units were arranged and was fearful of opposing hand lines. As command tried to sort out the situation Division 1 advised that he too had found the fire and was prepared to attack. At about the same time E754 forced the exterior door and announced that they were prepared to attack the fire, once their hand line was charged (it never was).

Meanwhile command called RS742B to ensure that they were conducting a primary search. Our primary objective should have been to conduct a search of the structure. While our hose line was appropriately placed to support that search there is no indication that its placement was guided by the requirements of the search. Command assigned a single company to search a two-storey church and

then focused on the fire, a clear indication of misplaced priorities.

Command should have supported the search effort with additional companies under a search group supervisor before augmenting other groups and/or divisions. Recognizing that this was a church on fire on a Sunday should have prompted command to two things:

1. The need to assign someone to work with church leadership to account for occupants
2. Understand that crews were facing large, open, perhaps oddly configured spaces, exposing them to increased risk of getting lost.

There was a delay in attacking the fire as command tried to sort out which where the units were. Finally, command told Division 1 to press the attack and advised the others to stand by. E701 was then directed to the floor above the fire. It turns out that the floor above was actually part of a second wing and while there was some smoke spread and fire spread in the roof assembly the area was physically remote from the main body of fire.

The delay in attacking the fire was based in the inability of the interior crews to develop rational models of the interior arrangement of the space. The amount and density of the smoke prevent visualization for interior crews. AT719 did attempt to use his thermal imager but it malfunctioned so they located the fire manually.

The fire was extinguished by E716 using the 1.75” line they stretched from their piece. Control of visible fire was obtained with a few seconds of flow.

Command found great difficulty in integrating additional help at the command post. Multiple persons attempted to assist command with unit tracking and incident control and some of their efforts led to greater confusion for command.

The arrival and presence of the DOC at the command post was the exception as it cleared up a great deal of confusion and certainly streamlined decision making processes. The DOC foresaw the need for additional resources and called for them on behalf of command on an alternate talkgroup.

While the existing operational paradigm of MCFRS encourages, if not mandates, the build out of “command teams”, the creation of ad-hoc teams not accustomed to functioning as a cohesive unit can be as detrimental as it is helpful.

Outstanding Issues

[1] When the 5th due engine accessed a door on the A/D corner of the structure (where the fire began) they introduced oxygen to the fire.

This was a case of extreme free-lancing. Command never assigned a unit that was by policy to remain uncommitted, however, they managed to engage on multiple levels throughout the incident. Command was more than clear in his distaste for freelancing and addressed this with the company in question.

[2] …unfortunately that battery died before she made entry to the building
There has to be organization wide discussion on two points. The first is how do we fix the battery problem and the second is whether units without radio communication should be operating in an IDLH environment.

[3] Because of the initial radio problem and the urgency of locating E716, both the initial engine and command failed to paint an accurate picture of the operational situation.
Command assumes responsibility for failing to paint an accurate picture of the nature and extent of the operation and will endeavor to do better the next time.

[4] Auxiliary personnel on the fire ground must be encouraged to check in at the command post to announce their presence prior to engaging in operations
Canteen 705 and FM19 both made numerous unnecessary transmissions on the tactical talk group and should be encouraged to refrain from such behavior in the future.

[5] Inaccurate use of the IDLH acronym as applied to CO. 1200 PPM is the IDLH not 35, 100, or even 200 PPM.
While we can certainly enforce our local rules we should not use real terms inappropriately. Surely a CO level of 200PPM is nothing to scoff at but it is not an IDLH and the wanton use of the term cheapens its effectiveness.

[6] Charging the second line took time because E716's driver, as we teach, was waiting for his supply line to be charged.
I understand the thought that says you never charge a back-up line until a continuous water supply is established. I have even taught that rule to new drivers.

But consider what would have happened if E716 stretched into that church and their line burned through (which it eventually did) and they were overrun by fire. E719 was not in a position to help because they were at the front door with a dry hose. A dry back-up line is not a back-up line.

The notion of not charging the second line is so engrained in our collective psyches that even if E719's officer insisted or tried to explain valuable time

would be lost waiting for the line to be charged.

I am not suggesting that we need to change the way we think about charging back up lines but I am suggesting that we need to act with our back up lines. It is this thought process that supports the idea of stretching the back-up line (when possible) off of the second due engine.

I am also not suggesting that we delay search protection or fire attack in standard structures until the second line is charged, however, when we face non-standard situations or situations where there is a reasonable likelihood of the back-up line being needed and where life safety issues have already been addressed, maybe we should wait until the back up line is charged to attack the fire.

[7] An engine company self-dispatched to the fire after clearing a medical call nearby. Obviously this is aberrant behavior and it was handled immediately.

Overall Analysis of Incident

This incident was not remarkable in that while the incident commander and unit officers met all of the published benchmarks and while there was only one known case of overt free-lancing and while only one unit self-dispatched to the scene, there was not a recognizable unity of effort and action.

Communications both laterally and vertically were poor. The incident priorities not covered as quickly as they could have been. The issue of how a unit officer behaves without an operable radio in an IDLH must be scrutinized. We can all agree that a functioning radio is a vital component of our operations but there has been no critical, policy level, discourse on the matter.

Tactically, the command and individual crews should have recognized that this incident was beyond the scope of the SOP in as much as the SOP is designed for residential structure fires where there is a reasonable likelihood that persons are still alive inside. With this being a church during active hours it was still critical that searches occur. The fact that it was a church should have clued units into the fact that they may have faced large open areas and/or complex floor layouts. While it is certainly possible that units should have anticipated greater than average needed fire flows and subsequently the need for higher flow rates, that would have been a secondary concern. The primary objective still would have been a search of the main areas of the building with hose line support.

Given the situation that we faced, and assuming that it was beyond the design limitations of the SOP I still believe that the standard resource allocation and positioning dictated by SOP was sufficient for initial operations. There is no indication that the first and second engine coordinated their operation but this was not a factor because the fire was small.

Even today, without any time pressure it is difficult to explain the physical layout of the structure. Command was not clear on how the units were spatially arranged until after the fact. Therefore command fully understands how the individuals unit could be co-located in a physical space and have no idea that they were dealing in the same space. Certainly it would have been helpful if command or interior units were able to draw a better picture of what was happening however, sometimes that is just not possible and I think what is important and was important for this incident was to be able to operate despite the uncertainty.

The units had committed, as they often do, before the arrival of command. Command had to supported the implicit objectives and tactical mechanisms of those initial units, until the nature of the incident became clearer. Admittedly, the ability to project future states of being or need was enhanced by the arrival of the DOC as much as it was initially limited by the urgency of the present.