

Title of Investigation: fa Super Store Fire	Investigation Number: 763010-07-0172	Report Number: 32
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**ATF NATIONAL RESPONSE TEAM
ORIGIN AND CAUSE REPORT**

SUMMARY OF EVENT:

ATF NATIONAL RESPONSE TEAM ORIGIN AND CAUSE DETERMINATION:

From June 19, 2007, through June 22, 2007, members of ATF's National Response Team conducted an origin and cause investigation of a fire that destroyed a business known as the Sofa Super Store, located at 1807 Savannah Highway, Charleston, South Carolina. This fire resulted in the deaths of nine (9) Charleston Fire Fighters.

NARRATIVE:

1. On June 18, 2007, at approximately 1908 hours, the Charleston, South Carolina, Fire Department responded to a working fire at the Sofa Super Store, 1807 Savannah Highway, Charleston, South Carolina. This fire destroyed the business and resulted in the deaths of nine (9) Charleston Fire Fighters.
2. The Sofa Super Store is owned by the Goldstein Family Limited Partnership, 1807 Savannah Highway, Charleston, South Carolina. The Sofa Super Store is insured through [REDACTED] Insurance of [REDACTED] Policy Number [REDACTED], with the agency being C.T. Lowndes & Company, 136 S. Main Street, Summerville, South Carolina, and telephone number (843) 875-2300.
3. ATF was contacted by the Charleston Fire Department, and was requested to assist in the origin and cause determination of this fire and to assist with any follow up investigation that is necessary.

PARTICIPATING FIRE INVESTIGATORS:

The following investigators participated in the origin and cause determination of this fire:

Prepared by: [REDACTED]	Title: Special Agent, Greensboro I Field Office	Signature: [REDACTED]	Date: 6/22/07
Authorized by: [REDACTED]	Title: Team Leader Southeast Region	Signature: [REDACTED]	Date: 6/22/07
Second level reviewer (optional): Zebedee T. Graham	Title: Special Agent in Charge, Charlotte Field Division	Signature: [REDACTED]	Date: [REDACTED]

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SA [REDACTED]

SOUTH CAROLINA LAW ENFORCEMENT DIVISION

Lieutenant [REDACTED]

SA [REDACTED]

WITNESS STATEMENTS:

5. **Fire Discovery:** This fire was discovered and reported by [REDACTED] DOB [REDACTED], who resides at [REDACTED] South Carolina, telephone number (843) [REDACTED]. [REDACTED] stated that at approximately 1856 hour he was driving his white [REDACTED] work van west on Savannah Highway when he observed smoke and then what he described as a "funnel type" blaze coming from the right (west) rear of the Sofa Super Store. [REDACTED] stated that he then turned around and attempted to drive to the fire, but his path was blocked by a locked chain link gate located on the west side of the Sofa Super Store. [REDACTED] then went inside the store and notified the employees of the fire. He stated that he and an older [REDACTED] (later identified as [REDACTED]) walked through the store toward the area where he had observed the fire burning on the outside the business, and when they entered the area which was later identified as the deck area, he observed the fire beginning to burn through the upper left ceiling area and into the deck area. [REDACTED] stated that he and the [REDACTED] then made their way back to the front of the store and told the employees to call 911, at which time [REDACTED] also called 911 on his cell phone. He stated that an employee then gave them a set of keys for the gate on the west side of the building so they could unlock it for the Fire Fighters. After the fence was unlocked and opened, [REDACTED] and the [REDACTED] walked down along the side of the building and he stated that he observed a mattress burning next to the building and a couch in front of the mattress that was also on fire. [REDACTED] stated that the area appeared to him to be an employee smoking area. He stated that he ran back to the front of the business, at which time he heard employees talking about retrieving a fire extinguisher and that he told them it was too late for a fire extinguisher. [REDACTED] stated that he asked the employees who had been smoking back in that area, and at first no one would answer him, but he continued to ask them about employees smoking in that area, and finally a [REDACTED] employee told him that "there was about ten people smoking out there an hour ago." [REDACTED] then left the store.

6. [REDACTED] an employee of Sofa Super Store, who resides at [REDACTED] South Carolina, telephone number (843) [REDACTED] was working the evening of the fire and stated that shortly after 7:00 p.m., an unknown person (later identified as [REDACTED]) came into the store and asked if they knew that the store was on fire. [REDACTED] and Assistant Store Manager [REDACTED] went further into the store heading towards the loading dock area they refer to as the deck area. [REDACTED] said he observed smoke coming into the deck area of the business from outside. He stated that he and [REDACTED] then went back towards the front of the store at which time he obtained [REDACTED] keys, and that he and [REDACTED] went outside and unlocked the gate on the west side of the business to allow access by the fire department. He then walked along the west side of the building and saw three (3) old couches, located outside the deck area, on fire. [REDACTED] said the couches were old pieces of furniture that had been collected from residences and stored at this location until they are removed by the City of Charleston. [REDACTED] also stated that he had frequently seen warehouse workers hanging out and smoking cigarettes in the area where the burning couches were located, but that he had not been in that area the day of the fire and could not say if anyone had smoked in that area that day.

7. [REDACTED] Assistant Store Manager for the Super Sofa Store, who resides at [REDACTED] South Carolina, telephone number (843) [REDACTED] stated that on the evening of the fire a civilian [REDACTED] came into the store and stated that there was smoke coming from the right (west) side of the building. [REDACTED] went through the showroom of the business to the deck area, where he and [REDACTED] observed smoke coming into the deck area from outside. [REDACTED] and [REDACTED] proceeded back to the front of the business, at which time he gave his keys to [REDACTED] to unlock the gate on the west side of the building, and he then obtained a fire extinguisher and proceeded back to the deck area. He then stated that while using the fire extinguisher he noticed heavy smoke and some fire around an exhaust fan located on the west wall of the deck area, as well as fire and smoke coming in around a sliding door located on the west wall of the deck area where the deck area attaches to the warehouse. [REDACTED] stated that after using the first fire extinguisher, he proceeded back to the showroom to retrieve another fire extinguisher, but when he returned to the deck area the fire and smoke was overwhelming and he had to retreat from business. [REDACTED] stated that while he was attempting to extinguish the fire he heard the roll down doors automatically drop down, stating that there are fire protection doors throughout the business. He also stated that the exhaust fan in the deck area was not used and that it had been covered with a blanket.

8. **Fire Suppression:** This fire call was received by the Charleston Fire Department at approximately 1908 hours on June 18, 2007. The first dispatch was sent at 1909 hours, with the first Engine Company, Engine 10, was en-route at 1909 hours. Ladder 5 was the first company on scene, arriving at 1911 hours. ASSISTANT CHIEF [REDACTED] Charleston Fire Department, stated that he arrived at the scene prior to any of the Engine companies, and he then advised the responding Engine companies to pull up to the front of the building due to trash being located at the rear of the store. Chief [REDACTED] then entered the building with Acting Captain [REDACTED] and proceeded to the deck area. He stated that he observed small traces of smoke coming from the ceiling area of the west showroom. When Chief [REDACTED] started opening a door to the deck area, he said the door was pulled out of his hands due to the differences in pressure between the showroom and the deck area. Chief [REDACTED] stated that the deck area was fully engulfed in orange flames and that he attempted to reach into the room to close the door but could not due to the extreme heat. He stated that Captain [REDACTED] also attempted to close the door but was unsuccessful. Chief [REDACTED] stated that the room quickly filled with smoke, and that he then received information that an employee of the Sofa Super Store was trapped inside the building so he then exited the building to assist in the rescue of the employee.

9. **ACTING CAPTAIN [REDACTED]** Charleston Fire Department, who was the Acting Captain on Engine 11 the day of the fire, stated that when he responded on Engine 11, he observed black smoke coming from the Pebble Avenue section of the building. Captain [REDACTED] then positioned Engine 11 at the northwest portion of the building. Captain [REDACTED] stated that he then entered the front of the building with Chief [REDACTED] passing several employees while proceeding toward the deck area of the business. He stated that he observed smoke coming from the ceiling tiles around the closed door between the west showroom and the deck area, and that when Chief [REDACTED] opened that door, he observed what he described as massive amounts of orange flames in the deck area. Captain [REDACTED] stated that he then proceeded back to the front of the business to assist with bringing a one and one-half (1-1/2) inch hand line into the building. As he was pulling the hand line into the building, Chief [REDACTED] noticed that the hand line was not charging, so he proceeded back outside to assist in charging the hand line. He stated that when he went to return outside, visibility inside the building had dropped completely and he had to hold onto the hose to find his way back outside. Captain [REDACTED] stated that the 1-1/2 inch line finally charged, and he then proceeded back inside the building, this time observing a two and one-half (2-1/2) inch line had been pulled into the building but was not charged. Captain [REDACTED] exited the building again, with the 2-1/2 inch line then being charged. Captain [REDACTED] then assisted in pulling a hand line to the loading dock area on the west side of the building, and when he returned to the front of the building he observed flames coming out of the front of the building. Captain [REDACTED] (5)

██████████ emphasized that this entire series of events, from dispatch to assisting in the loading dock area, took less than ten (10) minutes.

10. **Owner/Occupant:** The Sofa Super Store was open for business at the time of this fire. ██████████ Assistant Warehouse Manager of the Sofa Super Store, DOB ██████████ who resides at ██████████ South Carolina, telephone number (843) ██████████ stated that on the day of the fire, he and ██████████ were the last two men to leave the warehouse of the Sofa Super Store and that they clocked out of work at approximately 6:40 p.m. He stated they locked the doors on the warehouse and then walked out the front of the showroom together. They then locked the gate on the west side of the building that leads back to the loading dock and warehouse. He stated that at that point he had a clear view of the warehouse and did not see any smoke. He acknowledged that he does smoke, but that he did not smoke during the last hour or so of his work day.

11. ██████████ warehouse employee for the Sofa Super Store, ██████████ DOB ██████████ who resides at ██████████ South Carolina, telephone number (843) ██████████ stated that he left work at approximately 6:30 p.m. the day of the fire, and that he did smoke in the area outside of the deck area, but that when he finished with his cigarettes, he would throw the butts into a bottle of water. He could not remember when the last time he was on that side of the business smoking.

12. ██████████ warehouse employee for the Sofa Super Store, ██████████ DOB ██████████ who resides at ██████████ South Carolina, telephone number (843) ██████████ stated that he started helping with locking up the warehouse area at approximately 6:30 p.m. He stated that he exited the front of the business with ██████████ and another employee named ██████████ and as ██████████ and ██████████ were locking the gate on the west side of the building he had a clear view of the loading dock area and he did not see any smoke when he left at approximately 6:40 p.m. ██████████ stated that he does not smoke, but that several employees do smoke outside the warehouse/deck area, sometimes throwing their cigarette butts on the driveway near the loading dock or up and down the driveway on the west side of the building, as well as using the butt cans that are outside the warehouse. He did not remember seeing anyone in particular smoking right before he left the day of the fire.

13. ██████████ warehouse employee for the Sofa Super Store, DOB ██████████ who resides at ██████████ South Carolina, telephone number (843) ██████████ stated that at approximately 6:00 to 6:10 p.m. on the day of fire, he sat in front of the warehouse and smoked a cigarette. He stated that he then threw the cigarette straight ahead, onto the paved area between the warehouse and the deck area.

14. ██████████ DOB ██████████ who resides at ██████████ South Carolina, telephone number (843) ██████████ stated that he is employed by the Sofa Super Store to repair damaged furniture. ██████████ was working in the repair shop, located on the east side of warehouse and deck area, the day of the fire. He stated that sometime after 7:00 p.m. he heard sirens from what he thought might be a fire engine, but he did not realize they were coming to the store. He soon began smelling smoke, so he proceeded out of the repair shop into the warehouse. He then observed debris, which he described as miscellaneous papers and sandpaper, blowing toward him in the area of a ramp leading from the showroom/deck area into the warehouse. ██████████ attempted to find another escape route but realized they could not find another way out, so when he checked the area of the ramp again, he saw that the overhead door was down, which he indicated was never down, and that the door was on fire. He then proceeded back to the repair shop and indicated that he had a difficult time closing the door to the repair shop due to what seemed like a strong wind holding the door. ██████████ then called 911, advised the 911 dispatcher of his location, and

then began hitting the metal siding of the building so fire department personnel could locate him [REDACTED] was eventually located and rescued from the building.

BUILDING CONSTRUCTION:

The building was a single story corrugated steel structure covering approximately 30,000 square feet of showroom, office, and warehouse space and faced north on Savannah Highway. The main showroom had originally served as a grocery store and had been converted to a furniture store. Over the years, additional corrugated steel showroom space had been added on the east and west sides of the original concrete block walled building. Office space was located on the south end of the main showroom. A corrugated steel warehouse was added to the southwest quadrant and was connected to the showroom area by the platform/loading ("deck") area.

Showroom/Office Space:

1. The showroom/office space was on the north side of the structure and consisted of approximately 14,000 ft². The showroom space was split into three sections, with a main showroom with wings located along the east and west sides. The front door entered through the main showroom section and windows were located along the front of the entire showroom area. The showroom/office area was built over a concrete slab and had a roof of metal sheeting. There was carpet covering the concrete slab.
2. The main showroom was originally built as a grocery store and consisted of concrete block walls with steel trusses running east/west. The trusses were supported by the concrete walls on the ends with two separated steel girders and columns, running north/south on either side of the front door. The office space was located to the south of the main showroom. The office area was separated into several rooms, which had wood studs covered in gypsum. There was a concrete block room located to the south of and accessed by the office area. This rear concrete block room had a wood roof with a membrane covering. Along the south wall towards the southwest corner was a roll up door, with fusible link, leading into the warehouse area.
3. Additions were made to the east and west of the main showroom. Both of these areas had steel columns supporting steel main girders running north south and smaller steel "I" beams running east/west. The walls were 2x4 metal studs on the east/west/south sides, with 2x6 metal studs on the front/north side. The 2x4 studs extended 10' from the floor and were covered in gypsum. A drop ceiling was in place approximately 9' off the floor. On the south and west walls there was an eight inch (8") void space between the metal studs and the exterior metal walls. The main showroom and showroom wings were separated by three (3) roll up doors which had fusible links. On the west wing there was one exterior door located along the west side towards the northwest corner. There was a double door along the south wall entering into the deck area. On the east wing there were two exterior double doors located along the middle and southeast corner.

Platform/Loading Area (Deck):

4. The deck area was located to the rear and west of the retail space and consisted of approximately 2,200 ft², built over a crawl space. The walls were 2x4 wood studs covered with plywood on the interior and metal siding on the exterior. The roof was metal sheeting supported by wooden rafters. A roll up door, with a motorized open/close system, was located along the east side, separating the deck and rear of the main showroom. A sliding metal door was located along the southwest corner leading to an exterior ramp. Double doors were located along the north wall entering into the west wing of the showroom. This area was separated into areas by plywood walls and had floors covered with plywood and carpet.

Warehouse:

5. A 15000 square foot warehouse with a 27 foot high ceiling was located at the south end of the structure. The warehouse was high-rack storage with metal walls and roof, built over a concrete slab. The commodity in the warehouse was stored on 18 ft. tall rack storage units. Single row 42 inch deep rack storage units were located along the outer perimeter of the warehouse. Nine double row rack storage units were mounted in a north-south orientation in the central portion of the warehouse. The double row rack storage units were 85 inches wide with a 60 inch aisle separating the racks. A 16 ft. wide aisle was located at the north end of the central racks.

Active Fire Protection and Signaling Systems

6. There were no automatic fire sprinklers or signaling systems installed in the structure.

Passive Fire Protection Systems

7. The structure was separated into four fire compartments by noncombustible walls and self-closing automatic fire doors. All overhead self-closing fire doors were equipped with fusible links with activation temperatures of 165°F. The east showroom was separated from the main showroom by concrete masonry walls and three overhead automatic fire doors. The west showroom was separated from the main showroom by concrete masonry walls and three overhead automatic fire doors. The warehouse was separated from the rest of the structure by concrete masonry walls and one overhead automatic fire door.

Fusible links on all of the automatic self-closing overhead fire doors activated. Two of the three fire doors between the main showroom and east showroom closed as designed. The third overhead door activated as intended, but was held open nominally five ft. above the floor by a coat rack. None of the overhead automatic doors between the main showroom and the west showroom closed when the fusible links activated. The overhead automatic door to the warehouse operated as intended early in the fire.

Fire separation between the different fire compartments was compromised by an interior connection created by the "Deck" room. The "Deck" had originally been constructed as an open roofed loading dock. The fire codes require rated fire doors between interior compartments in a structure, but exterior doors in rated construction are allowed to be non-fire rated. Non-fire rated exterior doors were installed between the "Deck" and the main showroom and between the "Deck" and the West Showroom.

Electrical Examination:

The electrical utility service for the structure was provided by three pole-mounted transformers located on the southeast corner of the structure. The three transformers were wired in a delta-wye fashion and supplied 120/208 volt, 3 phase, 60 hertz service. The transformer primary fuses were pulled during the fire at approximately 1940 by a representative of South Carolina Electric and Gas. The three fuses were intact and the representative indicated the transformers were not laboring at that time.

From the transformers, service drop conductors were routed to a second power pole where the current-tap style utility meter was mounted. The meter, conductors and current-tap transformers were intact with no thermal damage. From the second pole the service drop conductors were routed to an attachment point on the rear of the structure. At the attachment point the conductors were spliced into 4 separate feeds and routed through conduit into the structure. Two parallel runs terminated in a wire-way on the interior wall at the attachment point. Several fused disconnects were fed from the wire-way. Examination of the devices and wiring, which were

SCENE PROCESSING:

On Monday, June 18, 2007, the fire occurred at the Super Sofa Store, located at 1807 Savannah Highway, Charleston, S.C. The ATF National Response Team was activated on Tuesday, June 19, 2007. On Tuesday, June 19, 2007, at approximately 8:30am, ATF SACFI [REDACTED] reported to the scene. On Wednesday, June 20, 2007, the ATF National Response Team was on scene and assisted the South Carolina State Law Enforcement Division, the Charleston, SC Fire Department, the Charleston, SC Police Department, and the Charleston County Sheriff's Department with the fire scene and continuing interview investigation. The origin and cause determination was started on Wednesday, June 20, 2007 and concluded on Friday, June 22, 2007. The authority for the fire investigation was originally based on exigent circumstances, then owner consent was obtained and the investigation continued and concluded with a State of South Carolina Fire Investigation Search Warrant for the property known as the Super Sofa Store. This investigation was documented by the use of photography, forensic mapping, evidence collection, fire dynamics analysis, and fire pattern and spread analysis.

The origin and cause investigation was conducted in the systematic and scientific manner. The fire investigation team began their investigation by a counter clockwise walk around of the entire Super Sofa Store. The walk around was started in the front parking lot of the business and concluded on the west side of the structure. During the walk around of the exterior, the exterior damage, the utility service entrance locations and the fire spread patterns were noted. The exterior examination of the fire scene revealed several attached buildings within the property of different style construction. The building at the front of the property closest to Hwy 17/Savannah Highway was determined to be facing in a northern direction. Examination of this building revealed fire damage to the entire structure. The least damage to the structure was noted in the west showroom area of the property. Structural collapse of the roofing system was observed from the southern warehouse area continuing throughout the store to the deck area, the west showroom area and to the main showroom and rear office areas.

The exterior examination of the front of the property revealed that that the front upper parapet had collapsed and was covering the entire front door portion of the business. This area was documented as the center or main showroom area. The east showroom area revealed that the front showroom windows were open (and or broken out during the fire fighting operation) and the interior contents revealed upper layer fire damage. Based on the observations in this area, this area was determined to be the least damaged area of the structure. The exterior walls on the northeast side showed minor heat damage, as the walk around continued in a southern direction the heat damage, mainly in the upper portions of the exterior sheet metal walls revealed more damage at the southern ends of this area. Upon getting to the east walls of the warehouse building at the southern end of the property, the exterior sheet metal walls revealed intense heat patterns and the effects of oxidation. These heat patterns resulted in the observance of color changes, texture changes and the structural integrity changes on the covered exterior walls. The loading dock or deck area is the portion of the structure which was determined by early interviews to be the area of origin. The sheet metal walls to the northern side of the warehouse area sustained intense heat from the fire originating in the deck area that resulted in the warping and twisting of the sheet metal exterior. This intense heat on the exterior walls of the warehouse caused the furniture stacked on the shelves up against the north wall of the warehouse to reach their ignition temperatures through radiation and convection heat transfer.

The fire investigation team began the removal of fire debris at ground level in the area known as the loading dock parking lot. The removal of debris throughout this investigation was conducted in a systematic layer by layer removal. The purpose of this removal process was to examine the scene from the upper layers to the lower layer at floor or ground level. Due to early witness interviews, it was determined that the exterior parking lot area was where the first witnesses observed a small rapidly expanding fire. In an area that was measured, at ground level, to be approximately 10 ½ feet wide and to 33 ½ feet in length, the investigation team found the remains of numerous items of discarded furniture. The witnesses described seeing a sofa and a mattress on fire at the early stages. The

damaged by direct flame impingement, uncovered no evidence of arcing, shorting or failure. All damage was consistent with the equipment having been de-energized when the fire progression reached the area.

The structure had undergone several additions and iterations. Wiring was primarily copper conductors with a mixture of armor cable, electrical metallic conduit, and non-metallic sheathed conduit.

Interior lighting for the structure was a mixture of fixed fluorescent fixtures, high intensity discharge (HID) fixtures and incandescent fixtures. The structure had minimal exterior lighting with a single HID fixture mounted on the east wall at the mid point.

Examination of wiring, devices and equipment was conducted primarily at the exterior and immediate interior area of the deck.

Five condenser units for split A/C systems were located in the north portion of the deck. Three units were manufactured by Carrier and the remaining two by NorDyne. The units exhibited normal amounts of weathering with minimal thermal exposure to the fire. Supply wiring was fed from individual non-fused disconnects (NFD). Three of the NFD's were mounted on the exterior wall adjacent to the condensers. Two additional NFD's were located on the common wall but within the interior of the structure. The exterior NFD's were intact with no evidence of arcing, shorting or failure. The interior NFD's were damaged by direct flame impingement. There was no evidence of arcing, shorting or failure of the HVAC systems, and their associated supply wiring, that were located in the deck area.

Two incandescent flood light fixtures were mounted by the warehouse roll-up door in the deck area. The fixtures were intact with exterior damage from thermal exposure to heat from the fire. There was no evidence of a failure of these fixtures that could have caused the fire. No other electrical equipment or wiring was located in the exterior deck area.

A wall mounted exhaust fan was located on the west deck wall. The fan motor was totally enclosed. The enclosure was intact with no arc burn holes. There was no evidence of arcing, shorting or failure of the exhaust fan. The fan supply wiring was solid copper conductors within armor cable. The fan was provided with a disconnect switch located on the interior wall adjacent to the fan. The insulation was melted and/or burned from the switch components and supply wiring. There was no evidence of a connection failure of arcing-through-char on the fan supply wiring. Two duplex receptacles were also fed off the fan supply circuit. The insulation within the receptacles was consumed during the fire. The power contacts of the receptacles were intact and there was no evidence of arcing or failure of the receptacles and associated wiring. There was no remaining evidence of any devices having been plugged into either of the receptacles.

A single HID fixture was mounted on a support column at the interior of the west deck wall. The fixture was constructed with a metal enclosure that housed the ballast, capacitor and lamp holder. The fixture was partially melted and fractured. The melt damage was localized to one exposed surface with damage more severe on the exterior than interior. The ballast exhibited external thermal damage on the same side as the enclosure damage with the protected areas having surviving insulation wrap and bobbin material. The internal wiring had no evidence of arcing or shorting. The supply wiring was provided by Type NM, solid copper conductor cable routed along the ceiling wall junction and fed from the east. The insulation was burned from the conductors. No arcing or shorting was discovered on the conductors along the west wall section. All damage to the HID fixture and associated branch circuit wiring was consistent with an external attack by fire upon de-energized components.

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fire investigation team noted that some portions of the west wall of the deck area were found collapsed on the furniture remains. These walls were carefully removed to examine the discarded furniture in this area. It should be noted that the majority of this area at ground level was covered in several inches of water. It should be further noted that floating on top of the water throughout this area were numerous cigarette butts. The investigation team was advised by the interview team that this was a known and allowed smoking area. The smoking policy for the store was that the smokers were told to discard their cigarettes in the butt buckets that were placed at the west end of the ramp near the man door to the warehouse. It should be noted that two metal buckets were found in this area, but the buckets had been turned over during the fire fighting operation. Nothing was observed in the buckets.

Upon removing the walls off the discarded furniture pile, the investigation team examined the area and the remains of the furniture on the ground. Based on the remaining debris, the furniture in this area was identified and documented. The furniture pile included: a roll out sofa bed, several sofas, two lazy boy recliners, an office chair, wooden pallets, and miscellaneous trash to include paper and plastic products and the remains of a wood framed box spring. The fire patterns on the remaining west walls of the deck area were examined. Based on the patterns on the wall it was determined that the wood framed box spring was leaning up against the building to the left of the exhaust fan opening. The exterior wall at this location revealed a protected area pattern the height and width of a twin size box spring. Oxidation patterns on the exterior wall were noted just above the area where the box spring was leaning. Further noted was an area of heavy fire damage below the exhaust fan opening at ground level. The exterior crawl space opening had been covered over by wooden slates that ran horizontally to the ground. An approximately three foot wide open 'V' pattern was observed on the wood sided crawl space. The 'V' extended from ground level to the floor of the deck. The remains of a possible three cushion sofa was found just in front of this burned out hole. SLED Special Agent [REDACTED] and his Accelerant K-9 Sidney conducted an examination of this area. K-9 Sidney did not alert in this area.

The fire investigation team then moved to conduct an interior examination of the deck area. The team entered this area by the ramp at the location of the sliding door. It was noted that the door had been locked at the time of the fire. The aluminum metal hasp to the locking system had been completely melted at the locking point, but the keyed styled lock was found on the ground near the door frame. The interview team provided the fire investigation team with a hand drawing noting the contents and locations of items in this area. This information was provided to them by one of the Super Sofa Store employees. The fire investigation team noted that the area inside and below the exhaust fan was full of furniture items that were being prepared to be shipped out the following day. These items were placed near the wall and expanded out approximately 8 feet from the wall. These items sustained extreme fire damage and most of the items in this area were charred and burnt beyond recognition. These items were carefully removed and examined. This area was cleaned down to floor level. The protected areas in this area revealed a thin layer of carpet. Upon cleaning this area out and down to the carpeted floor it was observed that portions of the wooden deck flooring closest to the west wall had burned out holes. The largest of the holes was noted below the exhaust fan opening. Several overlapping 'V' patterns were noted on the metal interior walls above the burned out holes in the floor near the bottom of the walls. Based on the fire patterns in this area, it was determined that the fire spread from the exterior ground level from the furniture on the outside, through the wood crawl space covering, to the crawl space deck flooring and up the interior walls and eventually spread to the furniture stored in this area. It should be further noted that the interior walls in this area were constructed of 2 x 4 studded walls, fiberglass insulation and a thin plywood wall covering. The second entry point of the fire into the interior of the structure was through the exhaust fan opening. The fire emanating from the wood framed box spring spread upward and into the open window frame of the fan housing unit, which was constructed of a 2 x 4 wood framing. SLED Special Agent [REDACTED] and his accelerant K-9 Sidney conducted an examination of this cleaned out area and did not alert in this area.



The exterior openings in the deck area consisted of two locked sliding doors and an exhaust fan on the west wall. The interior openings in this area consisted of a double man door on the north wall that leads to the west showroom area and a motorized roll up door opening on the east wall that leads to the rear area of the main showroom. A single man door was also found on the east wall, near the north wall, but had been covered over by a plywood covering. The motorized door was examined and was determined to be opened at the time of the fire. The double man doors were originally closed during the earlier stages of the fire, but were opened by the fire department at the early stages of their entry into the business. Interviews revealed that when the fire department opened this door, heavy fire conditions existed in the deck area and the fire fighting personnel could not get the door closed.

The interior fire scene examination continued from the deck area to the main rear showroom area. The team encountered a metal roll down door that was closed and led to a downward ramp to the interior of the rear warehouse area. The metal door had a fire protection system design with heat links attached to the gear system of the roll bar. The heat links activate at approximately 165 degrees F. Once the link is heated to this temperature it breaks in two and should cause the door to go from the upward rolled up position to the fully closed position. Based on interviews this door was originally open at the time of the fire, but activated when the fire moved into this area. The roof in this area toward the front of the business had completely collapsed and further investigation of this area was postponed till it could be removed.

The interior examination moved to the west showroom area. The metal double man doors had sustained extreme heat damage and showed signs of complete oxidation and rust formation on both sides of the doors and on its frame. The interior south wall of this area at the upper levels near the roof line showed signs of extreme thermal expansion and deformation. Based on this damage, the heating in this area allowed smoke, hot layer gases and flame impingement from the deck area to filter through to the void space area. The void space area was constructed as a drop down ceiling that contained an open space between the roof line and the showroom ceiling. This area consisted of all the service runs to include: ventilation duck work, electrical lighting and cabling. Based on the interior construction of the south wall of the showroom, being a insulated wall with metal stud framing and a gypsum wallboard covering, the fire and smoke from the deck was additionally forced in an upward movement to the open void space above the drop ceiling. Based on the interior examination, in this showroom from floor to ceiling, this area sustained full room and area fire involvement. The furniture displayed in this showroom was completely destroyed. The entire roof structure had partially collapsed and a full examination of this showroom was limited at this time towards the front of the building.

The interior examination of the west showroom continued with the examination of the opening in this area. Three roll down doors and one man door were examined on the east wall leading to the main showroom area. All three doors revealed that all of their fusible links had activated, but none of the three roll up doors activated as designed for fire protection. It was revealed by the interview team that these doors remained open at all times and were not properly serviced since installation. The man door was examined and determined to be closed at and during the fire. It is unknown at this time if this door was used in the normal course of business.

The fire scene investigation continued with the use of a crane that began the removal of the roofing systems. This operation was started in the deck area and moved to the west showroom area. This operation continued for the remainder of the day, Wednesday, June 20, 2007.

On Thursday, June 21, 2007, the roofing removal operation continued. As layers of the roof were removed the fire investigation team made entry into the business and examined the fire spread and damage to the remaining items throughout the west showroom and rear main showroom. The fire investigation team conducted a layer by layer debris removal in the areas around the locations the fallen fire fighters were recovered. Fire fighting equipment and

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other personal items found in the area were recovered and collected by the Charleston, SC Police Dept. Crime Scene Technicians. Further examinations of the interior were made as the roofing system was removed.

On Friday morning, June 22, 2007, the final walk through of the fire scene was conducted and concluded.

Based on the fire scene examination and early witness interviews, it is the opinion of the fire investigation team that the fire started on the exterior of the structure at or near the area below and in front of the exhaust fan opening. The fire spread into the interior of the structure through the exhaust fan opening and below by way of the crawl space and up into the interior walls and flooring. The fire ignited the furniture stacked in the area in front of the exhaust fan opening and spread upward to the roof of this deck area. The fire continued to ignite other combustible materials in the deck room as well as the roofing structure. As the fire continued to grow in this area it began to spread smoke and heated gases through other portions of the structure through various openings, such as the open motorized door (leading to the main showroom) and the man made openings in the interior walls. The fire caused the deformation of the metal walls on the north side of the room at the upper levels of the roof, which increased the openings to and continued to spread smoke and heat gases into the void space of the west showroom and main showroom. As the fire department arrived and began opening closed doors (the sliding door at the deck ramp and the double man door leading to the west showroom), the opening of the doors caused the fire to be fed more oxygen which gave the fire a chance to burn faster and hotter. The increase in oxygen supply and additional burning combustibles caused the fire to ignite the smoke that had been building in the upper voids spaces in the ceiling. This caused a fire storm affect that quickly spread throughout the structure.

EVIDENCE:

No samples or items of evidence were collected as part of the origin and cause determination. See Charleston, SC Police Dept. Crime Scene Division for all items collected as part of the body recovery and related items of fire equipment and personal belongings of fallen fire fighters

EXPOSURES:

The fire investigation team was informed that several residences in the rear or southern portion of the Super Sofa Store property sustained minor heat and water damage as a result of the large fire and fire fighting operations. These locations were not examined during this origin and cause investigation.

FATALITIES/INJURIES:

The following City of Charleston Firefighters died as a result of injuries sustained during the initial suppression efforts at the Sofa Super Store:

Engineer Bradford Baity – Age 37
Captain Mike Benke – Age 49
Firefighter Melvin Champaign – Age 46
Firefighter James Drayton – Age 56
Assistant Engineer Michael French – Age 27
Captain William Hutchinson – Age 48
Engineer Mark Kelsey – Age 40
Captain Louis Mulkey – Age 34
Firefighter Brandon Thompson – Age 27

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Several firefighters also sustained minor, non-life threatening injuries.

ESTIMATED VALUE OF LOSS:

The estimated loss at this time is approximately \$2.2 million dollars.

WEATHER:

The weather at 6:65pm on Monday, June 18, 2007, was 86 degrees F, wind out of the southwest at 11 ½ mph, humidity 69% and partly cloudy

CONCLUSION:

1. Based on the fire scene examination and the witness interviews to date, this fire is determined to be UNDETERMINED. The point of origin of this fire was determined to be at or on a sofa located in the Super Sofa Store loading dock in an area of discarded furniture. The cause of the fire could not be definitively determined. Due to the fact, the exact ignition source and sequence of ignition was not found or determined. It is the opinion of the fire investigators that either two possible events occurred: 1) the improper discarding of a lit cigarette or 2) the submission of an open flame by human intervention on the combustible materials in the discarded furniture pile.

DISPOSITION:

2. This investigation is open and/or pending further investigation.

This report was prepared by an ATF Certified Fire Investigator.



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Charlotte Field Division
Bureau of Alcohol, Tobacco, Firearms and Explosives