South San Francisco Fire Department

Information Summary of a Near Miss Incident

Columbus Salami Fire - Roof collapse of a commercial warehouse with Firefighters interior during an offensive attack

No Victims – Several companies reporting near miss incidents after roof collapse

Loss of several thousands of dollars of firefighting equipment

July 23, 2007
Columbus Salami Fire

Incident Number SOF-0903129

This is a Summary report. It is intended as a safety and training tool, an aid to preventing future occurrences, and to inform interested parties. At the time of this report not all investigation information was available; therefore the information contained within this report is subject to change.

Summary

This is a preliminary report, subject to change, due to the fact this report is being assembled prior to the completion of the official fire investigation. The following information is a summary of events just prior to a roof collapse at an approximately 45,000 square foot concrete tilt-up structure fire in the Columbus Salami slicing and packaging facility, 465 Cabot Rd. At the time of this roof collapse three engine companies, a quint company, a squad with two personnel and a fire rescue ambulance company were inside the structure and nearly missed being entrapped within the collapse. Additionally a single truck company was located on the roof. No injuries occurred from the collapse however all units had to quickly evacuated the building and abandon several thousands of dollars of equipment.

Conditions

Structure: 465 Cabot Rd is located in the industrial and biotechnological portion of the city, west of Hwy 101. The structure was an approximately 45,000 square foot, sprinklered, concrete tilt-up building. The roof was composed of glue laminated wood beams with 2 x 10 wood purlins, 2 x 6 rafters, plywood sheets with a foam cover sealed with a tar and gravel type roofing material. Internally the building was divided into two stories along the external walls and then approximately 20 to 25 feet deeper into the building a warehouse area that contained storage of food goods and packaging material in racks that ran from floor to roof the full height of the building. On the first floor; along the C-side wall was the slicing area with a hall and some refrigeration units, along the D-side were five loading docks separated from the warehouse by a concrete wall and roll up doors, on the A-side was office space. On the second floor was additional office space along the A and D-sides of the building and a open framed mezzanine along the C-side of the building above the slicing area with mechanical equipment used for moving and scrubbing the air within the warehouse portion of the building.

Fuel Types: The fuels within the building were standard office materials and furnishings, wooden structural components, packaging material such as plastic and cardboard and possibly some foam insulation.

Weather: At the time of the call it was 56 degrees Fahrenheit, cloudy, with a west wind at 11.5 mph.

Contributing Factors: The building was highly compartmentalized, with many dead-ends, irregular configurations and open areas that ran from warehouse into and above areas on the second floor that seemed separate but shared the same ceiling. In addition there was a large portion of the building that was insulated with a material that was six inches of foam sandwiched between two sheets of 1/8 inch metal on each side. This material was attached up the walls and as ceiling material in certain areas of the building to help keep sanitary surfaces for the food and temperature control.

Fire Origin: Currently the fire is under investigation and the origin has not been officially identified. However, units were originally informed that the fire was located on the second floor along the c side of the building in the unfinished mechanical area above the slicing station. All units converged their efforts on the A/B corner of the mezzanine area

Apparatus and Staffing: The first due fire apparatus in this district is a quint with a 75 ft. aerial, 1500 gpm pump and carries approximately 500 gallons of water. The vehicle is staffed with three personnel (Captain, Fire Apparatus Engineer and a Firefighter/Paramedic). The day of this call there was an Acting Captain and Acting Fire Apparatus Engineer.

South San Francisco Fire Department's Structure Fire Response requires a total of four engine companies, one truck company, two battalion chiefs, one fire based ambulance (rescue) and a RIC engine company. In this district a squad (quint with two personnel) is also attached to the structure fire response. Every piece of equipment contains three personnel (captain, engineer and firefighter) with the exception of the squad (one captain one engineer) and the rescue (two paramedic/firefighters).

In this first alarm assignment there were four individuals working in an acting capacity. The acting battalion chief is a captain with 26 years of experience. The first due acting captain has just less than seven years of experience. The first due engineer with just less than seven years of experience. And another acting captain on a first alarm engine company with just less than 13 years of experience. The rest of the companies consisted of personnel who were in their regular position and shift.

Sequence of events

On July 23, 2009 at 0204 hours Quint 62 was dispatched to a fire alarm at 465 Cabot Rd. While in route the call was upgraded to a structure assignment for a sprinkler activation and workers reporting that they saw flames in electrical room 100. San Mateo County Public Safety Communications (PSC) moved the call from Control 3 to Command 51 and assigned Tactical channel 35. Units B17, E61, E63, E81, T51, SQ65, B16 and E51 as the RIC were attached to the call. Q62 asked for further information and asked if building was evacuated, dispatch confirmed building is evacuated.

Q62 arrived on scene, parked at the A/D corner in front of a hydrant just prior to the building, gave a size-up, "nothing showing from a concrete tilt-up, no evacuees present" and met with two workers who walked from the evacuation rally point on side B of the building and reported to Q62, "fire was scene on the second floor in a mechanical/ electrical room". Q62 entered the building on the C/D corner door went up stairs to the second floor, opened a door that led to the room which ran along the C side of the building and found "heavy smoke". B17 arrived and took Cabot IC. Q62 closed the door, contacted the IC, reported the smoke, and asked Q62 to take the hydrant. E61 was positioned behind Q62 and stated that they would "grab the hydrant". While this was

happening Q62 returned to their apparatus to put on their SCBA, grab tools and then assist in pulling hoses for fire attack.

Q62 pulled forward along the street in front of the A side of the building to clear the way for E61 to take the hydrant. E61 grabbed the hydrant and proceeded along the driveway on the D side of the building to the D/C corner. Q62 and E61 pulled the 2 ½ in hose and the two gated wyes hose bundles. The 2 ½ hose was taken to the second floor landing and one hose bundle was deployed down the stairwell to prepare for making entry. Both E61 and Q62 entered the smoke filled room with the one hose line stating that there was "no heat" and searched the mechanical area. This area had several pipes and vent tubes that made maneuvering in the smoke more difficult. Q62 and E61 continued and worked their way along the C side wall towards the B side of the building Q62 felt the water from the sprinkler and believed that they had found the area of origin with one sprinkler head activated and no heat found with the TIC. They stated that they had a good amount of smoke and were having difficulty seeing.

While E61 and Q62 were attempting to locate the seed of the fire, SQ65 was assigned utilities and a SSFFD rescue was requested by Cabot IC. B16 arrived on scene and met with Cabot IC who was on the D side of the building. B16 had a face-to-face with IC and then was assigned Div. C and went to meet up with crews who had worked their hose line to the rear of the mechanical room. E63, E81, T51 all began to arrive on scene.

E63 assisted with taking some of the 2 ½ inch hose up the stairs and met with Q62 and E61. E63 driver went downstairs to retrieve his helmet that had fallen off while relaying hose, and saw a clear loading dock area. He opened two roll-up doors and then the electricity was turned off. He returned upstairs and assisted E63 in checking all the breakers that they could locate in the mezzanine area. They found none that were tripped. Units upstairs in the mechanical room asked for positive pressure ventilation to clear the smoke so that they could get a better idea of what was going on. Cabot IC assigned T51 the task. B16 found a scuttle hole in the area and the fans were pointed at the scuttle, smoke did not clear to well. B16 informed Cabot IC that ventilation was established. At this time while attempts were being made to clear the room of smoke Q62 informed the IC that they felt they "found the seed of the fire, that he could see no heat on his TIC and could only feel the water and felt the fire was extinguished by the sprinkler system". Cabot IC asked if they would like the sprinklers shut down and Q62 confirmed. Cabot IC assigned the task of shutting down the sprinklers to E81. SQ65 heard the request and stated that they are near the riser and will turn off the sprinklers.

Since the fans pointed toward the scuttle was not working to clear the area, T51 went to the roof through the scuttle hole and asked to remove the skylight above the accepted area of origin. They stated that they "could see lots of smoke but no fire". The skylight was cut and a crew in the mechanical area was asked to redirect the fans for better removal of smoke. After this was done T51 asked B16 and then Cabot IC for permission to set up their truck and gather tools in preparation for possible roof operations that could occur. SQ65 confirmed that the sprinkler system had been shut down and if Cabot IC

had another assignment. Cabot IC asked SQ65 to standby and come to the command post as well as confirmed with T51 to set up their aerial.

After the skylight was cut and the fans were redirected the room began to clear. E61 reported a "glow coming from downstairs in the warehouse area and that they believe there is still active fire below, Q62 and E63 are going to investigate", Cabot IC copies. Q62 and E63 leave E61 and B16 on the second floor and then proceeded downstairs to try and to find any extension which they had seen below the A/B corner of the mezzanine. Q62 and E63 proceeded through a hallway that ran below the mezzanine and parallel to the C wall. They checked the doors to the rooms on both sides of the hallway and found no heavy smoke or heat with the TIC. At they end of the hallway the found a door which led to an insulated room with another door leading out of the C side of the building. This room was insulated on all the walls and the ceiling with a material that was about 1/8 inch of metal, six inches of foam and the another 1/8 inch thick piece of metal. Within this room they could see heat with the TIC along the A side wall. E63 decided to see if they could work their way around to the other side of that wall believing that would give them best access to fight the fire.

While crews were searching for the fire on the first floor, E61 was upstairs with the hose line lobbing water on the fire. E61 communicates to Cabot IC, but is describing their current actions of "lobbing water on the fire and they think the "best access to the glow is from the B side of the building near the C side". Cabot IC copies and sends SQ65 to investigate from the exterior. Cabot IC calls Q62 and asks, "Confirming that we still have active fire? Do we need to reactivate the sprinkler system?

Truck 51 completed setting up the aerial and lets Cabot IC know they are now "back on the roof."

E61 has some difficulty contacting Cabot IC but explains, 'they are now at half a tank of air, they believe that they are keeping the fire from the roof and do not want to leave their assignment until relieved". Cabot IC confirms and sends "E81 to relieve E61 at C/D corner". E61 then contacts Q62 to ask them to "let us know when they find the fire so that E61 avoids pushing it on them".

B16, who is now with Q62 in the insulated room, has opened the door leading out to the C side of the building. B16 contacts Cabot IC and asks for a hose line on the C side of the building. Cabot IC assigns E81 to take the hose line to the C side of the building. SQ65 who is on the D side with Cabot IC assists E81 in hooking up to E61 engine.

Truck 51 who is on the roof opening skylights now reports "the smoke is getting heavier especially in the B/C area of the building".

Cabot IC explains that he has "E81 taking a line into the C side of the building with B16 to get a line on the fire and that he believes Q62 is checking the B side of the building."

Cabot IC has E51 reactivate the sprinkler system.

After the hot wall, in the insulated room, on the first floor, was discovered and while all of the other action was occurring; E63 has now added R61 with them and have worked their way from the insulated room back down the hallway toward the C/D corner and then through a loading dock that parallels the D side of the building. They follow this loading dock toward the A side of the building until they reach an opening that leads to the warehouse area. The warehouse is charged with smoke all the way down to about three feet from the floor. E63 proceeds in doing a right hand search until they come to a set of sliding barn doors between some high rack storage. They open the barn doors and see a room they believe to be 15 feet. x 15 feet, that has about three feet of fire burning in the far corner away from them, behind a open studded wall. Units later write that they could hear the sound of water expanding as it hit the flames in this area. E63 captain is back at the opening to the warehouse and is trying to communicate what the crews have found to Cabot IC without success.

Someone transmits on the tactical channel with a vibra alert sounding.

B16 informs Cabot IC that he "will now be Div. 1 and that they have water on the fire". Div. 1 asks for forcible entry tools to make a larger opening into the metal/foam/metal insulation.

E63 and R61 pull out to change SCBA bottles. Crews state, several minutes pass and they see Cabot IC, they ask about information on who is deploying the hose line for the fire they found in the warehouse area? Cabot IC tells them he did not know about anyone finding fire in the warehouse. E63 and R61 pull 2 1/2 inch hose off of E61 and connect the hose line to E61. They then bring it through one of the five roll-up doors, in front of the loading area, on the D side of the building. They work the uncharged hose into the warehouse opening, attach a 1-3/4 inch hose line and get to sliding barn doors.

E61 has now backed out of their position on the mezzanine because they are almost out of air. While exiting they turn off the blowers that were in the doorway. They meet the IC at the on the D side, explain what they had and what they were doing and Cabot IC sends SQ65 to get back on the line. A face to face is given between E61 and SQ65 and then SQ65 follows the hose line up the stairs and into the mechanical/ electrical room through smoke filled stairwell. SQ65 has zero visibility in the mezzanine area and leaves a light box at the door for direction of exit reference. SQ65 gets about 20 feet into the room and feels high heat and has still not located the nozzle to the hose line. They can see that the fire is above them and they decide to back out of the room. E61 has just met them at the top of the stair after changing their SCBA bottles. The two units stood at the door comparing the differences in the fire behavior from earlier to now and deciding if trying to get back to the nozzle is an option

After Div. 1 is established, T51 states that they have "heavy flame on the roof".

Div. 1 asks the IC, "How are we doing on resources?" He asks Cabot IC if they "get the RIC group supervisor to send over some pike poles so they can pull ceiling?"

Second alarm is called.

T51 repeats, “Smoke and fire is still present on the roof and that they are going to take an additional skylight on the B/C side of the roof.”

Q62 sees the roof of the insulated room is beginning to sag and can see that there is fire above them. They begin to try and raise E61 and SQ65 because they know that they are in the mezzanine above them. They inform Cabot IC of this issue.
E64 arrives as first engine of second alarm and asks for an assignment.

Truck 51 reports that they are “coming off the roof for water support” and let Cabot IC know that they have “about a half dozen holes that are vented with fire.” IC lets them know that E61 is working on their supply.

Div.1 asks for a second hose line, he states that “they are making progress and are darkening it down.”

Cabot IC states he is getting reports from E61 that they have “another fire on the first floor in the warehouse area towards the middle of the building, sounds like we may have two separate fires”.

RIC group supervisor tells Cabot IC, “You’ve got the whole roof involved”.

B16 steps out of the building and looks up at the C side roof line. He can see 20 to 30 feet of fire across the roof line. He looks in the door and can see the ceiling is sagging and knows that the fire is now above them and that they are not making progress with the with the two 1-3/4 inch hose lines. He informs IC to “get units off the roof and off the second floor”.

E64 is assigned to bring spare bottles to the C/D corner and to assist with fire attack at Div. 1.

Cabot IC checks with Div.1 and asks if they are pulling out of the building.

SQ65 and E61 are at the doorway to the mezzanine when they hear a loud crash in the room and the roof collapses in the room. SQ65 and E61 immediately get out of the building.

E63 and R61 ask for their line to be charged. As they are waiting they see the 15 feet x 15 feet room flash and fire comes out of the barn doors and over them. E63 and R61 see that the fire is now in the ceiling above them and can not confirm that they are getting water. E63 and R61 decide to exit the building.

Cabot IC confirms with Div. 1 that they are backing out of the building. Div.1 confirms that units are pulling out.

E61 driver asks E63 to confirm that they want water. All units are being pulled out of the building. Everyone is being pulled out of the building as it is now switching to a defensive operation.

Remainder of second alarm units are arriving.

B19 is assigned as Safety Officer, he contacts command 51 and asks for a list of all units assigned to this incident be sent to his pager.

E93 is asked by Cabot IC to supplement the sprinkler system and units on scene are tasked with setting up and supplying the water towers.

Issues For Review

Failure to complete a full 360 view of fire building.

- First in IC should not stop short of suspected fire building. Driving past would allow for a full three sided view of the structure (what you see on one side may be entirely different what is on the other) and in this case allow you to see the evacuation rally point on side B.

Entering a building with a known sprinkler activation without full PPE or tools

- Whenever entering in a structure with alarm sounding, sprinkler activation, manual pool or any other investigation mode always consider the worse case scenario. At minimum units should have Radio, SCBA, extinguisher, light box, TIC and tools.

No clear department SOG regarding auxiliary fire control systems

- No standard direction as to when a FDC should be pumped into, at what pressure and by whom
- No standard direction regarding the appropriate conditions must exist in order to consider the shut down of a sprinkler system or when to reactivate a system
- No standard direction which requires auxiliary systems to be monitored manned while in operation.

Communications

- Transmission from a portable radio within a concrete structure to the outside may be hindered
- Repeated confirmation of traffic should be required when key information is exchanged (copy that is not good enough)
- Radio reprogramming has not been updated for north county making changing channels on a portable, in an adverse environment, with PPE difficult, i.e. portable radios are set up Ctrl 3, Command 31, Tac 35, Tac 36, Tac 37, Command 51. This makes counting clicks to change frequencies challenging.
- More attention to the proper microphone placement in proximity to voice amplifier needs to be tested and standardized.

Command

- Command post needs to be set up and kept in one area.
- Command worksheets should be used at all times to track units, tactics, plot plan auxiliary systems and other key information.
- Divisions and groups should be utilized early on in incidents to ease the span of control issues and better handle accountability and critical information.
- Request for addition resources should be made early to prepare for worse case scenario
- Units need to report their activities and key information to supervisors so that tactics can be adjusted properly.

Hose lines

- Hose choice should be relative to probable fire load. 2 ½ inch lines were taken into two separate areas of the building and then a 1 ¾ inch line was attached to the end.
- Back-up lines should deployed whenever possible
- All efforts should be made to avoid opposing hose lines.

Ventilation

- Pros and cons of each type of ventilation tactic should be known, understood and weighted for the conditions that are present and the potential of the incident.

Safety

- Everyone is a safety officer. If you feel you see a key piece of information, be sure to pass it to your supervisor.

All members of the department should commit to memory the 20 structural watch-out situations.

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Weekly Fire Drill

Structural Watch-out Situations

The 20 Structural Watch Out Situations

The idea behind establishing the structural watch out situations is to aid the firefighter in recognizing a present or developing hazardous situation that may endanger themselves or others. When these situations start appearing (one may not be a problem, but five or ten sure are) on the incident a change of strategy, tactics, or simply re-evaluating risk versus gain will probably become obvious, the idea is to recognize them early on.

It is impractical to think that the average firefighter or incident commander is going to reference these 20 situations in the heat of battle, therefore the preferred way of integrating this information is to "pre-load" it. Two easy areas to pre-load the watch outs are in routine trainings and by simply posting them in the day room for discussion. Also think about incorporating these into the after incident critique so as to start reinforcing their use. These are taken from a workshop designed to manage risk created by Quinn MacLeod titled Risk Management, "Making a Difference at the Company Level". Any comments would be appreciated. Reference www.integrated-firesolutions.com

1. 360 view of fire and size up not performed.
2. Uninformed on strategy, tactics, fire conditions, and hazards.
3. Instructions and assignments not clear.
4. The incident is progressing poorly.
5. Transitioning from offensive to defensive or visa versa.
6. The structure has been evacuated by the public and is confirmed.
7. Water supply is unreliable.
8. Searching without a hose line or tag line.
9. Working above or below the fire.
10. Attempting to attack the fire from a ground ladder.
11. Interior building configuration makes escape to safe areas difficult.
12. Upon entering the structure you encounter heavy smoke conditions and / or high heat.
13. Unable to quickly locate the seat of the fire.
14. Unfamiliar with the building and / or its contents.
15. The building has had numerous alterations.
16. Operating on the roof with only one means of egress.
17. 15 minutes have elapsed & the interior fire fight continues.
18. Environmental conditions are extreme.
19. The incident scene is dark.
20. Mentally and / or physically tired.