BULLETIN

NO.: 21-145

DATE: September 9, 2021

TO: All Personnel

FROM: Steven Lozano, Deputy Fire Chief, Employee Services

SUBJECT: Green Sheet - Commerce Incident – A/C Unit through the Roof - Near Miss

Please find attached the Informational Summary Report of Serious or Near Serious Injuries, Illnesses and Accidents (Green Sheet) for the Commerce Incident.

- **Refer to SDFD Operations Manual**
  - **SI 10 Section 04 Safety Communications**

Reviewed by the Occupation Health and Safety Committee's investigation sub-committee; lead investigators: Captain Osborne, Captain Whitney, LG Sergeant Brown, County H&S Section representative; Captain Ted Porter, Coronado Fire and Battalion Chief Picone.

Any questions should be directed through the chain of command.

Please contact the Health and Safety Office at SDFDHealth&Safety@sandiego.gov with comments or areas of improvement. For all other questions contact HSO/Battalion Chief David Picone at 619.533.4466 or dpicone@sandiego.gov

Informational Summary Report of Serious or Near Serious Injuries, Illnesses and Accidents

GREEN SHEET

San Diego Fire-Rescue Department

Commerce Ave. Incident/ FS21092441
Air Conditioner through the Roof - Near Miss
Thursday, June 17, 2021

SUMMARY

On the night of Thursday, June 17 at 2105 hours a "First Alarm-Commercial" response was dispatched to a warehouse district populated with a range of tilt up, light weight and masonry warehouse buildings off Miramar Rd. on Commerce Avenue. Upon arrival, San Diego (SND) Engine 50 (E50) and converging units noted smoke and fire venting through the roof of a single (1.5) story warehouse building. SND Battalion 5 (B5) immediately took Commerce Incident Command (IC) from SND E50. SND E50 was assigned and established Fire Attack (FA) on the Alpha (A) side of the warehouse and made entry through the front door with a 1 ¾ hose line. Two additional engines were later added to the response to fulfill Rapid Intervention Crew (RIC) responsibilities.

Simultaneously, SND E41 entered the Charlie (C) side driveway and began fire operations. SND E44 established a water source to SND E41 from the only adjacent hydrant in the area. SND E41 and SND E44 firefighters forced entry through a main door and the adjacent roll-up door for better access. Firefighters entering the warehouse from the C side, encountered light smoke conditions with fire on a mezzanine above the A side entrance. During interior suppression operations the C side firefighters noted a large Air Conditioner (A/C) unit above the crews and alerted others to the danger. Crews cleared the area as the A/C unit

(under fire conditions) fell from the roof level above and almost landed on the fire crews working in the vicinity below.

Immediately following the incident, units working the interior retreated to the outside for safety. The IC and Safety Officer (SO) initiated a Personnel Accountability Report (PAR). After the PAR "All Clear" was assessed and verified; a tactical pause and reengagement strategy was developed and put in place. No injuries were reported by fire crews or to the general public. The warehouse occupancy of origin sustained major damage.

CONDITIONS

Weather:

Temperature: **62° Fahrenheit**
Relative Humidity: **90%**
Winds: **SW @ 5 mph**
Visibility: **9 miles**
Fuel Type: **N/A**
Road Conditions: **Clear, light, late evening traffic**
Topography: **N/A**
Fire Behavior: **See Fire Behavior Section Below**
Make/Model of Equipment: **N/A**
Structural Features: **Light Weight, Tilt up, Single Story, Masonry, Light panelized roof**

SEQUENCE OF EVENTS

21:06:52

- Units are assigned by Computer Aided Dispatch (CAD) in a Commercial Structure Fire Configuration per SDFD dispatch response matrix (2 Battalion Chiefs, 4 Engines, 2 Trucks, 1 Paramedic Ambulance)
- Units assigned are: SND B5, SND B7, SND E50, SND E44, SND E41, SND E35, SND T44, SND T35, American Medical Response (AMR) M-41
- Multiple incoming units noted a smoke column from a distance

- Upon closing in on the scene, multiple units noted the ever-present glow (indicative of a working fire) coming from the roof of the warehouse address of the fire call

21:11:26 - 21:11:44

- SND E50 arrives first at scene (CAD 21:11:26), enters the first driveway at the address on the A side followed immediately by SND B5
- SND E50 spots on the A side in an advantageous spot to deploy hose lines
  - SND E50 Captain discusses hose line selection for the fire upon arrival and decides on the 1¾" manifold hose deployment
    Note: No supply line was established due to proximity of a hydrant to the location determined by their travel route
- SND B5 arrives at scene (CAD 21:11:27) and enters directly behind SND E50
  - SND B5 spots near the rear of the parking lot with an obstructed view of the A/Bravo (B) side of the structure due to the apparatus placement of SND E50
- SND E41 arrives at scene (CAD 21:11:44) and enters on the C side of the warehouse complex due to a citizen at scene waiving entry to an access point

21:12:42

- SND E50's size up consisted of a 1 story commercial warehouse with smoke and fire coming from the roof and established "Commerce IC"
- SND B5 assumed command immediately upon arrival from SND E50
- SND E50 is assigned "Fire Attack (FA)" and deploys hose on the A side of the structure, focusing on entry at the front and main door of the affected business
- SND E41 arrived on the C side of the warehouse and waited for an assignment
  - Captain made repeated attempts to hail the IC via radio with no answer so decided to walk to the location of the IC for a face to face discussion
- SND E41 crews deploy hose lines on the C side of the structure and began working on forcible entry on a single door and the adjacent roll-up door
  Note: Division C had not been officially established and no supply lines had been laid or established to the Engines pumping on scene
- IC begins to make multiple requests to establish a supply line to SND E50

21:12:44

- SND E44 arrives at scene
- SND E44 lays 4" supply line to SND E41

- SND E41 and SND E44 firefighters combine efforts and establish fire operations on the C side

21:12:49 - 21:13:42

- SND B7 at scene
- SND B7 is assigned SO and proceeded to perform a 360 degree walk of the incident
- FA deploys hose lines and begins forcible entry into the structure
    - FA crews encounter difficult entry through the front door due to a mass of debris that had fallen from the mezzanine above the interior office onto the entryway

21:13:43

- SND T35 arrives at scene on the A side
- SND T35 is assigned "Ventilation Group (VG)" and positions ladders on the A/Delta (D) corner

21:13:47

- SND E35 arrives at scene
    - SND E35 is assigned to establish a supply line to SND E50
    - SND E35 is unable to find a hydrant and provides water to SND E50 via their tank
- FA advises IC that the "bulk of fire" is in the attic space of the building

21:13:53 - 21:18:25

- SND T44 arrives at scene and is assigned to VG
    - SND E44 requests SND T44's assistance for forcible entry of the roll-up door on the C side
    - SND E44 is advised that SND T44 is committed to Vent Group
- VG updates IC, "Roof is pretty soft and it's already self-vented" and "Opening up Skylights"
- SND E44 Captain assumes the command of the firefighters of SND E41 and makes entry into the C side with hose lines and proceeds to attack the fire
    - Flames are visible from the C side looking towards the A side on the mezzanine directly above the FA units entering on A side
- Interior conditions are relatively clear due to a few factors (Self-vented roof, opening of the rear roll-up door, large open space, small fire load, and favorable weather conditions)

- SND E41 firefighter notices an unstable A/C unit and notifies the SND E44 Captain inside the building
- A Large A/C unit falls from the roof due to structural compromise of the brackets holding the unit in place from direct flame impingement
- FA advises "ALL UNITS, roofing material has fallen in but no structural collapse"
- SND E44 Captain declares, "Emergency Traffic" via radio with no answer
- FA advises IC that an A/C unit has fallen through the roof
- SO is notified of "Ceiling collapse" and broadcasts "Priority Traffic" order for all units to exit the building
- IC asks SO to repeat their traffic
- Emergency Command and Data Center (ECDC) dispatcher broadcasts "Priority" traffic and calls for the evacuation of the warehouse based on the SO traffic
- IC acknowledges ECDC traffic and reiterates an "Evacuation" order and calls for a PAR from all divisions
- PAR is conducted shortly after units exit the structure with all personnel accounted for

21:18:26

- IC requests 2 additional engines to fill for the RIC position
    - Miramar Fire (MSM) E61 and SND E38 were attached to the incident

21:21::55

- ECDC acknowledges ceiling collapse in-between C and A Divisions

21:25:38-00:47:44

- A PAR is complete with all units accounted for and no injuries reported
- SO assumes C Division, where final suppression and extinguishment operations were conducted
- Before the commencement of the final suppression efforts, a tactical pause was initiated to form an alternate strategic and tactical plan that included newly observed and enforced "NO-GO Zones" within the structure
- Shift Commander (SC) was added to the call at 21:25:50

FIRE BEHAVIOR

The involved warehouse, 8524, is divided into two suites. Suite B was located within the east side (Delta) of the building and housed a vehicle customization shop named “Wrap City”. Suite A was located in the west side (Bravo) of the structure and was the unit of origin.

The building is divided into two suites, one and a half stories high and constructed of noncombustible masonry with a panelized flat roof that contains exposed purlins, beams, and rafters. Two commercial HVAC units are located on the rooftop where one HVAC unit collapsed into Suite A during suppression efforts. Both HVAC units were located adjacent to 4 X 8 skylights. The proximity of the skylights was a contributing factor to the collapse of the HVAC unit.

Suite A was configured with business office suites at the front entrance (Alpha). The offices accessed a large storage warehouse. The storage area had drywall covered walls with an exposed ceiling. There were commercial grade storage racks spanning the west (Bravo) and (east) Delta walls with various stored and stacked items with varying combustible packaging. There were multiple small vehicles also stored in the middle of the warehouse. These vehicles included a forklift, motorcycle, and small off road vehicles. The configuration of the warehouse included a passageway through the center to access the front and back of the building with no impediment.

A mezzanine, accessed from the warehouse, was located above the front office space. This space had stored and stacked items with exposed wood framing and rail members.

This was a confined, fuel controlled, high Heat Release Rate (HRR) fire. The fire did not develop beyond the growth stage. It originated behind a refrigerator that was located along the south end of the east wall (Bravo) of the warehouse. Combustible materials, including cardboard boxes and wood crates were located on top of and on racks immediately adjacent to the refrigerator. From behind the refrigerator, the fire spread to stored and stacked fuels extending upward to the exposed panelized roof. The mezzanine was located adjacent to the fire plume resulting in the ignition of secondary fuels closer to the exposed ceiling.

Fire progressed through convective heat transfer, a smoke and gas layer developed as well as a ceiling jet. Simultaneously, active burning continued from the area of origin in the south warehouse, concentrating convective and radiative heat flows to the ceiling directly above. A 4 X 8 skylight, located adjacent to the south central area of origin, was determined to have failed during fire progression. Skylight failure was a result of exposure to accumulated hot gases and radiant heat. Once the skylight failed, a single vent opening for hot smoke and gases to escape was created. The fire was fuel controlled and did not transition to ventilation controlled due to the single vent opening. The single vent opening allowed for localized intense burning in and around the skylight where fuel - air mixing was optimal. This caused weakening of the structural members of the adjacent HVAC system.

When fire suppression efforts began, the fire had been observed extending from the roof line. Initial reports on conditions were described as smoky but with no heat. This was consistent with the single vent opening allowing for heat to escape. When the roll up door was opened at the north (Charlie) side of the warehouse, a significant change to the fire scene was noted, a multiple opening flow (flow path) was created. The influx of ground level pressurized air allowed for the clearing of collected smoke in the compartment through the opening at the failed roof. The result was a significant increase in visibility for crews extending hose lines and allowed for a visualization of conditions at the ceiling. A firefighter identified an imminent HVAC unit hazard potential and relayed that information to his fire officer.

INJURIES/DAMAGES

- There were no reported injuries
- There was no reported damage to fire equipment or apparatus

SAFETY ISSUES FOR REVIEW

- Use of terms like “Priority Traffic” vs. “Emergency Traffic” is clearly defined
    - **The term "Emergency Traffic" will be utilized by any unit encountering an immediate perilous situation**
        - **The individual or unit transmitting “Emergency Traffic” will receive the highest priority from FCC, IC, and all operating field units.”** SDFD Operations Manual, SI 01, Fire Suppression: Communications
- “Priority Traffic” was called by the SO and not received by the IC
    - The IC clearly states, “Unit with traffic repeat, you were broken” on the Command Channel
    - ECDC dispatcher broadcast the “Priority Traffic” message along with an “Evacuation” order, reiterating the radio traffic from the SO
- Incoming Units experienced problems hearing/interpreting outgoing communications from IC
- Water Supply was not immediately established
    - Incoming units must make the establishment of a secure water source a priority when a working fire is known
- Once the IC confirmed units on C side had not established a water supply he broadcasts clearly for the “next due” engine to lay a line to SND E50 Fire Attack
- RIC was not established until late in the operation
    - RIC can be assigned to any incoming Engine or Truck company at the IC’s discretion
- Fire Attack and Vent Groups were the formally established groups
    - Alpha Division was established to replace the Fire Attack group name with no acknowledgement and later called Fire Attack instead of Alpha Division
- Charlie Division wasn't formalized until late in firefighting operations
- Crews from opposing directions (Alpha and Charlie Divisions) had established operations without clear communication being established between them
- Review “Risk vs. Gain” Analysis
    - This was a tilt up, lightweight, masonry structure that had been burning for an unknown amount of time and had self-vented with an unknown fire load late in the evening with no cars noted in the parking lot

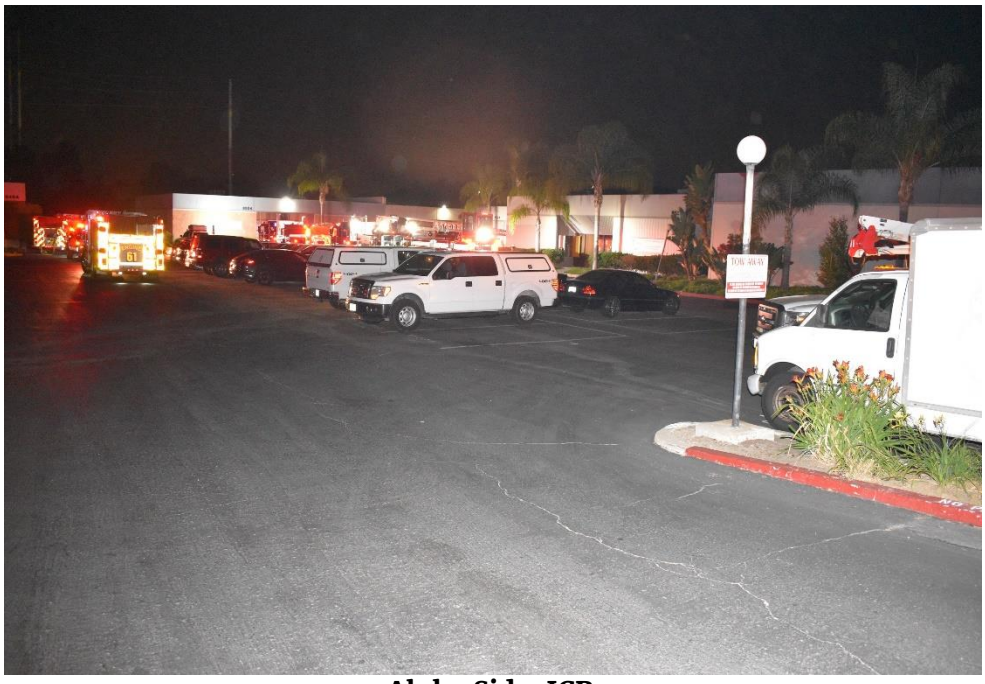
- Vent Group recognized the roof was compromised and made a good decision not to engage

INCIDENTAL ISSUES/LESSONS LEARNED

- Communications need to be clear, concise and understood
- Radio communications between the IC and incident units were broken and many times not received due to activation of the PTT button while another person is broadcasting
- Converging units arrived simultaneously and did not stage in an orderly fashion to await assignments
    - Incoming units need to stage outside of the incident footprint, in a direction of travel that is advantageous to efficient mobilization of resources needed to quickly engage in fire operations
- Clear understanding of Group/Division assignments need to be communicated throughout the incident to prevent accountability issues and counter-productive efforts
- Due to the Engine's commitment to the Charlie-side early in the fire, they were unable to lay a line to FA due to proximity of resources and lack of hydrants within the immediate vicinity
    - Hydrants servicing this location were located, uncharacteristically for the district, more than 400' from the address of the fire
    - Although abnormal in this instance, it is crucial for crews to actively canvas first-due districts for difficult situations that may require alternative strategies and resources
- Area familiarity played a large role in the quick initial progress of firefighting operations
- Local knowledge and officer experience of the area resulted in successful fire ground operations with no injuries or delays

PHOTOS/SITE DIAGRAMS/MAPS

Aerial View



Alpha Side, ICP

Charlie side

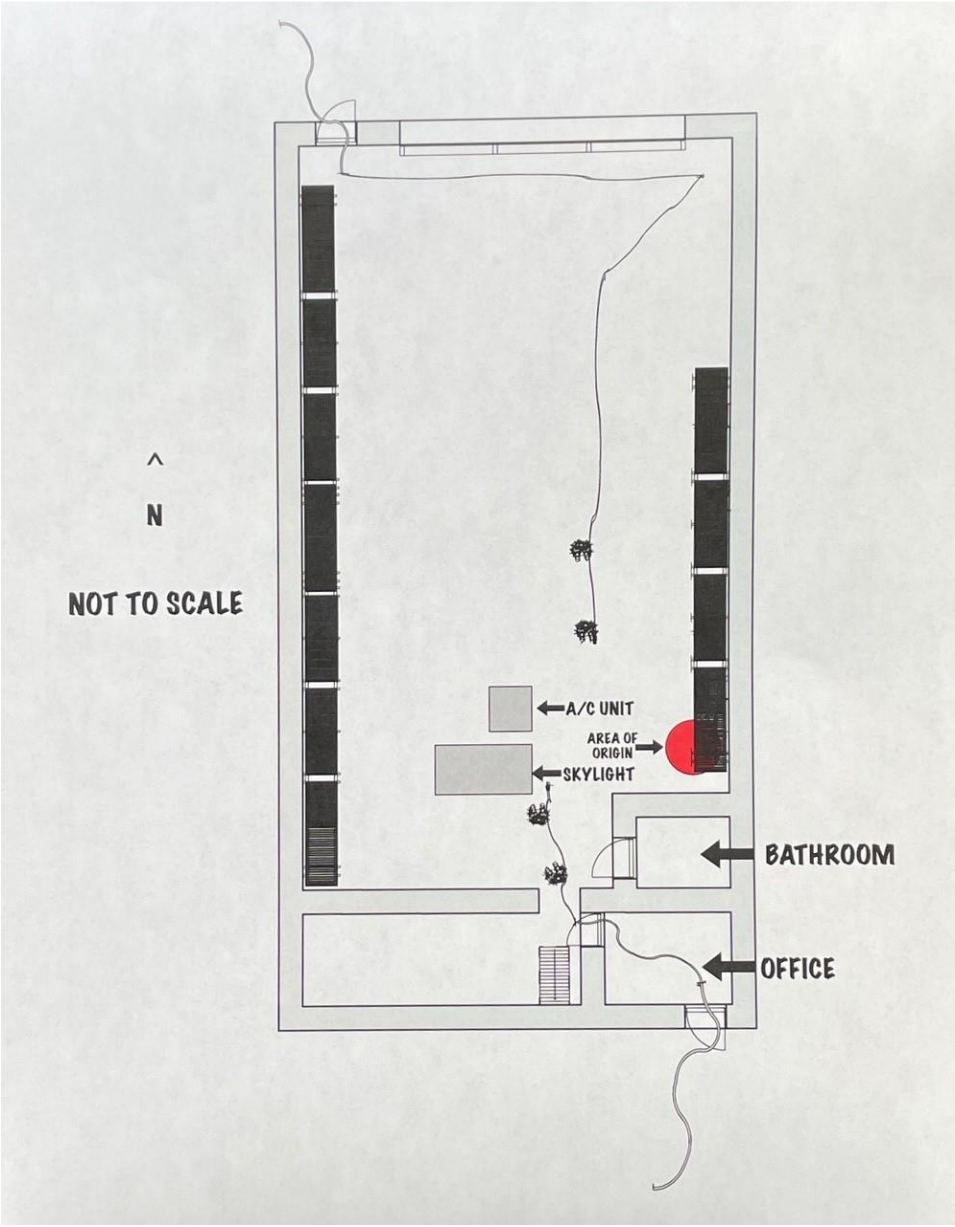
Charlie side

Interior, noted A/C unit (center, suspended)

Fire Result, damage

Interior, Charlie side

(Note: Left side, center is the A/C unit falling, just left of the pillar)



Reviewed by the Occupation Health and Safety Committee's investigation sub-committee.

Lead investigators:

Captain Daran Osborne

Captain Wayne Whitney

Sergeant Robert Brown

County H&S Section; Captain Ted Porter, Coronado Fire

Battalion Chief David Picone, Health & Safety Officer