Death in the Line of Duty…A summary of a NIOSH fire fighter fatality investigation

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Executive Summary

On March 9, 2020, a 36-year-old volunteer firefighter was killed when the front porch roof of a single-family residential structure collapsed while he was operating a 1¾-inch hoseline on the porch. Two other firefighters were injured while operating at Box 25-11. At 01:31:38 hours, the county communication center (Headquarters) dispatched Engine 125, Engine 225, Engine 336, Engine 129, Truck 36, Squad 33 (Rapid Intervention Crew (RIC), Squad 29, Tanker 33, Tanker 41, Air 45, and Chief 25 to Box 25-11 for a report of a residential structure fire. The crew of Engine 336 consisted of an officer, engineer, and a firefighter. Engine 336 arrived on scene at 01:37:32 hours, and Chief 25 arrived on scene at 01:38:06 hours. Chief 25 advised Headquarters that the structure was a 2½-story farmhouse, and the fire was well-involved. Chief 25 assumed Command. Fire was showing from every window and doorway of the structure. A male occupant of the house with several burns advised Command that there was an occupant trapped inside the house. Engine 336 pulled into a driveway of the residence and parked on Side Bravo, which was approximately 60 feet from the structure. When the officer opened the cab door of Engine 336, the chauffeur had to shield his face from the heat. The jumpseat firefighter (Firefighter 36-36) exited the apparatus and pulled a preconnected 200-foot 1¾-inch hoseline towards the Side Bravo/Side Alpha area of the structure. The jumpseat firefighter was wearing turnout gear, self-contained breathing apparatus (SBCA), and was “on air”. The captain of Engine 336 told the Firefighter 36-36, that Engine 336 was the only apparatus on scene, and this was a defensive fire. Firefighter 36-36 acknowledged this order. The captain went to the rear of Engine 336 and pulled a 300-foot 1¾-inch hoseline and moved towards Side

Charlie. Firefighter 36-36 operated the hoseline and eventually moved onto the porch. Chief 36 arrived on the scene at 0140 hours. After donning his turnout gear, Chief 36 began a walk around the structure to update Command. When Chief 36 approached Side Alpha, he noticed Firefighter 36-36 using an attack line in a defensive position flowing water into the 1st floor windows. Chief 36 then proceeded along Side Delta to Side Charlie. Chief 36 saw the captain of Engine 336 waiting for water. Chief 36 radioed Engine 336 and advised him to charge the hoseline. Truck 36 was responding and was given the assignment to setup for aerial operations upon arrival. Chief 36 heard a noise in the front yard and walked to Side Alpha. He noticed the porch roof had collapsed. Chief 36 saw a handline going under the burning, collapsed porch roof. Chief 36 immediately called a Mayday at 01:44:48 hours for a firefighter down on Side Alpha and requested a hoseline. The PASS alarm on Firefighter 36-36's SCBA had activated and was in full alarm. A 2nd Alarm was dispatched to Box 25-11 at 01:46:42 hours. The RIC (Squad 33) was not on the scene yet. Firefighters from Engine 225 and Truck 36 were trying to locate the trapped firefighter. The porch roof was made of heavy timber and could not be lifted by hand. The columns supporting the porch roof were made of powdered aluminum. The fire caused the columns to melt and split, which led to the columns failing. Firefighters immediately started removing debris and putting the fire out around the front porch to locate the trapped firefighter. Firefighters crawled under the roof and located the trapped firefighter's (Firefighter 36-36) hand. The down firefighter was laying on his back. Truck 36 firefighters went between the front of the house and the porch roof to start cutting the porch roof into sections so it could be lifted. Squad 33 arrived at 01:48:28 hours. Chief 36 requested a set of hydraulic spreaders to lift the porch roof for access. The spreaders could not lift the roof. Long 4 x 4's and a straight ladder provided leverage for lifting the porch roof, and crews pulled the firefighter out at 0156 hours. The firefighter was unresponsive and in cardiac arrest. The firefighter was moved to Ambulance 91 for patient care by emergency medical services (EMS) personnel. After approximately 20 minutes of advanced life support (ALS) care, medical control at a local trauma center advised

EMS to stop resuscitation efforts. The firefighter was declared deceased at 0220 hours. Command marked the fire under control at 02:41:33 hours. The fire was declared out at approximately 0430 hours.

Contributing Factors

- *Lack of effective scene size-up and risk assessment*
- *Lack of crew integrity*
- *Lack of established collapse zones*
- *Lack of situational awareness*
- *Lack of personnel accountability*
- *Offensive operations at a defensive fire*
- *Lack of command safety*
- *Lack of Mayday management*
- *Lack of fireground training and proficiency.*

Key Recommendations

- Fire departments should ensure the strategy and incident action plan, based upon the scene size-up and risk assessment, are communicated to all responding resources by the first arriving fire department resource. This includes communicating any hazard zones and defined collapse zones or exclusion zones at defensive fires
- Fire departments should ensure that company officers and firefighters maintain crew integrity during fireground operations
- Fire departments should ensure that all members utilize the principles of operational risk management at all incidents
- Fire departments should ensure that firefighters are trained to understand building performance under fire conditions and the potential for structural collapse

- Fire departments should train fire officers and firefighters on the principles of situational awareness
- Fire departments should ensure that incident commanders incorporate command safety into the incident management system during fireground operations
- Fire departments should ensure that all companies are operating based upon the assignment given by the incident commander. The Task-Location-Objective assignments should be communicated over the radio
- Fire departments should review their personnel accountability system standard operating procedure (SOP)/standard operating guideline (SOG) to ensure that accountability is maintained at each operational level
- Fire departments should provide a Mayday tactical worksheet for incident commanders in the event of a Mayday
- Fire departments should require all members engaged in fireground operations participate in annual proficiency training and evaluation. This verifies essential qualifications and competencies of its members to operate on the fireground.

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