

# ***NEW JERSEY DIVISION OF FIRE SAFETY***

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## ***Firefighter Fatality and Serious Injury Report Series***

### **Career Firefighter Severely Burned While Operating at a Structure Fire**

**Asbury Park, New Jersey  
January 10, 2011**

***Report Issued:***  
**February 1, 2014**



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**STATE OF NEW JERSEY**  
**Chris Christie, Governor**



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**DEPARTMENT OF COMMUNITY AFFAIRS**  
**Richard E. Constable, III, Commissioner**



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**DIVISION OF FIRE SAFETY**  
**William Kramer, Jr., Acting Director**

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# ***INTRODUCTION***

The investigation of this incident was conducted by the New Jersey Division of Fire Safety / State Fire Marshal in conjunction with the New Jersey Departments of Labor and Workforce Development and Health. This report was prepared in accordance with N.J.S.A. 52:27D – 25d, Duties of the Division.

The purpose of firefighter casualty investigations is to report the causes of serious firefighter injuries or deaths and identify those measures which may be required to prevent the future occurrence of serious injuries and deaths under similar circumstances. In some cases new information may be developed, or old lessons reinforced, in an effort to prevent similar events in the future.

Comments and/or inquiries concerning this report may be addressed to the address listed below:

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# GLOSSARY OF TERMS

*Pursuant to New Jersey Incident Management System regulations, to provide for uniform identification of locations and operational forces within an incident scene, the scene is divided geographically into smaller parts which are designated as divisions. Specific areas of the incident scene are to be designated as follows:*

- Sides of incident scenes shall be identified as letters of the alphabet beginning with the letter "A."*
- The side of the incident scene that bears the postal address of the location shall be designated as Division "A" by the Incident Commander. Where the incident scene has no postal address, the Incident Commander shall select any side to designate Division "A"*
- Continuing in a clockwise rotation, the side adjacent to the Division "A" side shall be designated as Division "B." The side adjacent to the Division "B" side shall be designated as Division "C." The side adjacent to the Division "C" side shall be designated as Division "D."*
- Floor levels shall be designated as Division "Basement" or "0"; "1" (ground level – not necessarily street level); "2", "3", and so on.*

## **Apparatus Designations:**

E – Engine	L – Ladder	A - Ambulance
SQ – Squad	R – Rescue	

## **Personnel Designations:**

FF – Firefighter	BC – Battalion Chief
DC – Deputy Chief	IC – Incident Commander
SO – Safety Officer	FO – Fire Official

CISD.....Critical Incident Stress Debriefing  
EMS.....Emergency Medical Service  
EMT.....Emergency Medical Technician  
HQ.....Headquarters  
ICP.....Incident Command Post  
IDLH.....Immediately Dangerous to Life & Health  
IMS.....Incident Management System  
LDH.....Large Diameter Hoseline  
NFIRS.....National Fire Incident Reporting System

NFPA.....National Fire Protection Association  
NIOSH.....National Institute for Occupational Safety & Health  
NJDFS.....New Jersey Division of Fire Safety  
PAR.....Personal Accountability Report  
PASS.....Personal Alert Safety System  
PEOSH.....Public Employees Occupational Safety & Health  
PPE.....Personal Protection Equipment  
RIC.....Rapid Intervention Crew  
SCBA.....Self-Contained Breathing Apparatus  
TIC.....Thermal Imaging Camera  
UASI.....Urban Area Security Initiative

# ***EXECUTIVE SUMMARY***

On Monday January 10, 2011 at 1015 hours, the Asbury Park Fire Department (APFD) responded to a reported structure fire at 416 Main Street. Responding units quickly arrived on scene, observing a large two-story commercial / residential structure, with smoke showing from the front windows of a second floor apartment. Personnel also encountered a person near the front of the building reporting that someone was still inside the apartment. Crews immediately began search and rescue operations and deployed a hoseline to the second floor for fire suppression operations. During interior operations, personnel reported that interior conditions were very hot with zero visibility, and that they had difficulty operating inside due to the apartment being very tight and cluttered.

While crews were operating inside, the exterior smoke condition became heavier, and additional personnel were now raising a ladder to the apartment windows to break them out for ventilation. While this was occurring, FF Jason Fazio's SCBA air supply became low, and he reportedly told his partner, FF Gregg Arce of this. They reportedly became separated, and it was believed by his partner that FF Fazio was exiting the apartment to change his air bottle. By this time, personnel believed to have located the fire, and with the hoseline in position, the windows were broken out by the outside personnel. Soon after, the fire flashed over, and was now intensely blowing out these front windows. However, the hose crew was not making progress on extinguishing the fire, as it was later realized that they were on the opposite side of the bedroom wall with no access to the seat of the fire. What was not known at that time was that FF Fazio was inside this front bedroom, and was now being severely burned by exposure to the main body of the fire.

While the fire was heavily involved in this front bedroom, outside personnel reported seeing a large flaming object hit the sidewalk in front of the building. It was then realized that this was FF Fazio, who had jumped from a second floor front window to escape the intense fire in the front bedroom. His turnout gear was on fire, and he was severely burned. Personnel extinguished the fire on FF Fazio, and all interior crews were immediately evacuated from the building. They tended to FF Fazio, and immediately transported him to a local trauma center.

An accountability check was performed, and it was initially believed that FF Fazio's partner was missing, however, it was soon confirmed that he had responded to the hospital with FF Fazio. By now, the fire continued to rage inside this apartment, and it was quickly threatening to spread via the common attic area above the apartments. Mutual aid companies had now arrived on scene, and personnel resumed firefighting operations. Soon after, the heavy fire conditions inside the apartment and throughout the attic area above were both

successfully extinguished without further incident. There was never anyone found inside the apartment as originally reported.

The fire origin and cause investigation was conducted by members of the Monmouth County Prosecutor's Office, the Monmouth County Fire Marshal's Office, and the NJ State Fire Marshal Arson / K-9 Unit. The area of fire origin was determined to be in the Division 2-A bedroom of the apartment, along the rear wall area. The fire was classified as accidental in nature, as investigators were unable to rule out the failure of energized electrical cords powering a table lamp and/or radiator-style space heater, resulting in the ignition of readily available combustible materials.

# **FACTORS / REMEDIES**

In order to minimize the risk of similar incidents, NJDFS investigators identified key issues that must be addressed and remedies that should be implemented within all departments.

- 1. FACTOR:** Deficiencies within the APFD radio communication system prevent the recording of transmissions, and the system is not capable of handling large scale or multiple emergencies simultaneously.

**REMEDY:** *The APFD should upgrade their communication system in accordance with NFPA 1221; Standard for the Installation, Maintenance, and Use of Emergency Services Communications Systems.*

- 2. FACTOR:** Staffing levels within the APFD result in the use of “Acting Officers”, as well as the lack of crew integrity during operations, as the limited personnel attempt to perform all necessary fireground operations.

**REMEDY:** *To every extent possible, staffing levels within the APFD should be maintained in accordance with NFPA 1710; Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments. This states that engine companies and ladder truck companies each “shall be staffed with a minimum of four on-duty personnel.” Understanding this, if adequate staffing is not available from within the APFD, department administration must provide for suitable initial alarm staffing by utilizing alternate methods such as automatic mutual aid from neighboring fire departments.*

- 3. FACTOR:** Crew integrity was not maintained during this incident. At times, APFD firefighters performed tasks within the fire building alone, including FF Fazio himself; which as a matter of normal safety practice is never acceptable.

**REMEDY:** *It is paramount that firefighters adhere to basic training protocols regarding crew integrity such as “at least two firefighters enter together and exit together” to provide an acceptable level of safety.*

- 4. FACTOR:** A dedicated RIC was not present or assigned during initial firefighting operations, as a mutual aid company was assigned this task, and they were not on scene upon FF Fazio’s distress and self-rescue.

**REMEDY:** *A dedicated RIC should be available on scene upon personnel initiating operations within an IDLH atmosphere. This should*



*consist of initial response personnel prior to the arrival of a mutual aid RIC if applicable.*

5. **FACTOR:** Essential fireground duties, including search, ventilation, and suppression must be well coordinated based upon the conditions present and the locations of personnel to allow for safe and effective operations.

***REMEDY:** Regular communication between interior, exterior, and command personnel is key to coordinating fireground operations between search, ventilation, and suppression personnel. All personnel must be properly equipped and at-the-ready in the proper locations to systematically perform their task to ensure safe and efficient fire control.*

6. **FACTOR:** The PAS utilized by the APFD did not effectively track the location, function, and time of personnel, and confusion ensued upon FF Fazio's distress and the subsequent evacuation of FFs from inside the structure.

***REMEDY:** The APFD PAS policies and operations should be amended to be in compliance with NJ IMS regulations under N.J.A.C 5:75, which would effectively track all personnel operating on the fireground.*

7. **FACTOR:** Despite multiple TICs being deployed inside the structure, including one reportedly with FF Fazio, these tools were not effectively utilized by personnel while searching for victims and the seat of the fire.

***REMEDY:** Where available, TICs should be regularly utilized to increase personnel safety during all aspects of fireground operations, and personnel should be trained on the proper operation of the TIC to ensure proficiency.*

8. **FACTOR:** Although checked at the beginning of each shift, personnel reported frequent problems with SCBA, including dead batteries for air supply displays and/or PASS devices, occasional low air supply in the tanks, and broken voice amplifiers. Further, there was no formal documentation performed to identify these issues for maintenance or repair.

***REMEDY:** All components of the SCBA should be checked by personnel at regular intervals, with a form to document each aspect of the unit. Further, any minor maintenance issues should be documented and repaired immediately, or the SCBA should be taken out of service pending required repairs or permanent removal from inventory due to unserviceability.*

# **INVESTIGATION**

*It should be noted that during the course of this investigation, a copy of the fireground communications was never produced by the Asbury Park Fire Department. It was reported that the communications system was an outdated proprietary system that did not have adequate provisions for successfully recording and/or duplicating these communications. To this end, NJDFS investigators were unable to successfully compile a detailed timeline of the incident, and only the original dispatch time is noted. Any other timeframes referenced should be considered approximations based upon interviews of personnel on scene.*

## **The Incident**

On Monday January 10, 2011 at 1015 hours, the Asbury Park Fire Department (APFD) responded to a working apartment fire at 416 Main Street. The initial response for the APFD consisted of BC-2, FO-30, E-77, L-89, and A-58. It was noted that although these units arrived on scene quickly, as APFD HQ is only a few blocks away, A-58 was first to arrive as they were nearby, returning from a local hospital after a medical call. Personnel observed a large two-story attached commercial / residential structure, with smoke showing from the front windows of a second floor apartment. This type of structure is also known as a “taxpayer,” as there are commercial occupancies on the first floor, and multiple apartments on the upper floor(s).

It was noted that some personnel reported encountering a person near the front of the building reporting that someone was still inside the apartment. A-58 personnel attempted to enter the second floor apartment, but were pushed back due to high heat and heavy smoke, and they were not equipped with the proper protective gear or equipment to safely proceed.

As L-89 positioned near the Division A/D corner of the structure, E-77 stopped at a nearby fire hydrant to lay an LDH supply hose for water supply. They performed a forward lay into the scene and positioned in front of L-89 at the Division A side for fire suppression operations. BC-2 (Acting BC) was the initial IC, and he requested a “Signal 10,” which for the APFD, recalls some off-duty personnel, as well as a mutual aid RIC.



**Figure 1 – Side A view of structure after fire was extinguished.**

Upon hearing this, Fire Chief D. Kevin Keddy responded to the scene from fire HQ. While this was occurring, L-89 Acting Captain FF Jason Fazio ran toward the door to the stairway for the second floor apartment. He later reported encountering a child stating (with a language barrier) that someone was inside the apartment. FF Fazio immediately entered the apartment to search for any victims that were trapped. He was followed quickly thereafter by his partner, FF Arce; the two met inside the apartment, and FF Fazio led his partner through the high heat and zero visibility inside the tight and cluttered apartment for their search operation.

Simultaneously, the crew from E-77 was deploying a 1.75" attack hoseline up the stairway to the second floor apartment. Once upstairs, the hoseline was charged with water, and this crew attempted to locate and extinguish the fire. It was later reported that they initially proceeded down the hallway toward the rear of the apartment, and encountered a locked bedroom door. Upon opening this door, there was no fire there, and they had to reposition the hoseline back toward the front of the apartment. While these crews were operating inside the structure, the exterior smoke condition became heavier, and exterior personnel began to raise a ground ladder to the apartment windows in preparation to break them out for ventilation.

Chief Keddy quickly arrived on scene, and conferred with BC-2 about the operations prior to assuming IC. BC-2 now became the interior division commander, and he proceeded to enter the apartment to check on the progress

of operations. The IC then ordered a “Signal 11”, which for the APFD, further upgrades the response to include a full recall of all off-duty personnel, as well as additional mutual aid apparatus and personnel from surrounding jurisdictions.



**Figure 2 – Photo shows exterior ventilation operations being initiated on side A and worsening smoke conditions as the building is opened up.**

While this was occurring, FF Fazio’s SCBA air supply became low and his low air alarm activated. He reportedly advised his partner, FF Arce of this condition. At some point they separated, and his partner believed that FF Fazio was exiting the apartment to change his air cylinder. However FF Fazio later stated that he continued searching for victims and/or the fire. FF Fazio later reported yelling that he found the fire at the front of the apartment, but this was unconfirmed by others in interviews conducted after the incident. By this time, additional personnel believed they had located the fire, as they saw a glow toward the front of the apartment.

With the hoseline in position, the IC ordered that the Division 2-A windows be broken for ventilation by the outside personnel. As heavy, dark smoke now pushed out these windows, the fire soon flashed over, and was now intensely blowing out these front windows. These deteriorating exterior conditions indicated to personnel outside that the hose crew was not making progress on extinguishing the fire, and personnel began to deploy a back-up 1.75” attack hoseline to the interior. It was later realized that the initial hose crew was on the opposite side of the bedroom wall from the location of the main body of fire and therefore could not effectively attack the seat of the fire from this position.





**Figure 3 – Photo shows the flashover conditions after ventilation was completed. FF Fazio was still inside the flashover room at this time. He was able to escape by diving out the right side window of the room where flames were emanating (the only one without window guards; see arrow above).**

What was not known by personnel was that FF Fazio was still inside the front bedroom that was ablaze at this time, and was now being severely burned by the fire. FF Fazio later reported that he began praying and went into “survival mode.” He searched around the cluttered room for an escape, locating a window and breaking it out with a tool he was carrying. He did not have time to issue a “Mayday” message or to deploy a personal “bail-out” system with which he was equipped. He just dove through the broken window, and fell to the sidewalk below with his turnout gear melting and burning off of him.

Exterior personnel reported seeing a large flaming object hit the ground in front of the building. They initially thought it was a piece of the building facade, however, it was quickly realized that it was FF Fazio and that he was severely burned. These personnel extinguished the fire on FF Fazio and began to cut his turnout gear and SCBA off of him. The IC immediately ordered the evacuation of all interior crews from the building and requested paramedics to respond. The interior crews reportedly were surprised upon exiting and seeing the commotion outside. As his fellow firefighters began tending to FF Fazio, A-58 was repositioned nearby to immediately package and transport him. FF Fazio’s partner got into the ambulance with him, and a retired city FF who was observing the scene drove A-58 to a local trauma center.

After this evacuation, a PAR was performed, and it was initially believed that FF Fazio's partner was still missing, as no one saw him get into A-58 minutes prior. It was soon confirmed that he had responded to the hospital with FF Fazio, and that all personnel were accounted for. By now, the fire continued to rage inside this apartment, and it was quickly threatening to spread via the common attic area called the "cockloft" above the apartments. Mutual aid companies had since arrived on scene, and personnel resumed firefighting operations. After extensive operations, the heavy fire conditions inside the apartment and throughout the attic area above were both successfully extinguished without further incident. All APFD personnel were ordered back to headquarters for debriefing, and the remaining scene operations were turned over to mutual aid personnel. It was noted that after extensive searching, there was never anyone found inside the apartment as originally reported.

### ***The Casualty Scenario***

At the time of the incident, Firefighter Jason Fazio was a 41 year old member of the Asbury Park Fire Department with 17 years of firefighting experience. During this incident, he was operating as the Acting Captain for L-89, a role he often filled despite his normal duty of being the driver / operator of the Ladder Company for the past seven years.

While conducting search and rescue operations in the second floor apartment, FF Fazio became trapped in the room of fire origin when it suddenly erupted into flashover conditions. While his equipment was burning and/or melting away, he managed to locate a window and proceeded to dive through the window, landing on the concrete sidewalk below.

FF Fazio was immediately transported to a local trauma center and quickly transferred to St. Barnabas Burn Center in Livingston, NJ. As a result of this incident, FF Fazio sustained 3<sup>rd</sup> degree burns to 57% of his body, and multiple bone fractures. After weeks in a medically-induced coma, he endured multiple surgeries and skin-grafts. He was transferred to a rehabilitation center three and one-half months later, eventually being released to his home, where a nurse's aide assists him and he continues regular therapy and rehabilitation sessions to this day.

It was noted that this incident occurred on FF Fazio's 41<sup>st</sup> birthday.

# **ANALYSIS**

## ***Fire Department Profile***

The APFD is a career fire department with 40 firefighters / EMTs, nine captains, four battalion chiefs, and a fire official operating under the direction a fire chief. The APFD serves the ocean front city with a population of approximately 16,000 (which is significantly higher during the summer season), residing in an area of 1.6 square miles. The department operates with 13 personnel on each shift out of one fire station, housing a fleet of two engines, one ladder truck, and two ambulances. The APFD also has two engines and one ladder truck as reserve apparatus. At the time of the incident, the department performed its own local dispatching and emergency medical services. According to NFIRS records, the APFD responded to approximately 1200 fire calls and 700 EMS calls in 2010.

*The following items are areas identified by NJDFS investigators as impacting directly upon the outcome of this incident:*

## ***Communications***

Deficiencies within the APFD radio communications system did not allow for effective recording and/or duplicating of fireground communications. This greatly hampered this investigation because investigators were unable to successfully compile a detailed timeline of the incident operations. As such, interviews of personnel were essential in determining any sort of operational details or timeframes, although with no exact level of certainty.

Further, the APFD did not fully operate on the established county-wide, multi-channel communications system, reportedly due to logistical and financial shortcomings that prevented effective operations on this system. As a result, the APFD is initially dispatched over the county system, but then a dispatcher within the APFD then re-dispatches the call details over their local system. The APFD personnel then operate solely on their local channel, with the IC or the dispatcher relaying information to the county or PD by phone or over another channel. This system often becomes overburdened when multiple incidents are ongoing, or upon the frequent EMS calls overlapping the fire calls. The APFD has since moved over to a regional dispatch system with facilities in Neptune and Freehold.

## ***Staffing / Crew Integrity***

Under ideal conditions, the APFD operates with 13 personnel on each shift, however, this number often drops to as low as nine due to staff requesting days

off. This leads to situations where apparatus are responding short on staffing, especially when both ambulances are needed, as FFs are detailed to EMS duties for the shift, taking them off of the engine or ladder for the initial response. During this incident, there were ten personnel on shift, not including the Chief or FO, who were also available on duty because it was a weekday. The breakdown of responding personnel was as follows:

- E-77 – Driver, Captain, and two FFs
- L-89 – Driver, Acting Officer, and one FF
- A-58 – two FFs
- BC-2 – Captain as Acting BC
- Chief as IC and FO-30 as Command Tech

Additionally, absences within the staff officer positions create the need for FFs to be placed in “Acting Officer” capacities, as was the case in this incident. It was further discovered that some Acting Officers within the APFD, including FF Fazio, were not certified by the NJDFS to the appropriate IMS level for the position they were filling. However, it appeared that most personnel did obtain the requisite training to fill these positions, but they simply did not file for the proper state certification.

With reduced staffing levels, the effectiveness and efficiency of firefighting duties are compromised as fewer personnel are available to perform these same tasks, such as ventilation, search, and suppression. To this end, the APDF relies heavily on recalling personnel during fires and/or mutual aid companies responding to assist. Either way, there is an initial delay in obtaining the proper number of personnel to safely operate.

Further, during this incident, there was a lack of crew integrity exhibited by many personnel. Crew integrity is defined as firefighters being paired in teams that enter the hazardous area together, perform their assigned task together and exit together. FF interviews revealed that during this incident, the personnel conducted various operations utilizing intermittent crew integrity, including during the interior search. The search was initiated by Fazio prior to his partner, FF Arce reaching him. Shortly after, they met up in the apartment but then separated again when Fazio became low on air. FF Arce initially believed that Fazio had exited the building when in fact he continued searching on his own for victims and the seat of the fire. It was at this point that conditions worsened dramatically and FF Fazio was forced to escape out the second floor window.

As a method of dealing with the many incidents where strict crew integrity is not possible due to staffing levels, the APFD has issued portable radios to all on-duty personnel. These radios allow FFs operating alone to monitor conditions and maintain contact with other personnel on scene. However, it was later noted by FF Fazio that he did not hear many radio transmissions, nor did he transmit any



messages. Again, this cannot be confirmed due to the lack of any fireground communication recordings being provided for this investigation.

### ***Rapid Intervention Crew (RIC)***

In accordance with Incident Management System (IMS) regulations under N.J.A.C. 5:75, which adopts the National Fire Protection Association (NFPA) Standard 1561, Standard on Emergency Services Incident Management, fire departments are required to provide at least two firefighters outside of an IDLH atmosphere. These firefighters are tasked with searching for and rescuing lost or trapped firefighters, should the need arise. It is recommended that this concept be taken to a higher level with the establishment of a Rapid Intervention Crew (RIC).

During this incident, the personnel who responded on the first alarm assignment were committed to rescue and suppression operations. Therefore a pool of FF's dedicated for RIC duties was not immediately available. To this extent, the APFD was not able to specifically designate the required personnel for the rescue of distressed firefighters.

Separate from the RIC requirements are what is commonly known as the "Two-in; Two-out" provisions of the Respiratory Protection Standards under 29 CFR 1910-134. This requirement states that there must always be at least two responders stationed outside during interior structural firefighting. They must be trained, equipped, and prepared to enter if necessary to rescue responders inside. There is however, an exception to this rule when there is an emergency rescue operation required; as was the case in this incident. Although at least two command staff personnel (the IC and FO) were operating on the exterior of the structure, they were not fully equipped and ready to actuate rescue. Due to the ongoing rescue operation, the APFD met the requirements of the "Two-in; Two-out" provisions.

The general requirements of the "Two-in; Two-out" provisions when not actively performing rescue operations are stated below:

- At least two employees enter the immediately dangerous to life or health (IDLH) atmosphere and remain in visual or voice contact with one another at all times;
- At least two employees are located outside the IDLH atmosphere; and
- Visual, voice, or signal line communication is maintained between the employee(s) in the IDLH atmosphere and the employee(s) located outside the IDLH atmosphere;
- The employee(s) located outside the IDLH atmosphere are trained and equipped to provide effective emergency rescue;

- One of the two individuals located outside the IDLH atmosphere may be assigned to an additional role, such as incident commander in charge of the emergency or safety officer, so long as this individual is able to perform assistance or rescue activities without jeopardizing the safety or health of any firefighter working at the incident.

Additionally, there were mutual aid companies responding for extra staffing and apparatus. However, it was noted that the incident commander did not specifically request mutual aid companies to perform dedicated RIC operations until after the time of FF Fazio's distress when he extricated himself from the sudden untenable conditions inside the building.

### ***Coordination of Operations***

At this particular incident, the size up of the conditions was performed from the Division A street side only, as the structure was a city block long, with no direct access to the immediate Division B, C, or D sides. However, given the minor smoke visible from that vantage point, as well as the possibility of a trapped victim, there were three distinct functions that needed to be performed in a coordinated manner: search, ventilation, and suppression.

An A-58 FF first entered the structure from the building entrance on the Division A side from the adjacent sidewalk and went to the second floor and attempted to enter the second floor apartment, but was pushed back due to high heat and heavy smoke. He was not equipped with the proper protective gear or equipment to safely proceed. Subsequently, as the apparatus arrived, FF Fazio immediately entered the structure, and ascended the stairs to the second floor where two apartments were located. He was closely followed by his partner FF Arce, but Arce lost visual contact with Fazio. Upon reaching the second floor level, they met up and began to search the kitchen and living room area of the left-hand side apartment.

A hoseline from E-77 was then advanced up the stairs and into the apartment. They proceeded to the rear of the apartment where bedrooms were located. The hose crew and search crew operated independently without coordination between their two tasks. This resulted in the search crew operating without the benefit of the protection of the hoseline as the two crews were deployed in opposite areas of the apartment.

While the interior operations were underway, FFs on the exterior were directed to horizontally ventilate the structure by removing windows on the Division A side of the second floor. A ground ladder was deployed by FFs to accomplish this task. However, there was no communication to the interior crews that ventilation was being performed. This action greatly intensified fire conditions in the room of origin where FF Fazio was searching. The room, with an ample supply of oxygen

quickly reached flashover causing Fazio to be exposed to untenable conditions. The hose crew was not in an ideal position to control the sudden increase in the volume of fire, which now enveloped FF Fazio, forcing him to dive out the window.

### ***Personal Accountability System***

During this incident, the APFD utilized a PAS in which each member has two tags, one tag is left on their turnout gear and the second tag is placed on a clipboard at the start of each shift. This clipboard and the PAS tags are then transferred to a larger command board during fire scene operations. To this end, the accountability of the APFD personnel is based solely upon traditional duties and/or special assignments for each apparatus. For example, the ladder crew would traditionally perform ventilation and search & rescue operations, and their tags are placed accordingly on the command board; regardless of the function they may actually be performing. In the same manner, the engine crew would normally perform fire suppression operations, and their tags would be placed accordingly on the command board.

While this system gives an overall accountability of who is on scene, it does not track an individual's location, assignment, or point of entry / exit. This can lead to much confusion during both basic and detailed operations, as was evident when the whereabouts of FF Arce was initially unknown after the evacuation. This is especially important when multiple recalled "off-duty" personnel and mutual aid companies respond, and APFD personnel assigned to the ambulance(s) resume firefighting operations during fire responses.

### ***Thermal Imaging Cameras***

It was reported that APFD firefighters utilized two TICs during interior operations; one was used by the engine company officer, and the other was reportedly used by FF Fazio as the acting ladder company officer. A TIC is a device that translates a thermal picture into an electrical picture and then a visual image for the human eye. This is accomplished because the TIC relies on the thermal energy emitted by all objects and not on reflected visible light, providing vision capability even with no light present. Thermal energy is characterized by its long wavelength, and fortunately for firefighters, the nature of this long wave thermal energy allows it to travel through smoke. The TIC generates a true black and white image; hotter objects appear white and cooler objects appear black to gray. It is this image that allows firefighters to "see" through the smoke, providing a more rapid means of locating victims or hidden areas of fire.

Both personnel later reported that the images on the devices' screens were "whited out." This condition can occur in spaces that contain high heat and also

on units equipped with contrast adjustment controls that are not properly set for the conditions being experienced. Due to this initial observation, these personnel felt that the TICs were ineffective, and they did not further utilize them during their operations. It should be noted that although FF Fazio reported having the ladder company TIC on the interior of the structure, this TIC was never recovered with his equipment or inside the structure following operations. It is possible that the unit may have been dropped upon FF Fazio coming under distress, and may have been burned beyond recognition, and discarded with other debris during overhaul operations.

### ***Self-Contained Breathing Apparatus***

This investigation revealed multiple issues within the APFD regarding SCBA checks, use, and maintenance. It was reported that at the beginning of each shift, each firefighter checks their own SCBA and related equipment, and the apparatus driver checks the spare units. These apparatus and equipment checks get briefly documented on a form that is submitted weekly, however, these forms rarely note any details of these checks.

Many personnel reported past instances of damaged or inoperable SCBA components, minor air leaks, and/or air cylinders that were not completely full. Typically, personnel would simply fix the issue, or replace the SCBA with a spare unit if needed, and this information would not always be documented for tracking purposes. This was further evidenced with FF Fazio, whereas he recalled checking his SCBA at the start of the shift, but he could not attest to the air supply level. He even reported that for this incident, it seemed that his air supply became low much sooner than he normally experienced while operating at fire scenes. However, without the baseline of his exact air supply level prior to the fire, it could not be determined if his air cylinder was less than completely full to begin with. Additionally, many personnel reported not checking their air supply level gauges or paying attention to their air supply indicator lights during their operations throughout this incident. At least one firefighter reported not seeing any air supply level lights despite checking his SCBA earlier, and all the current APFD SCBA units are equipped with these lights.

### ***PEOSH and NIOSH Inspections***

Following this incident, a PEOSH inspection was performed by investigators from the NJ Department of Labor and the NJ Department of Health. It should be noted that PEOSHA involvement in an investigation is all-encompassing, and can include inspections of facilities, apparatus, equipment, personnel, training, records, and other items as necessary, to determine overall compliance with a variety of accepted and adopted standards and regulations.

Additionally, NIOSH investigators were requested to assist with this investigation due to their expertise in the areas of turnout gear and SCBA analysis. To this end, NIOSH investigators reviewed this case, and were sent preserved items consisting of FF Fazio's SCBA and turnout gear for further examination. The details of their findings on FF Fazio's SCBA and turnout gear can be found at the NIOSH website once their investigative reports are completed.

<http://www.cdc.gov/niosh/fire/>

# **LESSONS LEARNED**

*The following items are areas identified as ways to correct issues regarding this incident and other general items designed to make incident scenes safer and more efficient:*

## **Communications**

IMS regulations state that a communications system should meet the demands of the fire department for both routine and large-scale emergencies. The regulations further state that larger fire departments shall require several additional radio channels (in addition to the main dispatch channel) to provide for the volume of communications associated with multiple incident situations that can be common in larger municipalities. The communications system should be compatible with typical mutual aid departments, and should provide reserve capacity for unusually complex situations.

The radio is often the only link between personnel operating inside and outside of a hazardous area or situation. With this in mind, it is strongly recommended that the APFD communications system and operating procedures be updated to provide a reliable method for their personnel to operate during emergency incidents utilizing various available radio channels, possibly determined by function (fire or EMS), or location on the fire ground. In this regard, excess radio traffic on a single channel will be reduced and the chances of urgent messages being received may be enhanced. Further, these procedures should include measures to allow for moving personnel off channels that are needed for exclusive use between the IC, RICs and trapped or distressed FFs.

All fire departments should possess communications recording equipment capable of recording multiple frequencies simultaneously in various formats - abridged, real-time, merged with dispatch phone calls. Also, dispatchers must make it standard practice to continually update times over the radio upon receipt of "significant" fireground transmissions. NFPA 1221; Standard for the Installation, Maintenance, and Use of Emergency Services Communications Systems recommends that communications centers shall have a logging voice recorder, with one channel for each of the following:

- Each transmitted or received radio channel or talk group;
- Each dispatch alarm circuit;
- Each telecommunicator telephone.

Additionally, NFPA 1221 recommends that records of the dispatch of emergency response units in response to alarms shall be maintained and shall identify the following:

- Units;
- Companies and supervisors for emergencies and subsequent emergencies;
- Supervisory officers for alarms and subsequent alarms;
- Time of acknowledgment by each unit;
- Time of arrival of each unit at the scene;
- Time each unit returned to service.

While operating at scenes that require the response of outside agencies and/or departments, the concept of Unified Command must be utilized. Under this concept, a representative from each agency involved with an incident will contact and/or stand-by at the ICP for orders from the IC. These representatives will exchange pertinent information with the IC to reduce the chance of freelancing and increase accountability of personnel on the scene.

### ***Fire Department Staffing Levels***

When considering the matter of staffing levels, Authorities having jurisdiction should recognize that when staffing levels fall below four FFs per company, critical fireground operations often are not carried out when needed. Tests conducted with the Dallas, Texas Fire Department indicated that staffing below a crew size of four can overtax the operating force and lead to higher losses. Similarly, NFPA 1710; Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments notes that engine companies and ladder truck companies each “shall be staffed with a minimum of four on-duty personnel.”

Another study was conducted by Ohio State University for the Columbus, Ohio Fire Department. In the study 404 structure fires were analyzed to show firefighter injuries and the rate of fire spread with various numbers of staffing. Minimum staffing thresholds were set at 15 personnel for residential structure fires and 23 personnel for larger fire scenarios such as commercial structure fires. The study shows that the number of fires that spread beyond 25 square feet in size increases as staffing levels diminish. Specifically, at residential structure fires, there is a 24.1% increase in the spread of fire when less than 15 firefighters respond on the initial alarm. However, the danger to firefighters increases even more dramatically resulting in a 46.7% greater injury rate when less than 15 firefighters respond on the initial alarm. At larger fires, when there are less than 23 firefighters on the initial alarm, there is a 17.2% increase in the spread of fire and a 73.5% increase in firefighter injuries as a result of reduced staffing.

While it is desirable for adequate staffing levels to be maintained by fire departments at all times, it is not always possible. Understanding this, if adequate staffing is not available from within the APFD, department administration must provide for suitable initial alarm staffing by utilizing alternate methods such as automatic mutual aid from neighboring fire departments. If this method is used, it is critical that the mutual aid departments be dispatched to reported building fires at the same time as the APFD so as to ensure they arrive as close together as possible. It is not advisable for mutual aid to be dispatched only upon the arrival of the first APFD apparatus. If however upon arrival of the first APFD apparatus it is found that mutual aid will not be needed, neighboring fire departments can be cancelled and returned to their respective stations.

Municipal officials need to understand that as the recognized employers of the department, they are legally responsible for inadequacies of a fire department. Elected officials can be cited for violations of laws and regulations and held liable in civil suits arising from departmental actions including those caused by inadequate staffing. Public officials need to adequately staff the fire department in order to assure fireground operations are conducted in a safe, efficient and effective manner. Although EMS service is a necessary duty within the APFD, this service needs to be balanced with the required fire protection needs of the community. These APFD EMS personnel should not further strain crew size by being unavailable for fire responses during EMS calls and/or not being fully equipped for firefighting duties upon their arrival as their turnout gear and equipment are carried on other apparatus. Alternatively, the APFD may want to consider hiring civilian EMTs to staff the ambulance service; thus permitting the firefighters that currently staff the ambulance to be reassigned to fire apparatus.

### ***Crew Integrity***

As previously stated, FF Fazio and FF Arce met up in the apartment after search operations had begun but then separated again when Fazio became low on air. FF Arce initially believed that FF Fazio had exited the building when in fact he continued searching on his own for victims and the seat of the fire. It was at this point that conditions worsened dramatically and FF Fazio was forced to escape out the second floor window. While it is understandable and admirable that FF Fazio continued searching alone after the two firefighters had become separated; especially considering that it was believed a victim was present; firefighters must not let their emotions control their actions in circumstances such as this. Firefighters by nature understand “the job must get done” and often take considerable and at times unwarranted risks, including performing tasks alone where a minimum of two firefighters are necessary to ensure safety. Such would seem to be the case with this incident. It is paramount that firefighters adhere to basic training protocols regarding crew integrity such as “at least two firefighters enter together and exit together.” It is a demonstrable fact that firefighting is



inherently dangerous, but it must be stressed that it is not an acceptable practice to trade one life for another. Typically, where this philosophy is embraced, it is often fatal for both the firefighter and the victim.

### ***Rapid Intervention Crews (RIC)***

As previously mentioned, IMS regulations under N.J.A.C. 5:75-5.28 require fire departments to provide at least two FFs outside of an IDLH atmosphere. These FFs are tasked with searching for and rescuing lost or trapped personnel, should the need arise. To every extent possible, it is recommended that this concept be taken to a higher level with the establishment of a dedicated RIC comprised of additional staff.

These crews should be specially trained and equipped to deal with rescue of FFs under the worst possible conditions. The crews can be composed of departmental personnel or mutual aid personnel. It is important for the IC to request a RIC as soon as possible after dispatch to allow for the crew to arrive quickly. Many fire departments have even refined their response plans to dispatch a RIC automatically upon receipt of a report of a structure fire.

If this concept is adopted by the fire department, it is crucial that the members of the RIC obtain all necessary training and equipment. Once on scene, crew members should not be utilized for any other tasks. Other FD members need to be well versed in the duties, responsibilities and operations of the RIC.

It was also noted earlier in this report that the “Two-in; Two-out” provisions of the Respiratory Protection Standards under 29 CFR 1910-134 are separate from the RIC requirements and mandate that there must always be at least two responders stationed outside during interior structural firefighting. They must be trained, equipped, and prepared to enter if necessary to rescue responders inside. The exception to this rule is when there is an emergency rescue operation required. Due to the ongoing rescue operation, the exception applied in this case and the requirements were met by the APFD. However, the Division of Fire Safety strongly recommends that fire departments strive to meet the more stringent requirements of the “Two-in; Two-out” provisions with adequate staffing and not by relying on the rescue exception. In this way, firefighter safety will be enhanced to the greatest extent possible during operations that are typically the most hazardous.

### ***Coordination of Operations***

The IC and the incident command staff are responsible for the coordination of all operations on the fireground, so as to safely and efficiently mitigate the hazard presented. Typically, when dealing with a structure fire, life safety is paramount,

and this would involve search operations to attempt to rescue any trapped victims. Often, search crews are operating in areas away from the immediate area of fire origin, and even attempt to isolate themselves from the spread of the heat and flames as a protective measure.

Ventilation is the act of removing the accumulated products of combustion from within a confined area. There are multiple methods of performing ventilation, however, the IC or Operations Chief must determine when and where crews will perform this task. If ventilation is performed too soon or in the wrong location, the fire and/or its byproducts can rapidly travel to unaffected areas, as the fire will be drawn to this new source of fresh air. However, if ventilation is performed too late, interior personnel will be driven back from the extreme heat and smoke.

Suppression involves extinguishing the fire, typically by a direct attack with a hoseline to apply water to the seat of the fire. To accomplish this, hose crews must locate the fire, and then take a position to both protect themselves, and still be able to apply water to the fire.

For these operations to successfully occur simultaneously, the IC and command staff must constantly remain apprised of the locations of all personnel, and the conditions that are being experienced both on the interior and exterior of the structure. With this continual flow of information, the IC and command staff can tailor the operations of these crews so as to control the fire while ensuring the safety of all personnel.

### ***Personal Accountability System***

Regulations for the NJ Personal Accountability System (NJPAS) under N.J.A.C 5:75 require that fire departments utilize a two-tag accountability system. The first tag is placed by the FF on the responding apparatus, and the second tag is given to a designated accountability officer prior to entering the IDLH. This system includes the use of PARs / roll calls, all within the framework of the IMS that is required to be utilized at all incidents.

The NJPAS is more than simply handing tags to the designated officer. It is also a system that requires communication between crews working inside the structure or hazardous area and company officers and the IC. Interior crews must continually apprise their company officers regarding conditions, location, and what they are doing. At the same time, company officers responsible for crews must solicit information from their crews and pass it along to the IC or operations chief. With proper two-way communication, everyone on the incident scene is cognizant of what each team is doing and generally has a sufficient idea of where they are, thereby lessening the chances of FFs freelancing.

## ***Thermal Imaging Cameras***

Fire departments that possess TICs should routinely employ them during all aspects of structural firefighting operations, especially whenever personnel enter a situation where visibility is reduced. The TIC is an important tool to make searching for a fire and/or its victims more efficient, which results in a higher level of safety for FFs. The TIC must be an integral part of rescue operations for lost or trapped firefighter, as it can help speed a RIC to the firefighter saving precious time in locating and removing the victim(s). Fire departments must continually train utilizing their TIC so that all FFs become proficient in its use. This training should cover the features of the TIC, how to interpret the images on the screen, and how to make adjustments to the contrast and resolution depending on the situation involved.

## ***Self-Contained Breathing Apparatus***

The air supply of an SCBA can be drastically reduced depending on many factors, including physical exertion, which will exhaust the air supply much sooner. This was illustrated when the Philadelphia Fire Department conducted extensive testing in a firefighting skills proficiency course with FFs using SCBA. For the 750 FFs tested, the average air consumption for a SCBA rated for 30 minutes was less than 15 minutes from full tank to low air pressure alarm, which is designed to activate when the air supply reaches approximately one-quarter capacity. However, FFs should not rely solely on this alarm to alert them to exit the hazardous area, as all mechanical devices are subject to failure. Even with proper SCBA maintenance, FFs must periodically monitor their SCBA air pressure gauge during operations. Also, during routine checks, all SCBA components should be checked for proper operation, and air pressures should be logged to track any possible problems with air leaks. Inspection forms should be utilized to document this information, as well as the date/time, and who checked each SCBA.

To help ensure efficient SCBA operations, fire departments must comply with Respiratory Protection Standards under 29 CFR 1910-134. This mandates that all FFs obtain a “fit test” annually, attesting to their ability to maintain a proper face mask seal. Should any FFs not receive a passing score on this analysis, they should be refitted with a different size / style SCBA face piece and retested until a passing score is obtained.

Currently available SCBA technology further increases the efficiencies of the SCBA, and increases safety for the user. This includes improvements such as better fitting facepieces with higher temperature resistance, visual air supply indicator lights within the regulator, voice amplification modules to reduce muffled communication, integrated PASS devices with heat sensors that automatically arm upon turning-on the SCBA, universal air connections and quick disconnects

for RIC, and “black-box” type circuitry that can track and recall the lifetime functions of the SCBA. Although some of these features are now considered “standard” on SCBA units, others can be installed either as new or retrofit applications.

Future improvements to SBCA face piece lens assemblies can be expected, as this lens is the weakest link in the SCBA protecting the firefighter. As was found in this case with FF Fazio’s SCBA, it has been found that the lens assemblies will begin to degrade at much lower temperatures than any other SCBA components, and rapidly fail when exposed to high temperatures. This would expose the user to the surrounding IDLH atmosphere, quickly resulting in severe injuries or death. To this end, many advisory and regulatory agencies, including the NJDFS, have issued safety alerts regarding this issue. This alert can be found in at:

<http://www.state.nj.us/dca/divisions/dfs/alerts/>

### ***Firefighter Survival Techniques***

No matter how cautious FFs are, fires are dynamic and conditions can deteriorate rapidly. It is imperative that they be prepared for dire situations should they occur. Fire departments need to train personnel to deal with the possibility of becoming lost or trapped. While it is difficult to simulate a training scenario in which a FF actually feels his/her life is threatened, creative, realistic and safe training exercises can be developed to help prepare them for dire situations.

Through repetitive training, FFs can learn such emergency survival techniques as “skip-breathing” to conserve precious air supply, entrapment self-extrication techniques, wall breaching techniques, ladder escape “bail-out” methods and so forth. It is also important that they be equipped with small items such as wire cutters, personal flashlights and personal lengths of rope or nylon webbing.

Above all, FFs must be conditioned to respond to individual emergencies calmly in order to make reasoned decisions. They must be taught that if they become lost or trapped the most important thing they can do is notify others of their plight and location as best they can. For this reason, every interior crew member should have a portable radio equipped with a sufficient number of operational frequencies and a dedicated command frequency. Further, they should use a pre-determined emergency term such as “May-Day” to notify the incident commander of their situation. Finally, FFs need to immediately activate their PASS devices manually so that rescue crews can locate them quickly.

# **GENERAL INFORMATION**

## ***Emergency Care of Firefighters***

The NJ Department of Health and Senior Services (NJ DOH) has issued a guide book, "Emergency Management Considerations for Firefighters" (also known as the "Pink Book") to the emergency departments of all hospitals in the State. Although these protocols did not impact upon this incident, this book covers the proper medical procedures and considerations for treating and/or stabilizing various firefighter injuries. It should be noted that the NJ DOH is currently updating the "Pink Book", and changing the title to "Guidelines for the Emergency Care of Firefighters". All FDs should check their local hospitals to ensure that emergency room staff do possess, and are familiar with, this guide book.

In accordance with American Burn Association recommended guidelines, and in keeping with the policies of The Burn Center at Saint Barnabas, a certified burn treatment facility for care and transport of burn patients, all individuals meeting the following criteria should be referred to the nearest certified burn center:

- All Partial thickness (second degree) burns  $\geq 10\%$  TBSA;
- All Full thickness (3rd degree) burns, regardless of size;
- All chemical, inhalation and electrical burns;
- Any burns to the face, feet, joints or genitalia;
- Patients with pre-existing medical disorders compromising outcome;
- Patients with burns and concomitant trauma (Follow regional medical control and triage protocols);
- Patients requiring extensive social, emotional or long-term rehabilitation;
- Pediatric burns without qualified personnel or equipment.

In New Jersey, consult with The Burn Center at St. Barnabas Hospital directly at (973) 322-5920, or the NJ DOH at (609) 984-1863

## ***Critical Incident Stress Debriefing (CISD)***

The purpose of a CISD Team is to provide individual counseling, group sessions and, if necessary, referrals to members of an emergency response organization involved in traumatic events. The teams are made up of specially trained fire, police and EMS personnel, along with mental health professionals who provide training and guidance to the team members and assist at the debriefing sessions.

The assistance provided by the CISD Team helps to sensitize the FFs to the possibility of stress reactions, hopefully avoiding future stress related problems. It allows the members to understand the range of normal reactions and provides

a method to deal with the incident and its after-effects. The use of a CISD Team in situations such as this is not a sign of weakness on the part of emergency personnel. Failure to deal completely with the emotional stress of such a traumatic occurrence can negatively affect both the professional and personal lives of those involved.

The NJDFS recommends the notification and use of CISD teams when the CISD trigger events are found to be present. Such significant events may include:

- line of duty death of a co-worker;
- mass casualty incidents;
- death of a child;
- death occurring after prolonged rescue efforts;
- when a victim reminds an emergency worker of a loved one;
- during highly dangerous or highly visible events;
- when the emergency worker influences death or injury;
- co-worker suicides;
- any other unspecified highly traumatic event.

Currently, CISD Teams are regionalized in New Jersey and are part of a statewide network. These teams will respond on a 24-hour basis whenever requested. Emergency contact numbers for activation of a CISD team are as follows:

The Statewide CISD Network – (609) 394-3600  
The NJ Fire & EMS Lifeline – (866) 653-3367

# **CONCLUSION**

Firefighting is one of the most hazardous occupations that exists. Firefighters understand that every fire they respond to is different in many ways from others they have fought. However, there are also many similarities between nearly all fires that must be identified by firefighters. A major similarity is the way fire typically behaves.

One such similarity is flashover. In fires where there are extreme heat conditions coupled with superheated flammable gases produced by the fire, an influx of fresh air from ventilation will nearly always lead to flashover if an adequate supply of water is not applied quickly. In this incident, ventilation, suppression and search and rescue operations were not well coordinated and the direct result was flashover and the severe injuries sustained by FF Fazio.

Of course the lack of coordinated operations was not the only factor; short staffing which may have led to freelancing, lack of crew integrity, and the lack of an initial RIC were also major factors. In this regard, due to circumstances beyond their control, firefighters often operate out a sense of responsibility to duty in ways they most likely know are unsafe in order to “get the job done.” Obviously, this attitude is admirable but it can also be a contributing factor for countless injuries and deaths of firefighters. Understandably, it is difficult for most firefighters to accept operational limitations with regard to adequate staffing and crew integrity when a civilian victim is in peril and underscores the need to provide firefighter training designed to develop awareness of operational abilities and limitations.

It is the NJ Division of Fire Safety’s sincere hope that the lessons learned from this and other similar incidents will serve to educate the fire service and inspire them to take all necessary measures to reduce firefighter injuries and deaths to the greatest extent possible. As has been stated in previous investigative reports issued by the NJ Division of Fire Safety, firefighting is an inherently dangerous occupation. Keeping this in mind, firefighters should rededicate themselves to developing a better understanding of the hazards of their profession, adopting best practices to minimize the risks of such hazards, and working within the limitations of available resources to get the job done to the best of their ability.

# ***REFERENCES***

Fire Investigation Report:

Monmouth County Prosecutor's Office. Case # AR11-00002.

Forensics Report:

Monmouth County Prosecutor's Office. Case # FN11-015.

Fire Investigation Report:

Monmouth County Fire Marshal's Office. Case # 1301-01-10-11.

NFIRS Report:

Asbury Park Fire Department. Incident # 11-0000101.

Fire scene photos provided courtesy of Mr. Thomas Berg (bystander).

NFPA 1710; Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments.

NFPA 1561; Standard on Emergency Services Incident Management

Public Employees Occupational Safety and Health (PEOSH) Respiratory Protection Standard (29CFR1910.134)

N.J.A.C 5:75 - NJ Personal Accountability System (NJPAS)

Ohio State University/Columbus Fire Division, "Measuring Firefighting Effectiveness," September 15, 1980.

NJDFS Safety:

Potential Failure of SCBA Facepiece Lenses. #12-1 dated July 2012.

NIOSH Reports:

National Institute for Occupational Safety & Health. Task # 17700.