Was Lint To Blame for the Fire?

Kenneth A Kandrac, CFI,

An attached single family dwelling along a Jersey shore river was the scene of a major structure fire. The insured's college aged son was in a third-floor room studying. While in a second-floor living room, the insured observed smoke flashing past the windows. Within a few minutes a first-floor smoke detector sounded. Going to the first-floor he observed fire venting from the laundry room, and within seconds he was driven from the first-floor to the exterior. He immediately called for his son, who quickly responded, but could not exit via the interior stairway, and was forced to jump from a second-floor window.

The investigation revealed a well involved fire in an electric clothes dryer. Fire patterns on the dryer were consistent with an extensive lint buildup. Continuing evaluation of the fire patterns and fire extension within the first floor showed an unusual configuration for the routing of the metal exhaust duct for the dryer vent. The builder had decided to route the exhaust from the laundry room, near the front of the structure, to the rear wall adjacent to a parking lot, an extended run for the metal duct.

The insured stated that he had the dryer duct cleaned more than a year before the fire. Removal of the dryer from the laundry room showed an excessive lint accumulation in the duct pipe. The duct transitioned into a 90º bend extending within a ceiling void to the rear of the dwelling. At the downstream end of the 90º bend, an octopus-shaped device was found lodged in the duct pipe. As evidenced during the inspection, the duct cleaning contractor lost the duct whip during his procedure.

Unfortunately, the insured was unable to recall the contractor that had been used.

1603 Old York Road
Abington, PA 19001
DJS associates

ADDRESS SERVICE REQUESTED

Please send us the address or business card of anyone you think would enjoy receiving "Expertly Speaking"

First-Class Mail
U.S. Postage Paid
Abington PA
Permit No. 321

"ExpertlySpeaking®"
Spring / Summer 2017 Forensic Consulting, Technology & Animations brought to you by DJS associates

IN THIS ISSUE

CONTACT DJS
215-659-2010
800-332-6273

Company Information
Joy S. Falk
jsf@forensicDJS.com
ext. 31

Marketing/Experts/Exhibits
Lauren A. Latzko
lat@forensicDJS.com
ext. 46

3D Laser Scanning
Jon W. Adams
jwa@forensicDJS.com
ext. 19

24/7 Investigations
Terry W. Myers
experts@forensicDJS.com
ext. 14

Engineering Animations
Hugh Borbidge, BSME
hbb@forensicDJS.com
ext. 23

Another Lap Swimmer Drowns

Tom J. Griffiths, Ed.D

As Americans get older, they tend to exercise more in order to stay in shape and remain healthy. Lap swimming is a nearly perfect exercise because there is no undue stress placed on the joints while swimming. However, exercising at advanced age does come with challenges. Prescription drugs, loss of balance, and medical events in the water can lead to drowning. This was the case for an older, middle-age male who was swimming laps at his fitness center.

Unfortunately, at the time of his distress, only one young lifeguard was on duty without any back-up, no installed emergency button, and the AED was not used. These breaches in the standard of care were heightened by the fact that the facilities' insurance company issued numerous recommendations prior to the drowning. In addition to strongly recommending two lifeguards on duty at all times; an emergency button pool-side; regular supervision, as well as in-service training for lifeguards, the facility was warned not to let lifeguards perform secondary pool duties while providing patron surveillance. With only one lifeguard in the facility, and performing pool tasks while on duty, the lifeguard was extremely slow to recognize, rescue, and resuscitate the victim.

As a result, a very quick and large financial settlement was awarded to the victim's family. This case was especially egregious because the facility ignored most, if not all of the recommendations of their insurance company.

Filling in the Gaps: The Drone

Jonathan W. Adams

For years, terrestrial 3D laser scanning has been one of the most powerful, reliable tools in the DJS arsenal for collecting highly accurate three-dimensional measurements. By deploying our 3D laser scanners around sites and objects, we have been able to efficiently capture critical data from multiple vantage points.

Some scenarios, however, introduce challenges which can prove difficult or impractical to document via terrestrial 3D laser scanning:

- Pitched roofs without good footing
- Upper surfaces of large vehicles, such as tractor trailers and buses
- Aquatic vessels, where large portions are not visible from land
- Areas that are inaccessible due to terrain

In these scenarios, we turn to our Unmanned Aerial Systems (UASs, "drones") to help fill in the gaps in datasets which may otherwise be left incomplete. These aerial vehicles, free from the constraints of fixed-location tripods, allow us to gather data from numerous unique perspectives. The airspace that exists above or adjacent to sites/objects often allows us the freedom to capture still images/video footage which can be utilized to generate accurate three-dimensional data for use in comprehensive documentation and/or analysis.

By combining the 3D data from terrestrial laser scanners with 3D data generated by photogrammetric image reconstruction techniques (utilizing still images captured by our UASs), we are able to produce complete three-dimensional datasets, which can then be further evaluated in forensic analysis, or utilized for comprehensive documentation of sites/buildings.

Playground Safety
Bruce I. Levenberg, MS

Case Synopsis: An elementary school-age child was injured from a fall during outdoor lunchtime recess. The playground area was an open public area but reserved for the exclusive use of the school when in session. It was composed of a large, grassy area with three ball fields and three separate pieces of climbing equipment (including the monkey bars from which the child fell). The equipment was permanently anchored in a fibar ® pit. Safe school playground milieu is maintained by anticipating, recognizing and addressing potential or impending dangers. School recess playground activities inherently involve some dangers; so, how can we conclude if this fall or in fact any fall, was or was not a result of negligence?

Expert Analysis: It is the responsibility of the school district in the proper designing, constructing and maintaining of safe equipment and grounds; proper planning and executing safe school policies and procedures; and providing proper student supervision to appropriately address all potential dangers. A physical inspection of the playground included an assessment of the playground layout; equipment recommendations for this age group; equipment and surface materials; potential hazards including sharp points; potential tripping or suspended hazards, and any possible crush and/or shearing points. The expert concluded that the playground was properly designed. The equipment was well-used and well-worn; however, well-preserved, in satisfactory condition and well-maintained.

As for school policies, there were regular comprehensive physical inspections of the grounds and equipment with corrective actions taken where and when indicated; the children were all peers thus age separation was not a factor; there were no conflicting or overlapping activities; transitions from place to place were well planned and well executed; signage was evident; there were no "outsiders" present; and the equipment was appropriate for that age group. The expert concluded that the plans and protocols in place were well formed and well followed.

As for supervision, there were a sufficient number of school aides on duty. They were positioned properly ensuring proper sight lines (in fact, an extra adult was present to cover other aides in case one had to leave for an "emergency"). The expert concluded that the level and practice of supervision was appropriate.

It was obvious that school playground recess activities have some inherent dangers, but in this case, those dangers were properly addressed. The school district, the principal and staff planned and instituted responsible and reasonable planning and protocols. They met "industry standards".

Result: Case settled before trial.

Bumper Damage Threshold Speed - Is It still 5 MPH?
Robert T. Lynch, PE

DJS recently conducted a low-speed rear-end impact test involving two recent model sedans. The goal of the testing was to determine the speed of the bullet vehicle (vehicle that impacts the rear of another vehicle) that results in damage to the rear bumper of the target vehicle (vehicle in front that is stopped or slowing). The damage threshold speed of bumpers to exhibit any residual damage has long been accepted as approximately 5 miles per hour. In other words, a vehicle would need to experience a change in velocity, or Delta-V, of 5 miles per hour during an impact before permanent damage would be expected to occur.

Two vehicles of similar weights were used for the testing. The target vehicle was stationary while the bullet vehicle was driven at a constant speed of approximately 6 miles per hour into the rear of the target vehicle. Equipment in both vehicles recorded changes in speed of approximately 4 miles per hour for both vehicles, below the typical bumper damage threshold of 5 miles per hour, but damage was observed to both vehicles, albeit minor damage.

High-speed video of the impact shows both the rear bumper of the target vehicle and the front bumper of the bullet vehicle deflecting by as much as 2 inches during the impact, but the bumper structures on both vehicles returned to their original shape immediately following the impact. The residual damage existed in the form of tag bolt imprints to the rear of the target vehicle and the plastic license plate bracket on the front of the bullet vehicle was cracked and deformed. If the target vehicle did not have a license plate bracket mounted on the front bumper, it is likely that no visible damage to either vehicle would have occurred during the test.

So, what is the take-away from this controlled experiment? Damage to the bumper cover can occur during a rear-end impact where the Delta-V for the vehicle is below 5 miles per hour. The bumper structure may not show signs of permanent deformation, but other visible damage is possible. And the damage threshold speed of 5 miles per hour, which has long been accepted within the collision reconstruction community as the change in speed a vehicle needs to experience before permanent bumper deformation (crush) is observed, still holds true for newer vehicle bumper structures.

Watch Where You Sit!
John L. Yannaccone, PE

Case Synopsis: One evening a woman was out to dinner with a group of people. During the dinner she reached down to grab her chair to slide in closer to the table. As she pulled her chair in, her hands were on the cushion with her fingers wrapped under the cushion. As she sat down, she was unaware that one of her fingers had moved into a gap that had opened between the frame of the chair and the cushion. When her weight loaded the cushion, a portion of one of her fingers was traumatically amputated by the frame of the chair.

Read More Case Studies Online at www.forensicDJS.com

Expert Analysis: The subject chair was inspected and it was found that one of the two screws used to attach the cushion to the frame of the chair on the side the amputation occurred was missing. The other screw on the amputation side, and one of the screws on the other side of the chair, were found to be very loose. The combination of loose and missing screws was sufficient to allow the cushion to separate as much as one inch from the chair's frame resulting in an opening large enough for a finger to get between the cushion and the frame. Numerous other chairs in the same restaurant were also inspected and many of them were found to also have missing and/or loose screws.

During this inspection, it was also noted that on the bottom of every chair was a warning that the frames should be inspected monthly for damage and that the screws attaching the cushions should be tightened at the time of the monthly inspection. This warning was clearly visible on the bottom of the chairs when they were flipped over on the tables every evening to allow the carpet to be vacuumed. The restaurant was unable to provide any information as to the last time the chairs were inspected; in fact, restaurant management indicated they were unaware that any inspection of the chairs was needed.

Result: Shortly after the inspection, a settlement was reached.

Event Data Technology and Headlights
R. Scott King, BSME

Event data recording technology has evolved steadily since its introduction nearly two decades ago. Historically considered mostly a source of pre-impact speed and brake application, EDR can now, in some vehicles, be a source of much more data and information, as the following case example demonstrates.

A nighttime collision between a left-turning passenger vehicle and an on-coming tractor-trailer resulted in a dispute between the operators as to whether or not the headlights on the tractor trailer were activated at the time of the collision. Often times, such disputes can be investigated by analyzing the light bulbs that were located in close proximity to the damaged vehicle components. The filaments within an incandescent light bulb located directly in the crush zone often exhibit a characteristic distortion. This distortion is often referred to as "hot-shock" and is the result of the filament's increased flexibility, or malleability, due to the increased temperature a filament experiences when it is activated. In this case, however, the collision damaged the headlights on the tractor-trailer such that the physical evidence typically relied upon to investigate and evaluate potential hot-shock was destroyed.

As is common on most newer commercial trucks, this truck was equipped with an EDR. The data from that EDR included information that described the vehicle's pre-impact speed, brake application, and a host of other parameters typically sought after a collision. However, this truck was nearly brand new and as such, was equipped with a network of on-board computers that included one capable of recording faults in systems such as climate control, entertainment systems, and lighting systems. Review of the data from that particular module indicated a fault within the headlight circuit. Research of that fault, and correlating its time of occurrence with data from the EDR showed that the fault occurred only once, and simultaneously with the collision. From this, the electronic evidence showed that indeed the headlights were on at the time of the incident.