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Note from the President of DJS Associates, Inc.

Steven M. Schorr, PE

With the distribution of this newsletter, DJS Associates is proud to introduce its new, updated look. We feel that our new logo signifies what DJS has been working toward for the last 45 years – the application of new technology to forensic consulting. Even with our new look our highest priority is still the commitment to professionalism, integrity, accessibility, rapid response and educational awareness and training.

A leader in accident/collision reconstruction, automotive/mechanical engineering and tractor-trailer/fleet safety, DJS has grown over the past **45 years** to become a highly respected global firm for forensic consulting, technology and animations. Consultants with DJS are available in all areas of engineering, science, computers and medicine and provide the same professional, ethical and accessible service you've come to expect from DJS. In the areas of technology, we are leaders in the state-of-the-art for High-Definition Surveying (HDS) laser scanning, Event Data Recorder (EDR) download and analysis, computer analysis applications of data, as well as 24-hour emergency response to rapidly respond to your case needs. DJS also provides access to the Forensic Storage and Technology Center, an innovative and groundbreaking forensic evidence storage, inspection and conference center. DJS has the experience and technical capabilities to collect data in the most effective, efficient and accurate manner, as well as evaluate the collected data in a three-dimensional environment leading to realistic and accurate demonstrative animations.

On behalf of DJS Associates, Inc. and its personnel, I welcome you to visit our new Web site at www.forensicDJS.com to learn more about our forensic consulting, technology and animation services, along with our commitment to providing educational support to the legal, insurance and engineering communities, as well as the public and private sectors. 

Physical Education Class with Coed Flag Football

Tom Bowler, CPSI, NPSS Safe Certified
Playground Consultant

Case Synopsis: The defendant, a private school, was conducting a mixed gender physical education class outdoors with the activity of flag football. Allegations in the complaint indicated the female plaintiff was tackled by a male player. Additionally, the plaintiff indicated negligence was caused by the defendant school in several ways, including lack of appropriate supervision and lack of promoting the appropriate policies and procedures. Overly aggressive play behavior was cited as well in the complaint. The female plaintiff suffered a right knee injury as a result of the incident.

Expert Analysis: The field was analyzed from the standpoint of where the physical education teacher was standing in relationship to the incident play. Measurements were taken. Additionally, the physical education teacher was interviewed. She explained the organization of her classes and the times they met per week. Progressions were developed for the sport, therefore the activity was sound. No contact was allowed (i.e., tackling, blocking, diving, blitzing). Penalties were enforced. It was later determined that the male player tripped while following through to get the girl's flag, thereby causing the injury.

Football Stadium Fall

Richard T. Hughes, PE
Slip, Trip and Fall/Structural Engineer

Case Synopsis: A fan at a professional football stadium falls down an upper deck staircase and is propelled down the staircase over the banister onto the fans below. His fall resulted in severe injuries. On first glance it appears to be a classic crazed drunk fan.

Expert Analysis: A visit to the stadium during a game was conducted and spectators were interviewed at the bottom of the staircase to determine how frequently people fell down the concrete staircase. Season ticket holders with years in the same section stated that people have fallen down the staircase several times each year. When asked if the people were intoxicated, they indicated many were not. The open-air concrete staircase was constructed out of precast concrete. During the course of an event, occasionally fluids, ice and snow spilled over, but the falls did not match these conditions.

There were 18 treads and risers in the steps. Measurements of each riser and tread were conducted. It was discovered that approximately halfway down the staircase a tread was one inch shorter than the balance of the staircase. While this appears insignificant and innocuous, to natural human behavior it is extremely noteworthy. Dimensional uniformity is one of the primary causes of staircase accidents.

When humans start to descend a staircase, by the third step they have already subconsciously registered the location of the next step into their iconic memory and automatically will position their leading foot accordingly without even looking at their feet. The ball of a person's foot comes in contact with the leading edge of a tread. If a tread is one inch shorter, then the contact area is reduced causing the foot to slip off the tread and the fall occurs. Dimensional uniformity is a building code and industry standard requirement and shall never exceed more than 3/16 of an inch. Once the flaw in the staircase was identified, a settlement was reached on behalf of the football fan.

Mercedes-Benz Class Action Suit

R. Scott King, BSME
Automotive/Mechanical Engineer

Case Synopsis: A Pennsylvania Mercedes-Benz owner brought a suit on behalf of himself and other Mercedes' owners alleging potentially serious engine defects resulting from the use of improper engine oil. The complaint alleged that

engines in certain late-model Mercedes SUV's were prone to heavy oil sludge build-up and potentially catastrophic damage. In the extreme, many affected engines required full replacement at a cost of up to \$6,000. According to the complaint, the cause of the sludge build-up was related to the manufacturer-authorized use of conventional engine oil; however, the vehicle was originally designed for synthetic oil, which typically lasts much longer than conventional oil.

Expert Analysis: A review of available data revealed that the suspect vehicles were equipped with an engine oil monitoring system that notified operators when an oil change was required. The system monitored such variables as temperature, engine speed, and mileage. The system was originally designed

for vehicles sold in Europe, where the use of synthetic engine oil is the norm; however, when the system was introduced in the North American market, where conventional engine oil is favored, the requirement for synthetic oil did not follow. As a result, the system was indicating oil changes far beyond the useful life of conventional engine oil, sometimes by 15,000 miles. Sludge build-up, and severe engine damage, often soon followed.

Upon class certification, the parties soon agreed to a nationwide settlement that created an extended warranty to provide affected class members with an engine replacement at no cost. And, of course, owners were advised to begin using synthetic engine oil!

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- Steven M. Schorr, PE

Improper Training for Forklift Operator Results in Death

Robert P. Jasinski
Forklift Consultant

Case Synopsis: Plaintiff was hired to operate forklifts within a manufacturing facility that manufactures steel components for the construction industry. The facility had several different forklift types, all with different operating controls. The employee was only trained on one type of forklift and the need arose for the employee to operate a forklift type he was unfamiliar with.

The employee attempted to operate the forklift and move it out of a travel aisle adjacent to an open loading dock door. The employee mounted the forklift, turned on the key, stepped on the dead man pedal and the truck began to roll toward the open dock door. It appeared the employee panicked and began moving the hand controls in a fashion he was familiar with to move away from the open door, but instead the truck continued to roll and the forks started to rise. The forklift rolled off the loading dock and his head was crushed by the overhead guard when it hit the ground.

Expert Analysis: OSHA requires powered industrial truck training that is equipment and site specific. Employers are responsible to provide both classroom and practical training and to document both. Regulations require that separate evaluations on each forklift type be done in the workplace. Separate practical training sessions are required, and must be documented, whenever there are differences in the controls, power type, or other different truck-specific functions.

The employee in this case was trained on a different brand of reach truck that had separate controls for each function, while the reach truck he was killed on had a multifunction control handle that he was unfamiliar with. Since the parent company was responsible for reviewing and approving the training at their subsidiary, the plaintiff's attorney brought suit against the parent company on behalf of the family of the deceased worker. The case settled prior to trial.

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Passenger Bus Hits SUV... or Vice Versa?

Curt M. Beloy, MSME
Collision Reconstruction Engineer

Case Synopsis: Mrs. Robinson was operating her SUV in the left lane of a one-way, two-lane city street, approaching a passenger bus that was traveling in the right lane. According to her testimony, as she was just about to overtake the bus, the bus began to turn right onto a side street. As the bus turned, the rear overhang swung left into her lane, struck the side of her vehicle, and forced her into the adjacent parked cars on her left. She brought suit against the bus line for her injuries resulting from the collision.

Expert Analysis: Vehicle specifications, vehicle damage, and roadway geometry were assessed in order to reconstruct the collision. The bus was modeled according to High-Definition Scan data and placed in a scaled three-dimensional (3D) environment. The steering and acceleration characteristics of the bus were used to accurately simulate the bus turn. The simulations confirmed that while the right rear tire tracked to the "inside" of the right turn, the corner of the rear overhang of a turning bus would indeed swing out slightly to the "outside" of the right turn. However, the

physical evidence and collision dynamics were ultimately inconsistent with Mrs. Robinson's testimony. Rather than the bus intruding into her "space," the vehicle damage indicated that the Robinson vehicle drove forward into the space already occupied by the bus. Additionally, the computer simulations showed the collision could not have occurred as she had explained.

The location of the bus on the road was limited according to the bus's turning radius, as well as the roadway geometry. It was found that the bus must swing the turn wide in order to clear the curbs and parked cars. Her testified version of events did not include the required "wide" path of the bus and as such, would not have led to a collision in a manner consistent with all of the available physical evidence. The analysis established that the bus was visible as a hazard and rather than yielding, Ms. Robinson attempted to squeeze her vehicle between the bus and the parked cars to her left.

Pool Safety Issues

Tom Griffiths, Ed.D.
Aquatics Safety Consultant

Case Synopsis: James Snipe, a middle-aged male who knew how to swim, swam across the deep end of a large local outdoor pool, more than once, with two teenage companions. He became distressed while swimming in the deep water. His younger companions stated that he complained of cramps and struggled on the surface prior to submerging to the bottom of the eight-foot-deep section of the pool. Mr. Snipe was also a healthy and fit individual.

The City Pool officials submitted a Safety Plan to the New York State Department of Health, stating that four lifeguards would always be on duty at poolside. In addition to only having three guards on duty, no lifeguard was positioned at the deep end of the pool where Mr. Snipe had difficulties. Making matters worse, none of the three lifeguards on duty, providing patron surveillance, was positioned properly; all were seated in low plastic deck chairs instead of the tall elevated lifeguard stations that were provided for the lifeguards.

Expert Analysis: Expert testimony by Dr. Griffiths, as well as a written investigative report authored by the New York Department of Health, found numerous oversights on the part of the Defendants. Not only were the lifeguards out of position and not scanning properly when they failed to detect a distressed victim, but the aquatic facility and its management failed to adequately screen, train and supervise the lifeguards who they hired. Management was accused of not supervising and training the lifeguards regularly to ensure that lifeguards scanned properly, positioned themselves properly, rotated regularly, and provided timely and effective resuscitation efforts as lifeguards should. Basically, management was charged with lack of oversight and control of the facility and as a result, Mr. Snipe was not noticed, rescued and resuscitated in a timely fashion.

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Additional Case Study on Reverse Side.....

Seminar Programs

Go to www.forensicDJS.com for more about dates, times and locations, and to review a listing of seminar topics.

-  **High-Definition Surveying (HDS) Laser Scanning: Cutting-Edge Technology for Case Investigation through Presentation**
-  **Motor Carrier Accident Investigations: Emerging Trends and New Technology from the Tractor-Trailer and Accident Reconstruction Consultants**
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-  **Buildings, Sidewalks, Ramps and Falls: Working with the Premise Liability Consultant**

Amusement Ride Restraint System Inadequate to Safely Restrain Four-Year-Old Child

Robert J. Nobilini, Ph.D. - Biomechanical Engineer

Case Synopsis: A four-year-old boy was injured when he fell 40 feet from a looping rollercoaster amusement ride in New Jersey. The ride consisted of two trains, each with five cars. The trains were mounted back-to-back, and traveled around the inner diameter of a large vertical ring. During the incident, a witness observed the boy fall from the ride as the train hesitated in an inverted position near the top of the loop. Each of the cars on the ride was equipped with a padded lap bar restraint and enclosed by a metal cage assembly. It was requested that a mechanical and biomechanical analysis be performed to determine the nature and cause of the subject incident.

Expert Analysis: A review of the incident revealed what the jury ultimately deemed negligent on the part of the amusement park and its operator. The subject amusement ride was classified as a "Major Ride" by the State of New Jersey, and therefore had a minimum age requirement of 12, unless the rider met the ride's height requirement. Since the ride was intended for children at least 12 years of age, it was reasonable that the height requirement be consistent with the height of a 12-year-old boy. Growth charts published by the Center for Disease Control indicated that the height of a 5th percentile, 12-year-old boy, was approximately 54 inches. At the time of the incident, the ride was being operated with a minimum height requirement of 42 inches, which was six inches less than the ride manufacturer's recommendation of 48 inches. The boy that fell was 44 inches tall at the time of the incident. Had the height requirement on the ride been representative of a 12-year-old child or at least at the manufacturer's recommended height of 48 inches, the boy would not have been allowed on the ride.

At the time the plaintiff was entering the ride, his mother was openly concerned and did not want him to go on the ride. However, the ride operator convinced the boy's mother that since he

met the height requirement he would be safe. New Jersey's Carnival and Amusement Ride Safety Regulations referenced ASTM Standards, including ASTM F 770-88 Standard Practice for Operation Procedures for Amusement Rides and Devices. Section 4.2 of ASTM F 770 stated, "The owner/operator of an amusement ride or device may deny entry to the ride or device to any person, if in the opinion of the owner/operator, the entry may cause above normal exposure to risk of discomfort or injury to the person who desires to enter, or if in the opinion of the owner/operator, the entry may jeopardize the safety of other patrons or employees." In this case the operator had the right to deny access to the child and should have sided with the mother and prevented the boy from entering the ride.

Rides that place riders in an inverted position often rely upon centripetal force to keep the riders in their seats. In order to generate centripetal force, the ride must be in motion. In the case of the incident ride, the operator could intentionally cause the ride to hesitate in an inverted position, removing the effect of centripetal force, and allowing the force of gravity to pull the rider towards the ground. When this occurred, the restraint system had to be adequate to secure the riders in their seats. A mechanical/biomechanical analysis of the ride's restraint systems revealed that while the lap bar restraint was adequate to restrain a 54-inch-tall child and only marginally adequate to restrain a 48-inch-tall child, it was inadequate to safely restrain a 44-inch-tall child when the ride was in an inverted position. This analysis also revealed that when the ride was in an inverted position, openings on the sides of the cage assembly aligned with the boy's body and that the position of the boy's hand on a vertical bar in the occupant compartment provided a pivot point about which the boy's body rotated before moving laterally through the opening. Jury returned a verdict for the plaintiff.