

A List of Typical Hazards Observed

in the Entertainment Industry, Public Assembly Venues, and Educational Performing Arts Facilities and Operations

by Jay C. Stone and Dr. Randall W.A. Davidson, Entertainment Health and Safety Risk Manager Consultants

Copyright, 1990

N.B. The following lists only a few of the major hazards and hazardous exposures that we have identified in areas of the performing arts and Entertainment and its production process, educational and commercial.

We strongly urge those who have the administrative authority or who are in any delegated supervisory capacity to “properly train for competency” those individuals and technicians who are under their care as employees, volunteers or students and who in the course of their work are subject to a multitude of this list of hazardous exposures, as well as other not noted here. This training applies to all levels of Education (K-University) as well as professional and commercial Entertainment.

This LIST OF HAZARDS is extremely minimal and only represents very specific areas that we believe everyone in the industries and areas listed in the title of this document, in our opinion, needs to be cautioned about and trained to recognize. Programs that are required and in compliance with the Laws, Codes and Standards must be researched, developed, initiated, adopted into training, and implemented. Constant evaluation of these Programs must be mandatory so that they are always up to date with the current Laws and Codes and that all individuals who affected by these Hazards are also current in their applications to their work and work areas.

There are a multitude of industrial programs and OSHA Programs that provide exemplary plans and many Risk Management, Health and Safety Programs and examples that can be copied. These programs can be accessed on the Internet and OSHA Programs can be obtained from Regional OSHA or from the national OSHA office in Washington, D.C. Other countries and their Occupational Health and Safety organizations also produce excellent programs which can be reviewed, i.e. Canada, Sweden, Germany, and the United Kingdom.

The LIABILITY that is a real possibility for you when you do not notify and do not train all personnel in regards to hazards and hazardous exposures in their particular industries and work places is extremely high.

Due Diligence and the Duty to Warn are legal requirements for everyone in Entertainment and related industries, i.e. Public Assembly, Fine Arts, Education at all levels and the Performing Arts, including Churches, Arenas, Stadiums, Night

Clubs and outdoor venues. Injuries, incidents, deaths, and major law suits proceed directly from the lack of implementation of Health and Safety Programs and Competency Training. Fines and imprisonment can result from not complying with all aspects of the Codes and Standards.

- *Federal Regulations, State and Local Ordinances and Codes applicable to each country or entity legally apply and shall be known and fully comprehended by all who work and are subject to them in the above designated industries.*
- *Hazards shall be identified and specific training and applicable programs developed, initiated, implemented, and monitored to address all of the hazards designated in this LIST.*
- *The Risk Management approach to all Hazards shall be the system that is applied to make sure that all levels and types of Hazards are fully addressed and evaluated and comprehensively integrated into the work regime.*

Required Control Levels: An Overview

There are three levels of controls for every hazard. Each hazard must be assessed and all three levels of control must have an answer. This is a brief overview of those controls.

*Engineering Control
Administrative Control
Personal Control*

Engineering Controls

Engineering controls, in the initial design phase consist of substitution (use a less harmful material), isolation, ventilation and equipment modification. If the work environment can be physically changed to prevent the employee exposure to the potential hazard then the hazard can be eliminated with an engineering control.

Administrative Controls

Administrative controls or work practice controls are any procedure which significantly limits daily exposure by control or manipulation of the work schedule or manner in which the work is performed. Job rotation, wet methods (cutting), housekeeping (dust collection, eliminating slip, trip, fall hazards), personal hygiene. If employees can change the way they do their jobs and the exposure to the potential hazard is removed then the hazard can be removed by a work practice control.

Personal Controls

Personal protective equipment (PPE) is the last level of protection for the worker. These must be used if a potential hazard still exists after an engineering control and an administrative control have been assessed and implemented. Every type of PPE also has a required training, use, and maintenance component.

Most of the hazard and safety problems we encounter are a direct result of the lack of understanding of these basic principles of hazard management. This lack of knowledge combined with deferred maintenance and the unconscionable ignorance of the laws and regulations related to these facilities and personnel by the management and supervisors of these facilities have made them the most dangerous hazard in the entertainment business. The type and variety of hazards and the risk connected with them seems to increase by the day. A constant watch and evaluation strategy is necessary to mitigate hazards and to manage the risks.

A LIST OF HAZARDS:

CHEMICALS HAZARDS AND EXPOSURES: in our opinion, coupled with the lack of properly engineered, mechanical ventilation (IAQ), present themselves and are found in the workplace as the greatest set of hazards to all who work at any level in the production of events, films and theatrical presentations of all types.

- ***There is a major legal need to fully implement all the requirements of the Hazard Communication Act and all other Standards and Codes that are supplemental to and aid in the complete compliance with this Act.***
- ***There are major updates and new Regulations and Guidelines being produced by many countries, and International Organizations.***
- ***from improper use of chemicals and chemical compounds***
- ***from improper storage of many chemicals and chemical substances***
- ***from lack of an orderly shelf storage of flammable and combustible liquids***
- ***lack of facility protection and security***
- ***lack of proper storage of idle LP-Gas cylinders (must be outside)***
- ***lack of proper and specific fire protection and suppression programs and devices, equipment***
- ***lack of proper personal protective devices (PPE) applicable in the use of chemicals***
- ***lack of up to date knowledge of NIOSH, EPA, and specific Codes and Standards that apply to all aspects of waste management***
- ***improper waste storage and disposal methods***
- ***improper handling of different types of waste***

- *lack of specified Hazardous Waste labeling and identification*
- *improper waste containers specified by OSHA, EPA, NIOSH*
- *lack of required, EPA, filing of waste hazardous material documentation*
- *lack of properly engineered, mechanical ventilation system, IAQ*
- *lack of professional training in the use of chemicals,*
- *lack of professional monitoring devices for the facility or space: alarms, detectors, sensors*
- *lack of emergency procedures and responses, drills, disaster training,*
- *lack of proper and specific IAQ ventilation for particular spaces,*
- *lack of proper cleaning procedures and equipment for work with chemicals,*
- *lack of proper labeling or not having any labeling*
- *improper containers: cans, bottles, coffee cups, old paint containers, soda bottles, plastic pitchers, water bottles`*
- *improper storage and handling of acids*
- *use of illegal storage cabinets*
- *lack of proper trash receptacles for used rags and materials contaminated by chemicals*
- *lack of specific training and use with acids and chemicals that have high flammability factors*
- *from flammable liquids not used correctly, not stored properly, and not in required safety containers. (NFPA)*
- *non-compliance with industrial, OSHA, and NFPA Standards*
- *not complying with required spill containment Standards*
- *lack of a proper Spill Containment Program*
- *lack of a required emergency training program for Spill Containment*
- *improper ventilation throughout all work environments*
- *smoking around all chemical and flammable liquids and compounds*
- *incorrectly marked and non-marked containers*
- *vapors from solvents used without proper personal protective equipment, lack of ventilation,*
- *fire hazards from incorrectly stored materials*
- *from lack of knowledge and misuse of MSDS'S by working personnel*
- *from MSDS's with misinformation and false/incorrect data*
- *from MSDS's that are not updated with latest findings*
- *from lack of required training for all personnel in the proper application and use of MSDS'S*
- *from lack of proper site and placard for placement of MSDS files in full view of workers*
- *lack of regularly scheduled evaluation of compliance with the Hazard Communication Act, EPA Regulations, and their specific applications to the work being done and the personnel who are doing the work*

ELECTRICAL HAZARDS AND EXPOSURES:

- *non compliance with the National Electrical Code, NFPA, and OSHA 1910.301.308 and other country Codes and Standards*
- *from not installing electrical systems as intended by the manufacturer and in accordance with the National Electrical Code and local ordinances*
- *from working near high power lines, especially with lift, scaffolding, ladders, and cranes, on movie shoots, on location, arenas, stages, and churches*
- *lack of proper planning for work with any electrical project*
- *lack of required and proper supervision*
- *barriers and signage missing from areas where electrical work is being conducted*
- *from fatigue due to extended hours and overtime when working with electrical equipment, oftentimes chronic fatigue*
- *from electrical devices and electricity transformers*
- *from cables, exposed wiring, frayed ends*
- *lack of proper insulation and broken or cut insulation*
- *equipment failures and breakdowns*
- *dimmers systems; unprotected and overheating and shorting*
- *portable electrical equipment: not maintained*
- *lasers, lack of proper cooling systems for lasers, breakdown of cooling system*
- *From not wearing required eye protection when using lasers*
- *Playing games with lasers when preparing productions*
- *fog machines with overheating elements*
- *fog machines with improper electrical wiring*
- *heat and vibration*
- *shocks from lack of proper grounding*
- *shocks and burns from ends of frayed cables*
- *from not wearing the required work clothes/garments*
- *not complying with the NFPA 70 E category 2 requirements*
- *burns or any physical damage to the body from electrical sources*
- *when replacing lamps, lighting equipment, or any electrical device from electrical systems in non-compliance with required and up-to-date NEC Regulations, reference documents, and interpretations from OSHA*
- *from working near open electrical circuit boxes, connections, wires, raceways, outlets, non grounded systems, buss bars*
- *from lack of proper grounding equipment, GFCI's*
- *From overloaded circuits*
- *from lack of scheduled preventive maintenance of motors, engines, winches, lifts, and all electrical equipment*
- *from the incorrect application of motors and lifting systems that proceed from using follow spots or any piece of equipment that causes vibration injuries*
- *from lack of a program for replacement of used and dangerous electrical equipment*

- *a regularly scheduled replacement program, dated*
- *from lack of knowledge of electrical practices and NEC Standards*
- *from not putting into actual practice NEC Standards that apply to the industry*
- *from using non-compliance extension cords*
- *cutting off one of the three prong plugs*
- *not using three wire type electrical cords*
- *using extension cords as permanent installations in violation of the Code*
- *allowing extension cords and cables to be a tripping hazard*
- *placing extension cords and cables under carpeting or mats*
- *placing extension cords where they may be damaged by foot or vehicle traffic*
- *from placing extension cords through holes in walls, floors and ceilings*
- *from placing extension cords through doorways and windows*
- *from using extension cords to service more than one portable appliance*
- *from splicing extension cords*
- *from not having proper, visible, legible signage for doors into electrical control panel rooms*
- *from removing panels from buss bars installations*
- *from not providing a working space of not less than 30”in width, 36”in depth, and 78” in height in front of electrical service panels*
- *from wires wrapped around pipes*
- *from raceways with broken and frayed wiring*
- *from placing cables and electrical cords near major heating sources*
- *from tying cables and electrical cords in knots*
- *hanging on cables to climb*
- *from not being repaired and installed by certified electricians*
- *from lack of periodically scheduled inspections of wiring and equipment to detect wear and damage*
- *from outlets not grounded*
- *from not inspecting outlets for loose wires and attachments due from vibration*
- *from cords that are stapled and/or nailed to all types of items*
- *from overloading the electrical circuits*
- *from not having double insulated tools or their equivalent*
- *from not having the proper and required fuse*
- *from not having an emergency power device to turn off electrical currents and equipment*

ROPE HAZARDS:

- *from using rope for purposes and applications intended for other pieces of equipment, i.e. wire rope,*
- *lack of maintenance*

- *From not replacing rope that is very worn and dangerous*
- *wrong types of rope for specific applications*
- *fibers in eyes, mouth, hair, on the skin, respiratory system*
- *burns*
- *breaking*
- *wrong knots for specific applications*
- *wrong configurations of rope in specific applications, i.e. hanging, flying, hauling, lifting, climbing*

- *cuts*
- *UV damage*
- *corrosion*
- *rotting*
- *drying out*
- *pulling apart*
- *skin reactions to Kevlar, plastic, hemp type rope*
- *not using gloves when necessary*
- *inhalation of fibers*
- *overloading the rope*
- *subjecting rope to conditions where it will readily abrade on metal, wood, stone or plastic*
- *stretching rope beyond its capacity so that it may break and lash out*

MAKEUP HAZARDS:

- *from make-up: old, used, deteriorated due to heat and lack of proper storage*
- *bacteria laden from use by many people*
- *mis-labeled*
- *lack of evaluation of chemicals in the makeup: not reading MSDS materials if applicable*
- *contaminated caused from lack of a proper and timely program for replacement and trashing of old makeup*
- *from make-up allowed to be placed and stored in high heat sources in cabinets and display areas*
- *from make-up used by other performers or among performers, especially creams: dipping fingers into creams*
- *reactions from make-up, such as allergies, body sores, loss of sight, skin damage, and other allergic reactions*
- *from types of make-up that cover all the pores of the body not allowing the body (skin) to breath*
- *from improper storage of make-up materials where other substances or materials might get mixed in with them, i.e. dirt, dust, air borne substances, other makeup*

- *from aerosol sprays used in make-up applications: eyes, respiratory, rashes, lung damage, opening pores to other chemicals and diseases, bacteria, impact on others in proximity of spray*
- *to respiratory health from aerosol sprays in close enclosures, lungs, eyes, skin,*
- *fires, from aerosol sprays*
- *from smoking around areas where aerosol sprays are used and stored*
- *Note: carefully read the labels on all containers of any makeup and look for toxic chemicals which may be used to enhance some makeup applications*

ERGONOMIC HAZARDS and INJURIES

- *from incorrect and improper methods of lifting and moving equipment*
- *lack of training in proper methods of lifting and moving equipment*
- *from not applying proper ergonomic techniques in all tasks*
- *from the incorrect application of ergonomic principles in the setting up of computers, monitors, and other office equipment: distances from computer, key board placement, sitting correctly*
- *from using chairs and tables not maintained properly*
- *from not using proper posture applicable to health and safety practices when sitting and using table surfaces for work*
- *from filing cabinets due to number of drawers pulled-out at the same time, and not securing cabinets to floor and wall*
- *from moving scenery and platforms, traps and trusses, large props without proper and careful planning, sufficient assistance for the size and weight of the item, and applying safe practices and methods to the movement of any object*
- *from not choreographing all movement of anything on stage, from scenery to props to people and animals*
- *injuries created in moving scenery and sets, wagons, trusses, and any other pieces of scenery when there is not enough preplanning and there is a lack of trained personnel to move the items properly and safely for all concerned*
- *injuries from using too few personnel which would be required for safety when moving equipment, scenery, platforms, curtains, machinery, trusses*
- *from poor arrangement for computer work*

TRAP HAZARDS:

- *created when stage traps or similar platform openings are used and maintained in an opened position without markings and barriers*
- *OSHA Regulations regarding openings are not known and complied with by stage personnel and thus create serious falling hazards*
- *created when traps are opened and there are not sufficient safeguards, i.e. marking, stanchions, guards, railings, lighting, barriers*
- *lack of specific blocking in any production or event*

- *lack of a walkthrough of the performing and work areas in order to comprehensively show the performers and technicians of the hazard that is presented by the trap being open during rehearsal or during production*
- *created when traps are opened and improper and insufficient lighting and platforms are used under the trap*
- *when there is lack of safe equipment utilized in the trap if individuals are to disappear or fall into the trap, i.e. platforms, safety pads, lighting, assisting personnel*
- *created when personnel are not competently trained and supervised in the use and care of traps at any time before, during or after the production*
- *when trap edges are not smooth with the rest of the stage and present tripping and slip hazards*
- *created when fog or pyrotechnic effects cloud the edges, stairs, ramps, and openings of traps or any acting or working area*
- *created when specific OSHA Regulations are not applied to the use of openings or edges of elevated platforms, traps, ramps, orchestra pits, trusses, and lifts*
- *injuries created or occurring when personnel who work with traps, equipment, elevated equipment, or any technical apparatus are not competently and properly trained and supervised as to the dangers of working with and near traps*

EXPOSURES AND INJURIES FROM HAZARDS WHEN NOT USING THE REQUIRED PERSONAL PROTECTIVE EQUIPMENT (PPE)

- *from not properly using the properly required and legal personal protection equipment (PPE) when required by Federal Regulations (OSHA and NIOSH) and other Compliance Regulations*
- *not applying reasonable health and safety procedures in the working environment*
- *from lack of Proper Personal Protective Equipment that is mandated by Federal Regulations (OSHA), reasonable care, a Standard of Care for the industry and for the particular and specific job that is being done at the time of the task*
- *from lack of proper hand protection for the particular and specific job assigned: types of gloves, creams, finger protection, cut resistance*
- *from lack of proper eye protection: face masks, goggles, safety glasses (PPE)*
- *from using improper eye wash stations and bottles*
- *from eye wash stations that do not use properly warmed, potable, mandated water as required by OSHA Regulations*
- *from flagrant misuse of eye wash bottles, playing games and spraying water on other workers, horseplay*

- *from actions that may cause injuries because eye wash bottles are not the correct application for certain operations where eye wash stations are needed and required by Federal Regulations*
- *from blocking eye wash stations: inaccessible because of scenery, props, tools, equipment, boxes*
- *from lack of proper bodily protection in every way, i.e. arm and head protection, legs and feet protection*
- *from using pneumatic staplers, nail guns, air hoses, and other pneumatic devices without full personal protection, hands, face shields, body shields*
- *from using pneumatic devices in assembling scenery and sets without the proper training by a competent professional*
- *from using glue guns or any adhesive spray, aerosol without the properly mandated (OSHA) Personal Protective Devices*
- *from lack of foot protection, i.e. work shoes, steel toed boots and shoes, non slip soles and heels*
- *from wearing improper footwear in shops, on location, working on the stage and grid: sneakers, flip flops, street shoes or any other footwear that will not provide foot protection*
- *injuries from not implementing proper, personal safety protective Regulations (PPE): no sneakers, thongs, sandals, jewelry, loose clothing, tight clothing, long hair not tied back, revealing clothing, loose-dangling key chains, headwear that blocks full vision,*

NOISE HAZARDS:

- *to hearing from lack of a Federally mandated Hearing Conservation Program (OSHA and NIOSH)*
- *from not being supplied and wearing proper personal equipment: mandated ear plugs or muffs*
- *from lack of proper insulation and noise reduction materials on walls and equipment mandated by OSHA and NIOSH Regulations for work areas that have major noise exposures and high decibel levels*
- *from regular exposure to impact and high decibel noise, as well as noise/sounds that exceed the proper Dba levels (OSHA) on a constant basis*
- *from constant exposure to noises when proper noise attenuation devices or material have not been applied to walls, ceilings, and equipment and maintained regularly*
- *from audio equipment piping music into the work areas as a distraction*

STORAGE HAZARDS: LACK OF PROPER ATTACHMENTS

- *from poor storage practices, cramming, pushing materials close to sprinkler heads,*
- *unsafe fire conditions,*

- *unbalanced loads, unsecured,*
- *overhead, lack of railings and kick boards, unlocked areas*
- *created from not safely securing any item used in production in order keep in from falling or falling over*
- *created by not firmly securing and fastening motorized equipment in the shop to the floor*
- *from overloading top shelving in storage units*
- *injuries from not properly securing shelves in seismic territories,*
- *placing too heavy a load on top shelving, unbalanced*

CORROSION:

- *from corroded materials*
- *from the weakening of materials by corrosion, especially those that may be hidden inside of other attachments*
- *from lack of preventive maintenance and replacement of corroded materials*
- *from the lack of proper coverings for materials from the weather and other corroding materials*

VENTILATION AND IAQ (INDOOR AIR QUALITY HAZARDS):

- *from lack of proper Ventilation practices and engineered, mechanical air handling equipment, properly designed exhaust fans, booths, circulation of fresh air and removal of used air (ASHRAE STANDARDS)*
- *injuries to individuals respiratory systems from not having properly mandated, Engineered Ventilation in compliance with Codes and Standards (OSHA, NIOSH, ASHRAE, IAQ, ANSI)*
- *from exposures created in working environments by not regularly scheduling Hepa vacuuming work areas and washing down surfaces*
- *exposures to individuals from the lack of proper storage and use of chemicals in non-ventilated working environments*
- *bodily harm from contamination in ducting, showers, sinks, fan outlets, air intake units, and from bacteria and microbes in ducting*
- *to health from non-ventilated dryers: fire, breathing problems, contaminated work environments, permanent respiratory damage*
- *from metal filings in the work and performing environments*
- *from welding and cutting: improper procedures, burns, fires, fumes, slag, poor ventilation, poor training, eye damage, improper clothing, lack of proper safety clothing*
- *from toxic fumes, vapors, or emissions*
- *from Carbon Monoxide, closed areas, vehicle emissions within garages, studios, arenas, confined space, enclosed areas of any type*
- *from cleaning metal surfaces, skin, eyes, vapors, fire, burns*
- *from aerosol sprays for painting or spot work*
- *from toxic fumes, vapors, or emissions*

- *from Carbon Monoxide, closed areas, vehicle emissions within garages, studios, arenas, confined space, enclosed areas of any type*
- *from cleaning metal surfaces, skin, eyes, vapors, fire, burns*
- *from aerosol sprays for painting or spot work*

SLIPS, FALLS, TRIPPING HAZARDS, EXPOSURES, AND INJURIES:

- *from slipping and falling and tripping*
- *from poor floor surfaces: gouges, splinters, loose boards, dirt, sawdust, metal filings, adhesives, breaks in surfaces, cleaning materials*
- *from lack of proper maintenance on a regular basis*
- *from slippery surfaces from water, solvents, leakage from sinks, barrels, food, spills, lubricants on walking surfaces*
- *from tripping objects: tools left on floor, pieces of wood and metal, plastic, paper, bottles, food, fasteners, electrical cords*
- *from not properly cleaning floors and stairs and other surfaces, including walls, grids, behind lock rails, catwalks, aisles, platforms*
- *from not properly abrading steps and tread surfaces*
- *from non-maintained external walkways, i.e. tripping, falling, slipping*

PYROTECHNIC AND SPECIAL EFFECTS HAZARDS:

- *from lack of proper, required and safe use of pyrotechnic devices*
- *from violating required storage of pyro materials*
- *from employing incompetent pyrotechnicians, unlicensed, untrained, not certified and individuals who are not careful and meticulous and violate the laws and Standards that apply to Pyrotechnics and Special Effects.*
- *to all personnel in entertainment, public assembly and performing arts environments from not hiring professionally competent, trained, skilled and licensed pyrotechnicians and special effects personnel*
- *to technicians, performers and audiences from misuse of pyro materials*
- *to facilities from special effects*
- *to stunt people and performers from lack of preplanning of special effects*
- *from Laser Units, shock, burns*
- *from using open flame of any kind on stage*
- *to performers and crews from special effects chemicals that have not been identified as dangerous and detrimental to the health of those in the effects areas*
- *to performers and crews from deliberate overuse and repeated applications of certain special effects (many, many takes)*
- *to technicians, crew, and performers, and stunt personnel from poorly planned or overzealous use of special effects*

- *from the misuse of special effects especially in indoor spaces or studio shooting conditions*
- *from using pyro and fog and smoke together, possible chemical reactions with human systems*
- *from not assessing and notifying technicians, audiences, shooters from a risk management point of view*
- *with pyro when working long hours, fatigue*
- *from Fog and Smoke Machines*
- *using and receiving pyro materials that have not been thoroughly evaluated as to where they were purchased from and from whom*
- *not complying with the required distances set out in NFPA and other jurisdictional, authorized groups*
- *from not using Personal Protective Equipment when required for handling or shooting Pyro materials*
- *from not checking thoroughly about shooting sites and prior incidents at those sites and by other shooters*
- *from blatantly violating safety practices set forth by Standards or industry practice and protocols: NFPA, OSHA, ANSI, ATF and Entertainment Industry Guidelines and Standards*
- *from igniting pyrotechnics in closed spaces*
- *from Strobe Units*
- *from lack of Emergency Procedures when firing or using Pyro products*

WEAPONS HAZARDS:

- *to entertainment personnel from the misuse of weapons*
- *lack of professional training and evaluation of skills*
- *poor quality materials*
- *improper storage*
- *lax security as to access to weapons*
- *lack of proper supervision of weapons*
- *lack of proper maintenance of all weapons*
- *from poor choreography where weapons are used in a production*
- *from using materials that have not been properly secured and verified as to quality*
- *from amateur use of weapons without professional training and supervision*

RISK MANAGEMENT PRACTICES: VIOLATION OF HEALTH AND SAFETY GUIDELINES: HAZARDS, LOAD INS AND LOAD OUTS

1. *from “hurry up and get it done directions ”when loading and unloading*
2. *deaths from load-ins and load-outs: poor supervision and planning*
3. *from individuals inside trucks or semi's, loading and unloading heavy materials*
4. *from not balancing loads of platforms inside trucks and semis*

5. *fatalities from “just do it” and “whatever it takes to get it done,” commands.*
6. *injuries from employing blatantly unsafe work practices in loading, unloading, rigging*
7. *from incompetency and lack of required skills among some workers*
8. *from personnel called upon to do too much in short period of times, under stress and pressure, fatigue, onerous conditions*
9. *from not using proper equipment to move materials in a safe manner*
10. *from not using required Personal Protective Equipment as mandated by Occupational Health and Safety Laws and Codes*

FIRE HAZARDS and EXPOSURES:

- *from lack of proper Fire Prevention and Suppression Practices*
- *from not using the proper application of NFPA and Standard of Care Fire Protection Methods and Procedures*
- *from blocking or obstruction of fire doors*
- *from not inspecting sliding fire doors and maintaining written records of their conditions*
- *from Fire Doors that will not close and fully and firmly latch*
- *from using wedges to keep Fire Doors open*
- *from using combustible second hand furniture, carpets, wooden props*
- *from lack of flame retarding for scenery, props, and other items used in productions of all types*
- *from blocked fire hoses and extinguishers*
- *from having fire extinguishers more than 75 feet away*
- *from lack of access to fire prevention notification devices*
- *from lack of proper Signage where required for egress and emergencies*
- *from lack of training with fire extinguishers,*
- *lack of judgment when to use them, and how to use them properly*
- *from the use of the wrong type of fire extinguisher*
- *from storing too close to sprinkler heads*
- *from hanging items from sprinkler pipes and heads: clothes, wires, scenery*
- *from not closing Fire Doors*
- *from propping open Fire Doors, wiring them open, stage weights to hold them open*
- *from not closing the Fire Curtain when the stages is not in use*
- *from defective release mechanism which will not allow Fire Curtains to come in*
- *from incidents from non-flame retarded curtains and drapes*
- *from lighting instruments too close to curtains and drapes*
-
- *from blocking fire curtains with scenery and props*
- *from exceeding the occupancy load of a room or space*
- *from not having the proper number of exits for a room or space*

- *from panic hardware that malfunctions*
- *from not having egress/exit door illuminated, indoors and outdoors*
- *from not having exit signs that are clearly visible at all times*
- *from deliberately covering over exit signs*
- *from cluttering hallways with costume racks, boxes, props*
- *from attaching items to the wall that narrow the width of hallway for egress and provide a hazard to bump into*
- *from not having minimum clear aisle width of 48" when seating is on both sides of the aisle*
- *from not having an emergency lighting systems which automatically illumines the path of egress for at least 90 minutes*
- *from having egress paths that pass through other rooms, kitchens, storage rooms*
- *from not maintaining 3 foot space around the circumference of hydrants*
- *from not maintaining a three year record of all fire inspections*
- *from violation of recommendations of Fire Loss Control Engineer from insurance companies*
- *from painted sprinkler heads*
- *from placing lighting instrument lens in areas where the sun may magnify the rays and cause a fire*
- *from using materials which may burn you*
- *from blocking fire sprinkler pumps, valves, and switches*
- *injuries from fire on stage and in shops, studio stages*
- *from lack of proper professional procedure in all welding processes*

FIRST AID HAZARDS:

- *from lack of proper First aid AIDS Practices, and Emergency Procedure Training where Blood Borne Pathogens are a concern and a potential exposure exists because of specific work that is being done*
- *from lack of proper Training in CPR and First Aid Techniques*
- *from lack of a Seismic Preparation Plan Drill*

RIGGING HAZARDS:

- *from lack of supervision of Riggers at all times*
- *from the lack of safeties on overhead equipment*
- *from not training all personnel who work on rigging in professional standards and industry standards*
- *from lack of redundancy on overhead equipment*
- *from defective Rigging Equipment*
- *from lack of preventive maintenance of rigging equipment*
- *from lack of training in Safe Rigging Practices*

- *failure of equipment due to lack of periodic inspections and preventive maintenance, and replacement of defective equipment of all types*
- *from catwalks due to defective hooks and fastening devices*
- *from electrical shock and falls from ladders and catwalks*
- *from rigging equipment improperly installed*
- *from not using rated hardware overhead*
- *from not fastening battens and other equipment in the proper manner*
- *from using counterfeit hardware*
- *from falling tools, equipment, lights that are not safetied off or do not have lanyards*
- *from catwalks: tripping, lack of grounding, dropping items*
- *from ladders to grids where rungs are not properly distanced from the wall so that feet can fit on them and hands not being able to grasp the rungs*
- *from lack of proper lubrication and a schedule of lubrication for devices that require lubrication*
- *from runaway lines*
- *from overloaded arbors*
- *from not using safety equipment to contain stage weights in the arbors*
- *from failure to handle and store stage weights properly*
- *from failure to replace worn rigging lines, both rope and wire rope*
- *from improper storage of items that can fall through grids on the grids*
- *from not cleaning grid, at least on an annual basis*
- *from allowing untrained personnel on the grid*
- *from not securing the access to the grid from personnel who should not be there*
- *from not complying with the fall protection requirements for all who work on the grid*
- *from not maintaining smoke doors*
- *from not maintaining all hardware for the fire curtain*
- *from blocking the fire curtain from closing*

LIGHTING EQUIPMENT HAZARDS:

- *from improper lighting installations, C clamp breakage, abraded wires, exposed wires, lack of fusing, open lighting cabinets*
- *from non-maintained lighting instruments*
- *from improperly wired instruments*
- *from improper hooks on catwalks*
- *from non-grounded cables and instruments*
- *from overhead items not properly secured and lacking redundant fastening with the proper application of the correct hardware or fasteners*
- *from speakers not being properly secured with the correct hanging hardware*
- *from speakers falling due to lack of redundant fastening*
- *from lighting instruments such as burns, shock, cuts*

- *from gel frames not being properly secured to instruments*
- *from top hats and barn doors not being properly secured*
- *and stored correctly according to OSHA Regulations*

PLATFORM, RISER, AND STEP UNITS HAZARDS:

- *from faulty handrails and step units*
- *from faulty platforms, not marked, no proper rails, toe and kick plates*
- *from poorly supported and constructed scenery: not proper industry standards*
- *from improperly fabricated platforms*
- *injuries from platforms that have not been thoroughly planned and have not been constructed correctly with the loads in mind*
- *from incorrect fastening devices for platforms*
- *from improper bracing for platforms*
- *from platform tops not properly secured*
- *from splinters in any wood surface or scenery*
- *from not maintaining, repairing and properly storing platforms before and after productions*
- *from not marking the edges of the Stage and other walking surfaces, i.e. platforms, elevations, steps, pits, ramps, traps*

HAZARDS DEALING WITH LIFTS:

- *from improper use of lifts and improper maintenance*
- *from standing on lift rails of baskets to rig higher points*
- *from not providing safety limits to lifts*
- *from the lack of training on lifts and platforms*
- *injuries from not using certified and trained personnel with lifts of all types*
- *from extended work on high elevations, lifts and platforms*
- *from lack of applying safety measures, such as brakes to the wheels of lifts*
- *from using the lifts in areas where they cannot be stable*
- *from violating the manufacturers guidelines for the use of lifts*
- *from violating the OSHA Standards for the use of lifts*
- *from violating the Federal Construction Standards for the safe use of lifts*

SANITATION AND HEALTH HAZARDS:

1. *from lack of sanitary practices: restrooms, make-up, green room, offices, shop, refrigerator*
2. *from poor housekeeping*
3. *from radiation from Microwave Ovens not properly maintained*

4. *from working two shifts or driving long hours, especially tour trips between gigs*

CROWD MANAGEMENT HAZARDS:

- *from lack of proper co-ordination of productions*
- *from noise from lack of noise barriers or properly placed and installed insulation for noise abatement, hearing protection*
- *from lack of proper Crowd Management and Crowd Control*
- *from lack of trained and competent security personnel for Crowd Management and Crowd Control*
- *from using the wrong or incorrect or non-maintained areas and equipment, i.e. stanchions, steps, lighting, etc. in Crowd Management and Crowd Control situations and events*
- *from lack of professionally trained personnel to handle crowd management and control*
- *from blocking exits, means of egress*
- *from non-operable emergency lighting*
- *from lack of pre event announcements as to exits, use of weapons, fog, strobes, etc.*
- *to Disabled personnel and audience members by not complying with ADA Laws*
- *from a lack of proper Emergency Response and Disaster Procedure*

FALL PROTECTION HAZARDS:

- *from not using proper Fall Protection Equipment as required by the Regulations of each country, Federal, State or Province*
- *from not having a Regulated Fall Protection System*
- *from not having a written rescue plan developed and implemented by a competent person in Fall Protection*
- *from not having full, competent training for Fall Protection for all personnel who are required and must work overhead*
- *from improper use of wire rope ladders*
- *from improper hanging points in ballrooms and elsewhere*
- *from improper hanging points in arenas, etc.*
- *from not using lanyards to retain tools, overhead*
- *from deliberate violation of Fall Protection Standards when working on lifts, with trusses, on wire rope ladders, platforms, roofs, scaffolding*
- *from deliberate violation of Fall Protection OSHA Standards in not supplying a secondary or redundant tie off line*
- *from misusing fall protection equipment for flying apparatus*
- *from using mountain climbing equipment for fall protection in theater*
- *injuries caused by not competently and fully supervising personnel who work with lighting trusses and wire rope ladders*
- *created by not complying with Fall Protection Regulations as to harnesses and fall arrest systems and fall restraints systems*

- *from not complying with the ANSI Standards and ASSE Guidelines for the use of Fall Protection*

SHOPS HAZARDS, EXPOSURES, INJURIES:

- *from the improper use of any and all hand tools*
- *from using particular tools for the wrong purpose for which they are designed*
- *from insects: spiders, wasps, bees*
- *from rodents: rats and other varmints*
- *from snakes and roaming animals of all kinds*
- *from using the wrong designated ladder for a purpose that it was not intended to be used for and not in compliance with safety guidelines and National Ladder Standards, OSHA and Construction Regulations*
- *from serrated metal edges*
- *from lack of toxic fume and vapor monitoring devices and PPE devices*
- *from poor supervision practices by those who are in charge of the shops and their personnel*
- *from the purchase/use of improper and hazardous equipment and materials*
- *injuries and fatalities from the use of counterfeit products*
- *from intense and impact noise*
- *permanent injury to hearing from not applying the OSHA Hearing Conservation Act and OSHA/NIOSH Preventive Hearing Loss Devices and Equipment*
- *from negligence of repair and lack of preventive maintenance of any equipment*
- *hazards that stem from lack of proper administrative response to notification of problems and dangerous situations, negligence, and liability*
- *from the use of broken and worn tools*
- *from the lack of proper guards on power equipment*
- *from not properly labeling containers in the shop*
- *from the use of improper fasteners*
- *from using defective fasteners, counterfeit, used nuts and bolts*
- *from unrestrained pressure vessels, not properly secured*
- *from shop glue guns and materials, e.g. burns, shock, respiratory damage*
- *from glue guns that are defective and melt*
- *from using non-rated hardware, especially overhead*
- *from tools which should have been replaced when they are found to be broken, abused, and missing parts*
- *from tools and equipment that have not been maintained*
- *from non-sharpened tools for cutting, cuts, punctures*
- *from poor training and insufficient instruction and on-going instruction in specific areas*

- *to health stemming from long working hours and fatigue, double shifts*
- *to health due to poor environmental conditions: improper ventilation, no ventilation, particulates in the work environment, lung damage, skin damage, hearing loss, eye damage or injuries*
- *to health from lack of properly cleaning work surfaces: walls, ceilings, floors, work tables, showers, sinks, phones, light switches*
- *to health and safety from clogged work sinks, bacteria and Legionnaires Disease, fumes, vapors, mists*
- *from compressed gas cylinders not being secured correctly*
- *to health from use of plastic in production: ventilation problems, breathing problems, fire, asphyxiation, lung and bodily organ damage, eye damage, skin damage*
- *from plastic being cut: Styrofoam, acrylic fibers, powder, fumes, splinters*
- *from cutting or forming plastic: burns, melting, fire, fumes*
- *from eating and drinking in work areas*
- *from non-abrasive surfaces on floors, steps where required for traction and safety*
- *from playing radio in work areas, distractions, rhythms, noise*
- *from sharp and pointed objects in shops, punctures, cuts*
- *from using the body instead of tools and equipment to move materials, scenery: using the hand and foot or back and knee, elbows, kicking, stomping, using the shoulder, head*

OUTDOOR HAZARDS:

- *from inclement weather: rain, snow, sleet, high winds, lightning storms*
- *from tornadoes, floods, dust storms*
- *from working in lakes, the ocean, water sites: drowning, swept overhead*
- *from lack of training in scuba and underwater techniques and protocols when working in underwater conditions*
- *from not taking into account the surrounding areas where you are working, i.e. streets, buildings, bridges, high wires, chemical storage areas, hazardous waste storage, nuclear units, forests,*

HAZARDS FROM ANIMALS:

1. *from using untrained animals in productions*
2. *injuries from not providing the proper supervision for animals before, after and during productions*
3. *from not complying with Standards of Care and Regulations for the use of animals and insects in productions*

COSTUME SHOP HAZARDS:

- *from dye vats in costume shops nor properly ventilated*

- *in costume shops created by lack of Federally mandated and properly engineered, mechanical ventilation system and NIOSH IAQ applications*
- *from not using proper personal protective equipment in the costume shop*
- *and permanent injuries created by not using personal protective equipment in all applications in the costume shop*
- *in the costume shop created by improper chemical use*
- *from improperly using powder dyes in costume shops*
- *from explosive materials misused in costume shops*
- *from using open burners and stoves in costume areas*
- *from electrical cords that have become frayed and have open connections in costume/wardrobe shops, and all shop or office areas*
- *from not grounded electrical plugs*
- *from storage areas that are not well organized and in disarray*
- *from shelving and file cabinets not properly secured*
- *from costume racks that are not stabilized*
- *from cuts and pin and needle punctures*
- *from lifting improperly*
- *from not having padded mats to ease back pains when standing*
- *from steam cleaning costumes*
- *from irons in pressing costumes*
- *from not complying with label warnings on all chemicals used in the shop*
- *from lack of proper illumination applications and standards*
- *from eating and drinking in the costume shop*
- *from shops that are situated in basements or attics and subject to mold and damp atmospheres*
- *from fatigue and stress from long hours worked either at one time span or a period of time*
- *from the use of glue guns*
- *from the use of aerosol adhesives*
- *from using highly toxic materials*
- *from slips and falls in the shop*
- *from poor housekeeping*
- *from costume and prop equipment not well maintained*
- *from costumes, too large, too tight, flimsy,*
- *fire problems and dangers when costumes are not flame retarded when necessary when working near equipment that produces high levels of heat or flame or pyrotechnic effects*

LADDER HAZARDS AND INJURIES

- *created by not using the proper ladders correctly*
- *created by not using ladders that are proper for the proper activity, e.g. electrical work, scenery work, folding ladders*

- *from not storing ladders correctly.*
- *from not maintaining ladders in all aspects, i.e. broken rungs, damaged uprights*
- *from standing on tops of ladders and the two last steps near the top of the ladder*
- *from not stabilizing ladders on even surfaces*
- *from improper placement of ladders, e. g. on tables, boxes, ramps, moving platform in order to reach higher areas*
- *from violating OSHA Regulations: placing ladders in front of door*
- *from allowing ladders to be moved with personnel on them*
- *painting a ladder in violation of OSHA Regulations*
- *caused by putting ladders on platforms and wheels such as A-frames*
- *from improper attitudes in using ladders and believing that a falling ladder can be stopped by any number of people holding it*
- *from not locking ladders*
- *from having one person go up ladder in front and another in back*
- *from violation of Ladder Industry Standards for Safety and Care of Ladders*
- *from not leaning ladders at the proper angle*

HAZARDS RESULTING FROM NOT PROPERLY TRAINING PERSONNEL

1. *from not fully training and supervising individuals in voluntary and educational situations and venues, heavy liability*
2. *from not fully documenting, memos, photographs, witnesses in incidents, injuries, deaths, property and equipment damage*
3. *from Confined Spaces: basements, under stages, crawl spaces, attics, grids, storage areas, elevator and lift maintenance areas, mechanical rooms, special scenery configurations, costume shops, prop areas*

This listing of Hazards to Health and Safety is not a definitive list. It is, in our opinion, a comprehensive beginning and a basis for those who work in the Public Assembly, Entertainment, Theater, Performing Arts, and Educational Theatre industries. It must be upgraded regularly, added to, and specifically tailored for the industries it represents.

We ask you to send us suggestions as often as you can, in order to fully develop this List of Hazards, as a tool for those who desire to comply fully with the Health and Safety Standards that should be implemented in every aspect of the Entertainment Industry, Public Assembly, and Educational Performing Arts.

Dr. Randall W. A. Davidson and Mr. Jay Stone, Principals and International Health and Safety Experts, Public Assembly and Entertainment Specialists, Risk Management Consultants, Education Performing Arts Specialists, Motion Picture Production Specialists

E-mail: www.riskit.com rdavidson@riskit.com, www.riskit.com
www.globalhealthandsafety.net Phone and Fax: 720-922-0707;
MICVID@IHMI.com; <http://209.130.95.171>; Risk International
8803 West Ontario Avenue, Littleton, Colorado 80128

**New book: Practical Health and Safety Guidelines for School Theater Operation,
by Dr. Randall W.A. Davidson: www.theaterhealthandsafetybook.com or
www.theatresafetybook.com**

**Dr. Davidson's Eye on Theater Health and Safety: Three Volumes, a Set, New
Books: January, 2000, available December, 2011.**

**New book: Risk Management: Health, Fire Prevention, Safety, Security,
Environmental, Code and Standard Citations as Applied to the Entertainment
Industry, Educational Theater, and Performing Arts Scene Shops
2012**

**New book: Fire Safety and Prevention in the Entertainment and Performing Arts
Industry: available, 2012.**

**New book: Risk Management in the Entertainment and Performing Arts Industry:
Available, 2012**

***RISK INTERNATIONAL provides 100 specialized Seminars, Workshops, and
Master Classes for Entertainment and Public Assembly Personnel, and Personnel
in the Performing Arts in Education: (commercial, professional, volunteer, and
educational)***