

# Utah Performing Arts Safety Manual



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First Edition

Edited by

Utah Division of Risk Management

With permission from the University of California Office of the President – Environment, Health & Safety, content from the UC Performing Arts Safety Manual was used.

Specials thanks to Ron Boshard, John Golom, Steven Hughes, Thomas Merrill, Mark Petersen, Karen Peterson, Lori Rupp, Ted Black, Wesley Whittington, and University of California Office of the President – Environment, Health & Safety.



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# Section 1: Introduction



The Utah Division of Risk Management recognizes the intrinsic value of the performing arts. We provide this manual to you as an aid to keep your performing arts activities safe. This manual can be used in both the higher ed and K-12 settings. Naturally, greater caution is needed for K-12 programs.

Performing arts activities occur as part of academic programs in theater, dance, music, and drama departments, or they may be coordinated by a student-run club or organization. Each of these entities is faced with a variety of health and safety challenges, and although some risks overlap into all areas, others are unique or more significant based on the scope and complexity of the performance, where it is occurring, and who is coordinating it.

In academic departments, faculty, staff, and students may be involved in numerous phases of production including design, set construction, electrical, props, special effects, costumes, makeup, acting, and front-of-house activities. All these areas present a wide array of health and safety hazards including, but not limited to, physical, chemical, and mechanical hazards in the shops, working at height challenges both on stage and

backstage, and material handling risks during set construction, load in, and strike activities.

Beyond the great array of hazards in academic performing arts activities, challenges exist in evaluating the risks associated with new productions and in training the many students involved in the programs. Dynamic and elaborate shows are being produced on a regular basis, thereby creating unique and challenging safety considerations for each play, concert or event.

The purpose of the Performing Arts Safety Manual is to provide faculty, staff, and students who work or participate in the performing arts with a general overview of potential hazards and related safe work procedures. The Performing Arts Safety Manual is designed to guide a theater or other performing art production from the planning stages to strike, and to provide additional information on safe work procedures, such as:

- recognizing and understanding the hazards associated with various performing arts operations and activities;
- knowing when to apply various types of health and safety controls, such as engineered devices (ventilation, machine guards, etc.), administrative practices (safety training, warning signs, etc.), or personal protective equipment (PPE) (respirators, safety glasses, hearing protection, etc.); and
- planning for and responding to emergencies such as fires, earthquakes, or chemical spills.

## SUPERVISION

Establishing a safety-management framework helps in identifying and correcting hazards, ensuring training and compliance, and communicating information related to safety and health issues. Well-defined roles and responsibilities are the cornerstone of a robust safety program in the dynamic and diverse world of educational performing arts activities.

Management may include deans, department chairs, superintendents, principals and/or theater directors who are responsible for ensuring an effective safety program is implemented in all areas under their scope of responsibility. For performing arts activities, your safety program should include all facilities or areas where employees and students work or are involved with production activities, including the scene shop, costume shop, prop shop, stage area, front-of-house, music recital hall, catwalks, etc. Those in charge must assign and authorize designated individuals to establish and support the key safety processes and procedures.

Supervisors are faculty and staff that oversee and direct others. This might include directors, producers, stage managers, house managers, technical directors, scene shop managers and theater professors and teachers. Supervisors play a critical role in the implementation of the safety program and must be empowered and authorized to:

- develop safe work practices and procedures;
- enforce health and safety rules;
- stop work activities that pose a danger;
- ensure routine documented safety inspections occur;
- provide safety training;
- make available and ensure the proper use of PPE;
- report and investigate injuries and incidents; and
- maintain health and safety documentation.

Employees and students, including student employees, volunteers, and students engaged in academic activities, are accountable for understanding health and safety rules and for following safe work practices. Employees and students must:

- obtain appropriate training for designated activities;
- use PPE as required and directed;
- report unsafe conditions, malfunctioning equipment, and other safety concerns;
- report all work-related injuries and incidents;
- understand what to do in the event of an emergency; and
- understand the limitations of students who are minors.

Your Environment, Health & Safety (EH&S) Office, Risk Management Office, and/or Risk Coordinator provide health and safety consultation, risk mitigation and injury management services to all individuals within your organization. Risk management and safety professionals may:

- assist with safety program implementation;
- develop and provide safety training;
- perform safety inspections;
- conduct job or task hazard evaluations;
- conduct incident investigations;
- monitor compliance;
- identify and evaluate emerging risks;
- implement and monitor Enterprise Risk Management (ERM) best practices;
- manage incident and injury claims, including workers' compensation claims;
- coordinate transitional return-to-work activities; and/or
- review contractual agreements.

These professionals should be consulted to assist in developing and implementing a site-specific safety plan based on the nature of the production. The Utah Division of Risk Management is also here to help and can play a consultative role.

## **HAZARD IDENTIFICATION AND CORRECTION**

Recognizing hazards within your performing arts activities and correcting these hazards are critical elements of a robust safety plan. The plan needs to include recommendations for completing and documenting routine safety inspections.

Inspections include assessments performed by trained and knowledgeable in-house staff, or an outside consultant or contractor with theatrical expertise. The Utah Division of Risk Management also has Loss Control Consultants who can perform these inspections. General facility inspections, including housekeeping, electrical safety, emergency egress, shop safety, and hazardous material storage, should be performed and documented periodically throughout the production, including, at a minimum, during set-up, production and strike activities.

Focused inspections on specialized systems within the facility, such as a counterweight rigging system or tension grid, should be performed based on the frequency of use, manufacturer guidelines, and recommended industry best practices. These systems are typically performed by a qualified theatrical contractor or a trained staff member.

Hazard identification needs to extend beyond facility inspections and should include process-related safety evaluations. Examples of process-related safety evaluations include determining and documenting the safe method for dyeing cloth for a costume, hanging lights from a balcony rail, raising or lowering an actor through a trap door system, or rehearsing a dance routine near the leading edge of an orchestra pit. A number of different approaches can be used to perform these evaluations including a job hazard analysis (JHA).



A JHA describes a task in a detailed step-by-step format, identifies potential hazards with each step, and outlines health and safety controls to minimize injuries or illnesses associated with these steps. The form for documenting a JHA can be as simple as three columns entitled “Task,” “Hazard,” and “Control.” This flexible process and systematic approach can be applied to tasks both large and small. Once completed, the document can be used as a training tool and can be incorporated as part of the written operating procedures for designated jobs or tasks within the facility.

## DEVELOPING CORE SAFETY FUNCTIONS

1. Define the Work or Activity: Clearly defining a task from initiation to completion helps reveal the possible risks, hazards, and environmental impacts associated with the activity.
2. Analyze the Hazards: Understanding the risks and hazards enables appropriate planning to protect people, property and the environment.
3. Develop and Implement Hazard Controls: Appropriate controls, authorizations, monitoring, emergency procedures, equipment and training are established and implemented before work begins.
4. Perform Work or Activity: Work begins when identified risks have been eliminated or controlled and readiness is confirmed.
5. Review and Provide Continuous Improvement Feedback: From the planning stage to the wrap up, gather feedback, review monitoring results, and look for ways to improve the process.
6. Documentation: All safety activities, including inspections and training, should be documented.

Safety inspections, process-related hazard evaluations and reporting unsafe conditions are all critical components of systematic hazard identification and control and are valuable processes in creating and maintaining a safe work environment.

Employees and students have the right to report hazardous conditions without fear of reprisal. Your supervisor must provide training and guidance on how to report a hazard and in all cases these reports can be provided anonymously either to the supervisor or directly to the Campus Health & Safety (EH&S) Director, District Risk Coordinator, School Supervisor or Theater Supervisor. Most entities have multiple ways for submitting hazard concerns via a document, email, or some type of electronic web-based submission process. Examples of unsafe conditions that may need to be reported include lack of PPE to perform a task safely, lack of (or broken) emergency equipment, or a frayed electrical cord. Higher education institutions and public schools may obtain additional assistance by contacting the Utah Division of Risk Management or the State Fire Marshal’s Office.

## **HEALTH & SAFETY COMMUNICATION AND TRAINING**

Supervisors are the first point of contact concerning health and safety information. Health and safety information may be distributed via emails, newsletters, or posters, during meetings, or by other suitable methods. Supervisors must provide and review resource and reference information pertinent to an individual's job, including relevant safety training, Safety Data Sheets (SDS), warning labels, JHA information, emergency response procedures, and safe work practices.

Another important component of training is termed on-the-job training or OJT. OJT is instruction and guidance provided by a supervisor or a knowledgeable individual while a job or task is being completed at the workplace. OJT is an important step in the process of an employee or student becoming fully trained and supports classroom training and education.

Prior to starting work activities or being authorized to access and use facility space, equipment, or tools, all new employees/students/volunteers must receive an initial overview of the department/facility safety plans and complete an orientation about critical emergency response procedures and life safety equipment.

Training is required for all new employees, all individuals before starting a new job, task, or operation, and whenever a process, procedure, material, or equipment is introduced into the work environment that represents a new hazard. Supervisors must receive training in order to recognize and understand the hazards their employees and students may be exposed to, and they must be well versed in the regulations and safe work practices to control these hazards. In short, identify training needs, timely provide the training, and then document that it occurred.

The Performing Arts Safety Manual can be incorporated into your organization by identifying training needs for various types of work activities (set construction, costumes, lighting, etc.) within the theater and performing arts.

## **EMPLOYEES/STUDENTS/VOLUNTEERS**

Empower employees, students and volunteers by providing them this manual and by holding them accountable to review its applicable sections and participate in assigned training sessions. Work with your supervisor/instructor to ensure all required training is completed. Talk to your supervisor/instructor if you have any questions, or if you do not understand the materials.

Students under the age of 18 are limited in the course and scope of their participation. Minor students should never work where they are exposed to a height of six (6) feet or greater, including working from ladders and catwalks. Nor should they be allowed to operate boom, scissor or other types of mechanical lifts. Minors may only use hazardous chemicals under the direct supervision of an approved adult employee.

## **REQUIRED TRAINING**

Provide the following training to all relevant staff and students:

- Hand and Power Tool Use: Safety requirements and the safe operation of all hand and power tools that may be used.
- Injury & Illness Prevention Program: Provide an overview of the plan, explain how to access your specific plan, how to report a hazardous condition, and what an employee's rights are under the plan.
- Hazard Communication: Review how to access relevant SDS, identify and discuss posted warning signs and hazard communication labels.
- Attire and Personal Protective Equipment (PPE): Discuss appropriate attire for various areas and activities, review the location of PPE, and explain steps to becoming trained and authorized to use PPE.
- Restricted Work Activities: Identify restricted or "Authorized Personnel Only" areas including grids, catwalks, confined spaces or other hazardous work locations. Fall protection requirements and training in the proper use of fall protection equipment.
- Emergency Contact Information: Discuss emergency contact information and location of phones to call 911 and campus emergency personnel as appropriate.
- Life Safety: Identify the location and discuss the proper use of emergency equipment such as eyewash, first aid kits and Automated External Defibrillators (AED's). Identify emergency exits, evacuation routes and emergency assembly areas. Review the location and use of fire alarm pull stations and fire extinguishers. Know the appropriate fire protection plans for the facility.
- Training Record Retention: Training records must be retained in accordance with the University/LEA recordkeeping requirements.

## **ACCIDENT INVESTIGATION AND INJURY REPORTING**

An "accident" is an unplanned event that results in injury, illness, or property damage. A "near miss" is an unplanned event that almost resulted in injury, illness, or property damage. An example of a near miss is when a ladder becomes unstable while the user is reaching and overextending, but the user regains balance and does not fall off the ladder. Both accidents and near misses should be investigated to determine their causes and to reduce or eliminate the hazards that contributed to them.

When accidents occur, employees and students must inform a supervisor immediately so appropriate medical treatment and follow-up procedures can be initiated. In the event of a serious or life-threatening injury or illness, 911 should be called immediately. Once the injured person has been attended to, notify appropriate personnel of any accidents involving employees, students or patrons even if the accident occurs after normal working hours. University or school personnel should make all appropriate notifications in accordance with the entity's policy.

When an employee (staff or faculty) has been injured and requires or requests medical treatment, the appropriate Human Resource personnel must be notified as soon as possible, and appropriate workers' compensation claim forms need to be completed.

Once medical treatment and initial notifications have been made, your Risk Management personnel should assist supervisors with accident investigations. These professionals can also provide the appropriate forms and documents to guide the process. In the event of a serious accident, Risk Management personnel may take the lead in performing the investigation. In the event of a near miss or minor accident, trained supervisors can complete the process and report the findings to their employees and students. Once accident and near miss investigations are complete, the findings and corrective actions should be reviewed with all employees and staff, and this review should be documented.

Accidents causing injuries and illnesses do not happen frequently. Understanding and being familiar with your emergency procedures for responding to an injury and following up with the appropriate notifications and completion of forms is critical. Supervisors need to be trained and understand these processes BEFORE an accident occurs.

## **SET CONSTRUCTION**

Planning is a critical component of set construction. Set designs are planned out in order to have a clear idea of the overall scope of the production, including structural requirements, special effects, props, lighting, furniture, decorative materials, paints, costumes, etc.

Planning also helps supervisors identify equipment and tool requirements, use of chemicals, personal protection requirements, and employee training needs. This, in turn, helps identify and implement applicable safety policies and procedures throughout the production process.

In K-12 schools, adults are required to design the sets to help prevent collapse and to ensure fall-protection systems such as guardrails are in place and effective. Backstage lighting is also important to prevent falls.

During set construction, and also during production and other low-light situations, flashlights or other means of lighting should be used to prevent slips, trips and falls. All stage edges should be marked with a contrasting material that provides a visual reminder of the edge to prevent falls.

## **STAGE FLOOR LOADING**

Caution must be taken to assure props and other stage materials do not overload the stage. Items that tend to create overloading include excessive props, storage on the stage, heavy materials in set construction, water features, etc.

## Section 2: Aerial Work Platforms

Aerial Work Platforms (Aerial Lifts) are used in the performing arts to safely raise a person to the height necessary to adjust lighting instruments, move curtains or props, reach out-of-the-way places, and complete other work.

### **Minors Must Never Operate or Ride in Aerial Lifts**

All operators must receive formal and documented training on each type of aerial lift and must be authorized prior to operating a lift. Ensure operators understand and comply with all manufacturer instructions and safety recommendations, as well as the following safety guidelines.

- Lock off, chain off, or lock away all lifts when not in use to prevent unauthorized use. Keys should never be left in a lift when the operator is not present.
- Inspect all parts before and after the use of the lift. Immediately report any missing, broken, or defective parts. The supervisor is responsible to determine if the lift should be used. Document lift inspections.
- Check the area in which the lift is to be used for possible hazards, such as drop areas, holes, floor obstructions, and overhead obstructions.
- All operators should read the operator manual in addition to receiving formal training.
- Ensure the outriggers, if equipped, are deployed and properly placed in order to prevent tip-over incidents.
- Immediately report any potentially hazardous conditions that become evident during operation.
- Know how to operate the manual emergency descent controls. Keep in mind, each lift is different, as are the controls.
- Wear all recommended personal protective equipment.
- Follow all manufacturer's safety guidelines regarding the use of fall restraint and/or fall protection devices. Requirements differ depending on the size and design of the lift.

### **USE GUIDELINES**

- Always maintain a three-point contact when getting on and off the lift: two feet/one hand or two hands/one foot.
- Always face the lift when getting on and off.
- Always lower the basket completely to the ground before getting on or off.
- Always maintain a firm footing while on the platform floor.
- Never use planks, ladders, or any other devices on the lift to achieve additional height or reach.
- Never stand or climb on the guardrails.
- Never exceed rated capacities. Rated capacity includes the combined weight of all persons, tools, and materials.
- Never exceed the maximum weight of allowable persons on the platform.

- Never exceed the maximum weight of allowable persons on the deck extension of a scissor lift.
- Never ride a lift while it is elevated unless it is designed to do so. All manufacturer instructions must be followed. Please note, manual lifts are NOT designed to be moved with someone at height and should never be used in this manner.
- Always follow the manufacturer's instructions regarding the use of the lift while elevated.

## Section 3: Audio and Video

Your performance venues may use a variety of audio and video equipment, including but not limited to mixers, loudspeakers, outboard gear, microphones, computers, projectors, and external dowers.

There are significant exposures while installing, maintaining, and storing audio and video equipment. You may be exposed to hazards such as heights, falling equipment, or the need to lift heavy equipment. Another potential hazard is the decibel level generated by speakers and amplifiers.



### ELECTRICAL RISKS

Supervisors and teachers must train staff and students, respectively, on the proper grounding requirements of audio equipment. Proper grounding will help eliminate a ground loop that can potentially damage the equipment and may result in electrical shock. Always avoid electrical shock hazards by following safe electrical work practices including lockout/tagout.

### RISKS OF FALLING FROM HEIGHTS

The procedures for hanging audio equipment may require you to work from significant heights on catwalks, scaffolding, tension grids, aerial work platforms, ladders, or other elevated work surfaces. Fall exposures must be identified in the planning stages and, where necessary, appropriate fall protection measures (guardrails, fall arrest gear, etc.) need to be in place and used. Employees and students must be trained on potential fall exposures and the presence or use of required fall protection. Supervisors and teachers must ensure staff and students are following all safety requirements.

### SUSPENDED AND STAND-MOUNTED AUDIO EQUIPMENT

Overhead speaker units can cause severe injuries if not secured properly. Staff must be trained on how to install and rig the suspended units properly. Minors should never perform this work. Ensure swags for flown cables are marked with caution tape and placed at a safe height. The cable should be placed at a height that will be clear for moving scenery and also be a safe distance off the deck.

Tripods can present a trip and fall hazard. They, too, can tip over, potentially causing harm. Again, proper training is critical. Ensure proper tripod placement to reduce these hazards.

### NOISE LEVELS

High noise levels generated during rehearsals and productions can result in hearing damage and hearing loss for the performers, crew, and orchestra. Conduct sound level testing when planning

high noise level events and provide appropriate hearing protection devices when the planned noise levels reach an eight-hour (8-hour) time-weighted average of eighty-five (85) decibels. Contact your EH&S Office, Risk Management Office, and/or Risk Coordinator for assistance in evaluating the hazards of high noise levels.

## **CABLE MANAGEMENT**

- Cable management for audio equipment poses the same hazards as cable management for lights. Audio cabling includes signal-carrying cables and power cables.
- Create a circuiting diagram for the theater indicating the location of all the audio/visual equipment. Add extra sheets as needed to plot the sound board. Use the circuiting diagram to plan the equipment locations. Use gaffers tape to label the circuit number at both ends of each cable.
- Use the shortest cables possible to eliminate hanging loops that may tangle. Provide only enough slack to allow for position adjustments.
- Group cables in parallel lines with Velcro rip-ties, theatrical cord, or tie line (glazed or unglazed) for these advantages:
  - a. time and materials are saved, because they don't require replacement each time a cable is added or removed;
  - b. eliminates the risk of cutting cables as there is no need to cut tape; and
  - c. the risk of injury from sharp-edged zip-ties is eliminated.
- Never wrap cables around support beams or catwalk guardrails.
- Use re-closable J hooks and/or Velcro cable straps to support cables that must be suspended from one point to another.
- Coil extra lengths of cable and use Velcro rip-ties to keep the coil stable.
- Avoid crossing paths with cables. If it can't be avoided, use cable guards and, if practical, use a cable guard that is equipped with yellow or orange stripes to alert cast and crew of the trip hazard.

## **INSPECTION, MAINTENANCE, AND STORAGE**

Regular inspection and maintenance will significantly reduce potential electrical malfunctions. Training is required for any employee responsible for inspecting or maintaining audio and video equipment.

## Section 4: Chemical Hazards

The key to safe chemical use is to understand the physical and health hazards of the materials you use, implement safe handling precautions, and recognize emergency and first aid procedures.

Each chemical container has a manufacturer's label with the chemical name(s), hazard warnings, and the manufacturer's name and address. Never remove these labels. If secondary containers are used, those containers must also be labeled with the information.

### Never Remove Chemical Labels

Each product has a Safety Data Sheet (SDS) which includes the following:

- physical properties;
- flammability and fire-fighting information;
- health hazards;
- emergency and first aid procedures;
- stability and special storage considerations;
- spill, leak, and disposal procedures; and
- personal protection information.



Supervisors, teachers or instructors should identify which products can be used. All employees must receive training on the location and content of the SDS, the required personal protective equipment (PPE), and the proper use, storage, and disposal of each product.

There are many types of paints, inks, pigments, and dyes used in the performing arts. While each product will have specific manufacturer's instructions, the following safety guidelines apply to all products. Read the product labels and the SDS to help you identify the potential hazards of the product you are using.

- Abide by ventilation requirements.
- Avoid ingestion of materials by not eating or drinking in your work area.
- Wash your hands before eating and drinking.
- Keep containers closed while stored and even between each use.
- Control ignition sources in areas where flammable liquids are used.
- Never puncture aerosol cans or expose them to high heat.
- Dispose of each product as directed by the manufacturer and in accordance with your Campus/LEA Hazardous Waste Management Program.
- Know and understand the chemical spill procedures for each of the products you are handling.
- Only use chemicals in an area with access to an emergency eyewash station.
- Don't leave your questions unanswered. Ask!

For more information, consult your Campus/LEA Hazard Communication Program.

## **MANAGING CHEMICAL WASTE**

The chemicals used to generate special effects may result in the generation of hazardous waste. Dispose of waste as directed by the product manufacturer and in accordance with your Hazardous Waste Management Program. You can contact your Safety or Risk personnel for more information and guidance regarding hazardous waste management. They can provide guidance regarding:

- proper storage of the waste until it is collected;
- different types of hazardous waste that should never be mixed;
- proper labeling of waste containers; and
- special handling requirements based on the hazard characteristics of waste.

# Section 5: Confined Spaces

Recognizing the presence and hazards associated with confined spaces is critical if you are working in them. Untrained, ill-equipped workers who try to work in, or rescue people from, confined spaces often become victims.



This section is intended to raise awareness of confined space hazards. It is not a permit-required confined space entry training resource. Only employees trained in the confined space entry operating procedures established by your LEA or University are allowed to enter confined spaces.

What is a confined space? It is an area large enough for a person to enter and perform assigned work; it has limited or restricted means of entry or exit; and it is not designed for continuous human occupancy.

What is a permit-required confined space? Any space that meets the definition of a confined space and:

- contains or has the potential to contain hazardous air conditions;
- contains a material with the potential to engulf someone who enters the space; or
- has an internal configuration that might cause an entrant to be trapped or suffocated or contains any other recognized serious safety or health hazards.

What are examples of confined spaces in performing arts facilities? Examples include but are not limited to:

- covered orchestra pits;
- elevator pits;
- house cove (attic) lighting positions;
- plumbing runs; and
- boilers.

When might personnel encounter confined spaces in performing arts facilities? Examples include:

- conducting inspections, repairs, and/or maintenance activities;
- working in designated areas such as front-of-house attic lighting positions; or
- conducting emergency rescue operations.

Hazards that make performing arts confined spaces deadly include:

- hazardous air conditions (such as flammable gas, too little oxygen, too much oxygen, airborne combustion dust, etc.);

- conditions that can trap or suffocate an entrant (such as inwardly converging walls or the lowering of the orchestra floor);
- mechanical hazards (such as gears, conveyors, etc.);
- electrical hazards;
- poor visibility, lack of lighting;
- falling objects;
- falling, tripping, insecure footing; or
- other hazards that would make escape or rescue from the area difficult.

Processes that can create a hazardous atmosphere include:

- aerosols, dust, fumes, mist, gases, vapors, radiation;
- chemical reactions;
- decomposition of organic matter;
- cleaning materials and reagents;
- welding, spray painting, grinding, sand blasting;
- stored products/chemicals;
- leaks and spills; or
- charging batteries.

**Never Enter Any Confined Space Until Properly Trained and Authorized as Serious Injury or Death May Occur**

There are ways you can help protect yourself and your co-workers such as:

- consult with safety and risk professionals;
- consult OSHA resources, procedures, and training requirements;
- never violate the posted warnings and restricted access signs;
- learn how to identify confined spaces;
- identify permit and non-permit required spaces in each venue and assure all spaces are appropriately marked;
- develop written safe working procedures for all confined spaces within each venue;
- never enter an area that could be a confined space unless trained and authorized to do so, and contact your supervisor or instructor if you are in doubt;
- never rely on only your senses to determine if a confined space has hazards as several hazardous gases are colorless and odorless; and
- never enter a confined space to try to rescue another worker unless properly trained and do so.

# Section 6: Cosmetics, Theatrical Makeup and Hair

Theatrical makeup practices can pose hazards for performers and makeup artists if not handled correctly. Make up should be safely selected, applied, removed and stored.



Preservatives, metals, solvents, dyes, waxes, and oils can be found in a variety of makeup and hair products. As an example, formaldehyde is a toxic chemical that can be found in artificial nail products. Chrome, aluminum, bronze, copper, and nickel can be found in eye makeup and powdered makeup applied to the body. These products can cause allergic reactions. Solvents, such as acetone and alcohol are found in nail products, glue removal products, and hair spray. These products can cause the skin to dry and crack. Acetone and alcohol based solvent products may also pose fire hazards. Hair dyes may contain chemicals suspected to be human carcinogens. Waxes and oils can cause inflammatory skin reactions.

## SELECTION

Use only cosmetic products for skin application; never use paint or other non-cosmetic products. Only use face products for the face, eye products for the eyes, and body products for the body. Use only as directed.

Purchase makeup that is commercially manufactured. Ensure the product label lists the product's ingredients. Maintain the informational sheets and Safety Data Sheets (SDS) that accompany the product in its original packaging and make that information available to the performers. Sharing the information can help performers avoid products that contain ingredients to which they know they are allergic. Have each user conduct a small patch test of the product before using it the first time to determine if the user has a reaction to the product. When needed, visit the product manufacturer's website to find more information about the product.

When selecting products that are sprayed, such as hair spray, select products that can be dispensed via a manual pump rather than pressurized gas. Use surgical adhesive instead of spirit gum where possible. When using glitter, only use glitter sized for makeup use.

## APPLICATION

### Makeup

Sharing makeup and makeup applicators may result in the transmission of diseases, such as conjunctivitis. A primary key to makeup application safety is keeping it clean. This is true whether

the makeup supply is a personal supply or a communal/shared makeup supply; and whether the performer applies his or her own makeup or a makeup artist applies it.

### General Guidelines for Keeping Makeup Clean

- Purchase and use a personal makeup kit if possible.
- Wash hands prior to handling the makeup.
- Wash face prior to applying the makeup.
- Do not smoke, eat, or drink while handling or applying the makeup.
- Replace makeup regularly. Dispose of old makeup to prevent its further use.
- Keep makeup containers sealed when not in use.
- Use clean brushes to apply makeup.
- Do not share makeup tools between people unless cleaned and sanitized between users.
- Use tap or distilled water to moisten palettes, brushes, or pencils.

### Guidelines for Shared Makeup

- Dispense makeup, whether cream or powder, from larger containers into smaller containers and label the smaller container to identify the performer using that container.
- Use a palette knife or wooden craft stick to transfer cream makeup from its original jar into labeled individual containers.
- Slice cream-stick makeup and lipstick using a clean palette knife and place the sliced portion in an individual labeled container, or on a labeled paper disk.
- Never place a makeup application device back into a shared makeup container after the applicator has been used. For example, do not place a mascara brush back in the mascara tube after the applicator has come into contact with someone's lashes.
- Use disposable makeup applicators, such as brushes and sponges.
- Ensure makeup artists wash their hands between performers.
- Clean and sanitize makeup pencil sharpeners between users.
- Clean and sanitize reusable makeup brushes and sponges between uses/performers.
- Use clean containers of clear water for each performer's makeup application.

### Hair

Hair products can pose skin absorption and inhalation hazards. Read the label prior to using any product and follow the listed safety precautions. Hair styling tools such as curling and flat irons and steam curlers can cause burns. Sharing brushes, combs, hair clips, as well as skullcaps, wigs, and facial hair can transmit lice and nits.

### Hair Product Guidelines

- Wear gloves when applying hair dyes and lightening products.
- Avoid dispensing large amounts of sprayed products in closed or unventilated areas.
- Use a hairspray face shield to protect the performer's breathing zone and eyes during the application of hair spray.

## Hair Styling Tools and Prop Guidelines

- Use thermo-shields or pads to protect surfaces and performers from contact with hot curling and flat irons.
- Remove combustible and flammable materials from areas where hot irons will be placed.
- Clean and sanitize facial hair pieces, skullcaps, and wigs between users.
- Clean and sanitize combs, hairbrushes, curlers, and other styling tools between users.



## REMOVAL

Proper removal of makeup is as important to the performers' health as proper application. Avoid the use of solvents for the removal of makeup, nail treatments, as well as latex and spirit gum removal. Never pull spirit gum or latex off, as this action can also remove healthy skin cells. Instead, slowly peel off the gum or latex. Promptly remove makeup after each performance using cold cream followed by warm water and an exfoliating cleansing product. Be sure to moisturize after cleansing with a hypoallergenic moisturizing lotion or cream.

### Storage Practices

Adopt makeup storage practices that reduce the likelihood of shared use and unauthorized access and that also promote cleanliness.

### Makeup

- Clean and sanitize reusable brushes and sponges and then place them in sealed labeled bags to keep them clean.
- Ensure all containers are closed.
- Store the makeup in a secure location to prohibit unauthorized access.
- Store makeup in a cool dry location.

- Replace mascara every three months.
- Replace other makeup every six months.
- Keep disposable applicators in sealed containers.

## Hair

- Clean and sanitize brushes, combs, and curlers and place them in sealed labeled bags to keep them clean.
- Inspect the power cords on curling and flat irons, as well as hair dryers, prior to putting them away.
- Report any damaged styling equipment and take it out of service.

## Chemical Handling

Hair dyes, hair and wig treatments, hair sprays, nail polish, and nail polish remover are just some of the hazardous materials used in performing arts cosmetics. These chemicals should be treated with the same respect as those hazardous materials used in set construction and props. As stated in the Set Construction chapter, follow the specific manufacturer's instructions for each product, as well as the following safety guidelines:

- Read the product labels and the SDS to help you identify the potential hazards of the product you are using.
- Know the ventilation requirements of the products you are using.
- Avoid ingestion of materials by not eating or drinking in your work area and wash your hands before eating or drinking.
- Keep containers closed when not in use.
- Control ignition sources in areas where flammable liquids are used.
- Never puncture aerosol cans or expose them to high heat.
- Dispose of the product as required by the manufacturer.
- Know and understand the chemical spill procedures for each of the products you are handling.

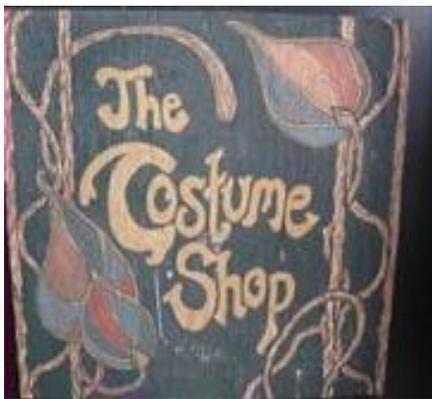
## Section 7: Costumes



Hazardous conditions can arise during the making, wearing, and storing of costumes. Costume designers may be exposed to hazards while operating scissors and other cutting devices, sewing machines, glue guns, and steam irons and when applying chemicals during the construction and repair phases.

Costume materials and the design of costumes may expose the performers who wear them to fire, heat stress, and trip/fall hazards. Costumes and accessories can pose fire, material handling, and trip/fall hazards during the storage phase.

### CONSTRUCTING, MODIFYING, AND REPAIRING COSTUMES



Before you start, it's important to read the instruction manuals of your tools. Some of the tools to be mindful of are sewing machines, power scissors, cutting devices, and steam irons. Know the purpose of your tools and how to use them safely. Just as important as knowing how to use the tool is ensuring they are safe to use. For that, inspect tools prior to use. Be sure you know how to report problems, take damaged tools out of service, and submit them for repairs or replacement. Always wear shoes to protect your feet from dropped items such as scissors, broken needles and pins. Always sweep the floor clean of debris after each work session.

#### Sewing Machines

The U.S. Consumer Product Safety Commission estimated that in 2005, 2,700 people were treated in emergency rooms for sewing machine injuries. Of those injuries, 60% were puncture wounds and cuts to the fingers, and some operators have actually sewn their fingers into the garments they

were constructing. Make sure you have received training on how to use the sewing machine prior to use. Remember, not all machines are the same, and some are quite powerful, such as sergers (also known as merrow and overlock machines) that use loopers and knives to tidy up the edges. Keep your fingers well away from the “presser foot” and “feed dog” of any machine to avoid exposing your fingers to the needles and/or knives.



### Scissors And Cutting Devices

Costume design and construction may require the use of various scissors and cutting devices, such as bent fabric shears, paper or craft scissors, embroidery scissors, pinking shears, power scissors, or rotary cutters. Here are a few reminders regarding the safe handling of scissors and rotary cutters:

- Always cut away from your body and hands.
- Keep your hands and fingers away from the cutting line.
- Always carry manual scissors with the point toward the floor and with your hand around the closed blades.
- Walk slowly when carrying scissors and be alert to your surroundings to avoid trips and falls.
- Hand off the scissors to someone else by holding the scissors by the closed blades in a loose grip and offering the handles (known as bows) to the person receiving the scissors.
- Remove power scissors from their power adapter prior to using them.
- Ensure the power cord is out of the cutting area.
- Only use rotary cutters that are equipped with a built-in blade guard.
- Follow the manufacturer’s instructions for changing the rotary cutter blades.
- Take dull scissors out of service and submit them for sharpening; remember only personnel trained to do so are permitted to sharpen scissors.
- Use scissors only for their intended purpose.
- Don’t run with scissors.

The improper use and handling of irons can result in personal injury and property-damaging fires whether you are using a domestic flat, steam iron or an industrial steam iron. Industrial steam irons may be gravity-feed or steam box varieties. Because industrial steam irons generate greater heat than the domestic steam iron, their use requires greater caution. In a gravity-feed steam iron, the steam is generated from a water supply tank suspended above the ironing box. In a steam box iron, the steam is under pressure, and the inadvertent release of the steam may result in painful steam burns.

Here are some tips to ensure the safe use of irons:

- Never use an industrial steam box iron until properly trained and given permission to do so.
- Never set a gravity-feed iron on its back (like a domestic iron); place it on its base plate or rubber heat-resistant pad.
- Never leave an iron turned on; turn it off when you are done using it.

- Unplug domestic and gravity feed irons after turning them off.
- Check to ensure all irons have been turned off and unplugged prior to leaving the area.
- Wear Teflon-coated gloves when handling hot steamed garments.

## Using Chemicals

Chemicals are often used to alter the appearance of materials used in costume design, such as dyes, stiffening chemicals, glues, and glue removers. The proper use, storage, and/or handling of chemicals can reduce the risk of injury and illness. Controls designed to reduce the risk of injury and illness include proper chemical use and storage; the proper use of personal protective equipment (PPE); and the use of engineering controls, such as ventilation systems and capture hoods.

Safety Data Sheets (SDS) and container labels provide information regarding the use, storage, and handling of chemicals. Know where to find the SDS for the chemicals you are using. Always read the label and directions regarding how to handle a chemical prior to using it. If you do not understand the information provided, ask someone to help you. Always return the chemical to the storage location specified.

Costume enhancement is often achieved through the aerosol application of a variety of chemically based products such as paint and special finishes. Inhalation of chemical vapors and dusts poses a health hazard, so applications that generate dusts and vapors should be conducted within a ventilation booth that captures these contaminants and exhausts them out of the building.

Be sure to wear the PPE assigned even when conducting chemical applications within a ventilation hood. PPE may include, but not be limited to, splash safety goggles, face shields, respiratory protection, chemically resistant gloves, aprons, coveralls, and dust masks. Use, store, and care for all PPE as instructed.

## WEARING COSTUMES



Performers may be exposed to injury and/or illness while wearing costumes. Trip/fall injuries may result from costume design, such as long trailing hems or over-sized shoes. Trip/fall hazards may also be posed by a costume that obstructs the performer's vision. Conduct an assessment in a low-hazard area to determine how the costume moves, how the performers handle the costume, and the performers' ability to see where they are going.

The risks of heat illness may be increased by costumes. Period costumes with corsets and multiple layers trap body heat close to the skin. Costumes that enclose the performer's head trap heat and humidity within the costume making it difficult for the body's cooling mechanisms to function properly. These conditions combined with the hot stage lights can increase the body's internal temperature. Monitoring performers for

signs of heat stress and training them to drink plenty of water and avoid caffeine and alcohol is a critical component of reducing the risk of heat-related illnesses caused by costumes.

Flaming costumes and those coated with flammable treatments increase the risk of fire when open flame is included as a stage prop (see the use of open flame). The use of flammable treatments and the use of open flame should be reviewed with your EH&S Office, Risk Management Office, and/or Risk Coordinator. The risks of costumes catching fire can be reduced through the use of flame resistant materials in the construction of costumes or treating costumes with flame retardant chemicals at the conclusion of construction.

## STORING COSTUMES

Costume storage practices can pose injury and property damage risks. Where and how the costumes are stored may damage fire suppression systems, obstruct exits, increase the fire load in the building, cause falling object hazards, result in falls to other elevations during the storing or retrieval process, or present material handling hazards.

Label the pipes of fire suppression systems with signs like “NEVER HANG ANYTHING FROM THIS PIPE.” Similar signs should be posted below fire suppression sprinkler heads that project horizontally from the wall, stating “NEVER HANG ANYTHING ON THE SPRINKLER HEADS.” All performers and crew should be trained in proper storage clearances from fire sprinkler systems. A minimum of eighteen (18) inch clearance should be maintained between sprinkler heads and any stored materials and a minimum of thirty-six (36) inch clearance and a clear path to all fire risers should be maintained.



Exit aisles should be kept free and clear of obstructions. Aisle widths will often depend on the depth of the storage shelves and the room needed to remove materials from them. Where rows of costumes are hung, maintain aisles that are at least twenty-eight (28) inches wide. Nothing should be stored on stairs or landings. All marked exits and paths to exits must be maintained in a clear condition to facilitate emergency egress.

Storage shelves should be equipped with some means of preventing items from falling off the shelves, such as a lip installed on the leading edge of the shelf. Stored items should not extend beyond the edge of the shelf. Heavy, awkward, and frequently accessed items should be stored on lower shelves.

Provide stepladders. The type of stepladder needed will depend on the layout of the storage area. If the area will accommodate it, use a mobile ladder stand. A mobile ladder stand is a movable, fixed height, self-supporting ladder that has wide flat treads in the form of steps and has a top step enclosed by guardrails. Ladders used should be either Type I or Type II industrial ladders. Ladders should be inspected routinely to ensure they are in good condition. Ladder training should be conducted at assignment and periodically to facilitate use compliance. Perform and document routine inspections to ensure storage rules are followed.

The use of mothballs and crystals that contain naphthalene is not recommended. Naphthalene is toxic to humans as well as insects. These chemicals are only effective when the larvae are exposed to high concentrations of the chemical, which can only be achieved when the clothing, draperies, furniture, or carpets are stored in air-tight containers. If the decision is made to use these chemicals, they must be handled in accordance with the manufacturer's instructions. In addition, clothing exposed to these chemicals must be cleaned before they are worn. Draperies and carpets exposed to the chemicals must be aired out in well-ventilated areas until the chemical odor is no longer noticeable.

The best means of controlling pests is good housekeeping. Storage shelves and the floors in storage areas should be cleaned prior to storing the materials and then routinely cleaned thereafter. Carpets and furniture should be routinely vacuumed, and draperies routinely brushed.

# Section 8: Drones

Unmanned Aircraft Systems (UAS), more commonly referred to as drones, can be a fun activity and provide a special element to a performing arts event. However, they can become a significant risk when not used properly.

## THE FAA AND OUTDOOR USE



The Federal Aviation Administration (FAA) regulates the use of drones outside. FAA guidelines and rules are ever evolving. For the most current information on how to use your drone lawfully and safely, please visit the FAA's website. Coverage from the Utah Division of Risk Management is dependent upon following the FAA requirements. Your entity or governing body may also have specific guidelines and rules. At a minimum:

- Follow all FAA rules.
- Obtain proper pilot training.
- Know your drone. Know its capabilities and how to operate it.
- Keep the drone in sight at all times.
- Don't fly over crowds or groups.
- Stay away from powerlines, buildings, lights, signs, vehicles, etc.
- Keep your drone away from aircraft, airports, and emergency response efforts (there are specific laws regarding the use of drones in and around these locations and situations).
- Don't violate anyone's privacy. Use cameras and other appurtenances appropriately.
- Be aware of your surroundings.
- Have a plan for addressing problems, such as unexpected crashes or power losses.
- Manage power levels. Never risk a crash.

## INDOOR USE

**K-12 Performing Arts Indoor Drone Use is Highly Discouraged**

The FAA does not regulate indoor use of drones. Therefore, it is critical to have in place prudent safety guidelines. Indoor use of drones for Higher Ed performing arts should consider:

- Use drones specifically designed for indoor, performing arts use.
- Program flight patterns. Practice! Account for the flow of air in your venue.
- Avoid flying over the audience.
- Stay above the stage while maintaining clearance between performers and stage equipment.
- Manage power levels. Never risk a crash.

## **INSPECTION, MAINTENANCE AND STORAGE**

Designate a lead employee of responsible charge for compliance to federal, state, and entity rules. Complete regular inspections including before and after flights. Proper inspections, maintenance and storage will significantly reduce malfunctions. Document maintenance. Document all other pertinent information such as pilot licenses, pilot training, crashes, injuries, etc.

# Section 9: Electrical Safety



Electrical hazards can be found throughout performing arts operations and include, but are not limited to, exposed wiring, improperly spliced wires, improperly installed temporary power distribution, improperly grounded wiring, use of damaged electrical cords, and the use of inappropriate size and type of extension cord.

Common examples of misused equipment and practices that are not allowed:

- Homemade ungrounded multi-receptacle boxes.
- Fabricating extension cords with ROMEX® wire.
- Using equipment outdoors that is labeled for use only in dry, indoor locations.
- Attaching ungrounded, two-prong plug adapter or extension cords to three prong cords and tools.
- Using circuit breakers or fuses with the wrong rating for over-current protection (e.g., using a 30-amp breaker in a system with 15- or 20-amp receptacles). Protection is lost because it will not trip when the system's load has been exceeded.
- Using modified cords or tools (e.g., removing ground prongs, face plates, insulation, etc.).
- Using cords or tools with worn insulation or exposed wires.
- Using electrical junction boxes with knockouts that are not attached to a wall.

## ELECTRICAL SAFETY MEASURES

- Conduct routine documented inspections and correct electrical hazards immediately.
- Permit only qualified, trained personnel to correct electrical equipment.
- Stop the work and correct the conditions when:
  - a. circuit breakers are tripped and/or fuses are blown;
  - b. an electrical tool, appliance, wire, or connection feels warm;
  - c. a burning odor is noticed; or
  - d. a tingling sensation or minor shock is felt when contacting the tool, cord, or piece of equipment.
- Maintain at least thirty-six (36) inches of clearance in front of and to the sides of all breaker panels.
- Ensure all wiring is appropriately secured to the set using plastic coated electrical fasteners that are designed to protect the wiring from damage. Metal staples should not be used.
- Never drape electrical wiring over doorways or openings.
- Provide strain relief equipment for all electrical cables.
- Use GFCIs and/or cords with built in surge protection features. All protection devices should be tested on a regular basis.
- Use grounded (three-prong plug) or double insulated power cords. Home-type extension cords should not be used.
- Use extension cords only when necessary.
- Never use an extension cord in place of permanent wiring.

- Ensure extension cords are in good condition and the right type for the job and/or work environment.
- Never connect multiple extension cords and surge protection devices together (daisy chaining).
- Protect all temporary cables/extension cords subject to vehicular or excessive pedestrian traffic.
- Never wrap an electrical cable or power cord around pipes, fire system piping or raceways.

## **LIGHTING**

- Check lighting equipment regularly for worn areas and exposed wires.
- Vacuum dust from mechanically interlocking auto-transformer dimmer boards on a regular basis.
- Ensure overhead lighting equipment is attached and all component parts are properly tied with the proper cable.
- Never allow cables to come into contact with any lighting instrument; properly attach cables to battens.
- Only use clip lights and extension cords for temporary lighting needs. The clips lights and extension cords must be removed before you leave the task or at the end of the work shift.
- Ensure live components are not exposed on lighting fixtures, lamp holders, lamps, or receptacles.

## **MOTORIZED EQUIPMENT**

- Provide precautionary signage in those areas where electrical equipment is being used and where there are high-energy sources.
- Check all motorized equipment on a regular basis to ensure its proper operation.
- Apply lockout/tagout and block out controls for equipment that may involve unexpected energization or start up (or release of stored energy) during cleaning, repairing, servicing, setting-up, adjusting, or un-jamming.

## **AUDIO**

- Check for proper grounding of audio equipment to eliminate a ground loop that can potentially damage the equipment and also result in electrical shock.
- Connect all devices to the same ground at the same point.
- Never overload amplifiers.
- Never connect audio equipment to the same circuit as lighting equipment.

# Section 10: Emergency Action and Response



Each facility should have an Emergency Response Plan. Contact your Campus Emergency Management or Risk Management Personnel for more information and training on your location specific plan.

For the protection of students, employees, visiting performers, and patrons, more detailed, venue specific emergency response plans may need to be developed. In most cases, each venue will have a pre-show recorded or standard announcement with

details about the emergency exits. This is a good opportunity to communicate key venue specific emergency response information to the audience. Stage management and front-of-house personnel will have a variety of emergency response duties that will require specialized training; however, certain aspects of emergency response apply to everyone and are included in this section.

## **PRIOR TO AN EMERGENCY**

- Find and review the emergency evacuation map for the area in which work is being performed. Supervisors should review the appropriate emergency information prior to the start of operations.
- Know the primary and secondary emergency evacuation routes.
- Know the assembly location to which you are to report in the event of emergency evacuation.
- Know where to report and internal procedures for shelter-in-place emergencies.
- Keep exit pathways free of obstructions.
- Keep exit doors clear of obstructions on both sides of the doors.
- Know the appropriate procedures for reporting emergencies.
- Know how to report damaged or used fire extinguishers, exit signs that are not properly illuminated and emergency lighting that may need repair.
- Know your duties and responsibilities for each type of emergency to which you are expected to respond.
- Know where the first aid kits and automated external defibrillator (AEDs) are located.
- Establish a system for inspecting and stocking the first aid kits.
- Participate in emergency response training and practice drills.

## **FIRE EMERGENCIES**

- Activate the fire alarm.
- Evacuate the building. Only fire department and/or trained fire brigade personnel are required to fight fires.

- Never attempt to use a fire extinguisher unless you have received appropriate training and the fire is no larger than a small garbage can.
- Close doors after you exit a room.
- Assign trained personnel to activate the “Curtain Release” to drop the fire curtain.
- Go immediately to the assigned assembly area.
- Wait at the assembly area until further directions are given.
- Never re-enter the building until permitted to do so by fire department personnel.

After each fire incident is controlled, investigate the incident to determine the causes of the incident and the results of the response actions, and take corrective action to prevent a recurrence of the incident and improve incident responses.

## **EMERGENCIES REQUIRING EVACUATION**

Some aspects of evacuation planning will apply to all venues, such as:

1. Evacuation Duties: Front-of-house personnel (adult volunteers and employees) are responsible for assisting patrons in safely evacuating the venue. Stage management personnel are responsible for assisting performers and crew in safely evacuating the venue. Instructors are responsible for evacuating K-12 students.
2. Evacuation Announcement Procedures: Define how the patrons, performers, and crew will be informed of the need to evacuate and specify who is responsible for making the announcement when it is necessary.

Other aspects of evacuation planning will be specific to the venue, such as:

1. Exit Routes: Ensure site personnel and those assisting patrons to evacuate have knowledge of the primary and secondary exit routes from all areas of the venue. Inform them the location of hazardous materials storage areas and that they should evacuate away from these areas. Remember, never store hazardous materials in or near an exit or exit pathway. Inform them of the accessible evacuation routes and the areas of refuge where evacuees unable to exit can shelter in place until assistance can arrive.
2. Assembly Areas and Sites: Ensure site personnel and those assisting patrons to evacuate know where to assemble after leaving the building. Ensure the location for each assembly area or site is out of the anticipated path of emergency responders and away from the venue or other structures or conditions that may present a hazard as a result of the event that generated the need to evacuate. As an example, another building would not be an acceptable assembly site in cases of earthquake.
3. Visible Evacuation Maps: Ensure evacuation maps are posted and kept visible at all times. All escape maps must have directional reality, and a “You are Here” legend.

## **SHELTER-IN-PLACE EMERGENCIES**

Some emergency situations, such as severe weather events, power outages, or active shooter situations, may require performers, crew, and patrons to shelter in place. Determine how the facilities will be secured and where personnel and patrons will be gathered to shelter them from

hazards, such as shattering glass. Ensure items such as water and restroom facilities can be safely accessed within or from the sheltering place.

## **CHEMICAL SPILL EMERGENCIES**

All personnel who work with hazardous chemicals or work in an area where hazardous chemicals are used or stored need to be informed of what steps to take in case of a chemical spill. Not all chemical spills require a call-out of the Hazmat team. Contact your EH&S Office, Risk Management Office, and/or Risk Coordinator to determine the specific steps to take for chemical spills on your campus. Work with them to determine if performing arts personnel can be trained and authorized to clean up some small spills. Ensure spill containment materials are properly maintained within the shops and areas where hazardous chemicals are used and/or stored.



## **CHEMICAL EXPOSURE EMERGENCIES**

Chemical exposure may occur through contact with skin or eyes, inhalation, or ingestion. Each type of exposure requires a different response. After the exposure incident is under control, investigate the accident to determine the cause, and take corrective action to prevent a recurrence.

### **Contact with Eyes**

- Immediately flush the eyes using the emergency eyewash station.
- Never wait to remove contact lenses.
- Keep your eyes in contact with the water for at least fifteen (15) minutes.
- Seek immediate medical attention.
- Provide a copy of the chemical's Safety Data Sheet (SDS) to medical personnel.

### **Contact with Skin**

- Immediately rinse your skin in running water.
- Remove jewelry and contaminated clothing while you are rinsing.
- Seek medical attention for chemical burns.
- Provide a copy of the chemical's SDS to medical personnel.

## Inhalation

- Immediately leave the room and seek fresh air.
- Immediately remove anyone overcome by vapors to fresh air.
- Leave the door open as you exit to ventilate the room.
- Provide first aid to persons overcome and call 9-1-1 for medical assistance if the person has lost consciousness.
- Seek medical attention if symptoms do not subside.
- Provide a copy of the chemical's SDS to medical personnel.

## Ingestion

- Reduce the risk of ingestion by refraining from eating, drinking, preparing, or serving food or beverages in areas where chemicals are used or stored.
- Seek medical attention for ingestion incidents.
- Provide a copy of the chemical's SDS to medical personnel.



## POWER OUTAGE EMERGENCIES

Trip and fall incidents generally increase during power outages. In facilities equipped with backup generators, the lights are usually back on within minutes. Know who to call if that does not occur. For those facilities that are not equipped with a backup generator or if the generator does not function properly:

- Stay put if there is no imminent danger.
- Wait for direction from front-of-house or stage management personnel.
- Call Facilities Services to report the outage.
- Proceed with care to an area lit with emergency lighting if the emergency generator does not activate after five (5) minutes.
- Use your cell phone as a light source if you do not have access to a flashlight.

- Turn off all computers, equipment, appliances, and lights to reduce the risk of damage from a power surge when the power is restored.

## **TRAINING**

Conduct documented emergency response training for all new crew members, performers (including visiting performers), students, and front-of-house personnel, including volunteers and temporary employees. Ensure all personnel understand their responsibilities and duties in each type of anticipated emergency. Provide front-of-house and backstage employees and volunteers with first aid, CPR, and AED training in addition to the other emergency response duties. Conduct training at least annually for all permanent personnel. Conduct training whenever the procedures change.

## **PRACTICE DRILLS**

Conduct documented emergency drills. These can be conducted in various scales from tabletop to campus-wide events. Invite students to be the audience and practice evacuations during dress rehearsals. Track and record the time it takes to evacuate the building or respond to an emergency. Conduct reviews of drills to identify what improvements are needed.

## **EVERYDAY PREPARATION**

Being prepared to respond to emergency situations takes preparation and daily vigilance to ensure basic fire and life safety is maintained. As you go about your everyday activities and especially during times of chaotic activity:

- Ensure fire exits, aisles, and exit pathways are clear and accessible.
- Ensure exit doors are clear of obstructions on both sides of the door.
- Report to the Physical Plant Department any exit signs or emergency lights that are not functioning.
- Ensure fire extinguishers are properly hung and inspected, the seal is intact, and the indicator gauges are in the green zone. Immediately report any fire extinguishers that do not meet these criteria.
- Ensure all fire-fighting equipment is clear of obstructions and accessible; this equipment includes fire extinguishers, fire hose stations, fire pull stations, fire suppression sprinkler heads, and fire sprinkler risers.
- Ensure flammable and combustible materials are properly stored and protected from ignition sources.
- Ensure compressed gases are secured to prevent them from falling or being knocked over.
- Ensure electrical panels are clear of obstructions and accessible.
- Ensure the doors of electrical panels are closed.
- Ensure extension cords are not used in place of permanent wiring.
- Take immediate action to correct any non-compliant conditions.

# Section 11: Ergonomics

Many people assume ergonomics only applies to using a computer or how you lift and move materials. Ergonomic risk factors are present in everything we do at work and at home. It is important to understand these factors, identify them in the tasks we perform, and take steps to change how we work to reduce or eliminate them.

## KNOW AND RECOGNIZE THE ERGONOMIC RISK FACTORS

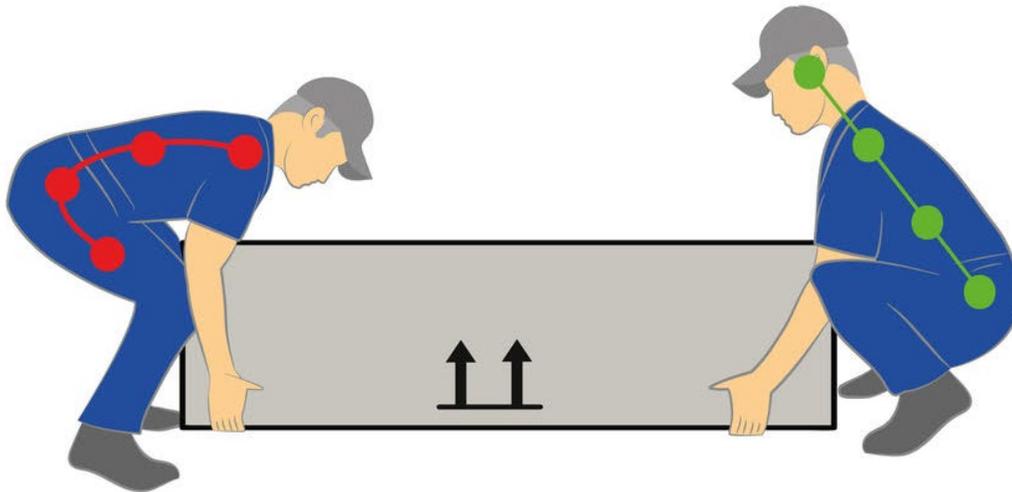
Job activities involving any of the ergonomic risk factors below, either alone or especially in combination, contribute to an increased risk of injury.

1. Awkward Postures: These are non-neutral positions that put our bodies at a mechanical disadvantage while we work.
2. Repetitive Motion: This is when same or similar movement is performed frequently.
3. Static Postures: Maintaining the same posture for extended periods of time can cause harm to our bodies.
4. Forceful Exertion: Using a high level of physical effort to perform a task can be problematic if the body is not prepared for the exertion.
5. Static Exertion: This is when a person holds the same posture for extended periods while applying force.
6. Compression or Contact Stress: This is pressure between hard or sharp objects and the soft tissues of the body.
7. Lighting: Inadequate lighting or significant glare contributes to eye strain.
8. Noise: High noise levels, based on decibel level and duration, can result in hearing damage.
9. Vibration: Overexposure to vibration from tools or equipment increases risk of injury.
10. Cold Temperatures: Decreases the flexibility of our muscles as well as our touch sensitivity as we work.

## AVOIDING ERGONOMIC RISK FACTORS

- Maintain comfortable, neutral body postures during daily activities.
- Reduce the frequency of performing the same motions by alternating between tasks that require different muscles. Take short breaks every one to two (1-2) hours to reduce muscle fatigue.
- Take breaks and/or routinely change your posture.
- Use the right tools for the job. Tools designed to help you maintain neutral body postures by reducing reaching and awkward wrist or arm positions are most favorable. Avoid forceful pinching or gripping. Use tools with comfortable handles and controls.
- Arrange your workstation/area to reduce or eliminate awkward postures such as over-reaching, bending, or twisting.
- Store only light-weight items above shoulder height. Use a step stool or stepladder to reach items at or above shoulder height.
- Store items that are awkward to lift on shelves that are positioned at waist height.

- Wear the appropriate personal protective equipment, such as hearing protection devices and vibration absorbing gloves, when indicated.
- Reduce contact stress by rounding or padding any square edges of work surfaces where your body is in continuous and/or repeated contact with the edge.
- Use material handling devices such as carts, hand trucks, and dollies to reduce muscle fatigue.
- Lift safely. Personnel should be trained to lift properly.



incorrect  
up

correct  
up

# Section 12: Eyewash Stations

Many performing arts facilities have eyewash stations installed in the shop area since this is where activities may create the potential for eye injuries. Evaluate areas where painting, spraying or scenery construction occurs to determine the need and placement of plumbed eyewash facilities.



Evaluate the Following to Determine the Need for an Eyewash Station:

- Are chemicals (corrosives, irritants, etc.) used that require eyes to be flushed if the individual is splashed in the eyes? Consult Safety Data Sheets (SDS).
- Consider how accessible eyewash stations are to the area in which chemicals are being used.
- Emergency eyewash facilities must be in accessible locations that require no more than ten (10) seconds for an injured person to reach.
- Is the use of face shields, goggles, or safety glasses required for the work performed? If this equipment is required to work with the chemical, then an eyewash station is most likely required.
- Never use water hoses or sink faucets in place of an emergency eyewash device.

## EQUIPMENT OPERATION IN AN EMERGENCY

- Move quickly to the nearest eyewash station.
- Lean over the eyewash station.
- Push the lever to activate the eyewash.
- Hold eyelids open and direct the flow of water into the eyes.
- Continue flushing the eyes for a minimum of fifteen (15) minutes (to keep the eyes from burning).
- Keep the eyes open and rotate the eyeballs in all directions to remove contamination from around the eyes. An injured person may require help holding their eyelids open.
- Seek immediate medical help after flushing the eyes.

## EQUIPMENT MAINTENANCE

- Maintain a clear path to and around the emergency eyewash station.
- Activate eyewash stations at least weekly to flush the line and to verify proper operation.
- Verify inspection activities and line flushing is being completed by maintenance personnel. Document these activities.
- Ensure eyewash spout caps are kept covered to keep them clean. Ensure caps are easy to remove for an emergency.

## ADDITIONAL TIPS

- Keep energized electrical equipment away from eyewashes.

- Never use eyewashes for non-emergency purposes such as cleaning shop equipment or personal objects.
- Never store things on or around eyewash stations.
- Never delay the use of the emergency eyewash station. The first few seconds after exposure to a hazardous chemical (especially a corrosive chemical) are critical. Delaying treatment, even for a few seconds, may result in irreparable eye damage.
- Never hesitate to use safety equipment.

# Section 13: Fall Protection

**K-12 Students Are Prohibited from Entering Any Location at Any Time Where the Use of a Fall-Protection System, Such as a Full Body Harness and Lanyard, Is Required**

## GENERAL SET CONSTRUCTION

Set construction involves exposure to fall hazards. Fall hazards are present when working on ladders, around paint frames, on catwalks, outside of catwalks, in elevated storage areas, and on unprotected elevated work platforms such as the open edge of the stage.



Fall protection systems must be provided to protect cast and crew from fall hazards where the fall risk is forty-eight (48) inches or more. There may also be special situations or conditions where fall protection is warranted or recommended at heights below four (4) feet.

The temporary nature of set construction presents unique challenges. When it is impractical to use conventional fall protection systems or the fall protection system presents a greater hazard, special steps must be taken to protect cast and crew from falls. The special steps start with the creation of a Fall Protection Plan that is developed specifically for the site where the set construction is being performed.

The plan must:

- Be kept up to date.
- Be kept on site.
- Specify the steps to be taken to reduce or eliminate fall hazards for workers who cannot be protected using conventional fall protection systems.
- Identify each location where conventional fall protection methods cannot be used.
- Include a safety monitoring system.
- Name the protection methods to be used for each job title.
- Specify the fall incident investigation process.

## FIXED LADDER

A fixed ladder is permanently attached to a structure, building or piece of equipment. Fixed ladders are used throughout performing arts facilities to access elevated areas such as fly lofts, tension grids and bridges/catwalks.

## General Guidelines

- Participate in ladder and fall protection training prior to ascending fixed ladders.
- Never use unprotected fixed ladders over twenty (20) feet in length.
- Remove all loose items from your pockets.
- Maintain three points of contact with the ladder when climbing; two hands and one foot or one hand and both feet.

A ladder safety system must be used when using a fixed ladder. A ladder safety system is required for ladders that:

- Exceed twenty (20) feet in length and are not equipped with a cage and do not have rest balconies every twenty (20) feet or fraction thereof.
- Side rails of a fixed ladder must extend at least three (3) feet above the upper landing.
- Ladders that extend through a roof hatch or floor opening must have rails that extend above the roof hatch to allow for a handhold above the hatch or opening.

## Ladder Safety System Fall Arrest Guidelines

- Only use full-body harnesses that are equipped with front or hip D-ring attachments.
- Inspect all fall protection equipment prior to each use. Immediately report any damaged equipment to your supervisor or instructor. Never use defective fall protection equipment.
- Attach or tie-off any tools or equipment, including hard hats, when transporting items up or down the ladder.
- Attach the front or hip D-ring to the carrier connection prior to ascending or descending the ladder.
- Ensure the connections are compatible and secure, and the snap hook is closed and locked.
- Disconnect from the ladder safety device to exit the ladder only after you are stable.
- Never detach from the ladder safety system during an ascent or descent of the ladder. Allow the carrier connection to lead you down. Climbing down out of position will cause the carrier connection mechanism to lock onto the carrier.
- Move upward slightly to release the carrier connection should it lock.
- Never use the ladder climbing body harness for attachment to fly, tension, and other types of fall protection systems that require body harness D-ring attachment at the back of the harness. Change body harnesses prior to attaching to another type of fall protection system.

## CATWALK SAFETY

Catwalks are walkways that provide access to technical and service areas located above the stage or auditorium. They may also provide a bridge linking fly-floors. These elevated work surfaces pose fall hazards. Falls from the catwalks can result in serious debilitating injuries or even death.



### Catwalk Requirements

- Secure rigid guardrails capable of supporting a live load of twenty (20) pounds per linear foot applied either horizontally or vertically downward at the top rail.
- The top rail should have a height of forty-two (42) inches to forty-five (45) inches from the upper surface catwalk flooring and the mid-rail should be approximately halfway between the top rail and the catwalk floor.
- The vertical support posts must have a one and a half (1.5) inch outside diameter or larger, and the spacing must be eight (8) feet or less.
- The catwalk should include toe boards to prevent items being kicked over the side.

### Guidelines



K-12 students may use catwalks under the supervision of their teachers if the catwalks are accessible by stairs or guarded ladders, have complete full decking, proper handrails (including mid-rail), and toe boards. K-12 students are prohibited from entering incomplete catwalks or entering any location at any time where the use of a fall-protection system, such as a full body harness and lanyard, is required. K-12 students should never reach beyond the guardrails or climb outside of the catwalk in any way.

In higher education entities, students and staff should be properly trained before accessing any location where fall-protection systems are required. Students and staff shall not reach beyond the guardrails or climb outside of the catwalk unless they use a proper fall-protection system and adequate training. NOTE: higher ed students or staff who are minors have all the same restrictions as K-12 students. Other guidelines include:

- Only trained and authorized personnel may access and work on or from the catwalks.

- Complete fall protection training prior to accessing the catwalks.
- Remove all loose items from your pockets prior to ascending to the catwalk.
- Tie-off or otherwise attach all tools to your person prior to ascending to the catwalk.
- Wear hardhats when the catwalk is known to have low head clearance areas. The hard hat should be secured once you reach the catwalk to prevent dropping it as you work.
- Use a fall protection system when the work requires you to lean over or through the catwalk guardrails to access the equipment on which you are working.
  - a. Inspect all components of the fall protection system prior to each use.
  - b. Wear a full body harness that has the D-ring attachment at the back.
  - c. Ensure the lanyard is attached to an anchoring point that is capable of supporting five thousand (5,000) pounds.
  - d. Choose an anchor point that is close to and behind you.
  - e. Ensure all connections are secure, and the connections closed and locked.
  - f. Never allow the lanyard to cross the front of your body or wrap around your arm or leg.
- Ensure personnel have been removed from the area beneath you prior to adjusting equipment that extends over the catwalk guardrails.
- Never use wooden planks, bars, ladders, or other devices to increase your height above the floor of the catwalk.
- Never use wooden planks to create ‘catwalks’ across open spaces.
- Never leave loose tools or materials on the catwalk.
- Never stack counterweights above the level of the toe boards.
- Ensure adequate lighting is available on the catwalk; use a flashlight attached to your hard hat if necessary.
- Never participate in horseplay on the catwalks; never throw items from the catwalks to the surfaces below.
- Never remove the catwalk rails unless secured with appropriate fall protection equipment that is properly installed.
- Always replace catwalk rails after removal to load items onto the catwalk.
- Conduct routine inspections and immediately report any unsafe conditions to your superior.

## **OUTSIDE THE CATWALK**

Some activities, such as hanging and focusing lighting instruments or audio equipment, require working on installations located outside the guardrails of catwalks, tension grids, or work platforms. K-12 students are never to be allowed to work outside of a catwalk with proper guardrails installed.

Working outside the guardrails, even if your entire body is not beyond the railing (leaning over, reaching through), greatly increases the risk of a fall. Falls from the catwalks and elevated areas can result in serious debilitating injuries or death. If there is a risk of falling or overreaching the guardrails, fall protection is required to mitigate risk.

### **Guidelines**

- Participate in and successfully complete fall protection training prior to working on, from, or beyond the guardrails of catwalks, tension grids and elevated work areas.

- Only trained and authorized personnel using an appropriate fall protection system may work outside the guardrails of catwalks, tension grids, and elevated work areas.
- Remove all loose items from your pockets prior to ascending to the elevated areas.
- Tie-off or otherwise attach all tools to your person.
- Use a fall protection system when working in these areas.
- Inspect all components of the fall protection system prior to each use.
- Wear a full body harness that has the D-ring attachment at the back.
- Ensure the lanyard and attachment point has a breaking strength of five-thousand (5,000) pounds.
- Select a self-retracting lanyard whenever possible.
- Never use any means to extend the length of the lanyard. Ensure the lanyard permits a maximum free fall distance of no more than six (6) feet.
- Never use a guardrail as an anchorage point.
- Choose an anchor point that is close to and behind you.
- Ensure all connections are secure and the connections are closed and locked.
- Practice using the attached SRL in these areas to ensure you are familiar with the tension and locking actions of the system.
- Never allow the lanyard to cross the front of your body or wrap around your arm or leg.
- Maintain your balance by avoiding quick or sudden movements in any direction that might cause line tension or locking.
- Move back behind the guardrails and onto the catwalk, tension grid, or elevated work area prior to removing the lanyard and repositioning it to another anchor point or at the completion of a work activity.

Ensure personnel have been removed from the area beneath you.



## **CONTROLLED ACCESS**

Fall hazards are present for crew and performers when they work around the open edge, elevated platforms, and other unprotected elevated surfaces. There are times when the use of a conventional fall protection system will not work in these areas.

As an example, the open edge of the stage is often treated as a controlled access area during construction-like activities including set construction, when the orchestra pit is lowered for equipment and material load in / load out tasks and during set deconstruction/strikes. When a fall hazard exists and conventional fall protection will not work, the area is deemed a controlled access area. A controlled access area requires the development of a Fall Protection Plan and monitoring of the area by a competent safety monitor skilled in fall hazard recognition.

### Controlled Access Requirements

- Develop a written Fall Protection Plan for each area that will require controlled access. The fall protection plan must outline the safety requirements and name the competent Safety Monitor.
- Designate the controlled access area with one or more control lines or by other means that restrict access.
- Train personnel in the requirements of the Fall Protection Plan and controlled access prior to allowing work in or around the area.
- Post signs to warn unauthorized personnel to stay out of the controlled access zone.
- Install the access control lines not less than six (6) feet nor more than twenty-five (25) feet from the unprotected or leading edge.
- Run the access control line parallel to the entire length of the unprotected or leading edge.
- Securely anchor both ends of each access control line to a standard railing or wall.
- Attach highly visible flags, or other material, to the access control lines at six (6) foot intervals or less.
- Support each access control line to ensure at its lowest point (including sag) it is not less than thirty-nine (39) inches nor forty-five (45) inches higher from the working level.
- Ensure the access control lines and supporting stanchions are strong enough to sustain the stress of not less than two hundred (200) pounds.
- Assign a safety monitor who is skilled in fall hazard recognition to monitor the work within or near the controlled access area.
- Ensure the safety monitor is present whenever personnel are working within or near the controlled access area.
- Ensure the safety monitor has no other duties than monitoring personnel in and around the controlled access area.
- Instruct all personnel to comply with all hazard warnings from the safety monitor.

### Duties of the Safety Monitor

A safety monitor may be a staff member, college student, or mature K-12 student. Duties include:

- Monitor the work area for safety concerns.
- Warn individuals who appear to be unaware of a fall hazard or are acting in an unsafe manner.
- Stay within visual sighting distance of personnel being monitored.
- Maintain communication with the personnel being monitored.

- Never engage in behaviors that take your attention away from the monitoring task – refrain from unnecessary conversations – never use your mobile phone while on monitoring duty – never engage in other duties.
- Restrict access to the area being monitored to personnel trained in the hazards outlined in the Fall Protection Plan.
- Remove personnel from the area if they fail to comply with warnings, or report those to the proper person with authority.

## PAINT FRAMES

Paint frames move through large floor openings from one level of the scene shop to another. The floor opening allows the paint frames to move vertically giving access to all areas of large backdrops and scenery pieces.



The ability to move the canvas up and down reduces the risk of falls by reducing the need to use ladders to access the upper reaches of the canvas. However, the floor opening in the floor through which the paint frame moves poses trip and fall hazards that could result in serious debilitating injuries or death.

There are regulatory definitions that may apply to the opening for a paint frame system. A “floor hole” is defined as any opening measuring twelve (12) inches or less in the least horizontal direction through which materials but not persons may fall. A “floor opening” is defined as an opening measuring twelve (12) inches or more in its least dimension through which persons may fall. In both cases, floor holes and floor openings require either guardrails or covers to be in place to prevent tools or materials from falling into them and to prevent injuries to individuals working near the openings. In cases where guardrails or covers are removed and a fall risk is present, a fall protection system (harness, lanyard, anchor point, etc.) must be used to mitigate this risk.

### Safe Use Guidelines

- Participate in fall protection training prior to working on or around the paint frame.
- Keep the guardrails located in front of the paint frame floor hole in place at all times.

- Never store items against the wall located behind the paint frame floor hole.
- Keep the paint frame lowered to its lowest position when it is not in use.
- Keep the covers/guards in place over the paint frame floor hole, where floor opening covers/guards are available, when the paint frame is not being used.
- Wear approved fall protection when the guardrails are removed, and the paint frame floor hole is exposed without the use of appropriate weight bearing covers/guards.
- Require personnel working on the lower paint frame level(s) to wear hard hats when others are working on the floor above.
- Never climb on the guardrails to gain access to a higher point on the canvas.
- Never use a ladder on the upper paint frame level to gain access to a higher point on the canvas.
- Never store items against the guardrails as they may fall through the floor opening and injure personnel on the lower level.
- Check with Safety/Risk personnel to determine if the lower level of the paint frame is a confined space and what steps, if any, must be followed to enter this level.

## **PORTABLE LADDERS**

Portable ladders come in many shapes and forms. Portable ladder types include standard stepladders, two-way stepladders, platform stepladders, orchard ladders, trestle ladders, extension trestle ladders, extension ladders, articulating ladders, rolling steel ladders, and telescoping ladders.

Improper use of ladders can result in serious injuries. However, following basic safety rules can greatly reduce the risk of fall incidents.

### **Maintenance/Condition**

- Inspect any ladder prior to use. Check for loose steps and rungs, cracked or split steps or side rails, loose or bent hinges, and missing ladder feet.
- Never use a defective ladder. Mark the defective ladder as “DEFECTIVE” and remove it from service. Advise your instructor/supervisor of the ladder’s condition.
- Only complete ladder repairs as directed and specified by the manufacturer. Never make unauthorized repairs.
- Check to ensure the OSHA required ladder information labels are in place.
- Make sure the ladder is free of oil, grease, or other hazards.
- Use only fiberglass or wood ladders when doing electrical work.

### **General Safe Use of Portable Ladders**

- Check the ladder label to ensure it is rated to support the combined weight of your body and tools/materials.
- Make sure stepladders are securely spread open.
- Never use a folding ladder in an unfolded position.
- Use ladders on stable and level surfaces only. Articulating ladders are the only exception as they are designed for use on multiple levels.

- Ensure ladders are stable prior to climbing it.
- Always face the ladder when ascending or descending and use three points of contact at all times (two hands, one foot/one hand, two feet).
- Never stand on the top two steps of the ladder.
- Never reach too far above or to the side of a ladder, as this may cause you to lose your balance.
- Move the ladder as needed to reach the desired work area.
- Never carry in your hands while climbing a ladder. Use a hand line, lift, or hoist to raise and lower heavy and/or awkward loads. Secure materials carefully.
- Never stand, walk, or work under a ladder while it is in use.
- Store ladders away from doorways, exits, traps, and edges of the apron or orchestra pit.
- Secure stored ladders with ropes or chains to prevent them from falling.

#### Safe Use of Extension Ladders

- Position extension ladders so the base to height ratio is 1:4, or 75 degrees. For example, the base of a 12-foot extension ladder should be three (3) feet away from the wall.
- Ensure straight and extension ladders extend at least three (3) feet beyond the landing surface.
- Secure extension ladders at both the top and the base to prevent the ladders from moving from the points of rest. If this is not possible, have someone stand at the base of the ladder and secure it against slipping.

#### Safe Use of Trestle and Articulating Ladders

- Assemble and use a trestle and/or extension trestle ladder in compliance with the manufacturer’s user guide.
- Don’t modify ladders.
- Ensure the extension section of an extension trestle ladder never exceeds the base section length.
- Step down and off of “A” frame trestle ladders prior to moving them. Never ride the ladder.
- Position and secure the ladder in compliance with the manufacturer’s instructions, especially if it is equipped with manufacturer wheels.
- Ensure the ladder is stable prior to mounting it.



#### **SCAFFOLDS/ELEVATED WORK PLATFORMS**

Scaffolds and elevated work platforms are used in the performing arts for a variety of reasons. OSHA defines scaffolds as, “any temporary elevated platform (supported or suspended) and its supporting structure (including points of anchorage), used for supporting employees or materials or both” (Occupational Safety and Health Administration [OSHA], 2010). All crew members must receive formal, documented training regarding how to assemble and work safely on scaffolding, and performers must receive formal, documented training regarding working safely on scaffolds.

## General Guidelines

- Complete scaffold user safety training before working on a Performing Arts project that includes the use of a scaffold. A trained person with knowledge, prior experience, and the recognized ability to train users in scaffold assembly and use may provide scaffold user safety training.
- Inspect all scaffolding parts before and after use.
- Ensure the entire width of the scaffold platform is equipped with planking.
- Ensure the planking is scaffold-grade or better wood when using wooden planking.
- Immediately report any missing, broken, or defective scaffolding parts.
- Use scaffolds only when they are constructed with the proper guardrails, mid-rails, and toe boards (as appropriate).
- Ensure toe boards are installed when work levels are six (6) feet or higher above the ground floor and where persons are required to work or pass under the scaffold.
- Ensure screens or other barriers are installed between the toe boards and upper guardrail if personnel will be passing under or near the scaffold.
- Tie the scaffolding to a permanent structural support using heavy wire or tie-in devices.
- Lock the wheels on rolling towers to prevent movement except when the tower is moved to a new location.
- Keep scaffold loads within safe limits. Follow the manufacturer's or construction coordinators safe working load recommendations. Ask if you don't know the rated capacity.
- Never use scaffolds where contact could be made with live electrical circuits or power lines. Always maintain safe clearance from any electrical source.
- Immediately report any potentially hazardous conditions that become evident during operation.

## Safe Use Guidelines

- Use a personal fall arrest system when working from boatswains' chair, catenary, float, needle beam, ladder, or pump jack types of scaffolding.
- Wear a hard hat equipped with a chin strap when working on a scaffold.
- Tie off your personal fall protection system to a permanent structure. Never tie-off to the scaffold.
- Never climb cross braces. Use only approved access ladders or steps to climb the scaffolding.
- Use both hands while climbing, and always maintain three points of contact.
- Never exceed the maximum allowable persons in the platform.
- Never stand on the scaffold guardrails.
- Never place ladders or makeshift devices on top of scaffolds to gain greater height.
- Never ride a moving scaffold.
- Never jump down onto the platform.

## TENSION GRID

The tension grid is a modular wire grid system that provides access to theatrical lighting, audio cables, loudspeakers, and stage rigging. Any edge of the grid that is not attached directly to a wall must be equipped with guardrails.



Guardrails must have a top rail that ranges between forty-two (42) inches and forty-five (45) inches above the grid floor and a mid-rail approximately halfway between the top rail and the grid floor. The guardrails must be designed for a live load of twenty (20) pounds per linear foot applied either horizontally or vertically downward at the top rail. The guardrails must also be equipped with toe boards that extend at least 4 inches above the grid.

### On the Grid

- Only trained and authorized personnel may access and work on the tension grid.
- Never enter the grid alone.
- Always work with a spotter below when there is a risk of objects falling from the tension grid (i.e., during set-up and strike). The spotter should be positioned in a safe location to keep people out of the area below and warn those working on the grid of hazards or hazardous behavior.
- Remove all items from clothing pockets prior to ascending to the grid.
- Tie or otherwise secure tools to the worker.
- Wear a hard hat equipped with a chin strap in low ceiling grid areas. Hoist the hard hat to the grid using a bucket and line system similar to getting other materials onto the tension grid; never wear it while climbing to the grid. Secure the hard hat to your head with the chin strap once you attain the grid.
- Wear fall protection harnesses attached to the fall arrest system in accordance with the fixed ladder code of safe practice when using fixed ladders to access the grid.
- Wear fall protection harnesses and properly anchored lanyard when working on lighting and other elements suspended outside of the tension grid.
- Never drop ropes or electrical cables from the grid to the stage. Pull ropes and electrical cable up to the grid, coil them, and carry them down or lower them using a bucket and line system.
- Never cut holes in the tension grid or otherwise physically alter the grid.

- Never bounce on the tension grid surface.
- Never exceed the weight load specified by the grid manufacturer.
- Conduct routine documented inspections of the grid.
- Immediately report hazards to your supervisor or instructor.

#### On the Stage

- Wear hard hats on the stage floor whenever personnel are working in the grid.
- Install warning signs and barriers to prevent personnel from entering the area beneath the grid when there is a risk of objects falling from the grid, such as during set-up and strike.

### **TRIGGER HEIGHTS**

Working at heights poses a risk of fall incidents. Falls from heights can result in serious debilitating injuries or death.

Working at heights occurs in many performing arts activities and may include working on or from permanent structures (catwalks, tension grid systems), temporary structures (elevated scenic platform) or portable devices (ladders, mobile scaffolds, aerial work platforms). This prescription of safe practice discusses the trigger heights for fall protection requirements and general safety guidelines for working at heights.

Please keep in mind there is not one single trigger height that can be applied to all settings and all work activities. A review of regulatory requirements confirms that trigger heights vary depending upon the workplace setting being evaluated (building or other elevated work location), and work activity being performed. Based on these differences, the heights can range significantly from thirty (30) inches to six (6) feet. Beyond these requirements, there may also be different trigger heights designated for certain special circumstances such as low slope roofs, aerial work platforms, fixed ladders, and erecting scaffolding.

Ensure you review specific areas of working at heights: controlled access, fixed ladders, portable ladders, working outside the catwalk, paint frames, rooftop restraints, and tension grids. All personnel must successfully complete fall protection and fall rescue training prior to working at heights. Keep in mind OSHA regulatory requirements represent the legal minimum standards. There may be situations where fall protection should be used at heights less than those mandated by the regulatory standards. As noted, fall protection and trigger heights can be a complex topic and consulting your safety or risk management staff for assistance is advised.

#### Guardrails

Guardrails must be provided on all open sides of unenclosed elevated work locations, such as roof openings, open and glazed sides of landings, platforms, runways, ramps, or working levels more than thirty (30) inches above the floor, ground, or other working areas of a building.

Exceptions: There are some exceptions for loading docks, stages, seating areas, and machine servicing areas, such as:

- On the auditorium side of the stage, raised platforms and other raised floor areas such as runways, ramps and side stages used for entertainment or presentation
- Performing Arts galleries, balconies, or other such elevated seating locations where a forty-two (42) inch railing would obstruct the sight lines may be protected by a guardrail or other barrier of not less than thirty-four (34) inches in height.

Contact you Safety or Risk personnel if you have questions regarding the use of fall protection systems. Generally, fall protection systems are required when the work exposes personnel to a fall of six (6) feet or more. Types of fall protection systems include:

- **Personal Fall Arrest Systems:** These systems consist of a horizontal lifeline or retractable lanyard secured to the back and above the person's waist to a harness. The lifeline (also known as a lanyard) must be anchored to a point capable of supporting at least five-thousand (5,000) pounds per person. The lifeline itself must have a breaking strength of five-thousand (5,000) pounds. The system is designed to limit the fall to six (6) feet.
- **Positioning Devices:** These devices consist of ropes and body harnesses that limit the fall to no more than two (2) feet. The anchoring point must be capable of supporting twice the intended load or three thousand (3,000) pounds, whichever is greater.
- **Personal Fall Restraint Systems:** These systems consist of body belts and harnesses attached to a lifeline that does not permit the user to move beyond the edge of the working area. The anchoring point must be capable of supporting four (4) times the intended load.
- **Approved Safety Nets:** These systems are used for working heights of twenty-five (25) feet or more, only when personal fall protection or other conventional types of protection are not practical.

## **PITS, TRAP DOORS, & CHANGES IN ELEVATION**

Pits, trap doors, and changes in elevation (stairs, ladders, etc.) pose trip and fall hazards. To reduce the risks of trip and fall incidents:

- Mark changes in elevation, including the edge of the stage, with phosphorescent tape or LED lights as appropriate.
- Inspect ladders and stairs for stability prior to each performance and rehearsal.
- Lock trap doors in place when not in use.
- Lock pits in place when not in use.
- Use barricades and other signs to restrict under-stage access to pits and trap door operations to authorized crew and performers.
- Rehearse the proper use of trap doors.

Temporary fall protection measures may be required during rehearsals around open traps, elevated stage platforms, or at the leading edges of the stage or orchestra pit. Identify these hazards during the production planning process and install temporary rails or create a controlled access zone to prevent individuals from falling into or off of these features.

# Section 14: Front-of-House

Front-of-house personnel have multiple responsibilities that impact audience safety. These responsibilities begin prior to the public arriving, continuing throughout the performance, and are not finished until the audience members exit the facilities.



Front-of-house personnel can also help ensure the safety of the performers during the performance. Fire and life safety duties are first and foremost. Beyond fire and life safety responsibilities, front-of-house personnel are also often responsible for signs and notices, food safety including licensing and permit compliance, safety inspections, safe facility conditions, and incident investigations.

## **ADVANCE PREPARATION**

Actions must be taken in advance of the performance to ensure the front-of-house staff is ready. Getting ready includes the establishment of an Emergency Evacuation Plan (see Section 9: Emergency Action and Response), training staff, preparing facilities, and routine maintenance. Responsibilities for front-of-house personnel vary from one entity to another. They generally include the lobby, auditorium, ticket office, restrooms, and refreshment areas. Some may also be responsible for heating, ventilation, and air conditioning, or even the exterior of the building and gift shops.

## **TRAINING THE STAFF**

Front-of-house staff includes paid personnel and volunteers. Each position should have clear responsibilities that are documented. Review them in training sessions conducted well in advance of shows. Training should include:

- specific job duties;
- dress codes;
- house rules;

- hazard recognition;
- how to deal with difficult and/or unruly patrons and who to contact for assistance; and
- emergency response duties.

## **FOOD SAFETY**

Food is often made available during intermission and may vary from concession tables that dispense pre-packaged beverages and retail food items, such as candy and chips, to the serving of hot and cold beverages from bulk containers and the dispensing of homemade food items.

The front-of-house staff must ensure compliance with Health Department food and beverage rules in addition to any entity specific policies. Other considerations include:

- have an adult oversee the concessions in K-12 settings;
- verify appropriate permits have been obtained from the appropriate local authority; and
- ensure food handler permits, when required, are clearly displayed in the concession area.

## **PATRON SAFETY**



Ensuring patron safety is essential. Patron safety begins prior to their arrival and continues until their departure from the facility.

- For venues with portable seating, ensure the local Fire Marshal or Safety/Risk personnel have approved the seating layout, including egress.
- Ensure routine safety inspections are conducted, documented and appropriate corrective action taken. Inspections should include the exterior of venues and night lighting conditions.
- Complete routine inspections and testing of emergency lighting systems. Confirm egress is illuminated appropriately. Also test back-up generators.
- Check all illuminated exit signs to ensure they are functioning properly and are not obscured.

- Ensure exterior entrance aprons and sidewalks are clear of slip, trip and fall hazards, such as wet leaves, twigs, gravel, sand, wet grass clippings, snow and ice.
- Provide enough entrance mats for expected weather. Keep extras in case additional mats are required.
- Ensure the printed program provides appropriate warnings for strobe lights, lasers, live animals (not for use in K-12), or theatrical smoke (not for use in K-12).

## **PERFORMER SAFETY AND HOUSE RULES**

Some entities will have a specific role of House Manager, while others combine the manager duties to those of supervising staff and/or teachers and professors. This manager role should evaluate whether the program needs additional security or prohibition language regarding:

- use of flash photography;
- video recording; or
- food and/or beverages in the auditorium.

## **PRIOR TO EACH PERFORMANCE**

Although routine safety inspections are made of the facility, the House Manager must ensure the venue is inspected again prior to the performance and arrival of patrons in order to identify hazards that may have developed since the last routine safety inspection. The House Manager should ensure all hazardous conditions are immediately corrected and, if necessary, cancel the performance and evacuate the building. The use of a checklist to document the inspection will help to ensure all areas of concern are observed and can also be used to document corrective actions taken.

# Section 15: Fire and Life Safety

This section focuses on reducing the possibility of fire. It also provides proactive measures to ensure all occupants may exit the venue safely in the event of fire or other emergency.

## ACCESSIBLE EXITS



- Ensure aisles, corridors, exit pathways, and exit doors are unobstructed.
- In venues equipped with portable seating, ensure aisle widths meet building code and Fire Marshal requirements.
- Ensure aisles and corridors along the exit pathway are not obstructed in any way.
- Verify that concessions and vending tables do not obstruct access to exits.
- Ensure curtains and decorative hangings do not obstruct the view of or access to exits.
- Keep exit signs and doors free from decorations. Never cover exit signs.
- Ensure there are clear areas on both sides of the exit doors to allow the convergence of evacuees. Each side of the door must be clear to at least the width of the doorway.
- Ensure exit doors are unlocked and open with ease.
- Keep exterior sides of exit doors clear. Maintain a clear path leading away from the building to a safe place of refuge.
- Never store anything in or under stairways as materials may catch fire and prevent egress.

## EMERGENCY LIGHTING AND ILLUMINATED EXITS SIGNS



- Test the emergency lighting system on a regular basis.
- Test and inspect the emergency back-up generator as required.
- Check all illuminated exit signs to ensure they function properly and are unobstructed.
- Check the aisle lighting to ensure aisle pathways are properly illuminated.

## **FIRE EXTINGUISHERS, FIRE ALARM PULL STATIONS, AND FIRE HOSE STATIONS**

- Ensure all fire extinguishers are in place and inspected.
- Ensure all fire extinguisher charge indicator gauges are in the green zone of the gauge.
- Ensure all fire hoses are properly mounted, inspected and undamaged.
- Ensure access to the fire extinguishers, fire alarm pull stations, and fire hose stations, is unobstructed and un-obscured. Vertical clearance must be from the floor to the ceiling and must extend horizontally thirty-six (36) inches from all sides of the fire extinguisher.

## **FACILITY CONDITIONS**

Performing Arts venues should be clean and free from slip, trip, and fall hazards.

- Ensure entry rugs are level and have no folds.
- Ensure the lobby floor is dry and will remain dry as the patrons arrive. Provide extra entry mats if necessary.
- Ensure the exterior of the entryway and sidewalks are free of wet leaves, twigs, gravel, sand, wet grass clippings, snow, ice, or any other hazard.
- Ensure restrooms are clean and that floors are dry. Toilet seats and cubical walls should function properly and be secure. Stock bathrooms appropriately.
- Ensure cleaning tools and materials are immediately accessible should the need arise.

## **WHILE THE PATRONS ARE PRESENT**



### **Emergency Actions**

Front-of-house personnel are responsible for making safety announcements, crowd control, and safety rule enforcement. The House Manager must be on premises prior to patron arrival and stay until all patrons have left. In an Emergency the following are important procedures:

- From the stage, the House Manager should provide information regarding the nature of the emergency and instruct the audience (i.e., evacuate, shelter in place, etc.). The Stage Manager is responsible for evacuating the back of the house.
- Ushers should direct patrons to exits during evacuations and lead them to assembly points specified in the Emergency Response Plan.
- Take steps to prevent patrons from accessing the stage and other areas uninvited.
- Follow law enforcement and fire department directions when they arrive on scene.
- After the emergency, cooperate with your Environment, Health & Safety (EH&S) Office, Risk Management Office, and/or Risk Coordinator in their incident investigation and after-action report.
- Venue-specific Emergency Response Plans may vary; check the Emergency Response Plan for your venue to ensure you understand the procedures.

## Patron Injury/Illness Response and Investigation

Immediately provide first aid for minor injuries using universal precautions to reduce the risk of transmitting bloodborne pathogens. Universal precautions include:

- Allow the injured person to clean, bandage, and/or apply pressure to wounds if he or she is able.
- Summon emergency medical services by dialing 9-1-1 for non-minor injuries. Examples of non-minor injuries include head injuries, unconsciousness, heart attack or its symptoms, stroke, deep wounds, asphyxiation, broken bones, or falls.
- Use the automated external defibrillator (AED), if one is available, when needed. Follow instructions and your training.
- Notify the person in charge immediately of injuries and illnesses.
- Post personnel along the route from the building entry to the injured person to assist the prompt arrival of emergency medical personnel.
- Begin the gathering of information for the investigation as soon as the injured or ill person's medical needs are met.
- Obtain information regarding the injured/ill patron, such as name, address, telephone number, medical conditions and/or medications being taken (this information must be provided to emergency medical personnel as soon as possible)
- Obtain information from witnesses, including name(s), contact information, what they saw and/or heard.
- Document investigation on the appropriate investigation form.
- Report the incident to your EH&S Office, Risk Management Office, and/or Risk Coordinator

## **AFTER THE PERFORMANCE**

After the performance, ensure that:

- all patrons have departed;
- clean-up operations are initiated;
- food and beverages are properly stored and secured;
- exit doors are secured; and
- incident reports are completed and filed.

# Section 16: Hazard Communication

Various chemicals are used in all stages of a performing arts production. Some of the more common risks that can cause injury include paints and solvents used in relation to scenery, production and set construction, fire retardants and paints applied to costumes, dry ice used for smoke/fog, makeup, and oil-based and water-based fog fluids used for special effects.



## BASIC GUIDELINES

- Consult with your EH&S Office, Risk Management Office, and/or Risk Coordinator. Discuss the entity-specific Hazard Communication Program, procedures, and training requirements.
- Use personal protective equipment (PPE) properly and as specified by the Safety Data Sheets (SDS).
- Label all secondary containers with the chemical name and primary hazard warning.
- Immediately report chemical spills if you are not a trained responder.
- Ensure all chemicals are stored in appropriate containers and/or cabinets.

## MAINTAIN AN ORGANIZED FACILITY

- Ensure chemical inventories are updated on a regular basis, in accordance with the guidelines set forth in your Hazard Communication Program.
- Maintain a lean, well-managed chemical inventory.
- Evaluate storage requirements to ensure incompatible chemicals are stored separately.
- Provide appropriate storage cabinets for flammable and combustible materials.
- Keep corridors free of hazardous materials at all times.
- Keep containers, including hazardous waste containers, closed, except when in use.

## FOLLOW SAFE HANDLING PROCEDURES

- Evaluate the hazards: read the SDS before beginning work with any chemical.
- Ensure appropriate PPE is available and used.
- Never smell chemicals to identify them.
- Understand the labels/pictograms associated with each chemical you use and proceed accordingly.

## **BE PREPARED**

- Only trained personnel should clean up spills. Inform your supervisor or shop manager of all spills.
- Know where to find and how to use emergency equipment: telephone, first aid kit, fire extinguishers, eyewash and emergency shower, and spill kit (if applicable).

## **IDENTIFY AND HANDLE HAZARDOUS WASTE**

- Regularly check hazardous material to identify its use, expiration date, labeling, if it's been abandoned, containers that once held chemicals, and any unwanted material that should be discarded or recycled.
- Handle hazardous waste as identified in the hazardous waste management program.
- Dispose of waste as directed by the product manufacturer and in accordance with the Hazardous Waste requirements.

## **MANAGEMENT PLAN**

Contact your EH&S Office, Risk Management Office, and/or Risk Coordinator for more information and guidance regarding hazardous and industrial waste management. Seek guidance regarding:

- Proper storage of the waste until it is collected.
- Mixing hazardous wastes (materials may be incompatible and may increase risk and disposal costs).
- Proper labeling of the waste containers.
- Special handling requirements based on the hazard characteristics of the waste.

# Section 17: Heat Illness

Heat-related illness is most often associated with outdoor venues; however, it is important to remember heat-related illnesses can also occur while working indoors.



Performers may be susceptible to heat-related illnesses as a result of wearing heavy costumes and/or exerting physical effort under stage lights. Heat illness is a serious medical condition resulting from the body's inability to cope with a particular heat load and includes sunburn, heat rash, heat cramps, heat syncope (fainting and dizziness), heat exhaustion, and life-threatening heat stroke. Dehydration may also occur.

## BASIC GUIDELINES

- Know the environmental conditions that increase the risk of heat illness, such as high air temperatures, high humidity, exposure to sunlight, exposure to heat generating equipment, lack of air movement, intensity and duration of physical exertion, and clothing, such as personal protective equipment (PPE) or costumes.
- Know the personal conditions that increase the risk of heat illness, such as medications, age, weight, physical fitness, health conditions, and consumption of alcohol, caffeine, water or food.
- Ensure shade is available when outdoor temperatures reach or exceed 75°F.
- Ensure cool water is available throughout work shifts.
- Learn to recognize the signs and symptoms of heat illness, such as rashes, muscle pains and spasms, dizziness, light-headedness, heavy sweating, headache, nausea or vomiting, paleness, fatigue, and weakness. Symptoms of heat stroke include red, hot, dry skin; very high body temperature; dizziness; nausea; confusion; strange behavior; unconsciousness; rapid pulse; or throbbing headache.
- Immediately summon emergency medical assistance for anyone exhibiting the signs and/or symptoms of heat exhaustion or heat stroke.

## PROTECT YOURSELF

- Pre-hydrate and stay hydrated. It is important to maintain the habit of drinking the minimum amount of water every day.
- Drink at least one quart of water every hour.

- Report to your supervisor or instructor immediately if water is not available.
- Avoid caffeinated beverages that dehydrate the body, such as coffee, tea, colas, and energy drinks.
- Avoid alcohol. In addition to dulling senses and other risks, alcohol dehydrates the body.
- Eat lighter meals when working in hot conditions.
- Pace yourself if you are not accustomed to working in warm or hot environments. Start work slowly and pick up the pace gradually.
- Seek shade and/or a cool area to rest if you begin experiencing symptoms such as dizziness, headache, weakness, fatigue.
- Loosen or remove PPE and heavy costumes whenever they are not needed.
- Immediately report any heat illness symptoms to your supervisor or instructor.
- Summon emergency medical assistance when necessary. While waiting, move the person to a cool shady area, loosen or remove heavy clothing, provide cool drinking water, and fan the person.

# Section 18: Housekeeping

Work areas can become congested during production and performance processes. Maintaining a clean work environment is essential to the prevention of injury, fire, and chemical spill.

Clutter can contribute to injuries and can increase the risk of fire. Everyone has a responsibility for keeping all areas of the Performing Arts facilities clean and orderly.

## BASIC HOUSEKEEPING PRACTICES



- At minimum, clean up at the end of each work session.
- Place tools and materials back in their proper storage location at the end of each use.
- Sweep the floors at least daily; sweep more frequently when the work generates waste material that falls to the floor, such as scrap materials, threads, wood chips, and saw dust.
- Use a brush to clear waste from worktables, work benches, and machinery. Never use your hands or compressed air.
- Ensure trash and recycle receptacles are properly labeled and available.
- Empty trash receptacles at the end of each day.
- Immediately clean up spills of any kind. Follow hazmat spill procedures for large chemical spills.
- Maintain well-organized storage areas.
- Ensure storage areas are clean, dry, and labeled.
- Place small items, such as fasteners, staples, bolts, nails, screws, brads, hinges, glues, molding, sandpaper, buttons, thread spools, needles, scissors, and makeup in sealed containers.
- Purchase only the quantity of materials needed; avoid purchasing excessive amounts that clutter storage areas.
- Conduct routine inspections and immediately correct unsafe conditions and behaviors.
- Conduct routine inventories and dispose of unnecessary materials.

## SHOP HOUSEKEEPING PRACTICES

- Avoid running power cords across or in aisles; use cord guards, if necessary, to reduce trip hazards.
- Keep machines clean of all scrap materials.
- Always sweep the floor clean of debris after each work session.
- Avoid accumulating scrap lumber, metals, and other materials.
- Wood storage must never be allowed to accumulate at the exterior of the building.

- Never store wood, metal, props, prop pieces, and other shop storage anywhere that encroaches on the width of exit-ways and required marked exits.
- Secure stored plywood, lumber, metal, and plastics in a manner that prevents the stored items from falling.
- Hang or otherwise secure ladders.
- Store power tools with the power cords coiled.
- Store power tools in their custom storage cases when such cases are available.
- Never store flammable or combustible materials in the dimmer room.
- Ensure sawdust collection systems are properly positioned and functioning properly.
- Empty sawdust collection systems in accordance with the manufacturer's specifications to ensure they function properly and to avoid fire hazards.
- Replace ventilation hood filters in accordance with the manufacturer's instructions.
- Dispose of hazardous and industrial waste in accordance with local Hazardous Waste Program procedures. Call your EH&S Office, Risk Management Office, and/or Risk Coordinator if you have questions.

# Section 19: Lighting

Performing arts lighting has many functions. It is used to see what's occurring on the stage, to focus the audience's attention on a specific person or area, or to set the tone or mood of a particular scene. The uses of performing arts lighting are as varied as each production at your campus.



Working with performing arts lighting can be a dangerous activity. Conducting operations such as hanging lights, sometimes in the dark, with high-voltage electricity has the potential to cause a variety of accidents and injuries such as falls, fires, electrocution, and injuries from falling objects. In addition, lighting equipment is heavy and can cause significant injuries if mechanical aids or proper lifting techniques are not used. This section contains a brief overview of typical lighting operations and hazardous exposures while installing, maintaining, and storing lights and fixtures.

## **FIRE RISKS**

Performing arts lighting equipment may burn hot, and the lenses used in the lights can magnify the heat. Make sure you use only approved equipment to modify your lights; using unauthorized materials to rig lighting colors or change the shape of the light can put you at risk for fire. Make sure any sources of heat, such as very hot lights, are placed well clear of anything that could ignite, including paper, plastic, flammable furniture, and draperies. To decrease the risk of fire, use lighting as designed by the manufacturer.

**To Avoid Fires: Use Lighting as Designed by the Manufacturer**

## **ELECTRICAL RISKS**



There are inherent electrical exposures while working with lighting instruments. Performing arts lighting uses a lot of electricity, and the risk of electrocution is high. Lighting equipment must be checked regularly for worn areas and exposed wire that might put you, your staff and students at risk for electric shock. Do not ignore even a slight tingle when you feel this sensation while handling a lighting instrument, cord, or component of the equipment. This tingle is an indication that something is wrong, and you may be at risk of exposure to a more significant electrical shock. Inform your supervisor/teacher of this condition and correct the issue before it becomes a major problem.

## **RISK OF FALLING FROM HEIGHTS**

The procedures for hanging and focusing lights may require you to work from significant heights on catwalks, scaffolding, tension grids, aerial work platforms, or other elevated work surfaces. Fall exposures must be identified and addressed. See Section 12: Fall Protection for further information.

## **OVERHEAD LIGHTING**



Performing arts lighting rigs are very heavy and can cause severe injuries if they fall. Employees and students must be trained on how to hang and properly secure lights. All lights must be tethered to the lighting rig with a safety cable and double-checked for safety.

Because the lights are at greatest risk of falling when the lighting rig is being moved or worked on, make sure no one is in the area below before performing any overhead lighting work. In addition to looking below, clearly announce and notify all individuals in the area that overhead work is occurring. Remember, the performing arts venues are often dark, and you may not be able to see if anyone is below the work area. Lighting should never be moved in the dark. All lighting should be set prior to its use.

## **BATTENS/ELECTRICS**

Battens are metal pipes that hang above the stage or audience. Scenery, drapes, curtains or lights may be hung from them. When a batten is used to hang lighting, it is referred to as an “electric.” Electrics contain many wires that when energized are dangerous. Make certain the electrics are not too close to flammable materials, such as scenery and draperies, because the heat can scorch and possibly ignite the materials.

Regular inspection and maintenance will identify loose screws and bolts that may fall and cause an injury to someone below. Checking the rope locks is important to ensure electrics and battens

are holding properly. Cables need to be properly rigged to avoid snagging on battens, scenery, and draperies.

## DIMMER ROOMS AND BOARDS



Train those who operate and/or maintain light boards and dimmers. Make sure the manufacturer manuals are available for review. Good housekeeping practices are essential. Never store flammable or combustible materials in the dimmer room or near dimmer equipment.

The follow spot is a light that is physically moved by an operator to follow a performer as he or she moves around the stage. It might have devices to change colors or the beam size. The follow spot operator may have to monitor several areas at the same time.

The follow spot operator must be thoroughly trained on the manufacturer's instructions and safe operation of the follow spot, maintenance procedures (electrical attachments, worn cables, grounding, gel frame, stability of the unit, lamp replacement), potential burn exposures, and what to do in the event of an emergency.

## CABLE MANAGEMENT

Lights focus the attention of the audience and set the mood for a scene. A lot of planning goes into the placement, color, and intensity of the lights, and the same amount of care must be given to running cable. Improperly run cables can become a tangled mess that poses trip and fire hazards and hinders troubleshooting to determine why a light is not working. Failure to manage the cables can also become a distraction to the patrons in small, intimate venues where the audience can see everything. Start with a plan that avoids chaos.

- Create a circuiting diagram for the theater of all circuits.
- Use a light plot to determine how many circuits are needed for each lighting location.
- Use the circuiting diagram to plan which circuits will be used for which lights. Try to leave a few spare circuits in each location.
- Use gaffer tape to label the circuit number at both ends of each cable.
- Note on the light plot which circuit each light was plugged into.
- Use the shortest cables possible to eliminate hanging loops that will tangle.
- Provide sufficient slack in the cable to allow for focusing.
- Never tie down the lighting instrument's power cord.
- Group cables in parallel lines with Velcro rip-ties, theatrical cord, or tie line (glazed or unglazed) for these advantages:
  - a. time and materials are saved as they don't require replacement each time a cable is added or removed;

- b. eliminates the risk of cutting cables as there is no need to cut tape; and
- c. the risk of injury from sharp-edged zip-ties is eliminated.
- Never wrap cables around support beams or catwalk guardrails.
- Use re-closable J hooks and/or Velcro cable straps to support cables that must be suspended from one point to another.
- Coil extra lengths of cable and use Velcro rip-ties to keep the coil stable.
- Avoid crossing paths with cables. If it can't be avoided, use cable guards and if practical, use a cable guard that is equipped with yellow or orange stripes to alert cast and crew of the trip hazard.

## **INSPECTION, MAINTENANCE, AND STORAGE**

Regular inspection and maintenance will significantly reduce potential electrical malfunctions and fire hazards. Training is required for any employee responsible for inspecting or maintaining lighting instruments. Your Performing Arts Department may have specific inspection requirements. In general, inspections of lighting should include:

- Visual observations of the condition of cables, plugs, cords, grips, insulation, and electrical pockets.
- Confirmation that lighting instruments, electrics, cables, gel frames, top hats, barn doors, and other electrical instrumentation are clean and dust free.
- Confirmation that electrical equipment is stored in a clean and dry storage area.
- Confirmation that the power cords are coiled, the shutters closed, and all attachments secured.

# Section 20: Lockout/Tagout



Lockout/tagout (LOTO) is a method of preventing equipment from being set in motion and endangering workers. Failure to properly isolate and de-energize energy sources can be fatal. You must follow LOTO policy for your protection and the protection of others.

The application of LOTO is not limited to electrical energy. It is critical for your safety to remember that power sources include mechanical, hydraulic, pneumatic, chemical, thermal, and others. Other energy is often stored energy, such as electrical batteries, capacitors, and springs. Even gravity presents a form of energy.

## GENERAL GUIDELINES

- K-12 Students should not be engaged in work or duties that require LOTO without proper supervision.
- Consult with your EH&S Office, Risk Management Office, and/or Risk Coordinator and refer to the Campus/LEA specific LOTO Program, procedures, and training requirements.
- Apply LOTO procedures whenever adjusting, servicing, or maintaining any power tool or machine. Examples include when blades or attachments on power tools or machinery must be changed, whenever a guard or safety device must be removed or by-passed, when persons might be caught in moving machinery, or anytime unexpected movement of machinery or tools could cause injury.
- Identify all sources of energy supplying the tool or machine prior to starting the procedures.
- Ensure you have the appropriate lockout devices, locks, and tags.
- Never assume when the power switch is in the “off” position there will be no movement. Dissipate all residual energy prior to beginning the service or repair work. Ask your supervisor if you do not know how to do this procedure.
- Ask your supervisor or instructor if you are unsure of how to proceed.

## APPLYING ENERGY CONTROLS

- Notify others in the area that you are shutting down and locking out the tool or equipment.
- Shut down the tool or machine using its on/off switch and normal shut-down procedures.
- Bleed, drain, and clear all steam, air, gas, and hydraulic lines to ensure there is no residual energy.
- Release and block any mechanism under load or pressure.
- Apply the lockout devices, as well as the locks and tags. Unplug tools and equipment equipped with a power cord; apply a clamp-shell cover to the plug. Remember some machinery and power tools have more than one source of energy; ensure all energy sources are de-energized and locked-out.
- Fill out the tags: name of person performing the lockout, reason, and date.

- Test the on/off switch to verify there is no movement or energy release.
- Keep the keys to the lockout devices on your person at all times.

## **REMOVING ENERGY CONTROLS**

- Only the personnel who applied the LOTO may remove the LOTO. See your supervisor for exceptions.
- Remove all tools, parts, and scrap.
- Ensure the system is fully assembled, and all guards and safety devices have been restored.
- Notify personnel in the area that you are re-energizing the tool or machine.
- Remove the locks, tags, and lockout devices following the manufacturer's checklist to re-energize.
- Make another visual check to ensure everyone is clear prior to starting the tool or machine.
- Never remove a lock until you are absolutely sure that it is completely safe to do so.

# Section 21: Maintenance

Theater maintenance can easily be overlooked in the excitement of production preparation and performances. Theater maintenance is essential for providing a safe and healthy entertainment experience for staff, students, and patrons.



## AWARENESS THROUGH INSPECTION

Maintenance starts with being aware of what needs to be repaired. That is best achieved through routine inspections. Effective inspections involve more than simply making observations and checking them off. They involve a cycle of steps that include:

1. Observation: Complete initial observations and assess conditions. While inspecting, take immediate steps to correct conditions and behaviors wherever possible.
2. Evaluation: Evaluate issues that cannot be resolved during observation. Determine root causes.
3. Plan: Make a plan to resolve issues and address root causes. Involve the right people. Plans may include training, maintenance, budget allocation, etc.
4. Implementation: Work with the right people to implement the plan.
5. Assessment: Once the plan has been implemented, assess how well it's working. Sometimes corrective actions do not work out. Be prepared and willing to circle back to earlier steps in the cycle. Review and evaluate additional corrective actions again until the desired state is achieved.

Inspections should be routine. In dynamic environments such as performing arts classes and venues, hazards can develop and evolve quickly, so it is necessary to be vigilant. Check prior

conditions and identify any new, unsafe conditions or behaviors. Hazardous conditions can develop rapidly through normal use, wear and tear. Early recognition and correction are essential to providing a safe and healthy environment.

Setting up an effective inspection cycle requires identifying what needs to be inspected; who is responsible for each step; when inspections occur; and how the inspections will be managed. Depending on what needs inspection, inspectors may include entity staff, teachers, students, outside experts, or regulatory agencies.

Follow your entity policy and procedures regarding inspections. Update them as needed. “Routine” should be dictated by the dynamics of the environment. In areas where things are in continuous motion, inspections should be more frequent. Some inspections need to be conducted at the start of each shift, such as those for aerial lifts and forklifts. Other inspections are conducted less frequently, such as annual fire extinguisher inspections.

Not all unsafe conditions or behaviors can be fully corrected immediately. A corrective action log is a key tool to track outstanding items and to document temporary corrective actions. Temporary corrective actions may include restricting access to areas or taking unsafe equipment out of use. It also includes stopping unsafe behavior. Permanent corrective action may require policy development and training once the behavior and its causes are understood.

## **CLEANING SAFETY**

Routine maintenance includes cleaning and sanitation. Safety precautions must be taken to reduce the risk of injury. Here are some safety tips:

- Schedule floor maintenance, including simple cleaning, during the hours when the fewest people are present.
- Post portable “wet floor” signs.
- Where there is more than one elevator, mop in front of one at a time; allow the floor to dry before moving on to the next.
- Keep the labels on cleaning materials in place and legible.
- Label all secondary containers with the chemical name and primary warning listed on the original container.
- Close restrooms while cleaning them.
- Select less hazardous cleaning materials when possible.
- Provide appropriate personal protective equipment (PPE) to cleaning personnel.
- Conduct fall hazard awareness training for custodial personnel assigned to clean elevated seating areas.
- Conduct weekly inspections of emergency eyewash stations and deluge showers. Maintain a record of those inspections.

## **SCHEDULED MAINTENANCE**

Scheduled maintenance is also known as preventative maintenance. Tools, machines, equipment, and production systems need scheduled maintenance. Scheduled maintenance is generally coupled

with an inspection to identify other repair needs. Some types of scheduled maintenance will be performed by Performing Arts Department personnel, some will be performed by your entity's staff, and some will be performed by a contractor. It is critical for the Performing Arts Department to know what needs to be inspected and serviced, who will do it, and when. Therefore, work with your maintenance staff leadership to determine responsibilities, procurement and scheduling. Examples of scheduled maintenance that must be managed include, but are not limited to:

1. Ventilation/Spray Booth Hoods: Hoods are required to be tested after their initial installation, after alternation or repairs, and at least annually. Maintain records of the tests. Work with Campus/LEA personnel to determine how the regular replacement or cleaning of the filters will be accomplished. The proper maintenance of the filters is essential to prevent significant reduction in airflow. Cleaning and replacement instructions are located in the owner's manual. Maintain a log to record filter changes and maintenance activities.
2. Heating Ventilation and Air Conditioning (HVAC): Filters must be replaced or cleaned regularly to prevent significant reduction in airflow. A log must be maintained that records filter changes and maintenance activities.
3. Back-up Generators: This equipment must be tested at least monthly. The test is typically conducted by Campus/LEA personnel. The generators must be serviced annually by qualified personnel. Follow the manufacturer's guidelines for scheduled maintenance.
4. Stage Curtains: The stage curtains require routine, frequent inspections and periodic inspections by qualified outside personnel. After each performance, inspect the curtains for tears, dirt, and other damage. Repair tears and holes immediately using pins or by sewing the fabric; never use tape. Semi-annually, clean the curtains either by brushing them with a medium soft bristled brush or by vacuuming with an industrial vacuum. Start at the top front of the curtain, working left to right or right to left, and then down the curtain. Repeat the procedure on the back of the curtain. If the material is not constructed of inherently flame retardant material, the curtains must be inspected and retreated by a company certified to do so. Flame retardant retreatment must be completed after the curtains are washed or dry cleaned. They must also be retreated every two to five years; check with your local Fire Marshal who has jurisdiction regarding treatment frequency. Replace the draperies when the fabric begins to tear easily, starts to rip free from its heading, or begins to fray on its own.
5. Counterweight Fly System: Complete annual fly system inspection and servicing by competent Performing Arts personnel. Arrange for an inspection by an outside expert at least every three to five years. Maintain records of all inspection and servicing activities.
6. Tension Grid: Schedule periodic inspections of the tension grid with outside contracted experts in accordance with the manufacturer's instructions or at least every three years. Remember the outside expert inspections are in addition to routine inspections conducted by Performing Arts personnel. Maintain records of all inspections and service activities.
7. Forklifts and Aerial Lifts: Follow the owner's manual specifications for the maintenance schedule. Some maintenance may be completed by Campus/LEA personnel and other work will be completed by outside contracted personnel. In addition to the scheduled maintenance, ensure daily inspections are completed prior to use.
8. Scene Shop Power Tools: Follow the maintenance schedule defined for these items in each owner's manual. Most often this can be completed by trained Performing Arts personnel, while some work should be completed by outside contracted services.

9. Costume Shop Steam Irons and Sewing Machines: Follow the maintenance schedule detailed in the owner's manual for each machine. Depending on the equipment, maintenance may be completed by Performing Arts personnel or outside contracted services.
10. Pest Control: Refer to your Campus/LEA Pest Control Procedure. For questions, consult your EH&S Office, Risk Management Office, and/or Risk Coordinator.
11. Fire Curtain: The fire curtain must be tested and tagged annually. It must have an unobstructed path of travel to the stage floor.
12. Fire Curtain Manual Release Levers: The fire curtain manual release levers shall be properly labeled, accessible, visible and unobstructed.

# Section 22: Material Handling – Forklift Safety

Forklifts and other powered, material handling equipment requires special training and attention. Therefore, entities should never grant their use to anyone except those with proper training. K-12 students must never operate forklifts.

## The Operation of Forklifts by Minors Is Prohibited



### GENERAL SAFE OPERATING GUIDELINES

The information below is not a substitute for obtaining required training and authorization.

Use

- Never attempt to operate a forklift or other powered industrial equipment until trained and authorized to do so; industrial truck operators must have a valid forklift driver's license.
- Complete and document a pre-use inspection. If the vehicle is used over the course of multiple shifts, complete an inspection at the top of each shift.
- Never operate a faulty vehicle. Tag it out of service, remove the keys, and report the problem to management.
- Never engage in stunt driving or horseplay.
- Always look in the direction of travel.
- Never allow a person to stand between the forklift and a fixed object.
- Never give rides to others. Never ride on the forks. Never ride on the load being moved.
- Barricade the area and assign spotters to keep personnel out of the area when the forklift is in use.
- Never permit anyone to stand, pass, or work under the elevated portion of any industrial truck, whether it is under load or empty.
- When parking the vehicle, set the brake, move the mast to a vertical position, and lower the forks to their lowest position.

## Loading And Unloading

Loading and unloading material may present unique risks. Serious injury and death have occurred during loading and unloading operations. Complete the following:

- Post warning signs for pedestrians.
- Mark the planned traffic area. Ensure it is large enough to allow the forklift operator to lower the load and turn into the direction of travel.
- Whether on a dock, in a yard, or inside a warehouse, prior to any loading and unloading trailers or pickup trucks, ensure equipment is turned off; secure the vehicle wheels with chock blocks, dock locks or other appropriate device; ensure trailer nose stands or jacks are fully engaged on trailers if no longer attached to the pulling vehicle; walk the floor of the truck or trailer to identify floor defects and weaknesses.
- Keep anyone not involved with loading and unloading out of the area.
- If unloading an enclosed trailer, keep the inside well lit.
- Shrink wrap palletized loads to prevent the load from shifting during movement.

## Dock Safety

- Ensure the edges of loading docks are marked.
- Install dock barriers, such as chains equipped with signs, to warn drivers and pedestrians of dock fall hazards.
- Use dock boards or plates to bridge the gap between the dock and the trailer.
- Get assistance to move the dock board/plate into place where automated dock plates are not in use.

## Loading and Unloading Storage Shelves

- Label the storage shelves/racks with their weight bearing capacity. Never exceed this capacity.
- Ensure the storage shelves/racks are anchored to the ground.
- Ensure the pallet is the right size for the racking system. Pallets that are narrower or shorter than the racking horizontal support arms could easily topple into the racking system.

# Section 23: Moving and Lifting Materials Safely

Performing arts work involves a lot of lifting and moving of items. Improperly lifting items increases the risk of injury.



## BEFORE LIFTING OR MOVING MATERIALS

How you lift and move is just as important as what you lift or move. Even a light load can cause injury if handled improperly. Before you start a lift or move materials:

- Warm up your muscles.
- Assess the object(s) to be moved noting size, weight, shape, and balance.
- Assess and clear your path of travel before moving an object.
- Use a mechanical aid such as a cart or dolly whenever possible.
- Never perform unnecessary lifts. If a cart or dolly is not available, ask a co-worker for assistance if needed.
- Wear sturdy footwear to ensure secure footing.

## LIFTING

- Stand as close as possible to the object you are going to lift.
- Position your feet shoulder width apart with one foot slightly behind the other.
- Squat down to the load. Bend at your knees, not at your waist.
- Grip the object firmly with both hands (not just your fingers) and keep your arms and elbows tucked in close to your body.
- Use handles, if provided.
- Tighten your stomach muscles as you grasp the load securely, but don't hold your breath!
- Maintain a comfortable position, keeping the normal curve of the lower back.

- Keep your head and chin up as you lift.
- Lift with your legs; they are the strongest muscles.
- Lift smoothly and keep the load close to your body.
- Avoid twisting your body while lifting or carrying objects. If you need to change directions, move your feet in the direction of travel.
- Avoid storing heavy items above shoulder level.

## POWER ZONE

The power zone for lifting is close to the body, between mid-thigh and mid-chest. Comparable to the strike zone in baseball, this zone is where arms and back can lift the most with the least amount of effort. Modify your lifting practices so that you can perform your work within your power zone.



## PUSHING AND PULLING TIPS

- Always keep the load close.
- Push rather than pull whenever possible.
- Tighten your stomach muscles before and as you push. It will give your back support.
- Bend your knees to help maintain the natural curve of your spine.
- Maintain the alignment of your shoulders and hips (avoid twisting).
- Keep your hands aligned with your wrists and forearms; avoid bending your wrists.
- When pushing, lean toward the object. When pulling, lean away from the object.
- Use the power of your leg muscles instead of your back.
- When using a cart, place your hands near the outer edges of the handle(s) to provide turning leverage. However, keep your hands within the parameter of the handle to reduce the risk of crushing your hands.
- Use a power grip on the handle if its design allows. A power grip is when the palm and fingers are in contact with the handle.
- Use a cart equipped with well-functioning wheels. Inspect for undamaged tire surfaces, lubricated components, and when present, properly inflated pneumatic tires.
- Ensure casters are rated for the weight being transported.
- Plan your route. Avoid inclines, traffic, and obstructions when possible. Sweep the travel path to reduce debris.
- Use a cart with large wheels when moving loads over uneven or rough surfaces.
- Keep the load in front of you and use caution when negotiating uphill or downhill slopes.
- For steep slopes, use assistance and moving equipment with hand breaks.
- Never move a load that feels too difficult for you to handle. Seek assistance or break the load up into smaller, more manageable sizes.
- Never exceed the load bearing capacity of cars, dollies or any other moving equipment.

## Section 24: Paints, Dyes and Inks

Paints, dyes and inks are commonly used for scene and props including French Enamel Varnish (FEV) work. They are also commonly used in costume design. Dyes are often used to change the color of hair and wigs.



### GENERAL GUIDELINES

- Know the location of the nearest emergency eyewash station, first aid kit, fire alarm pull box and fire extinguisher.
- Before using any product, always review its Safety Data Sheet (SDS). Follow all related safety precautions.
- Never use paint thinner to remove paint, dye, or ink from skin. Rather, use specifically formulated materials to remove them.
- Wash your hands prior to eating, drinking, preparing food, or touching your face.
- The lack of appropriate housekeeping increases the risk of chemical exposure. Maintain good housekeeping practices:
  - a. Clean and organize storage and use areas.
  - b. Clearly label containers.
  - c. Immediately clean up spills.
  - d. Never allow paint, chemicals, or other materials to accumulate on shop floors, shelves, stage floors, under platforms, or in other work areas.
  - e. Store flammable and combustible materials in NFPA-approved storage cabinets.
  - f. Properly dispose of all hazardous waste in a timely manner.
  - g. Never dump chemicals in the trash or down the sink, storm drain, or septic systems.
  - h. Never eat, drink, or prepare foods or beverages in areas where chemicals are used or stored.

### WHEN WORKING WITH POWDERED MATERIALS

- Use water-based products if available.
- Select pre-mixed paints and dyes when available.

- Measure, mix, and handle powders in a designated and contained glove box or in a hood equipped with local exhaust ventilation.
- Wear chemically resistant gloves and protective clothing to protect your skin and attire.
- Wear chemical goggles when using caustic dyes and other corrosive chemicals.
- Wear a dust mask if using large amounts of powdered dye.
- Ensure the container is tightly sealed after dispensing the material.
- For spilt powders, damp mop floors and sponge surface areas.

## **WHEN WORKING WITH LIQUIDS AND AEROSOLS**

- Wear safety glasses when applying paints and dyes.
- Wear protective clothing, such as painter's coveralls and a painter's cap to keep paint out of your hair and off your scalp.
- Ensure the room is properly ventilated. Use fans, if necessary, to blow fumes and vapors out of the area and away from your breathing zone.
- Use a ventilation hood when applying aerosol paints and dyes.
- Use the appropriate respiratory protection device when applying aerosol paints and dyes whenever appropriate ventilation is not available. Consult with supervisor first.
- Wear chemically resistant gloves if hands need to come in contact with dye, such as wig or hair dyeing.

## **WASTE DISPOSAL**

Dispose of waste paint, inks, and dyes as directed by the product manufacturer. For more information, consult your Campus/LEA Hazard Communication Program. Obtain and follow guidance regarding:

- Proper storage of the waste until it is collected.
- Proper labeling of the waste containers.
- Special handling requirements based on the hazard characteristics of the waste.

# Section 25: Personal Protective Equipment



Personal Protective Equipment (PPE) includes all types of equipment used to reduce the risk of injury while performing potentially hazardous tasks. PPE includes eye, face, head, foot, hand, respiratory, body, clothes and fall protection.

Your supervisor, instructor or teacher is required to identify the PPE you must use. They will also teach you how to use it.

## GENERAL PRACTICES

- Use PPE for its intended use.
- Inspect PPE prior to wearing it, and immediately replace damaged items.
- Clean and sanitize PPE as instructed by the manufacturer and your supervisor and after each use. Store in an area where it will remain clean for the next use.
- Comply with all posted PPE safety and instructional signs.
- Consult with your EH&S Office, Risk Management Office, and/or Risk Coordinator as needed.

## EYE AND FACE PROTECTION

- Wear the appropriate eye and face protection for the task at hand.
- Wear safety goggles or safety glasses and/or a face shield when work will likely generate flying debris.
- Wear chemical splash goggles when working with hazardous liquids.
- Wear a welding helmet when welding.
- Wear goggles or face shield equipped with the appropriate level of shading when using a torch to solder or braze.

## HEAD PROTECTION

- Wear a hard hat equipped with a chin strap when in areas with low clearances or a potential for falling objects.

## FOOT PROTECTION

- Wear safety shoes (i.e., steel toe) when working in areas or on tasks with risks of falling objects, rolling objects, or objects that may pierce the sole of your shoe.
- Wear safety shoes with non-conductive soles when the task may pose an electrical hazard.

## HAND PROTECTION

- Wear appropriate gloves whenever your task is at risk from cuts, burns, harmful physical or chemical agents. For example, consider chemical-resistant gloves for working with chemicals and leather or canvas work gloves for handling materials with rough edges.
- Never wear gloves that don't fit to avoid the danger of entangling them in moving machinery or power tools.

## HEARING PROTECTION

- Wear hearing protection devices when exposed to continuous or intermittent high noise levels.
- Wear hearing protection devices appropriately to achieve the anticipated level of protection.

## RESPIRATORY PROTECTION

Respiratory protection is mandated by OSHA for some exposures. Further, there may be times to use it even when not required to do so by regulation.



Respiratory protection devices may include N-95 masks (disposable “dust” masks), half-face air purifying masks (reusable elastomeric masks with cartridges and filters for different contaminants), or a self-contained breathing apparatus (SCBA). The type of respiratory protection device needed will depend on several variables including the toxicity of the material, length of exposure, and engineered control measures. Use of respiratory protective equipment requires initial coordination and consultation with your EH&S Office, Risk Management Office, and/or Risk Coordinator. The use must also follow your Campus/LEA Respiratory Protection Program. These requirements include training in the proper selection and use of respirators, understanding the nature of the air contaminant (gas/vapor or particulate), an evaluation of the concentration and duration of potential exposure, medical certification, and fit testing in the particular type of respirator you will be using.

### General Guidelines

- Consult with your EH&S Office, Risk Management Office, and/or Risk Coordinator and refer to the local Respiratory Protection Program for use procedures and training requirements.
- Never perform tasks that require respiratory protective equipment until after receiving respiratory protection training and passing all other requirements specified in the Respiratory Protection Program.
- Consult with your EH&S Office, Risk Management Office, and/or Risk Coordinator for respiratory protection guidance when introducing a new chemical product.

- Contact your instructor, supervisor, or your EH&S Office, Risk Management Office, and/or Risk Coordinator if you have any problems using the assigned respiratory protection devices.

## Respiratory Use

- Never enter an area that is suspected of having an oxygen deficiency.
- Inspect the respiratory protection device for defects before each use.
- Never wear a defective respiratory protection device.
- Wear respiratory protective equipment appropriate for the exposure.
- Wear N-95 dust masks when performing tasks that generate sawdust whenever there is no dust collection system.
- Ensure there are no items or materials, such as facial hair, long hair, a respirator strap, or anything else that would prevent a tight fit. The respiratory protective device should be sealed to the surface of the face. A good fit and seal must be obtained for the mask to function properly.
- Complete a positive and negative user seal check after donning a tight-fitting respirator to ensure the device is properly placed and sealed against the skin.
- Follow all manufacturer guidelines and those provided by your entity for changing respirator cartridges and filters. Gas/vapor cartridges and filters remove gases and vapors. Change them before chemical breakthrough occurs. Or in other words, the cartridge or filter should be changed before it becomes saturated and chemicals enter your mask.
- Immediately leave the exposure area if you smell or taste the contaminant the respirator was supposed to remove. Inform your supervisor or teacher right away.
- Replace particulate filters and pre-filters designed to remove particles (dusts, mists, etc.) if breathing through them becomes difficult. Immediately report to your instructor or supervisor if changing the particulate filters or pre-filters does not relieve breathing difficulties.
- Dispose of N-95 dust masks according to guidance provided by your supervisor or teacher or when they become damaged or excessively dirty.
- Clean reusable respiratory protection equipment in accordance with manufacturer's instructions.
- Never share respiratory protection devices with other users until the devices have been cleaned, sanitized, and dried in accordance with the manufacturer's instructions.
- Store cleaned and sanitized respiratory protection devices in a manner that keeps them clean and in good condition. Store them in a sealed bag or container where they will not get deformed, away from extreme heat, sunlight, dirt, and debris. Do not hang them on a hook in the shop near your workbench.

# Section 26: Rigging

## HOISTS AND WINCHES

Hoists and winches are used to move all types of materials and equipment such as scenery, platforms, flying individuals, operating fire safety curtains, moveable lighting instruments, and hoisting trusses.



Employees and students must receive formal and documented training on proper use and safe operation of the equipment prior to use. The following are general guidelines. Each motorized device has a manufacturer's manual that contains information about the intended use and design of the device, load specifications, and instructions on safe operation. Read and understand the manufacturer's operation and safety instructions before operating any mechanized equipment.

### General Guidelines:

- K-12 Schools should consider appropriate ages in their rules regarding the operation of hoists and winches.
- Never exceed the hoist lifting capacity. Ensure the allowable weight is clearly labeled on the hoist/winch and support beam.
- Select the proper rigging gear. Ensure it is within the Safe Working Load (SWL) of the web sling or wire rope being used. All persons completing rigging activities need to be trained in the proper rigging procedures and how to properly calculate rigging loads.
- Inspect the rigging gear prior to use. Look for signs of wear and/or damage, such as broken wires, separation in the wire or strand, flattened wires, signs of chemical etching, rust, or other unusual conditions. Replace and discard wire rope when even one broken wire is observed at any point in its length.
- Check emergency stops and brakes for efficiency and safety.
- Only use a hoist hook equipped with a safety latch that closes the throat of the hook.
- Lockout and tagout equipment if it is defective, has malfunctioned, or needs repair. Report all details to your supervisor or instructor immediately.
- Never exceed 45 degrees on the sling angle to avoid too much tension on the sling.
- Never leave a suspended load unattended.
- Never pass a load over people. Never allow anyone to walk under the load.
- Require all students and employees working in the area to wear personal protective equipment appropriate to the hazard, such as hard hats, eye protection, hearing protection, or gloves.
- Talk to your supervisor or instructor if you have any unanswered questions as to capacity, loads, applications, or movement.

## ROPES, WIRE ROPE, AND CHAINS



If you use rope, cordage, or chains, it is important to understand how to use and properly care for these materials. Ropes and wire ropes are used in the operation of rigging mechanisms and to hoist materials and/or equipment to overhead platforms. Chains are used to support, lift, and attach materials and equipment such as curtains, rigging equipment, lighting, etc. All ropes and chains require maintenance and safe operation. It is critical to understand load capacities. Employees must receive training prior to operating any rigging equipment.

### Use and Maintenance General Safety Guidelines:

- Inspect rigging equipment before use, after any alterations, and at regular intervals.
- Make sure counterweights are secured with a lock plate to keep them in place.
- Report and remove any damaged or defective ropes from service.
- Never shorten chains and ropes by knotting.
- Never exceed the safe load capacity of the system.
- Follow manufacturer safety procedures when loading, unloading, or operating rigging systems.
- Warn people on the stage and grid before moving anything.
- Maintain control of moving pieces at all times.
- Never access the catwalks until trained and authorized to do so.
- Secure rigging equipment when not in use.



Fiber Rope

- Make sure the rope is aligned so it doesn't abrade on metal housing or other metal parts of the rigging system.
- Inspect the rope prior to use. Look for signs of wear, crushing, fibers shedding, rips in the covering jacket, breaking of the internal core, parts of the rope becoming unbraided, and breaking of the shell.
- Never drag a rope. Dragging a rope will damage its outer fibers and leads to the eventual deterioration of its overall strength.
- Avoid kinking the ropes. Kinking will strain the rope and over-stress its fibers.
- Never exceed the rope's load capacity.
- Never knot two ropes together. If a rope isn't long enough, get one that is.
- Never allow rope to freeze.
- Always store rope away from heat, moisture, chemicals, rodents, and sunlight.
- Use gloves to protect your hands from splinter-like fibers.
- Check with your supervisor or instructor when a rope is shedding an excessive number of fibers. There may be a problem with the process. It's also possible that a respiratory should be used during the activity.

#### Wire Rope

- Inspect the length of the rope for signs of friction, obstructions, wear, kinking, or deformation.
- If any wires are broken, even just one, replace the rope.
- Report damaged wire rope to your supervisor immediately.
- Use gloves to protect hands from broken wires.
- Apply U-bolt over the dead side of the wire rope and tighten nuts on the live side. "Never saddle a dead horse."
- Use a thimble at the loop to protect the wire rope from wear.
- Never exceed the wire rope's load capacity.

#### Chains

- Always choose an appropriate type of chain for the task at hand. Ask your supervisor or instructor if you are unsure.
- Inspect the chain prior to each use for wear. Look for worn and/or elongated links.
- Know the chain's load capacity. Never exceed it.
- Never twist or knot a chain.
- Take up slack slowly and make sure every link seats correctly.

## Section 27: Set Deconstruction (Strike)

Set deconstruction is also known as strike. Sets are deconstructed in order to build up the next scene, but complete deconstruction and removal from the stage of sets, props, costumes, lights, and sound equipment occurs when the show ends its run at the venue. Ensuring everyone's safety during the strike starts with a plan.

The strike plan will address what, how, when, who, and safety of the deconstruction process. Since there are costs associated with deconstruction, the strike plan should be developed at the design stage of the production, so costs of the strike can be included in the production's budget. The strike plan should take into consideration the campus's sustainability plan when determining what will be salvaged for recycling and reuse and what will go to the landfill. This decision is made early on because there are often extra costs associated with recycling and reuse that will impact the budget. To eliminate confusion later, the plan should be in writing and approved by the authorized Campus/LEA authority. Additional checklists for use during the actual strike will facilitate efficient operations and ensure nothing is overlooked.

### WHAT, WHEN AND HOW

The strike plan includes details regarding what areas will be deconstructed, such as:

- Stage deck;
- Backstage hallways;
- Bridge/catwalks;
- Booth;
- Dressing room and makeup;
- Classrooms;
- Audio/sound; and
- Portable seating

The strike plan states in what order the deconstruction will occur. This will often depend on the number of crews who can safely complete their work concurrently. Steps of the strike may include:

- Removal of portable auditorium seating;
- Installation of guardrails, chains and warning signs at the edge of elevated stages;
- Removal of props;
- Removal of electrical fixtures;
- Removal of sound equipment;
- Removal of chairs and music stands from the pit or orchestra area;
- Removal of soft goods, such as stage curtains, screens, shims, fabrics, masking, etc.;
- Dismantling of the sets/scenery;
- Removal of lighting booms;
- Removal of battens; and
- Repainting the stage deck.



The strike plan defines how deconstructed items will be handled. The plan should identify what will be retained for reuse, what will be recycled through a formal recycling program or vendor, and what will go into the dumpster for landfill disposal. Identify where to obtain the storage containers for retained items for reuse and where to store them once the strike is completed. Identify what arrangements must be made to provide recycling containers and scheduling a dumpster.

The strike plan stipulates when the strike will occur. The determination for the timing of the strike is influenced by the scheduled use of the venue, the availability of the strike crew, the availability of the scene shop, labor contracts, and safety concerns. More injuries occur on night shifts or when personnel work extended and/or unusual hours. Scheduling the strike to occur the morning after the last performance reduces the risk of injury incidents related to fatigue and the inattention associated with fatigue. Sometimes the schedule of an incoming production dictates that the strike must begin as soon as the final curtain call is concluded. When this is the case, the proper training and preparation of the strike crew and the provision of rest breaks and healthy refreshments becomes more critical.

## WHO

The written strike plan spells out who will be involved in the strike and what responsibilities they are assigned. The strike should be supervised by a trained and qualified person. The strike supervisor must remain on premises and actively supervise the strike during strike activities. Identify who will serve as crew and further determine:

- Who will install safeguards for the edge of the stage?
- Who will be responsible for ensuring proper personal protective equipment (PPE) is used?
- Who will be responsible for safety oversight and ensuring compliance with safety rules and regulations?
- Who will make the arrangements for packaging, storage, and disposal of materials?
- Who will complete the final walk through to ensure the strike is complete?

## Keep It Safe

Advanced planning helps to ensure the safety of the strike crew. Strike safety considerations include:

- The scheduling of the strike;
- Strike crew and leader training;
- The provision of PPE;
- Provision of appropriate tools;
- Reducing distractions; and
- Provision of rest periods and refreshments.

## **STRIKE TRAINING**

Conduct documented strike training for the crew, crew leaders, and strike supervisor in advance of the strike. Ensure the training includes:

- An explanation of the strike plan including who, what, when, and how.
- Each crew's assigned tasks, how to do them and when.
- How to handle recycled and waste materials:
  - a. remind them to remove nails and staples from wood or hammer them flat;
  - b. tell them where the materials will go; and
  - c. instruct them to keep routes and access to exits and dumpsters clear and safe.
- How to safely use the tools assigned for their tasks:
  - a. give instruction regarding how to safely use assigned tools; and
  - b. give instruction regarding how to safely clean and store tools at the completion of the strike.
- PPE requirements including what to wear, when to wear it, how to care for it and how to return or dispose of it at the completion of the strike.
- Basic electrical safety training.
- Prohibited behavior, such as horseplay, working under the influence of drugs or alcohol, etc.

Prior to starting deconstruction tasks, conduct a safety meeting to review the task steps.

## **PROVIDE PPE AND APPROPRIATE TOOL TRAINING**

The appropriate use of PPE reduces the risk of injury. The PPE necessary for each crew member will depend on the task they are assigned and the work that is occurring around them. Provide and require the use of:

- Hard hats when overhead hazards are present.
- Safety glasses and goggles when using hand and power tools or when there is a risk of flying debris.
- Work gloves when required to handle materials with abrasive edges.
- Reflective vests when increased visibility is required.
- Chemically resistant gloves when hazardous chemicals are used.

Provide the appropriate tools for the tasks to be completed. Require proper use and training.

## **REDUCE DISTRACTIONS**

Distractions during strike activities increase the risk of injury. Strikes are already noisy. It is not unusual to have to shout to be heard. Prohibit the use of personal entertainment devices. Distractions can also be caused by unauthorized personnel "visiting" the strike. Limit the strike to authorized personnel. If students must be there to observe the operations, require them to adhere to all safety rules and precautions expected of the crew, and require them to be continuously supervised.

## POST-STRIKE REVIEW

After each strike it is important to conduct a review. Ensure the review addresses the following:

- What lessons can be learned from the events of the strike?
  - a. What went well?
  - b. What did not go according to plan?
  - c. What needs to be changed?
  - d. What should be done differently?
  - e. How will you ensure the change occurs?
- Did any injuries happen, even minor ones?
  - a. Why did each injury incident occur?
  - b. What could be done to prevent a recurrence at the next strike?
- Were there any near miss incidents?
  - a. Why did each incident occur?
  - b. What can be done to prevent a recurrence?
- What should increase?
  - a. PPE?
  - b. Rest periods?
  - c. Training?
- Are there policies or procedures that need to be amended or created?
- How will you share the information from this meeting to benefit others?
- How do you hold yourselves and others accountable?



## FALL PROTECTION

Fall hazards for set construction are also present during strike. Please take the time to review the fall protection information located in Section 12: Fall Protection.

## Section 28: Slip/Trip/Fall to Same Level

A simple slip or trip that results in a fall to the same level can result in serious injury. It isn't necessary to be working at heights to suffer injury from falling down, so everyone is at risk. You can avoid slips, trips, and falls by observing some simple safety guidelines.



### GENERAL SLIP, TRIP, FALL PREVENTION GUIDELINES

- Wear the appropriate footwear for the environment. For example, wear sturdy work boots with non-slip soles in the shop and backstage areas.
- Walk rather than run.
- Ensure you allow enough time to travel and avoid rushing.
- Focus on where you are walking.
- Never talk on the phone, text, or read email or texts while walking. Give your attention to where you are stepping.
- Never carry loads that obstruct your field of vision.
- Get assistance for carrying heavy loads or take smaller loads and make more trips.
- Use a material handling device, such as a cart.
- Clear the path of travel prior to moving materials.
- Keep the floors swept and clear of debris.
- Keep the aisles and passageways clear of stored items and other obstacles.
- Hold onto the handrails when walking up or down stairs.
- Never run up or down stairs.
- Keep drawers of filing cabinets, storage cabinets, and desks closed. Never turn your back or walk away from an open drawer.
- Immediately clean up any liquid or dry material spills. Ask someone to watch the area of the spill if you have to leave to obtain clean-up materials.
- Follow the specific procedures established for cleaning up chemical spills and disposing of the waste material. Report the spill and evacuate the area if you have not been trained to clean it up properly and dispose of the material. For more information, see Section 15: Hazard Communication.
- Prior to leaving the area with a spill, complete the entire cleanup process including sweeping and removing the absorbent materials.

- Keep cleaning materials, such as absorbent materials, brooms, dust pans, and waste containers adjacent to areas that are routinely contaminated with debris and/or spills.
- Use warning cones and signs to warn of wet floors, regardless if moisture is from cleaning or weather conditions.
- Provide umbrella bags or storage areas near entry doors during inclement weather.
- Increase the length of entry mats during inclement weather.
- See Section 13: Front-of-House and Section 14: Fire and Life Safety for more information.

## Section 29: Special Effects

A variety of special effects can be found in performing arts productions. The list is extensive and includes, but is not limited to, atmospheric smoke, fog, and haze; confetti; snow; foam; lasers; strobe lighting; pyrotechnics; fire; explosives; pits; trap doors; changes in elevation; flying and rigging performers and other objects; and suspended items above the audience.

Special effects pose hazards that increase the risk of personal injury and property damage; therefore, the use of designated special effects should be reviewed and approved by your EH&S Office, Risk Management Office, and/or Risk Coordinator. In some cases, the Campus Fire Marshal must also approve their use.

### ATMOSPHERIC SMOKE AND FOG



Smoke is an atmospheric effect composed of solid particulate produced by combustion, where fog or haze is composed of liquid droplets. Smoke is produced using pyrotechnic materials, such as white or color smoke cartridges, or other flammable substances. Fog or haze can be produced using a variety of commercially available machines using glycol, glycol/water mixtures, water, mineral oil, or dry ice. The use of the equipment to produce these special effects can result in operator injury from chemical exposure, fire, or explosive discharge. Train all operators prior to permitting them to work with the chemicals, equipment, and devices that produce these special effects.

Many people are sensitive to smoke or the airborne constituents of smoke, fog, or haze equipment. When smoke, fog, or haze is approved for use in a production, warnings must be posted at the front of the house, at entrance doors to the theater, and in the program. As an example, the following communication could be posted: “WARNING: Synthetic fog is used during this performance.”

The use of atmospheric smoke, fog and/or haze may change a non-hazardous confined space into a hazardous confined space. Consult with your EH&S Office, Risk Management Office, and/or Risk Coordinator prior to using atmospheric smoke, fog, or haze.

### LASER AND STROBE LIGHTS

Laser and strobe lights can induce seizure in some people with epilepsy or photosensitivity. When laser and/or strobe lights are approved for use in a production, warnings must be posted at the front of the house or entrance doors to the theater and in the program. As an example, the following

communication could be posted: “WARNING: Laser and/or strobe lights are used during this performance.”



Some laser lights have the potential to cause eye damage if a person stares directly at the light, and some lasers can cause skin burns if too strong or too close. Consult with your EH&S Office, Risk Management Office, and/or Risk Coordinator with any questions concerning the use of lasers. Only Class 2 lasers may be used. Approved laser lights must meet requirements set forth by the Food and Drug Administration’s (FDA’s) Center for Devices and Radiological Health. Only employees trained to do

so may operate laser lights. Inform all performers and crew in advance and educate them regarding the hazards and safety precautions associated with the use of lasers and strobe lights.

The use of laser lights in outdoor theaters can present a threat to aircraft operators. Therefore, the use of laser lights in outdoor theaters is prohibited unless prior permission is obtained in writing from the Federal Aviation Administration (FAA).

## **OPEN FLAME, PYROTECHNICS & EXPLOSIVES**

**Never Use Explosives**

Explosives should never be used in the performing arts in Utah K-12 or Higher Education Schools. The use of open flame (candles, fires, matches, lighters, etc.), pyrotechnics, or explosives can result in tragedy. Consequently, the use of open flame and pyrotechnics is prohibited in K-12 schools and highly discouraged at the university level. Universities who consider using open flame or pyrotechnics must obtain approval from the Office of the State Fire Marshal through their University Fire Marshal. Further, they should also consult with the Utah Division of Risk Management. Each event should be discussed on a case by case basis and include a risk analysis. Is the proposed activity within the university’s risk appetite? All use of open flame or pyrotechnics on a college or university campuses shall comply with all applicable codes. There are a number of things that must be considered including, but not limited to: drought, venue attributes, venue location, audience size and location, vendor attributes including available insurance, staffing, safety feasibility, and the Utah Division of Risk Management coverage exclusions for bonfires, fireworks, and pyrotechnics. Colleges and universities are subject to all official orders regarding state lands unless specifically excluded.

**K-12 Schools Shall Never Use Open Flames or Pyrotechnics as Part of Performing Arts; All Others Must Have Pre-Approval From The State Fire Marshal**

Fire permits are required in most jurisdictions for the use of open flame in an assembly area and for the use of fireworks and pyrotechnics. Contact the Campus Fire Marshal well in advance of the performance, including its marketing and advertisement, for assistance in contacting the State Fire Marshal's Office.

## **SNOW, CONFETTI & FOAM**



Artificial snow is made from chemical mixes, shredded paper, or plastic. Chemically produced snow may pose hazards such as skin and eye irritation or internal ingestion risks. Check the Safety Data Sheet (SDS) for any warnings and safe use directions. Share these warnings and directions with the performers and crew.

Shredded paper, shredded plastic, or foam may be used as confetti or artificial snow. These materials can produce dust that can be a fire hazard, and/or result in eye or respiratory irritation.

- Never use these materials when an open flame or other ignition source is present.
- Provide dust masks when necessary to crews assigned to clean up the material.
- Never reuse disbursed material, as it can become contaminated with moisture or other debris from the floor.
- Clean up the disbursed material immediately following each performance or rehearsal.
- Dispose of the material in closed metal containers.
- Use flame-proofed materials when possible.

Confetti cannons typically used compressed air to shoot confetti. Never shoot them towards people or animals. They should be shot upwards. K-12 students should never shoot confetti cannons.

## **PITS, TRAP DOORS & CHANGES IN ELEVATION**



Pits, trap doors, and changes in elevation (stairs, ladders, etc.) pose trip and fall hazards. To reduce the risks of trip and fall incidents:

- Mark changes in elevation, including the edge of the stage, with phosphorescent tape or LED lights as appropriate.
- Inspect ladders and stairs for stability prior to each performance and rehearsal.
- Lock trap doors in place when not in use.
- Lock pits in place when not in use.
- Use barricades and other signs to restrict under-stage access to pits and trap door operations to authorized crew and performers.
- Rehearse the proper use of trap doors.

Temporary fall protection measures may be required during rehearsals around open traps, elevated stage platforms, or at the leading edges of the stage or orchestra pit. Identify these hazards during the production planning process and install temporary rails or create a controlled access zone to prevent individuals from falling into or off of these features.

## **FLYING PERFORMERS & HANGING OBJECTS**

### Flying

Temporary fall protection measures may be required during rehearsals around open traps, elevated stage platforms, or at the leading edges of the stage or orchestra pit. Identify these hazards during the production planning process and install temporary rails or create a controlled access zone to prevent individuals from falling into or off of these features.

Flying and rigging performers and other objects poses a hazard to the performers and crew below. It also poses a hazard for the performers being flown. Contact your EH&S Office, Risk Management Office, and/or Risk Coordinator for approval when planning to fly any performers in a production. Use the services of a professional rigging company with a professional technical engineer that has suitable experience in rigging performers and flying overhead objects. Ensure the company has proper insurance and that you can transfer the risks to them.

'Flying' actors in approved safety harnesses requires strict safety controls including utilization of a reputable flying effects company to train the actors. A reputable flying effects company will train your participants how to properly wear a safety harness as well as how to safely operate the flying controls. Ensure proper harness training is provided. Two types of harnesses are commonly used: a two-point seat harness or a full body harness. It is critical to ensure students are trained. Each harness must be inspected before each use. The harness must fit correctly and securely before the performer is lifted. Never allow unauthorized individuals or students to use harnesses. Never allow flying over the audience. Ensure emergency rescue procedures are in place if needed.

### Suspended Items

If an unusual item or particularly challenging items are to be suspended, contact your EH&S Office, Risk Management Office, and/or Risk Coordinator for approval. Avoid suspending objects above the audience. All items suspended should be rigged and hoisted by a professional rigging company. Safety straps must be installed in addition to the rigging to prevent a catastrophe in the event of failure.

# Section 30: Special Props

Special props, such as weapons, add realism and excitement to productions. They also increase the risk of injury to the cast, crew, and audience, so special care is needed when handling, using, and storing them.

## Prior to Use



- Obtain written permission from your EH&S Office, Risk Management Office, and/or Risk Coordinator for the use of weapons before weapons are obtained or used. However, K-12 schools should never use real firearms or weapons with sharp edges or points.
- Never use personal weapons in a production.
- Never bring personal weapons on site.
- Only use props owned or rented by your entity.
- Follow your weapons checklist for each production to ensure all weapon requirements are met.
- Notify Campus Law Enforcement when weapons will be used in any production.
- Review safety precautions to be observed prior to each training, rehearsal, and performance session.

## **K-12 Schools Should Never Use Weapons with Sharp Edges or Points**

### EDGED WEAPONS

The category of edged weapons includes piercing weapons, and examples include, but are not limited to, knives, swords, rapiers, razors, arrows and bows (recurve and crossbow), pitchforks, maces (spiked ball on a chain), hatchets, axes, saws, spears, kunai, throwing stars, and darts.

In addition to the list above, prior to using any edged weapons, adhere to the following:

- Only use weapons designed for stage combat for stage combat, as these weapons are constructed to be strong enough not to break into dangerous pieces during use.
- Ensure the edges of the edged weapons are dull, and the tips of piercing/pointed weapons are blunted.

### Use and Handling

- Never play with weapons or engage in horseplay.
- Never remove the weapons from the stage or backstage area without prior authorization.
- Only use weapons during supervised training, rehearsal, and performance sessions.
- Review and practice choreography prior to the actual use of the weapons.

- Never leave weapons unattended.
- Inspect weapons for damage after each use.
- Immediately report weapons that are damaged during training, rehearsals, or performance, and submit them for repair. Damage may include burrs caused by contact with hard surfaces.
- Wear the appropriate personal protective equipment such as hearing protection, eye protection, face protection, and body protection during training, rehearsals, and performances.

### Storage

- Keep all protective devices, such as sheaths, scabbards, and edge guards in place until ready to use the weapon.
- Keep kunai and throwing stars in storage cases when not in active use.
- Store weapons in locked cabinets and/or storage rooms.
- Store bows in an unloaded state (releasing the string) until needed for use onstage.
- Store arrows in a separate location from the bows.

## FIREARMS

K-12 Schools should never use real firearms, including firing blanks. Audio system sound effects must be used when sound is desired.

### **K-12 Schools Must Never Use Real Firearms in Any Way**



The Utah Division of Risk Management strongly discourages the use of real firearms for higher education. Even blank rounds are dangerous. Discharged wadding can cause injury or death. Also, the noise levels produced by the discharge of firearms can cause hearing damage. Take firearms safety seriously. If a higher education institution still wishes to use blanks in a production, your entity may have rules prohibiting you from doing so. First consult with campus police, your EH&S Office, Risk Management Office and the Utah Division of Risk Management.

## LIVE ANIMALS

Live animals in theater productions can pose a variety of hazards and challenges. The animal may cause illness or injury to the performers, crew, or audience. Materials for the care of the animals may increase the fire load within the building and may otherwise be hazardous to human health. Animals must be pre-approved by your EH&S Office, Risk Management Office, and/or Risk Coordinator. Please note, however, the use of live animals is usually prohibited in K-12 schools.



The animals themselves may be harmed by the actions of the performers, crew, or audience. Physical injury, such as scratches, bites, contusions, and broken bones can result when animals are frightened or threatened and use their natural defensive mechanisms. Animals can also transmit illnesses to humans through scratches, bites, simple contact, secretions, and airborne pathogens. Animals may also cause flea infestations. Performers and crew members may have an allergic reaction to the animals.

Ensuring the safety of the performers, crew, audience, and the animals requires adhering to specific steps before allowing the use of any animal in a production.

## **Never Use Poisonous Animals**

### Conduct a Risk Assessment

The use of live animals in performing arts activities may require the review and approval of your EH&S Office, Risk Management Office, and/or Risk Coordinator. As part of production planning, contact your Risk Coordinator early in the decision-making process and request assistance. Your Risk Coordinator, EH&S Office, or Risk Management Office can help you work through the risk assessment process and document the safe procedures for handling and caring for the animals.

Your risk assessment should answer these fundamental questions:

- Is the animal essential to the production?
- Are there alternatives?
- How will the producers ensure the animal is obtained only from a competent handler/trainer or other legal provider?
- Will the animal be exposed to other animals on stage or in the audience?
- What hazards are posed by the animal's natural behavior when reacting to loud noises, lighting, special effects on stage, stunts, other animals on stage, or service animals in the audience?
- How can you influence the animal's behavior?
- With whom will the animal interact or have contact (i.e., crew, performers, or audience)?
- How much contact will there be with the animal?
- What routes of entry might microorganisms be transmitted (i.e., hand to mouth contact, mouth to mouth contact, secretions, bites, scratches, or airborne)?
- How will the animal's movements be controlled?
- How will bodily fluids and secretions be managed?
- Who will be responsible for the animal on campus? Off campus?
- How will separation between the animal and any food and beverage areas be maintained?
- Who will be the animal handler/trainer? What training have they received?

- Where will the animal be housed during the course of the production and between performances?
- How will the animal be fed and cared for during the course of the production?
- Will materials needed for the care and comfort of the animal, such as hay and/or straw, increase the fire load in the theater?
- What are the costs of including the animal in the production? Be sure to consider all fees, licenses, rentals, equipment, insurance, security, food, veterinary inspections/care, maintenance products, and waste disposal.
- What special emergency response and evacuation procedures need to be developed?



### Control Measures

If the decision to use animals is approved after the risk assessment is completed, work with your EH&S Office, Risk Management Office, and/or Risk Coordinator to develop control measures designed to help protect the cast, crew, audience, and the animals. The following control measures must be activated.

#### Develop an Animal Care Plan

Develop an “Animal Care Plan” to ensure the safe and humane treatment of the animal and the safety of the performers, crew, and audience. Ensure

the plan details the following:

- The trainer/handler should be responsible for the care and behavior of the animal at all times.
- How the animal will be transported to and from campus and what travel paths will be used for the animal’s transportation.
- How the animal’s movements will be controlled when waiting for rehearsals and performances on-stage and during transportation.
- Determine the frequency of the rehearsals and performances for the animal; ensure the amount of time is kept to a minimum.
- How long the animal will be on campus.
- How food and water will be provided while waiting for rehearsals and performances.
- What measures will be taken to ensure the animal is able to relieve itself.
- Who will dispose of the waste and ensure the area is kept sanitized?
- Who will groom the animal?
- How will the animal be protected from unnecessary handling, such as excessive contact from crew or patrons, petting, or impacts from production noise?
- What are the emergency response and evacuation procedures for evacuation, escape and recapture, injury to the animal or individuals?
- What is the name and contact number for the animal’s owner, the animal’s trainer, and the emergency veterinarian?



Work with Campus/LEA Risk Manager or Coordinator

Work with your Risk Management to identify any insurance and/or contractual obligations. Risk Management may direct you to:

- Notify all potential performers and crew members of the animal's participation. Ensure they understand the amount of animal contact anticipated and the potential hazards associated with it.
- Obtain parental permission forms for minor performers and crew members. Obtain liability waivers for adult staff, crew, or performers. Ensure the forms require the disclosure of any known allergies.
- Obtain written verification from a licensed veterinarian that the animal is healthy. This must be obtained prior to bringing the animal on campus or school grounds.
- Ensure an adequate number of competent people have been retained to control the animal.
- Obtain written verification that the animal is properly licensed where required by local ordinances.
- Provide adequate means to maintain personal hygiene before and after animal handling.
- Provide the appropriate personal protective equipment whenever needed (for example, safety shoes when working with large animals, gloves when working with large birds, etc.).
- Ensure patrons and the public are informed that animals are in the production. As with special effects notifications, this information should be included in advance advertising, posted in the lobby, and printed on the program.
- Obtain a signed contract with the animal's owner/handler that has been approved through your Risk Management.
- Or recommend not using the animal.

# Section 31: Spray Booth and Spray Finishing Operations



Any spray painting or work with finishes that emit vapors or generate a fine mist should be done in spray booths. Some may or may not have an odor. Therefore, it is important to check to see if the Safety Data Sheet (SDS) state that the material is volatile. Generally, the prop shop utilizes spray paint and spray finishes more than any other area in the performing arts.

Water-soluble latex or acrylic paint and glaze materials are standard in prop shop painting and in the use of pure pigments for mixing into glaze, dyes for French Enamel Varnish (FEV) work, bronzing powders, and gold leaf. Supplies include buckets and pails, brushes, wood combs, and sponges.

One of the major risk exposures to the performing arts is the use of chemicals. Training must include physical and health hazards of all chemicals used. Training should also include safe handling precautions, emergency/first aid procedures, and proper chemical storage, especially that of flammable liquids. Follow the specific manufacturer's instructions for each product, and the following safety guidelines:

- Read the product labels and the SDS to identify the potential hazards of the paint or other products in use.
- Know the product's ventilation requirements.
- Do not eat or drink while painting or doing work with finishes. Do not keep food or drink in your work area and wash hands before eating or drinking.
- Keep containers closed except when in use.
- Control ignition sources in areas where flammable liquids are used.
- Never puncture aerosol cans or expose them to high heat.
- Dispose of the product as directed by the manufacturer and in accordance with your Campus Hazardous Waste Management Program. Contact your EH&S Office, Risk Management Office, and/or Risk Coordinator if you have questions.
- Know and understand the chemical spill procedures for each product handled.
- The paint booth filters must be replaced whenever dirty or clogged, but not less than once per year.
- Paint booth doors must be self-closing.
- To prevent overspray accumulation, sprinkler heads in paint booths must be paper bagged.
- The spray booth exhaust flow must meet or exceed one hundred (100) linear feet per minute of flow for operator safety.
- Paint booths should have Class I, Division I explosion proof fittings and fixtures.
- No spray finish operations should occur within twenty (20) feet of any sparking equipment.
- Immediate access to a fire extinguisher must be provided near paint booths.



For more information see Section 4: Chemical Hazards, Section 15: Hazard Communication, and your Campus/LEA Hazard Communication Program.

Chemical waste is often hazardous waste. Dispose of waste as directed by the product manufacturer and in accordance with your Campus/LEA Hazardous Waste Management Program. Contact your EH&S Office, Risk Management Office, and/or Risk Coordinator for more information and guidance regarding hazardous waste management.

# Section 32: Storage

Proper storage practices help ensure exit pathways and doors are accessible, fire hazards are avoided, chemical exposure risks are prevented, and the risk of injury is reduced. Storage practices apply to all areas, and everyone has a responsibility to keep tools and materials properly stored.

## GENERAL STORAGE PRACTICES

- Storage areas must always be clean and dry.
- Keep stored items at least eighteen (18) inches below fire suppression sprinkler heads.
- Keep stored items at least twenty-four (24) inches from the ceiling in areas that are not sprinklered.
- Never obstruct doors, doorways, or exit pathways.
- Maintain a clear, unobstructed space of at least thirty-six (36) inches, in all directions, from electrical service equipment, fire extinguishers, fire hose stations, and fire alarms.
- Never hang stored items on or from fire suppression sprinkler pipes or sprinkler heads.
- Secure overhead storage.
- Never allow stored items to extend beyond the storage shelf.
- Store small items within sealed storage containers to promote stable storage.
- Ensure stacked items are level or secured to prevent tip-over.
- Secure lumber, brooms, and ladders to prevent them from falling or sliding out of their storage areas.
- Label storage areas and shelves. This promotes returning items to their designated storage area.
- Conduct routine inspections of storage areas for early identification of safety and storage issues.

## CHEMICALS (PAINTS, THINNERS, DYES, SPRAY PAINT, CLEANING PRODUCTS, ETC.)



It is imperative that chemical storage is done properly to avoid fire and hazardous safety issues. Store flammable/combustible materials in designated NFPA-approved flammable storage cabinets. Always avoid storing oxidizers and flammable/combustible materials together. Segregate them from other types of non-compatible chemicals. Store corrosive acids and bases separately. Segregate these too from other types of non-compatible materials.

## HAND AND POWER TOOLS

- Store tools in their custom storage cases whenever you have them.
- Keep guards and protective sheaths in place when storing sharp-edged tools.
- Coil power cords and hoses. Keep them on shelves or in bins to prevent a tripping hazard.

## Section 33: Stunting and Aerial Dance



### STUNTING IN HIGHER ED

Follow your performing arts college/department guidelines. Guidelines may vary by college within a University. Keep safety as a priority. All performers, equipment and maintenance staff must be properly trained.

### STUNTING IN K-12 SCHOOLS

#### General Concept of Progression

Teachers must follow the general concept of progression. As they do lesson planning and choreographic exploration, they must teach students all the necessary preparatory steps to execute a complex concept or movement. In other words, they must make sure that students master basic steps before moving on to more difficult or complex ones. Performing arts departments should not attempt cheer like stunts or pyramids without proper training. All applicable National Federation of State High School Associations (NFHS) safety rules must be followed.

- Without help, students should demonstrate that they have the arm and core strength to orient themselves upside down. Cheer teams often use the "Ground-Up" model for this skill which can be useful for the performing arts. The model is also helpful for some teacher/student assisted exercises.
- Follow all weight sharing/bearing concepts when performing stunts and skills with a partner.
- Use common sense when deciding to move on to more advanced moves. It is imperative for the teacher to understand students' abilities and not to push them beyond their physical limits.

## Lifts and Partner Lifts

- Anyone acting as a base must not assume a backbend, headstand or similar position. They should never hold objects in their hands while supporting a top person.
- When acting as a base for an extended lift, the individual must have both feet in the direct of the weight-bearing contact with the performing surface.
- Use spotters to help control a partner lift (ascending or dismounting) or release skill or toss.
- For safety purposes, a spotter must be in the proper location with the appropriate body position to help minimize risk to the top person. They must remain visually focused on the head, neck and shoulders of the top person.
- A spotter should not place his or her torso underneath the lift or partner lift. A spotter should keep their hands free in order to spot and minimizing risk. A spotter is required for rehearsals and performance of lifts, partner lifts, release skills or transitions that stop in an extended position.

## Inverted Positions

- During any production, the top person in a lift or partner lift should mostly remain in a non-inverted position. An inverted top person may pass through an extended position but must not begin, end, pause or stop in an extended, inverted position.
- For inversions where the base of support begins and remains below shoulder level, at least one person shall be in a position to protect the head/neck of the top person and shall maintain contact with the top person's upper body (waist and above, which may include his/her hands/arms) until the top person is no longer inverted or his/her hands are on the performing surface. This contact shall be sufficient to stabilize/control the top person's position.

## Non-Release Lifts

- Non-release lifts and partner lifts should never be performed above two levels. Two levels means that the top person(s) receives primary support by one or more bases who are in direct, weight-bearing contact with the performing surface. In other words, the bases are the first level, the top person is the second.
- A participant must not move over or be under a partner lift except when helping to build, stabilize or dismount the partner lift.
- A top person may be moved from a vertical position to a cradle or horizontal position (straight body) provided all the following conditions are met:
  - a. The top person maintains contact with at least one base or spotter.
  - b. At least two individuals (catchers and/or bases) catch the upper body of the top person.
  - c. The catchers must be to the side or front of the person(s) moving the top person.
- When the catchers are not the bases, they must remain close to the bases in order to be in place prior to the top person's position change.
- A flip from the performing surface that lands in a partner lift or cradle position is not permitted.
- A person must not jump unassisted onto the back of another person who is in a horizontal position.

- A top person should never flip off any stationary object, such as a prop, desk, bleacher, platform, scaffolding, or any other object.

### Release Skills/Tosses

- In all release skills and tosses, the top person must be directed vertically and be caught by the original bases.
- The top person should never land in an inverted position.
- Participants should never pass over or under other participants, or through or over a prop during any release skill or toss.
- The top person should never make more than 1 full turn during a release.
- Any toss or release skill that is one foot or more above the tosser (person throwing) must be performed on a padded surface. Mats must be at least one and a half (1.5) inches thick.
- The top person must not hold objects in their hands.
- A helicopter type move is permitted, provided that the rotation in the horizontal plane is not greater than 180 degrees. Further, the top person must be in a face up position and must not twist. There must be at least four bases who serve as both tossers and catchers. The tossers and catchers must be in position to protect the top person's head, neck and shoulders for the entire duration of the skill or release.
- A log roll is permitted. However, it must not involve more than one complete rotation and the top person is not in contact with another released person.
- Toe or leg pitches to a jump or tumbling skill are not permitted.
- Swan dives are not permitted.
- Always use the progression process. Always have more spotters than required until the skill is mastered.
- Use common sense when deciding to move on to more advanced moves. Always consider the performers' abilities. Never push them beyond their physical limitations.

### Suspended Stunts

Suspended stunts and lifts can be impressive, however great care is needed to stay safe.

- There must be at least two bases for non-braced, suspended splits that originate below prep level. The top person must have both hands in contact with at least one individual on the performing surface.
- For non-braced, suspended splits that originate from prep level or pass through or above prep level, the top person must have both hands in contact with one or both bases once he or she has reached the full split position.
- For swinging stunts, any downward movement must begin from below prep level. Further, the top person must be face up. The top person should begin on the performing surface or in a stunt that is below shoulder level.

### Dismounts and Catches

Unless otherwise stated, dismounts to the performing surface from shoulder level or above (including from props) require assistance from a base or spotter. The base or spotter must be able

to slow the decent of the top person. Bases and catchers should not move during a dismount. If a dismount involves a skill (e.g., toe touch, twist, etc.) two bases or a base and a spotter are required. Advanced partner lifts and releases (ballroom lifts, cheer-type lifts, or other dance or drill lifts) must be taught with appropriate spotters.

### Props with Elevated Weight Bearing Surfaces

Props are not always designed to hold weight. Therefore, performers should never climb, sit, stand, or dance on props that are not specifically designed to hold them. Even when a prop is designed to hold one or more persons, great care must be taken.

## **K-12 Students Must Never Perform Lifts or Partner Lifts While on Elevated Props**

Never perform an inverted position or stunt while dismounting a prop. A performer may mount a prop from a forward roll only when it is safe to do so. Otherwise, never tumble or perform any other inverted position onto a prop. Avoid tumbling on props, unless there is adequate space on the weight bearing surface and the surface is no more than three (3) feet high. Students must refrain from doing any other inverted positions while on props.

Other safety precautions to follow:

- Never climb, sit, stand, or dance on props that are not designed to hold weight.
- Props that are designed to hold weight must be secured while in use.
- Props must be free of hazards such as sharp edges or splinters.
- The weight-bearing surface of a prop must not exceed five (5) feet in height.
- Performers must maintain contact with the prop if it is over three (3) feet high.
- Stacked props must be secure and properly fastened to one another. The props must maintain balance at all times.
- Dismounts to the performing surface from props higher than three (3) feet must have an assisted landing.
- Never do cradle dismounts from props higher than three (3) feet.

### Tumbling, Gymnastics, Drops

- Do not tumble over another person.
- Do not tumble while holding props.
- Never perform dive rolls.
- Never perform flips that land in a partner stunt or cradle.
- Do not perform more than one full flip, cartwheel, summersault, twist, or other inverted stunt at a time.
- Do not jump from a standing or squatting position backwards onto the neck, shoulders or hands. Never perform rubber band/kip up skills.

- When completing airborne drops, performers should catch their weight on their hands or feet as opposed to knees, abdomen or other body parts.

### **AERIAL DANCE IN HIGHER ED**

Follow your performing arts college/department guidelines. Guidelines may vary by college within a University. Keep safety as a priority. All performers, equipment and maintenance staff must be properly trained.



### **AERIAL DANCE IN K-12 SCHOOLS**

Aerial Dance, which includes silks and aerial skills/arts, are a very hazardous activity involving acrobatic work using fabric, cords, swings, rings and other equipment designed to hold the performer or dancer in the air. Common injuries from falling, twisting, and other risks include pulled muscles, bruises, fabric-burns, choking, and dizziness/nausea. Possible risks include, but are not limited

to, sprains, broken bones, paralysis or even death. Because of the extreme risk associated with aerial dance, K-12 schools should avoid this type of performance.

## **K-12 Students Should Not Perform Aerial Dance**

Fly systems, used to create a flying effect of a person, are okay for use when acrobatics and other hazardous dance movements are not performed. Fly systems must be properly vetted, installed, and maintained. It is best to have a professional fly system company perform this work.

# Section 34: Tools & Machines; General Shop Safety



All employees and students must receive documented training before operating any type of woodworking or metal equipment, machine, or tool. Woodworking and metal work are dangerous. It is important that safe and proper operating procedures are understood and followed.

To lessen the possibility of injury, use machines and tools appropriately. If normal safety precautions are overlooked or ignored, severe injury may result. If the user does not understand the task, equipment operation, or safety precautions, they must seek direction from the instructor, supervisor or teacher. Fundamental shop safety procedures must always be followed. Consult the manufacturer's information and manual for your tool or equipment for specific instructions and details.

## GENERAL SAFETY GUIDELINES

- Complete fundamental shop safety training and tool/machine/equipment specific training prior to beginning work in a wood or metal shop.
- Wear proper shop attire, including closed-toe shoes.
- Wear the proper personal protective equipment (PPE) for your project such as gloves, safety glasses, goggles, and/or a face shield. Hearing protection may be required for not only the operator, but also others in the area.
- Store food and drink in designated locations away from work areas.
- Never consume food and drinks in the work areas.
- Do not wear rings, watches, necklaces, or other jewelry, or loose clothing when using hand and power tools.
- Restrain long hair to keep it away from machinery, tools, and points of operation.
- Store cell phones, MP3 players, and other personal electronic devices. Never use them in the shop.
- Always operate machinery in well-ventilated areas and provide for proper dust removal. Use local exhaust ventilation when available.
- Follow supervisor and teacher instructions.

## WORK AREA

- Maintain clean and organized work areas. Plan ahead to avoid rushing. Allow sufficient time to clean up after a project or task is completed. Sweep up and clean away sawdust and scraps throughout the work process. Keep floors free of slip, trip, and fall hazards. Keep work areas clean.
- Always cleanup work areas and sweep floors after use.

- Inspect tools and machinery prior to use. Never use a damaged tool or machine.
- Shut off and disconnect power from all tools and machinery prior to adjusting or changing out components. Don't work on your tool until it has come to a complete stop.
- Never leave machinery or power tools running unattended.
- Report all injuries, spills, equipment malfunction or damage, and emergencies to the supervisor or teacher immediately.
- Only qualified individuals should repair tools and equipment. Supervisors or teachers must properly lockout and tagout equipment until repair is complete.
- Never dump hazardous waste in drains. Contact your EH&S Office, Risk Management Office, and/or Risk Coordinator for guidance regarding hazardous and industrial waste management. Also see Section 16: Hazard Communication.
- Wash hands thoroughly after completing work.

## HAND & POWER TOOLS



Hand and power tools pose injury hazards that may result from contact with their sharp edges, sharp tips, moving surfaces, power source, point of operation, and material waste generated during operation. This risk for injury increases from inappropriate use.

Training is a critical component for the safe use of hand and power tools. All employees and students must receive documented training before use. Follow these general safety guidelines to reduce your risk of injury.

Use of your personally owned tools is prohibited. Use only the tools provided by your entity. These tools must be properly maintained and have all the appropriate guards.

### General Use

- Safety glasses, goggles, and, when necessary, a face shield should be used when working with tools that generate debris, such as dust, splinters, chips, flakes, or shards. Use them also if construction materials may snap or rebound. Please note, a face shield alone does not qualify as appropriate eye protection. Face shields should be used in conjunction with safety glasses or goggles. Use hearing protection whenever needed.
- Wear proper shop attire, including closed-toe shoes.
- Wear N-95 dust masks when generating saw dust.
- Wear tight-fitting work gloves for handling materials. However, never wear gloves while working with power tools.

### General Safety Precautions:

- Do not wear rings, watches, necklaces, other jewelry, or loose clothing when utilizing hand and power tools.
- Restrain long hair to keep it away from machinery, tools, and points of operation.

- Never use a tool without prior training regarding its safe use.
- Comply with the manufacturers' instructions on tool use and care. Service and maintain tools as specified by the manufacturer.
- Inspect tools before each use to identify any defects, such as frayed power cords, damaged casings, damaged handles, or damaged working surface.
- Remove defective tools from service and immediately report it to your supervisor or instructor.
- Direct the action end of the tool away from your body during use.
- Keep observers at a safe distance away from the work area.
- Sweep up the floor and work surfaces to remove waste and saw dust.
- Properly dispose of waste and saw dust.

Power Tools (tools with power sources: electric, pneumatic, liquid fuel, hydraulic, and powder-actuated):

- Never use power tools on wet surfaces or in wet conditions.
- Never use a tool with its machine or blade guard altered or removed.
- Never carry or hoist a power tool by its power cord.
- Never pull the cord or the hose to disconnect it from the receptacle.
- Keep your finger away from the power switch while carrying a tool connected to a power source.
- Keep power cords and hoses away from sharp surfaces, edges and sources of heat.
- Turn off and unplug power tools before servicing or making any adjustments, such as loading them, changing blades or bits, adjusting settings, or cleaning.
- Turn the power switch off, unplug the tool, and properly store it at the end of each use or end of the work period.
- Secure the work piece with clamps or a vice to ensure tool can be operated and controlled with both hands.

Hand Tools



- Use hand tools only for the purpose for which they were designed. For example, don't use a screwdriver as a chisel or crowbar.
- Remove tools from use when their handles are damaged. For example, wooden tool handles may splinter or crack, or the handle may become loose.
- Remove wrenches from use if the jaws are sprung. Remove impact tools, such as chisels and wedges, from use when the head of the tool is mushroom-shaped.

## **CIRCULAR SAWS AND TABLE SAWS**

All employees and students must receive documented training before operating any type of saw. Woodworking is dangerous. Safe and proper operating procedures must be learned and followed. Proper use will considerably reduce the possibility of injury.

## General Safety Guidelines

- Wear the proper PPE for your project such as gloves, safety glasses, goggles, and/or a face shield. Hearing protection may be required for not only the operator, but also others in the area.
- Wear proper shop attire.
- Tight-fitting work gloves only for handling materials. Never wear gloves while working with power tools.
- Wear tight-fitting work gloves for handling materials. However, never wear gloves while working with power tools.



## General Safety Precautions

- Do not wear rings, watches, necklaces, other jewelry, and loose clothing when using saws.
- Restrain long hair to keep it away from machinery, tools, and points of operation.
- Always exercise caution. Do not proceed without a full understanding of the task at hand and saw interface.
- Never engage in conversations with others while operating a saw. Concentrate on your work.
- Inspect the saw before each use. Ensure the casing is not cracked, the handles are secure, and the power cord is in good condition.
- Never use a faulty saw. Lockout the saw, and report it to your supervisor, teacher or instructor.
- Never change a saw blade or attempt to free a stalled blade until ensuring the switch is in the off position and the power cord is unplugged from the power source.
- Set the cutting depth as shallow as possible to make the cut, while also limiting the exposure of the blade below the material.
- Never carry a circular saw while touching the trigger switch.
- Keep hands away from saw blades. Use a push stick to cut narrow pieces of stock. Use a stop block to crosscut short lengths.
- Never reach in the path of a saw blade, whether above or below the material, or behind the guard. Never reach over a saw or place any part of the body in a saw's path.
- Maintain firm footing; never overreach to complete a cut.
- Always check for obstructions, such as nails or screws before cutting.
- Never start the saw with the workpiece pressed against the blade.
- Never perform any operation free-hand. Always use a rip fence or guide, clamped or nailed to the stock, to position and guide the work during ripping operations.

- Avoid kickbacks (wood thrown back toward you) by keeping blades sharp and maintaining rip fences parallel to saw blades. Never force a saw while cutting.
- Always ensure a circular saw blade has stopped and the lower blade guard is in place before setting the saw down.
- Never use excessive force. A table saw will cut cleaner and be safer at the rate for which it was designed.
- Ensure large pieces are supported.
- Never leave the saw running unattended. Turn the power off. Do not leave until the blade comes to a complete stop.
- Never operate the saw while under the influence of drugs, alcohol, or medication.
- Never stand on a table saw.
- Keep saws in good condition. Keep them sharp and clean for optimal performance. Follow manufacturer instructions for lubricating and changing accessories. Check for damaged parts, alignment of moving parts, binding of moving parts, breakage of parts, mounting, and any other conditions that may affect its operation. Report damage to supervisors or teachers.

## WELDING/SOLDERING/BRAZING



Welding is the most common method of joining metals. Sometimes, constructing a set involves metal fabrication, which requires metal welding and cutting, also known as hot work. Soft soldering, using an electric soldering iron, is a common practice when working with lighting and audio wiring.

Brazing is similar to soldering; however, the temperatures used to melt the filler metal are higher. Welding, soldering, and brazing present significant hazards including exposure to hot materials, ultraviolet light, gases, fumes, noise, and heat stress.

Only trained employees and students are authorized to perform welding, soldering, or brazing work. Your entity may also have a specific policy on who is allowed to perform this work. Check with your EH&S Office, Risk Management Office, and/or Risk Coordinator.

### Fire Watch

OSHA and NFPA recommend a 30-minute fire watch during any operation involving hot work. However, depending on the scope of work and the hazards present, the fire watch may need to be extended to an hour. Consult with your local Fire Marshal, EH&S Office, Risk Management Office, and/or Risk Coordinator.

### General Safety

- Protect all persons adjacent to the welding areas from the infrared rays through the use of noncombustible or flameproof screens or shields.

- Always wear appropriate protective eyewear when doing or watching the work. Soft soldering using an electric soldering iron does not require tinted safety glasses or goggles. However, protective eyewear must be worn as solder can spit and create an eye hazard from the molten metal. Brazing and torch soldering require tinted safety goggles or helmets due to the higher temperatures and potential exposure to ultraviolet light.
- Use all required personal protective equipment, such as leathers, gloves, welding helmets or hoods, leather shoes, fire retardant overalls, and goggles in all welding and soldering operations.
- Inspect welding helmets, soldering goggles and hand shields for leaks, openings, or highly reflective surfaces. Replace them as needed.
- Conduct cutting, welding, and soldering operations only in areas that are, or have been made fire safe.
- Conduct cutting, welding, and soldering operations in well-ventilated areas. Use local exhaust ventilation, such as snorkel hoods or backdraft slot hoods to control fugitive emissions.
- Maintain suitable fire extinguishing equipment ready for use during welding and cutting operations.
- Never use creams or ointments on burns. Expose the burned area to cold water for at least fifteen (15) minutes. Seek medical treatment for any large burns and/or if the burn is second degree (blisters) or third degree (the skin is charred).
- Maintain your personal protective equipment in good condition. Talk to your supervisor or instructor if you have any questions about the requirements.
- Ensure an emergency response burn blanket is available.
- Discard welding rods, solder, and dross in accordance with your entity's hazardous waste disposal procedures.
- The welding exhaust system must be fully functional and used whenever any amount of welding takes place.
- Do not store, prepare, or consume food and beverage in or around areas where cutting, welding, or soldering operations occur.
- Always wash hands with soap and water when done.
- Maintain designated fire watches for 30 minutes or more whenever cutting, welding or soldering.

## Gas Welding

- Store and transport compressed gas cylinders in an upright position with valve protective caps on. Secure cylinders in an upright position using two restraining devices made of non-combustible material, such as metal straps or chains. Place the restraining devices within the top and bottom 1/3 of the tank. Never use ropes or canvas straps as these will be destroyed in the event of a fire.
- Welding gasses must be properly separated in storage. Cylinders cannot be stored on carts. OSHA requires that regulators be removed, safety caps be installed, and cylinders be separated if not used within a 24-hour period.
- Never store or place cylinders where they are exposed to heat, flame, impact, electric arcs or circuits, high temperature process equipment, or sparks.

- Tag empty cylinders with an “EMPTY” tag and store them separately from full ones with the valve cap in place.
- Ignite torches using only friction lighters or other approved devices.
- Unless staged on a welding cart for immediate use, acetylene and oxygen gas cylinders must be separated by at least twenty (20) feet, or by a fire wall at least five (5) feet in height with a 30-minute rating. This applies to both full gas cylinders and tanks considered empty.

### Arc Welding and Cutting

- Remove electrodes from holders prior to leaving the area. Situate holders in order to prevent student or employee injury.
- Always unplug the soldering iron if you have to leave the area and when you finish the job.
- Never leave a hot soldering iron unattended.
- Keep power supply switches in the off position whenever arc welders or cutters are not in use or during transport (even if moving inside a room or building).
- Never unplug a machine while it is in the on position.
- All students, employees, and observers must cover their skin completely while conducting or observing welding operations to prevent ultraviolet burns or damage.
- Keep power cables and welding leads clear of walking and working areas to reduce the potential of a trip and fall injury.
- Always wear appropriate protective eyewear.
- Use lead free solder to reduce the potential exposure to lead fumes, dust, and debris.
- Conduct soldering operations on a fire-proof or non-flammable surface to reduce the risk of fire. Keep the work area clean and free of clutter and combustible materials.
- Always use a secure soldering stand, and always place the soldering iron in the stand when you put it down.
- Never touch the tip or element of the soldering iron to check if it is hot.
- Always allow the work piece to cool before touching it.
- Let the soldering iron fall if you drop it. Never try to catch it as it falls. Immediately, pick it up by the handle and place it in the stand.

## Section 35: Conclusion



The Utah Division of Risk Management understands the great value that performing arts brings to K-12 and Higher Ed programs. There is great joy and positive impact for students, teachers, staff and audience members. We encourage you to keep safety as a priority through your performing arts endeavors. We hope this manual will be a helpful resource and a guide to you. When in doubt, talk to your EH&S Office, Risk Management Office, and/or Risk Coordinator. Enjoy and be safe!

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