

School Stage and Auditorium Safety: Rigging

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Some of the most overlooked, yet significant, safety hazards in your school building occur in a place you are least likely to look for them – on the stage and in the auditorium. Losses can be catastrophic, however, with proper maintenance, training, and inspections, you can minimize the risks. To assist NYSIR subscribers in managing risk, this article about stage rigging is the first in a two-part series addressing stage and auditorium safety.

Types of Rigging

Counterweight Systems

The most common type of stage rigging in schools is the manually operated counterweighted rigging system. The popularity of this system stems from its lower cost, its flexibility, and its ability to allow scenery and curtains to fully enhance the performance. However, counterweight systems require trained operators to use them safely. The operator must be able to keep the system balanced, (the counterbalancing weight must match the weight of the scenery, curtains and lighting equipment), for safe operation.

Rigging systems generally operate like elevators, with weights that balance the load. The loads are attached to pipe battens that support the lights, scenery and curtains. Each batten is connected to an arbor, by means of a steel aircraft cable which is threaded through "Loft Blocks" and a "Head Block" and finally to a "Counterweight Arbor". Counterweight Arbors ascend and descend along vertical steel rails and require manila "purchase" lines looped through "Floor Blocks" that are then moved by hand. The "Floor Blocks" must be firmly secured to the floor. These "Lift Lines", as they are known, are locked in place by "Rope Locks" ensuring that each batten can be locked at the necessary height.

Motorized Systems

A motorized rigging system uses winches to lift loads. It's safer and less complex to operate than a counterbalance system, but the cost, approximately three to four times the cost of counter-balance systems, makes it an unpopular choice for schools.

Keeping Rigging in Working Order

Administrators should be aware of the potential for problems so they can discuss stage safety intelligently. Excessive noise, fraying/flattened wires, or bent pipe battens indicate that a problem exists. When problems



are suspected, a responsible operator should lower the system until it can be properly evaluated.

Rigging systems suspend hundreds of pounds of equipment directly over the heads of everyone on stage and backstage. To prevent accidents, rigging should always be routinely inspected and maintained to prevent catastrophic system failure. Stage rigging needs to be checked to ensure that:

- Parts are lubricated
- Ropes are not frayed, stretched, nor do they have dry rot
- Cables are in good condition and properly connected
- Weights are properly secured
- Pipe battens are not bent

How frequently is rigging inspection required at school stages? New York State Education Department, (NYSED), regulations require annual visual inspections by a qualified Code Enforcement Official and the

Director of School Facilities, and inspections every five years by a licensed architect/engineer. Consider adding your stage rigging to the annual inspection list so that it is never overlooked. There also are companies that will perform an inspection of your stage equipment. The costs will vary, depending on the size and complexity of your stage rigging system. An approximate price range of stage inspections is anywhere from \$250 - \$1,000 and the process takes about one full day.

Inspection Reports and Records

Following the professional survey of the stage rigging system, an inspection report should be prepared which includes the entire stage, from the floor to the ceiling, and all parts between. The report should be submitted listing all deficiencies and supported with photographs and/or video. This report should be shared with appropriate administrators and staff for review of the written proposal and to schedule necessary follow up actions.

Careful record keeping in a stage file, one for each stage in the building, should contain the following items:

- Maintenance records
- Previous inspection reports
- Copy of stage manual
- Contact information for stage contractor
- Pictures
- Log of problems noted
- Information on stage curtains
- Records of all communications regarding the system

Training and Instruction

Proper training should be provided to any staff member who works backstage. Untrained operators pose a serious danger to others. Although there are no national standards with respect to qualifications for operating a counterweight rigging system, there is a reasonable expectation that supervisors will understand safe practices and instruct students appropriately. Students need to be educated about the hazards of operating stage equipment, supervised and never allowed to perform dangerous tasks.

All rigging users should understand that they are responsible for identifying and evaluating hazards and be familiar with the operations manual. Supervisors must be present to oversee students at all times. Community groups using the auditorium should be instructed not to operate the stage rigging system without assistance of trained personnel.



A stage-rigging contractor may be able to provide additional training, including teaching operators how to avoid common operator errors and what sights or sounds may signal trouble. Warning signs and operating manuals should be provided backstage. Posted signs should warn users of specific rigging hazards and general stage safety rules, such as tying back hair and not wearing loose-fitting clothes when working backstage. Proactive rigging operators are the first line of defense in preventing stage accidents.

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