

INDUSTRY WIDE LABOR-MANAGEMENT SAFETY COMMITTEE

SAFETY BULLETIN #16

**RECOMMENDED GUIDELINES FOR SAFETY WITH
PYROTECHNIC SPECIAL EFFECTS**

This Safety Bulletin applies to pyrotechnic materials such as explosives and flammable or combustible liquids, gases and solids when used to create pyrotechnic special effects.

ALL USE, HANDLING, STORAGE AND TRANSPORTATION OF PYROTECHNIC MATERIALS SHALL BE IN COMPLIANCE WITH ALL APPLICABLE FEDERAL, STATE, AND LOCAL LAWS AND REGULATIONS.

Pre-Production/Planning

- When pyrotechnic materials are used on set, such use shall be under controlled conditions with due regard for the safety of all involved.
- The Production Company or Studio shall make sufficient advanced notification of the use of pyrotechnic materials to the appropriate departments (such as Special Effects, Stunts, Camera, Art, Construction, Hair, Make-up and Wardrobe), in order to safely plan pyrotechnic special effects. Any performer who may be involved in a pyrotechnic special effect shall be notified.
- Any required licenses and/or permits shall be obtained from proper Authorities Having Jurisdiction (AHJ) over pyrotechnic materials prior to using pyrotechnic special effects. Pyrotechnic Special Effects Operator(s) must hold valid State and Federal license(s), as applicable.
- Consideration of using remote control detonation devices should be discussed with Safety, Fire, Production, Stunts, and Special Effects prior to use.
- Prior to pyrotechnic special effects work, productions must develop emergency procedures and contingency plans, including identifying emergency fire suppression equipment and personnel needs. All equipment shall be checked to verify that it is in good operating condition. Individuals using this equipment must have proper training in its use and limitations.
- The need for personal protective equipment (PPE) should be identified during the planning stage.
- Special effects personnel must inform the Transportation Coordinator of what pyrotechnic materials will be transported. Vehicles must be properly placarded when

required by Federal or State law. All vehicles transporting pyrotechnic materials shall have an inventory of the materials being transported or stored readily available. Drivers must be qualified to transport pyrotechnic materials.

- Sets, equipment, props, wardrobe, make-up, wigs, hair supplies, etc. that will be in close proximity to planned pyrotechnic special effects must be prepared accordingly and/or should be made of flame retardant material. All sets, equipment, props, wardrobe, wigs, etc., must be made available in advance to the Pyrotechnic Special Effects Operator in charge for evaluation, to establish placement, and if necessary, for testing.

Clothing and Personal Protective Equipment

- Cast and crew in close proximity to planned effects should wear appropriate protective clothing. Depending on the hazards involved, this clothing should include appropriate closed-toe footwear, long pants, and a long-sleeved shirt made of 100% cotton or material which provides equal or greater protection.
- Cast and crew must be notified by the Pyrotechnic Special Effects Operator in charge when there is potential for exposures to pyrotechnics, such as fireball, debris, and shock wave. PPE must be provided as appropriate for the hazard(s) involved and considerations must be made for head, hand, eye, ear and respiratory protection. Depending on the hazards involved, the AHJ may require full fire turnout gear and Self Contained Breathing Apparatus (SCBA). These guidelines will also apply to performers when appropriate. All users must have proper training in the use and limitations of such PPE.

Fire Protection

- Pyrotechnic materials shall be kept a safe distance from open flames and other sources of ignition. Where required, such materials shall also be stored in approved, properly labeled containers.
- Smoking is prohibited in all pyrotechnic areas and "No Smoking" signs shall be posted in all appropriate areas of the premises or locations where pyrotechnic materials are stored and handled.
- Sufficient fire suppression equipment (such as charged extinguishers and fire hoses) must be manned, ready for use and placed at an appropriate safe distance from the effect, during testing, rehearsal and filming.
- Designated personnel performing fire suppression activities during testing, rehearsal and filming must be properly clothed and wear appropriate PPE.

Personnel Using and Handling Pyrotechnic Materials

- Special effects personnel working with pyrotechnic materials (pyrotechnicians) should be dressed in appropriate clothing to protect them from potential hazards. At a minimum, clothing should consist of appropriate closed-toe footwear, long pants, and a long-sleeved shirt made of 100% cotton or material which provides equal or greater protection. PPE considerations must be made for head, hand, eye, ear and respiratory protection. Depending on the hazards involved, the AHJ may require full fire turnout gear.
- Intoxicating liquids, drugs and other controlled substances (except for prescription drugs not impairing the user's judgment and motor functions) shall not be used by any person handling pyrotechnic special effects at any time during transportation, set-up, firing or removal.
- Pyrotechnicians must be given sufficient time to safely perform the work (including the transporting, storing, creating, rigging, firing, striking and extinguishing of all pyrotechnic special effects materials). While conducting such duties, pyrotechnicians should not be rushed, interrupted or distracted from focusing on their work.
- The rigging of any type of pyrotechnic device to a performer shall be done by a qualified special effects operator.
- Pyrotechnic special effects shall not be fired unless the area involved with the firing is in the continuously unobstructed full view of the Pyrotechnic Special Effects Operator in charge or his or her designated representative at the time of firing, unless equal means of observation are used.

Awareness

- When using pyrotechnic special effects on any set, notification shall be given to personnel by way of the call sheet, or other suitable means. The call sheet should also state the type of pyrotechnic special effects work that is planned.
- Before any pyrotechnic special effects or potentially hazardous sequence is to be performed, all persons involved shall be thoroughly briefed at a safety orientation meeting on the site.
- The safety orientation meeting shall include an "on site walk-through" and/or "dry run" with the Pyrotechnic Special Effects Operator in charge and all other persons involved in the event, including Stunt Coordinator if applicable. PPE should be in place at that time.

- No performer shall be rigged with a pyrotechnic device without his or her prior consent and consultation with the qualified Pyrotechnic Special Effects Operator in charge and, if applicable, Stunt Coordinator.
- If practical and upon a reasonable and timely request, the Pyrotechnic Special Effects Operator in charge may conduct a test firing of pyrotechnics when such are to be discharged in the vicinity of cast and crew.
- If at any time a significant change becomes necessary, the First Assistant Director will again call all persons involved in the event to another meeting to confirm everyone understands the proposed change(s).

Emergency Procedures

- Emergency procedures and contingency plans, including appropriate signs and signals and the authority to abort the shot, shall be specified prior to engaging in any pyrotechnic special effects work.
- Before the performance of a pyrotechnic special effect, the First Assistant Director, or designee, shall clearly announce to all persons the location of exits, the primary escape route and alternate escape routes. Escape routes must provide a clear and unobstructed passage to a designated safe area.
- Each person should ensure their designated escape routes are clear and remain accessible. Any person who is unsure of their designated escape routes should check with the First Assistant Director and learn of the escape routes upon entering the work area.
- In the event of an emergency, only those designated with emergency response roles should enter the pyrotechnic special effects area.

Authorized Personnel in the Pyrotechnics Area

- Access to areas where pyrotechnic materials are stored or handled shall be limited to authorized personnel only. All other personnel shall remain at a designated safe distance. If needed to prevent unintentional entry into hazardous areas, warning signs should be posted and/or other appropriate precautions taken.
- Prior to using pyrotechnic special effects with minors present, key production personnel, such as the Director, First Assistant Director, Pyrotechnic Special Effects Operator in charge, Stunt Coordinator and safety professional, should confer with the minor, minor's parent/legal guardian and Studio Teacher to review and discuss the planned activity. Only those minors under the age of 16 whose performance requires them to be on the set when pyrotechnic special effects are being handled are allowed on the set, and in some states may be prohibited altogether. Production should

check applicable state laws with respect to the employment of minors in these situations. The production shall consider any reasonable request from the minor, minor's parent/legal guardian, and/or Studio Teacher regarding the minor's proximity to any pyrotechnic special effect.

Use of Power Sources in Firing Pyrotechnic Materials

- To protect against accidental firing, all electrically fired pyrotechnic devices shall be shunted at all times prior to firing.
- Power sources for firing pyrotechnic special effects devices shall be restricted to isolated ungrounded batteries or individually designated ungrounded generators (below 5 kilowatts to comply with non-grounding requirements) used exclusively for firing purposes only.
- Commercial or house power shall not be used directly for firing purposes.
- There should be no wireless transmissions in the area where electrically fired pyrotechnic devices are being used without prior consultation with the Pyrotechnic Special Effects Operator in charge. In addition, caution should be taken to avoid extraneous or induced electrical currents from sources such as power lines, radar/microwave transmitters, electrical cable, lightning, static electricity, etc. Note that static electricity is especially a problem during periods of low humidity.
- Whenever practical, pyrotechnic special effects should be hard wired from the effect to the firing system. When remote control firing is planned, special precautions must be taken to prevent accidents, including but not limited to the following:
 - Having familiarity with the system being used and its limitations;
 - Performing a risk analysis in the event of premature firing or firing failure; and
 - Testing the firing system under the anticipated conditions of use.

Safety on the Set After Use of Pyrotechnic Material

- After each pyrotechnic event, no one shall enter the pyrotechnic area other than the Pyrotechnic Special Effects Operator in charge, or his or her designated representative(s), until it is declared safe. This includes testing, rehearsals, and filming.
- Appropriate fire watch, as determined by the AHJ, should be maintained after each pyrotechnic event.