

Performer Flying and Aerial Stunts

INFORMATION SHEET #14

Following the guidance in this information sheet is not compulsory, unless specifically stated, and you are free to take other action. If you follow the guidance you will normally be doing enough to comply with WorkSafeBC regulations.

OVERVIEW

Performer flying and aerial stunts require the supervision of a fully trained and experienced professional flying director/stunt coordinator/rigger, the use of appropriate engineering, and specialized equipment. The title of the flying director/stunt coordinator/rigger may vary depending on the industry, but that person to be qualified, should have appropriate knowledge of the work, the hazards involved, and the means to control the hazards by reason of education, training, experience, or a combination thereof. This is best practice to ensure a safe and secure work environment to give people the ability to create their art.

This information sheet uses the title “flying director” to refer to a qualified person.

All parties involved in performer flying or aerial stunts are recommended to know who is responsible for each aspect of the scene.

DESIGN AND CONSTRUCTION

Fly systems are suggested to be designed:

- With safety for flying and other performers, crew and audience as a priority
- For simplicity and reliability in operation and durability in repeated use
- To ensure predictability and repeatability of action

Do load calculations, then select appropriate components with the applicable safety factor.

In the case of manually operated or mechanical fly systems, ensure movement and control of the performer considers their physical abilities and limitations, training, skills, and access needs as well as those of the flying operator(s).

Ensure hardware and other technology is appropriate and adequate for the intended use.

Equipment used (ropes, lines, cables, harnesses, and hardware) ought to be designed to support the unique performer using them, including the appropriate safety factor. The equipment is also suggested to be manufactured for the purpose or be of an equivalent standard. Many rated components are marked with a load rating, either attached to or engraved on the component. Occasionally, the equivalency is noted in the documentation, such as in the case of rope and others. The flying director is suggested to approve the use of all equipment.



SAFETY PRACTICE

The equipment ought to be manufactured for the purpose or be of an equivalent standard. Many rated components are marked with a load rating, either attached to or engraved on the component. Occasionally, the equivalency is noted in the documentation, such as in the case of rope and others. The flying director is suggested to approve the use of all equipment.

Final safety approval rests with the flying director, flying operators and performer.



Performer Flying and Aerial Stunts

INFORMATION SHEET #14



Harnesses should fit correctly and be specific to the performer's unique physical characteristics. The harness is part of the rigging system, not part of the costume.

Any costume elements worn over the harness must not impair the safety of the performer or others in any way. No part of the costume can be attached to the harness without the express permission of the flying director and then only in the way they approve. The performer should also be consulted before changes are made.

Costumes, wigs, and props required to be used or worn by the performer ought to be presented to the flying director in sufficient time for evaluation and to determine if such items will impact the effect.

Performers on flying props ought to be secured to the prop by cables and harnesses.

Equipment ought to be rated at a minimum breaking strength to load ratio of ten to one (10:1) for static loads or seven to one (7:1) for dynamic loads – whichever is greatest.

All structural components that may injure a worker in the case of failure ought to be designed with appropriate safety factors.

Ensure proper guarding of operating controls that might be activated unintentionally and use proper guarding of moving parts that might pose a hazard.

Ensure adequate clearance between the performer and any other element or structure.

A firm base (platform or scaffolding) for the performer to fly from ought to be in place if the performer is not being flown from the ground. These units are properly secured, so they do not move as a best practice.

The documentation that explains equipment capability and how to operate the equipment ought to be available to flying operators and others. Additionally, it ought to identify hazards and provide relevant safety warnings.

SAFETY PRACTICE

Any component, if stressed too close to its limit, can fail. When designing a system to fly performers, components and rigging points are chosen such that the potential load is a small fraction of the minimum breaking strength of the weakest component.

Establish a plan for response, rescue and recovery ([OHS Regulation Part 32 – Evacuation and Rescue](#)) in the event of a breakdown of any mechanized element. Rescue plans and procedures (including how to rescue a suspended performer) are suggested to be developed specifically for the system in use.



Performer Flying and Aerial Stunts

INFORMATION SHEET #14

SYSTEM GUIDELINES

As a best practice, the manual controls will be clearly labelled and easy to understand and use. Flying operators are recommended to know and understand how to use the controls and receive training on the equipment and its proper operation before use.

- The performer and flying operator will have clear access to the load-in point.
- There will be sufficient illumination to properly hook up, check and operate the flying systems.
- The drop zone, fly area (aerial arena) and landing point will be clear of obstruction according to the instructions of the flying director.
- A fall arrest system is recommended to be incorporated into the rigging system. The system is to include a method (rescue plan) of safe retrieval in the event the fall arrest system is used ([OHS Regulation Part 11 – Fall Protection](#)).
- A reliable and agreed-upon communication system between the performer, flying operator and

ground crew, ought to be established as a best practice.

- The flying operator will be in a position that is secure and free from obstruction and distraction.
- When the flying operator is unable to hook up the performer, a qualified person will be assigned to do so.
- Static or fixed lines intended for active loads such as swinging or climbing should not be tied off directly to abrasive structures that may damage or weaken the primary lines, as a best practice. Components, such as webbing, rope, or cable, which are susceptible to wear due to abrasion are suggested to be backed up with a passive secondary.
- The use of poles, bars, hydraulics, etc. and other specialized flying systems that do not use fall arrest and passive secondaries are recommended to include adequate precautions under expert supervision to ensure performer safety.

TRAINING AND REHEARSAL

It is recommended that aerial stunts and flying systems have an assigned flying director.

Each performer should be notified of potential performer flying and aerial stunts prior to engagement. The engager should consider the unique abilities and limitations, training, skills, access needs, and experience of the performers and may request advice from the flying director prior to casting.

The engager may encourage the performer to communicate to the flying director any information (such as fear of heights) or conditions (such as a previous injury) that might influence their ability to perform.

The flying director is advised to review the schedule in consultation with the employer to ensure that adequate time is provided based on the show

requirements and the needs of the flying operator and performer.

The flying operator, performer and spotter (if used) are suggested to:

- Be given adequate, progressive training and rehearsal time with a flying director
- Do complete dry-tech testing of the system under expected loads and operating conditions
- Conduct sufficient tech rehearsal to ensure the predictable and safe operation of the fly system.
- Provide adequate rehearsal time to integrate the action into the production.
- If understudies or backup flying operators are used, they require full training and rehearsal by the flying director, equal to that of the person they are replacing.



Performer Flying and Aerial Stunts

INFORMATION SHEET #14

Familiarize the performers and crew who will be involved in the sequences with the components of the flying system:

- Identify standards and ratings on the harness, connectors, anchor points and other components
- Explain how a qualified person will inspect and ensure all components of the system are in good repair
- Demonstrate how to put on the harness, adjust, and inspect it. Identify the qualified person who will inspect the harness adjustment before every rehearsal and performance
- Explain the cueing and operation of the sequence, as well as communication for stopping or indicating a problem.

Before every flying rehearsal or run-through, test all components of the system in its complete range of motion for flying operators and performers. The testing should include as many elements of actual performance as initially determined by the flying director, including props, costumes, sound, and lighting.

For tech and rehearsals, establish a communication system and chain of command, starting with the flying director. All communication should be initiated by or go through the flying director.

For tech, rehearsals, and performances, ensure the flying operator, performer, and spotter have a clear communication method for stopping or indicating a problem.

Use an assigned spotter (or other monitoring means) when the flying operator has limited observation of the fly system or the performer.

Where changes are made to any sequence that includes flying, ensure that changes are made and tested by authorized qualified personnel and that additional rehearsal is held to establish familiarity and comfort with the new sequence.

If the assigned flying director is not part of the running crew or cast, they will train a replacement to carry out pre-performance testing and inspecting of all flying systems and equipment and the scheduling of any necessary stunt or fly call before the performance.

IN-SHOW OPERATION

Conduct pre-show testing of all components of the system in its complete range of motion. Check out the stunt harness inspection video [here](#).

All flying systems, equipment, ropes, knots, and other tie-offs are recommended to be checked for wear, damage, and integrity before every performance. If any defects are found, it is best practice not to fly performers until the system is repaired and restored to its original condition.

Monitor and operate machinery safely with an eye toward unexpected occurrences and malfunction.

Ensure operational changes are made only by authorized and qualified personnel and fully rehearsed.



Performer Flying and Aerial Stunts

INFORMATION SHEET #14

MAINTENANCE

Ensure maintenance and inspection are done by qualified personnel.

Establish a maintenance schedule with a method of documenting the maintenance work done.

Conduct maintenance according to the schedule and more frequently when any observed behaviour of the system warrants it.

Lock out and tag out mechanized elements for maintenance activities where any operation of the fly system would pose a hazard.

A retirement schedule for the replacement of equipment should be considered and established by the flying director. The flying director determines which equipment, if any, needs such a schedule. If the integrity of any fly equipment is in doubt, it is best practice to be retired from service permanently or repaired and recertified by the manufacturer.

Check the manufacturer's instructions before using any cleansers, markers, paint, or stickers on components or equipment. No part of a harness should be cleaned, dyed, painted, or marked with a substance that might degrade the strength and/or integrity of the harness materials.

Use appropriate containers to store fly equipment to avoid moisture, abrasion, dirt, ultraviolet light, extreme temperatures, and other hazards.



NOTE: One type of equipment or action may be substituted for another, so long as the safety of all parties involved in the effect is at least as great as it would be without the substitution. Provide sufficient rehearsal to familiarize everyone with the newly substituted procedure or equipment.

REFERENCES

For additional information, please refer to the following resources.

- [Actsafes Stunt Harness Inspection video](#)
- [Actsafes Stunt Safety Plan](#)
- [Actsafes Information Sheet #7 - Rigging Systems and Flown Scenery](#)
- [Actsafes Information Sheet #9 - Stage Combat, Stunts and Weaponry](#)
- [WorkSafeBC OHS Guideline Part 11.2-6 Fall protection during stunt work](#)
- [ESTA ANSI E1.43 - 2016 Entertainment Technology - Performer Flying Systems](#)

