

GUIDANCE FOR RIGGING IN EUROPEAN ARENAS

EUROPEAN ARENAS ASSOCIATION

Foreword

The European Arenas Association was formed in 1991 and presents leading European entertainment arenas to both audiences and event organisers.

At the time of writing Membership of the EAA has reached 31 Arenas, spread across 20 nations. Its purpose is to enhance audience experiences, spread best practice across Member Arenas, and to be a forum for Event Promoters to discuss and develop new themes, ideas and events.

This document has been produced with the input of many individuals within the venue operation and rigging industries. Contributors have included house riggers, rigging contractors, health and safety managers and operations managers with responsibility for rigging in their venues. Some of the content is taken or adapted from existing venue rigging codes / rules.

Format of information provided to venues

It is important that information relating to rigging installations is accurate and provided with sufficient lead time in order that it can be assessed prior to approval and any potential issues highlighted in advance.

A Comprehensive Guide to what information should be supplied and in what format can be found at the rear of this document (section 11.2).

Introduction

This rigging guidance has been produced by members of the European Arenas Association (EAA) for use in EAA venues.

Its purpose is to provide:

- Guidance to venue operators on a wide range of safety matters relating to rigging, in order to ensure the health, safety and welfare of anyone working in or visiting EAA venues.
- Advice to riggers and rigging companies on general venue requirements relating to rigging and associated activities.
- Advice and guidance on the use of personal protective equipment (PPE) and commonly used rigging equipment.

This document is not intended to be a technical manual for riggers, however it should be regarded as setting minimum operational standards expected of riggers.

The guidance is structured such that it can be applied in any venue and it is therefore general in nature. It should be used in conjunction with any venue specific and national rules and regulations.

It is important to note that where EU directives are listed within this document you must consult your country's regulations; individual country interpretation of the directives will often differ.

Definitions

Rigging

For the purpose of this guidance, rigging is defined as “the installation, removal or other activity using lifting or suspension equipment or accessories used in tension for lifting or supporting display, production, performance or event technical requirements”.

Lifting Equipment

Any item used to raise, lower or suspend a load.

Employer

A person or entity which hires the services of another.

Safe Working Load (SWL)

The maximum load for which the equipment may safely be used, the SWL may differ from country to country in accordance with local regulations.

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1 Legislation

- 1.1 European Health & Safety legislation, Approved Codes of Practice, guidance and general “good practice” apply to rigging operations as they do to all work activities. The overall aim is to secure the health, safety and welfare at work of employees, the self-employed and all other persons who may be affected by work activities (e.g. audiences).

Each country has its own laws and regulations, many of which originate from EU Council Directives. For example:

- Directive Number 89/654/EEC Health and Safety at Work
- Directive Number 2006/42/EC Machinery
- Directive Number 89/655/EEC Use of Work Equipment

Anyone who is involved in or has responsibility for rigging operations should ensure that he / she is familiar with the Regulations that apply in the country in which he / she is working.

- 1.2 Venues have the right to inspect all rigging, working methods and equipment to ensure compliance with relevant legislation, codes of practice etc., and to refuse to permit the use of non-compliant equipment and working methods.

2 Responsibilities

In order to ensure compliance with legislation, everyone involved in or controlling rigging operations have responsibilities to themselves and to others. There is a general hierarchy to the process but it is important to note that persons in overall control always retain some degree of liability for activities carried out under that control, even when specialist contractors are hired in to do the work.

2.1 Employer Responsibilities

Consideration should be given to appropriate written procedures for rigging activities and this may include sign-off documentation. Procedures and documentation will vary from venue to venue.

Venues generally may be considered as shared workplaces where employers responsibilities fall upon the venue and its hirer's and agents which may include venue management companies, promoters, organising companies, production companies and rigging contractors.

Effective communication between all employers is paramount. Particular attention should be paid to communication when different nationalities and therefore different languages are involved. It is easy for misunderstandings to arise when people are using a language that is not their first language.

Under Health & Safety Legislation an employer has a duty to ensure, so far as is reasonably practicable, the health, safety and welfare of his employees and that the activities being undertaken do not affect the safety of others, including members of the public.

This duty covers the following areas:

- Provision and maintenance of plant and systems of work so that they are safe and without risk to health.
- Ensuring reasonable arrangements are in place for the safe use, handling, storage and transportation of articles and substances.
- Provision of information, instruction and training to his employees.
- Ensuring the workplace is safe, including safe access and egress, and is without risk to health.
- Provision of adequate facilities to look after the welfare of employees whilst at work.

This duty extends to those who may be contracted to undertake work on behalf of the employer who will, in this case, be acting as a Client. The Client cannot

absolve himself of the principle duties outlined above by contractually deferring them to his contractor or sub-contractors. Even though the Client may be contractually two or three times removed from an individual working on a project, he still carries responsibility for that individual's conduct. This duty also applies to the self-employed. Wherever possible, documentation should be put in place and signed by relevant individuals.

Should an accident occur to a contractor or sub-contractor, the Client will be expected to demonstrate to an enforcement agency that he undertook the appropriate measures to ensure that his contractors were competent and possessed the appropriate skills and resources to safely undertake the project involved.

2.2 Employees / Self-Employed Responsibilities

Under Health and Safety Legislation, employees and the self-employed have a duty of care to look after their own health and safety and that of others they may affect by their acts or omissions.

These individuals carry a responsibility for ensuring that all equipment being used has been properly maintained and inspected; whether this equipment is owned by the individual or by a third party.

Individuals also carry responsibility for ensuring that they are fit and able to carry out particular tasks, this includes control of working hours and ensuring that appropriate rest periods are taken (Working Time Directive 2003/88/EC).

2.3 Reporting of Accidents

Any accidents and/or incidents involving rigging operations shall be reported to venue management immediately in addition to any other statutory reporting requirements that may be applicable.

3 Competence

3.1 A competent person is someone who has sufficient training and experience or knowledge to carry out rigging operations safely whilst recognising their own limitations. Rigging operations shall be undertaken and supervised by competent persons who are qualified by training and experience.

3.2 Any company involved with rigging operations must appoint an authorised person to advise on rigging matters. The authorised person shall have the practical experience and theoretical knowledge of the use of any equipment to be used to enable faults and weaknesses to be assessed and to determine whether such equipment is able to perform within its design limits.

The appointed authorised person shall carry out periodic examinations in line with relevant European Legislation and the approved company examination regime, or at more regular frequencies.

The authorised person must have authority to reject the use of defective equipment when the defect(s) render the equipment unsuitable or unsafe for its intended use

3.3 Riggers working on the ground must have a level of knowledge to enable them to undertake the pre use checks of lifting equipment and accessories to prepare them for lifting and, whilst not necessarily having the experience for working at height, have the same knowledge as that of a rigger working at height.

3.4 Training for riggers may include but not be limited to the following:

- Rope access techniques in accordance with current legislation and guidance
- Emergency First Aid
- Manual Handling Techniques
- Mobile Elevated Work Platforms and other similar equipment
- Rescue Techniques
- Use of lifting equipment as a competent person

In assessing experience, account should be taken of the fact that, in many cases, riggers gain their experience within the industry and that historically there has been a lack of formal training leading to nationally recognised qualifications. However, it is recommended that where possible, riggers should undertake training in relevant areas and a record of this training kept in the company files.

4 General Safety Precautions

4.1 Working underneath rigging operations

Where possible, all personnel should be excluded from beneath areas where overhead rigging or lifting operations are taking place.

The exclusion zone shall be clearly identified and appropriate signs should be in place to close off the area entirely.

When designating a hard-hat area, this is more easily managed if an entire space, hall or room is designated as such, rather than specific areas within the space. Clear and unambiguous signage must be put in place.

The person or persons responsible for designating exclusion zones, hard-hat areas and for issuing hard-hats must be defined. This person must also determine when the area ceases to be an exclusion zone or hard-hat area.

4.2 Working at height

Duty Holders must:

- Avoid work at height where possible.
- Use work equipment or other measures to prevent falls where they cannot avoid working at height.
- Where they cannot eliminate the risk of a fall, use work equipment or other measures to minimise the distance and consequences of a fall should one occur.

Work at height must be properly planned, appropriately supervised and undertaken by competent individuals all of which should be supported by appropriate documentation.

Rigging Work at height should not be undertaken by an individual without a second person on hand to react to any accidents or safety related situations that may arise. Ideally that person should be a rigger competent with working at height.

Work at height should not be undertaken by an individual who is feeling unwell or suffering from a condition (physical or mental) that may result in difficulties when working at height. Any such condition must be reported to the Rigging Manager / Supervisor prior to work commencing.

Under no circumstances shall rigging personnel be under the influence of alcohol and / or drugs while carrying out rigging operations.

Riggers shall obtain confirmation from their Doctor / Physician that any prescribed medication will not affect their ability to perform their duties. Any such confirmation must be reported to the Rigging Manager / Supervisor prior to work commencing.

High-level walkways and work areas must be kept clear of loose equipment at all times. An inspection of the work area should be undertaken before work commences and upon completion of work. Tools and equipment should be hoisted to high level by means of rope or similar system rather than being carried by individuals.

Any loose equipment (including tools and communication devices) must be properly secured when working at height.

4.2.1 Access Equipment

All access equipment shall be used in accordance with manufacturers' instructions / guidelines, including the correct use of harnesses and head protection.

The Safe Working Load of access equipment shall be permanently displayed on the equipment. It is the responsibility of the operator of the equipment to ensure that the carried weight does not exceed the Safe Working Load.

Special attention should be paid to the correct assembly and stability of ladders and other static forms of access equipment, including the use of outriggers where fitted.

Persons trained in the correct use of such equipment should only carry out assembly of static access equipment.

Operators of Mobile Elevated Work Platforms for use in rigging related operations must ensure that they comply with venue competency requirements.

4.2.2 Flexible Ladders

Flexible ladders used to access flown truss structures shall only be used in conjunction with a suitable fall arrest system. Fall arrestors should be rigged independently of the flown structure and positioned directly above the user. In cases where it is intended to attach fall arrestors to ground supported systems, the manufacturer of the support structure must be consulted.

4.2.3 Mobile Elevated Work Platforms

If it is necessary for an operative to leave a mobile elevated work platform while positioned at high level, he / she must have appropriate PPE and identify a secure point of anchorage for the harness lanyard. The lanyard shall be secured before leaving the platform.

When returning to the platform, the operative must ensure the lanyard remains in position until the transfer to the carriage has been completed. At no time should the operative be connected to both the platform and the structure.

5 Hours of Work

Employers should refer to the relevant national regulations or the EU Working Time Directive 2003/88/EC; Riggers have a duty to ensure that their competency is not affected by tiredness. Employers, Promoters, Production Managers and Venue Managers have a duty to ensure that Riggers and Rigging Supervisors get adequate rest periods.

6 Personal Protective Equipment for Work at Height

6.1 General

Personal Protective Equipment (PPE) for working at height shall be provided by employers and the self-employed. PPE for working at height should be suitable and sufficient for the work to be carried out and conform to relevant standards, legislation, regulations and venue specific requirements

The users of the PPE must be trained in its use and inspection. Inspections should be documented. Equipment should be renewed in accordance with any manufacturers' recommendations.

Guidance on the use of commonly used items of PPE is contained in relevant European Norms.

6.2 Rescue from workplaces at height

Venues and riggers must have in place a rescue plan and the appropriate equipment and training for a rescue operation.

Within the venue, safe systems will be available such as horizontal lifeline systems, catch net systems, fall arrest systems or some combination of these. Ideally consideration will be given to self-rescue methods during the design and installation phases of such systems; production must have their own rescue plan in place.

In any rescue plan, some of the areas to consider are:

- Correct PPE i.e. compliant with the recommendations in Section 4.2 of this guidance.
- The risks of lone working. A second person that should ideally be a competent climbing rigger will be able to react immediately to a situation.
- A person falling in a full body harness may very quickly experience circulatory problems and there is a risk of cardiac arrest from the shock.
- Communication
- Location of access equipment
- Location of medical facilities
- Liaison with the Fire & Rescue Emergency Services to ascertain means of access when working at heights.

- Availability of telephone numbers and contact details for relevant individuals and agencies.

7 Lifting equipment

7.1 Legislation

All lifting equipment used shall comply with all current relevant legislation (See 1.1 of this Guidance).

7.2 General

All lifting equipment and accessories designed in accordance with the Machinery Directive.

- Have the SWL/WLL clearly marked or be available to users by other means, e.g. charts or tables provided with the equipment.
- Carry the CE mark
- Be used in accordance with the manufacturer's instructions/guidelines
- Be of sound material, construction and free from defects
- Be tested, inspected and maintained as necessary in accordance with manufacturer's recommendations and relevant legislation.

Current valid reports of inspection or certificates of test/thorough examination must be available for all lifting equipment and lifting accessories.

Lifting equipment must only be used by competent persons.

8 Examination and inspection of lifting equipment

Thorough examination and inspection of lifting equipment is fundamental to safety in rigging operations.

8.1 The nature, type and frequency of thorough examinations

All equipment used in rigging shall be subject to a thorough examination scheme that is compliant with relevant national legislation and manufacturers recommendations.

In general, the examination and inspection scheme should specify the nature of the examinations and inspections to be undertaken and the intervals between them and should ensure that all examinations and inspections are documented.

If any equipment becomes damaged it should be withdrawn immediately until it is re-examined, re-tested and the thorough examination is documented. If found to be beyond repair, it should be destroyed.

Electrically operated equipment should be subject to an appropriate testing scheme. Records should be available and the equipment suitably marked and documented.

8.2 Lifting equipment documentation

Lifting equipment and accessories are covered under EU Council Directive 2006/42/EC Machinery and any enacting national regulations in member states.

Venue owned lifting equipment must have appropriate documentation confirming that it has been thoroughly examined in accordance with legislation and manufacturer's recommendations. National or Local Authority enforcing departments may require see documentation at "reasonable notice".

Lifting equipment brought into a venue by others e.g. a touring production, must have accompanying documentation confirming that it has been thoroughly examined in accordance with legislation and manufacturers recommendations. This documentation shall be made available to the venue management if requested.

9 Working Practices

9.1 General conditions

A competent rigger shall undertake all rigging work in a responsible manner and consideration shall be given to the safety of all persons who may be affected by such works.

A Rigging Supervisor (Head Rigger) shall be appointed to supervise all rigging operations.

9.2 Suspension points and method of attachment

Arenas have venue specific requirements / regulations regarding suspension points, method of attachment and the loading capacity of different elements of the building structure. Riggers must ensure that they comply with these requirements and there must be consultation with the venue management.

When working at height, riggers will inevitably be working in the vicinity of building services including electrical equipment, cables, gas and water pipes, sprinkler system etc. No load, no matter how small, shall be suspended from any of these services or containment systems carrying such services. Care should be exercised when working or rigging near light fittings or other heat generating equipment. Before carrying out work on, or adjacent to, any electrical equipment, ensure that the necessary electrical isolation has been carried out.

9.3 Bridles

When bridles are installed to provide suspension points, particular attention will be paid to the included angle created between the individual legs of bridles. This angle will at all time be the minimum possible to keep the forces within agreed limits.

9.4 Load spreader beams

In situations where bridling is unsuitable, e.g. if the attachment points are unsuitable for application of a horizontal load then the use of spreader beams should be considered.

9.5 Truss Systems

All truss systems should be used in accordance with manufacturers' instructions / guidelines as well as in accordance with venue specific rules.

9.6 Slinging

Slinging of equipment and loads shall be undertaken to manufacturers' instructions & guidelines and in conjunction with venue specific regulations

Prior to final lifting, a check shall be made at ground level and any necessary adjustments made.

9.7 Work areas

Every arena will have its own specific rules and guidelines for rigging operations work areas. Some points for consideration are:

- Areas for rigging operations to be clearly defined and access to such areas restricted to competent personnel.
- Communication between persons working at high level and ground crew.
- Notification of rigging operations to other personnel working in or near areas where rigging is taking place.
- Designation of temporary storage and assembly area for rigging equipment.
- Provision of Safety signs.

9.8 Suspended signs

Prior arrangement shall be made with the venue for the hanging of suspended signage.

Any signs supplied for rigging shall be checked to ensure they are fit for suspension.

An assessment should be made by a competent person of the requirements for the safe rigging of every sign.

The suppliers of such signs shall be responsible for the integrity of the sign and its suspension fittings.

Signs of timber or metal framed construction may only be rigged if fitted with fully closed eye lifting rings, bolted preferably through the full depth of the sign, the capacity of which must be sufficient to completely support the load on any individual fitting.

The venue will reserve the right to refuse to allow the suspension of any signs where the suspension fitting supplied is inadequate.

Drop weighting to the bottom of banners may only take place when the weighting is completely sealed within the banner by positive means, such as stitching or vinyl welding. The provision of bottom drop weight pockets by gluing is not acceptable.

9.9 Catenaries

Prior arrangement shall be made with the venue for the installation of catenaries.

9.10 The installation of secondary suspensions

Where necessary, the installation of Secondary or “Safety” suspensions for suspended loads should be considered. The requirement for this varies between countries and arenas. In some countries there may be a mandatory requirement for secondary suspensions in some circumstances.

When required, the secondary suspension will be installed to bypass the mechanical lifting unit, as a minimum, in case of mechanical failure.

Additional mechanical lifting units can be installed as an alternative to secondary suspensions, thereby providing redundant capacity equal to 100% of the load.

10 Insurance and Public Liability

The minimum level of liability cover required by rigging companies working within venues will be set by the venue's insurers and may be increased depending on the nature of the services to be supplied.

11 Planning and Provision of Information

As with most activities, the key to safe and successful rigging lies in effective forward planning and exchange of information.

The Client or the Client's representative in the form of Designer, Contractor, and Production Manager Etc. should ensure that accurate information regarding the loads to be rigged is provided to the arena as soon as possible. This is irrespective of whether the rigging will be carried out by venue riggers, touring riggers or outside contractors. Information should also be provided on any moving loads, loads involving people or anything else out of the ordinary. In turn, the venue should highlight any problems, restrictions, regulations and other requirements. Where appropriate, method statements and risk assessments should also be provided.

11.1 Risk assessment

A suitable and sufficient Risk Assessment must be carried out for all rigging and lifting operations.

Those individuals and / or organisations that are responsible for the rigging and lifting operations must carry out the Risk Assessment. The Risk Assessment must be documented and available for examination.

11.2 Format of information

When reading these notes it must be borne in mind that this covers events of a very large variety from the very large and complex 300 points plus shows to the very small 2 points or simple banner shows. Some of the productions will be very experienced in rigging planning and some productions may at best, only have a very basic understanding. Also the various arenas require different data to be presented differently or only require particular data initially to satisfy the differing constraints be it: load/crewing/risk/licensing etc.

The documents that are requested below include most of the data arenas require for rigging purposes, but it may be some venues may ask for additional information depending on the complexity of the event.

Some venues request rigging information by a certain date prior to an event, and some venues impose charges for late submission of rigging information. Either way, it is best practise to provide rigging information at least three weeks prior to the event. This will enable all the relevant parties to start the various processes they may be required to do to fulfil their obligations for the event. Some productions leave the rigging until production rehearsals and in many instances this is often far too late. It is understood that rigging information will be more accurate if done at rehearsals, however if the rehearsals are very close to the first events, a

provisional rigging plot prior to this would be useful to venues as it would usually indicate at the very least if the show is small medium or large.

11.2.1 Document provision

1. Rigging Plot in PDF: should have dimensions, loads and datum.
2. Rigging Plot in DWG or VWX format: should have dimensions, loads and datum.
Drawings should be saved as the penultimate release version. Any references should be fully bound.
3. Spread sheet in CSV or XLS with loads, dimensions, motor type (SWL i.e. 1t, 2t, D8, D8+, Cat A). The Total load should preferably be in metric.
4. Spread sheet PDF with loads, dimensions, motor type (SWL i.e. 1t, 2t, D8, D8+, Cat A). The Total load should preferably be in metric.

11.2.2 General notes

- Any symbols used in rigging plots should be accompanied with a clear key.
- Stage size to be shown with a dimension from datum to downstage or up-stage edge.
- Version number with date to be indicated on all documents.
- Changes to be indicated from version to version.
- Please avoid where possible drawings with very large file sizes that have excessive information on such as 3d, set etc. As well as being potentially ambiguous, these can be very difficult to manipulate if the user at a particular venue does not have an in depth knowledge of CAD or do not have a computer with suitably fast graphics cards. If this type of drawing is deemed necessary as it could provide helpful information, it should therefore be additional to the requested rigging information/plots.
- Please try to be pragmatic with sending out too many rigging plot updates with very small and minor changes. If the venue already has a version, it is usually prudent to wait until a significant number of changes have been made before sending a fresh plot.
- Always include Head rigger name, email, contact details, or single rigging representative point of contact.
- Indicate if the max weight of the hoist is included, particularly if using inverted.

- Indicate the required hook height.
- Indicate loads in kilograms (kg).
- Indicate if the load moves during the show. If so indicate peak loads at relevant point positions.
- Where relevant, how sound load changes with build or angle.
- Where relevant, how moving loads are transferred from point to point i.e. tracking video loads.
- Indicate with documentation how load was determined? Load cell or calculation.
- Any performer flying should be clearly identified within rigging documentation. Separate relevant detailed information must be provided as necessary. (i.e. position, risk assessment, timings, rescue).
- In case of any personnel working at height during the show, e.g. on spot platforms, full details must be provided including method statements and risk assessments.