

IGVW

Interessengemeinschaft
Veranstaltungswirtschaft

Standards of Quality
Approved Code of Practice

>>SQ Q2

Entertainment Rigging - Qualification

Version 2, English, April 2013

Legend

Some explanatory notes regarding the structure of the standards:

| | |
|---------------------|------------------------------------|
| SQ | Standard of Quality |
| O | Organisation |
| P | Code of Practice/Working Procedure |
| Q | Qualification |
| 1, 2, 3, ... | Consecutive Numbering |

O Organisation/Documentation

Internal set-up and organisation of company operations
Process documentation and certification

P Code of practice/working procedure

Supply and use of working materials

Q Qualification

Qualification of skilled personnel and experts

igvw – Your contact partner for this Standard of Quality is the igvw.
The current management personnel can be found on our website: www.igvw.org.
Revised version compiled in English, April 2015.

The solutions and practices described in these standards of quality do not exclude other equally safe solutions or practices found in technical regulations implemented in the member states of the European Union or Turkey or any other contracting states of the Treaty on the European Economic Area.
Please note:

Wherever possible gender-free nouns and pronouns have been used.
Where this is not possible the male noun or pronoun has been used to improve readability, but also is meant to refer to females.

Preliminary Note

SQ Standards are intended to define the necessary quality levels required of services provided within the event technology industry.

SQ Standards take into consideration current legal positions and on that basis, provide a description of the industry's specialised working procedures. They contain a summary of the applicable legal standards and requirements in areas of work safety and health protection.

This Quality Standard has been developed by an igvw (Entertainment Technology Industry Association) working group in cooperation with DGUV (German Social Accident Insurance) and a working group consisting of safety engineers of the following institutions: ard.zdf.medienakademie, ARTE, BR, Bavaria, DR, DW, HR, IRT, MDR, NDR, ORF, RB, RBB, RBT, RTL, SF, SR, Studio Hamburg, SWR, WDR and ZDF.

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1 Area of Application

This standard applies to education and training for RIGGING in productions in the entertainment technology industry as well as to the responsibilities of educational institutions, providing criteria for judging the qualification of instructors.

Please Note:

“Entertainment” includes events such as concerts, theatre and other shows, fairs, congresses, conferences, exhibitions, presentations, demonstrations, movie sets or sound stages etc.

“Venues” are, among others, theatres, multipurpose halls, studios, production centres of film, television and radio studios, temporary buildings, concert halls, congress and convention centres, schools, exhibitions, fairs, museums, discothèques, amusement parks, sport venues and outdoor theatres.

2 Normative and Informal References

(we accept no responsibility for the accuracy or completeness of the contents)

PREVIOUS DESIGNATION · NEW DESIGNATION as of May 2014

BGV A 1 / GUV-V A 1 · DGUV Vorschrift 1

Principles of Prevention

BGV C 1 / GUV-V C 1 · DGUV Vorschrift 17 / DGUV Vorschrift 18

Venues and Production Centres of Dramatic Performances

BGV D 8 · DGUV Vorschrift 54 / DGUV Vorschrift 55

Winches, Lifting and Towing Equipment

BGI 810 · DGUV Information 215-310

Safety Aspects in Productions and Entertainment - Textbook

BGI 810-3 · DGUV Information 215-313

Safety Aspects in Productions and Entertainment – Overhead Loads

BGI 556 / GUV-I 556 · DGUV Information 209-013

Riggers/Slingers

BGI 515 · DGUV Information 212-515

Personal Safety Equipment

BGR / GUV-R 198 · DGUV Regel 112-198

Use of Personal Fall Protection Equipment

BGR / GUV-R 199 · DGUV Regel 112-199

Use of Personal Safety Equipment for Rescue from Heights and Depths

BGG / GUV-G 912 · DGUV Grundsatz 315-390

Principles for Checking Mechanical Systems on Stages and in Studios

DIN 56950

Entertainment Technology - Mechanical Systems on Stages and in Studios

DIN EN 353-2

Personal Fall Protection Equipment – Part 2:
Guided Type Fall Arresters Including an Anchor Line

DIN EN 361

Personal Safety Equipment – Harnesses

DIN EN 363

Personal Fall Protection Equipment – Personal Fall Arrest Systems

DIN EN 364

Personal Fall Protection Equipment – Inspection Procedure of PFPE
Employment Regulation

igvw SQ P1

Trusses

igvw SQ P2

Electric Chain Hoists

igvw SQ P4

Mobile Electric Devices in Entertainment Technology

igvw SQ Q1

Certified Entertainment Electrician

3 Entertainment Rigging Expert

This industrial standard defines the 3-step-training for the qualification in „entertainment technology rigging expertise“:

LEVEL 1

LEVEL 2

LEVEL 3

RIGGING in entertainment technology applies to the installation and operation of event-specific load holding devices. This includes transportation, horizontal travel and fastening of loads in entertainment technology as well as accessing the specific work space while making proper use of the personal fall protection equipment.

Hereinafter, all definitions refer to the current versions of the igvw industry's standards SQP1, SQP 2 and SQP 4.

3.1 Rigger LEVEL 1

The Rigger LEVEL 1 carries out simple tasks that include:

- Mounting of truss systems
- Fastening loads to trusses
- Fastening loads to fixed slings, anchor or suspension points.

Setting a sling, temporary sling, anchor or suspension point is admissible only under the inspection of a rigger with LEVEL 2 or higher certificate.

3.2 Rigger LEVEL 2

The Rigger LEVEL 2 carries out independently all entertainment technology rigging tasks.

This includes, in addition to all Rigger LEVEL 1 activities:

- Managing and supervising of all rigging tasks
- Setting temporary sling, anchor or suspension points
- Dimensioning of and system choices for technical equipment
- Carrying out the necessary risk assessments.

The work of the Rigger LEVEL 2 is equivalent to the work of the former expert for entertainment rigging acc. VPLT SR 3.0

The Rigger LEVEL 2 bears responsibility for his scope of work and for the realisation of the necessary risk assessments.

3.3 Rigger LEVEL 3

The Rigger LEVEL 3 possesses specific professional and leadership qualifications and is also able to comprehend complex projects.

This includes, in addition to all Rigger LEVEL 2 activities:

- Planning of and system choices for complex projects
- Carrying out the necessary risk assessments
- Assuming command and leadership.

The Rigger LEVEL 3 might, as a responsible choice, delegate tasks and activities to a Rigger LEVEL 2.

4 Management and Supervision

This industrial standard is also designed as a guideline to help companies make responsible choices in personnel enabling them to judge crucial professional qualifications.

When allotting tasks to someone (an employee or contractor), the employer has to take into account whether the person is qualified for the respective rigging activities.

It is essential that the person in question has the professional qualification, ample experience as well as operational practice and will observe the applicable laws and regulations.

The necessary qualification for the planning, mounting, dismantling and use of rigs depends on their complexity and on the result of the respective risk assessment. The operating company of a venue is responsible for design, load capacity, and condition of the attachment points provided in the building as well as for the floor load capacity. It is their responsibility to provide the appropriate documentation.

The static calculation of constructions is the exclusive responsibility of a qualified technical engineering office, notably the calculation of sling, anchor or suspension points and the load capacity of truss constructions.

If employees of more than one company or several single enterprises are involved in the RIGGING craft, a responsible person in command (rigger with LEVEL 2 or higher certificate) has to be appointed.

The company/employer must imperatively assign the implementation of tasks and activities to a person fulfilling the requirements of this standard of quality.

5 Qualification

This chapter describes the respective prerequisites for qualification as an expert for entertainment rigging LEVEL 1-3 as well as training contents and requirements in examinations.

5.1 Rigger LEVEL 1

5.1.1 Prerequisites

A basic mathematical knowledge is an immediate prerequisite, namely: basic arithmetics, trigonometry, geometry and solving simple equations.

To be admitted to a training course, applicants have to present the following documents:

- First aid certificate not older than 24 months
- valid health screening according to G 41 (risks from working at height)
- Proof of the minimum age (18 y)
- A completed training as an specialist for entertainment technology
or
- Proof of a minimum (discipline related) occupation time of 3 years in the entertainment technology sector

5.1.2 Training Contents

The training for Rigger LEVEL 1 has a modular format, containing both theoretical and practical disciplines. The training must be absolved within a 12-month period.

The legal basis herefore is derived from the contents of Chapter 2: Normative and Informal References.

Basic Fire Protection

- Constructional and technical fire protection
- Fire protection facilities
- Fire extinguishing agents

Basic Principles of Electrical Installations

- Exposure to electrical hazard
- Effects on the human body
- 5 safety rules for working with electric devices
- Maximum allowable touch voltage
- Protection classes and IP Codes
- Rotating magnetic field
- Safety instrumented systems
- Electrical fuses
- Automatic circuit breakers
- Circuit breakers
- CEE system of electrical connectors

Basic Principles of Structural Analysis

- Description of (static) forces
- Calculation of support reactions of static determinate beams
- Instruction concerning load distribution on multi span beams
- Assessment of the state of strain with beams under bending stress
- Normal and bending stress
- Instruction concerning other kinds of stress (hole bearings, shear/torsional stress)

Technical Equipment (Theory)

- Lifting tackles
- Load carrying attachments
- Truss systems
- Hoist devices
- Basic nomenclature of electrical engineering
- Distinct classification of D8, D8+, C1
- Control of D8, D8+
- Visual inspection
- Elevating work platforms
- Scaffoldings and ladders

Technical Equipment (Practice)

- Choosing and dimensioning of lifting tackles
- Performing different kinds of sling methods and truss linking
- Mounting trusses, including appropriate tools
- Rigging trusses and using diverse hoist devices

Personal Fall Protection Equipment (PFPE) – Theory

- Legal basis
- Components and choice of the appropriate PFPE on the basis of risk assessment and operating instructions
- Judging PFPE regarding its suitability, quality and state
- Intended use of PFPE
- Safekeeping and maintenance of PFPE
- Basic physics of falls
- Information about orthostatic shock
- How to behave in the event of an accident

Personal Fall Protection Equipment (PFPE) - Practice

- Checking PFPE for suitability, state and functions
- Discard criteria
- Learning and performing the most common knots for diverse situations
- Use of PFPE on horizontal and vertical structures
- Use of diverse protection techniques while climbing and devices on vertical restraints
- Rigging on sling, anchor or suspension points, respectively, on restraint or fall arrest systems
- Diverse techniques of rope assisted work positioning
- Basic principles of self-rescue techniques

Risk Assessment

- legal requirements

5.1.3 Examination Requirements

Examinations must be taken in theory and practice.

The candidate must score at least 70 percent of the maximum points in order to pass the theoretical examination. In practical examinations, the examiner's judgement of the necessary skills will determine the evaluation „pass“ or „fail“.

The examination records must be archived by the educational institution for a period of 5 years.

5.2 Rigger LEVEL 2

5.2.1 Prerequisites

To be admitted to the training course, the applicant has to present the following documents:

- First aid certificate not older than 24 months
- valid health screening according to G 41 (risks from working at height)
- Proof of the minimum age (18 y)
- Rigger LEVEL 1 training and certificate, and a minimum of 20 logged working days under inspection of a Rigger LEVEL 2
or
- Proof of a minimum (discipline related) occupation time of 3 years in the entertainment technology sector, passed examination of Rigger LEVEL 1, and a minimum of 20 logged working days under inspection of a Rigger LEVEL 2.

5.2.2. Training Contents

The training for Rigger LEVEL 2 has a modular format, containing both theoretical and practical contents. The training must be absolved within a 12-month period.

Legal Basis

- Liability
- Risk assessment for the area of activity
- Defining the area of activity and ways of communication

Rigging-specific Structural Analysis

- Transverse force and bending moment transmission to stressed components
- Local stress caused by induced forces outside truss construction knots
- Load capacity of common connector systems
- Information about stress induced on corners etc.
- Stress induced on tower components
- Calculation of multiple hangers or bridles
- Calculation of buckling resistance

Technical Communication

- Basic principles of technical drawing
- Creating views and projections
- Reading rigging plans
- Compiling part lists
- Use of truss construction kits

- Interpretation of structural analysis data
- Interpretation of lighting and hall plans

Personal Fall Protection Equipment (PFPE) – Theory

- Refreshing knowledge PFPE
- Organisation of a rescue chain and coordination of rescue measures

Personal Fall Protection Equipment (PFPE) - Practice

- Learning and practicing diverse rescue techniques
- Absolving a rescue exercise with diverse approaches and rescue techniques/ access and rescue technique variations

Technical Equipment - Theory

- Planning of auxiliary supporting constructions, including constructions with ground support, taking into consideration different spans and stress levels
- Description of the individual components
- Dimensioning and system choices
- Considering local circumstances, such as soil characteristics, floor load capacity, slopes (construction stability)
- Use of diverse elevating work platforms
- Creating a risk assessment for an exemplary project
- Repetitive checks of hoist devices, troubleshooting
- Necessity of the expert examination of D8+ and C1 hoist devices
- Creating a guideline

Technical Equipment - Practice

- Calculations of measurements using rigging plans
- Sling methods on ceiling structures
- Use of technical equipment such as ropes or sheaves
- Creating cable taps
- Replacing integrated hoist devices in truss constructions
- Building a two point supported construction
- Building a three (or more) point supported construction
- Building special constructions (e.g. on two levels)
- Using a secondary safety system on hoist devices
 - Subsequent removal of hoist devices (e.g. during fairs)
 - Efficiency control of the preliminary created risk assessment
- Use of technical equipment for the mounting of truss constructions

5.2.3. Examination Requirements

Examinations must be taken in theory and practice.

The candidate must score at least 70 percent of the maximum points in order to pass the theoretical examination. In practical examinations, the examiner's judgement of the necessary skills will determine the evaluation „pass“ or „fail“.

The examination records must be archived by the educational institution for a period of 5 years.

5.3 Rigger LEVEL 3

5.3.1 Prerequisites

To be admitted to the training course, the applicant has to present the following documents:

- First aid certificate not older than 24 months
- valid health screening according to G 41 (risks from working at height)
- Proof of the minimum age (24 y)
- Rigger LEVEL 2 training and certificate, and proof of a minimum LEVEL 2 occupation time of 3 years as well as a minimum of 50 logged working days within the last 12 months
or
- Proof of a minimum (discipline related) occupation time of 3 years in the entertainment technology sector, passed examination of Rigger LEVEL 2, and a minimum of 50 logged working days
or
- Certificate of expert in entertainment rigging according to SR 3.0 and a minimum of 50 logged working days within the last 12 months before application

5.3.2. Training Contents

Rigging-specific Structural Analysis

- Calculation of stress on individual parts of the truss or construction
- Calculation of stress induced on corners etc.
- Calculation of multiple hangers or bridles - support, truss stress, including software solutions
- Creating an exemplary type static calculation for a virtual truss
- Calculating complex systems

System choices

- Interpretation of static calculation and transfer to the planning
- Examples of analyzing an exemplary type static calculation
- Survey of electronic calculation tools
- Mechanical systems (hoist devices and controls)

Safety Systems – Theory

- Judging fixed and temporary sling/anchor/suspension systems on the basis of the constructional requirements according to EN 795 – presentation of diverse safety systems available on market
- Mounting, use and checking of temporary sling/anchor/suspension systems
- Planning and set up of provisional sling/anchor/suspension systems (lifelines)

Safety Systems – Practice

- Creating temporary sling/anchor/suspension systems

Technical Communication

- Operating a CAD program
- Creating 2D/3D constructions with CAD libraries
- Constructing/Drawing special construction components in 3D
- Transfer of rigging plans into hall plans

Risk Assessment

- Writing a risk assessment for a complex rigging production

Personal Fall Protection Equipment (PFPE) - Theory

- Refreshing knowledge PFPE
- Organisation of a rescue chain and coordination of rescue measures

Personal Fall Protection Equipment (PFPE) - Practice

- Learning and practicing diverse rescue techniques
- Absolving a rescue exercise with diverse approaches and rescue techniques

Personnel Planning and Instruction

- Survey of Organisation of set-ups and procedures
- Anticipatory Organisation: individual steps in procedures
- Definition of Organisational and specialist responsibility as well as of responsible choices and control
- Criteria for choosing the right personnel
- Delegation and transfer of duties
- Judging working conditions
- Service descriptions and contracts
- Basic principles of perception and learning

- Planning and instruction with diverse group sizes
- Documentation of instructions

Social Competence and Leadership

- Types of learning and motivation
- Forming a group
- Non-verbal communication
- Communication structure
- Conflict talk
- Leadership styles and strategies
- Self image – perception by others
- Personal responsibility
- Team spirit – key qualifications
- Knowledge of human nature
- Critical faculty
- Self-discipline
- Linguistic competence
- Cooperation
- Communication

5.3.3. Examination Requirements

Examinations must be taken in theory and practice.

The candidate must score at least 70 percent of the maximum points in order to pass the theoretical examination. In practical examinations, the examiner's judgement of the necessary skills will determine the evaluation „pass“ or „fail“.

The examination records must be archived by the educational institution for a period of 5 years.

6 Proof of Qualification/Certificate

The certificate is provided by the igvw.

Therefore, it is indispensable that the educational institution informs the igvw about the examination results.

Furthermore, the participant will obligatorily transmit the following documents to the igvw:

• **Proof of logged working days**

- LEVEL 1 - 20 logged working days under inspection of a Rigger LEVEL 2
- LEVEL 2 - 30 logged working days under inspection of a Rigger LEVEL 2
- LEVEL 3 – 50 working days logged within 12 months

Having fulfilled all the above requirements, the participant will receive a proof in the form of a certificate and an identification card provided by the igvw. Furthermore, the rigger's accreditation will be published on the website: www.igvw.de

Certificates of all 3 Levels shall be valid for 36 months.

The personal responsibility of the certificate's owner in order to receive the qualification are the following requirements:

- A valid first aid certificate
- valid health screening according to G 41 (risks from working at height)
- Proof of annual instruction in the use of Personal Fall Protection Equipment, including practical exercises (DGUV-Vorschrift 1 / BGV A1)
- It is strongly recommended that all subcontractors/self-employed annually participate in an external course on the use of Personal Fall Protection Systems
- Proof of the further training as well as the logged working days must be sent to the igvw prior to the end of 36 months.

Required numbers of logged working days p.a.:

| | |
|----------------|-----------------|
| Rigger LEVEL 1 | 20 working days |
| Rigger LEVEL 2 | 30 working days |
| Rigger LEVEL 3 | 50 working days |

The validity of the certificate expires:

- in case the work as a rigger will not be commenced within 12 months
- in case the rigger will not deliver proof of further specific training with at least 12 units (1 unit = 45 minutes).

The igvw has the right to revoke certification in case the entertainment rigging expert acts unlawfully or in contradiction to the state-of-the-art technology (e.g. SQ P1, SQ P2, BGI 810-3 / DGUV Information 215-313).

The igvw shall, in this case, revoke the accreditation as well.

7. Educational Institutions and Instructors

The education of an entertainment/event rigging expert requires the careful observation by the educational institution of all the requirements listed in the industry's standard SQ Q2.

7.1 Tasks and Responsibilities of Educational Institutions

The educational institution bears responsibility for the qualification according to this industry's standard SQ Q2.

This also includes the diligent control of the participants' allowance based on our prerequisites.

Furthermore, it includes the choice of qualified instructors (an instructor is qualified when they are working full-time in their special field and have the qualifications listed below), the termination of the training on schedule, the implementation of the training contents as well as thorough examinations including documentation.

The educational institution bears responsibility for transmitting the records to the igvw, positive results as well as negative ones.

7.2 Qualification of Instructors

In order to become an instructor according to this industry's standard for the qualification of an entertainment rigging expert, the applicant

- has to have an extensive knowledge about rigging granted by their specific professional training and experience
- has to be familiar with the current government regulations concerning occupational safety and hazard prevention as well as with the generally accepted rules of engineering
- has to be at least 24 years old
- has to be capable of communicating training concepts and leading a group through a training course/seminar.

The qualification of an instructor teaching practice modules must, at least until the training for LEVEL 2, correspond to the next higher qualification.

Instructors for LEVEL 3 training must deliver proof of the same qualification or higher.

Appendix

Appendix I – Training Time Schedule

| Education Units (1 unit = 45 minutes) | Number of Units |
|--|-----------------|
| LEVEL 1 | |
| Survey of the Basic Legal Principles | 8 |
| Basic Fire Protection | 8 |
| Basic Electric Engineering Principles | 8 |
| Basic Principles of Structural Analysis | 16 |
| Technical Equipment – Theory | 16 |
| Technical Equipment – Practice | 24 |
| Personal Fall Protection Equipment (PFPE) – Theory | 16 |
| Personal Fall Protection Equipment (PFPE) – Practice | 24 |
| Examinations | 12 |
| Total | 132 |
| LEVEL 2 | |
| Basic Legal Skills | 16 |
| Rigging-specific Structural Analysis | 24 |
| Technical Communication | 8 |
| Technical Equipment – Theory | 16 |
| Technical Equipment – Practice | 16 |
| Personal Fall Protection Equipment (PFPE) – Theory | 16 |
| Personal Fall Protection Equipment (PFPE) – Practice | 16 |
| Examinations | 8 |
| Total | 120 |
| LEVEL 3 | |
| Rigging-specific Structural Analysis | 16 |
| System choices | 8 |
| Safety Systems – Theory and Practice | 6 |
| Technical Communication | 8 |
| Risk Assessment | 8 |
| Personal Fall Protection Equipment (PFPE) – Theory | 8 |
| Personal Fall Protection Equipment (PFPE) – Practice | 8 |
| Personnel Planning and Instruction | 12 |
| Social Competence and Leadership | 12 |
| Examinations | 8 |
| Total | 94 |

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