



General Operational Hazard Guide

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Disclaimer

In legislative terms, the requirements of the *Work Health and Safety Act 2011* (the WHS Act) and Work Health and Safety Regulations (the WHS Regulations) are mandatory. In contrast, a guide is designed to assist obligation holders to comply with the requirements of an act or regulation. The information contained in the LPA guides is not mandatory, has no legal status and may not apply in all work situations.

Obligation holders still have a duty to assess the risks in each work situation and take all reasonable steps to eliminate or minimise the risks that are specific to each work activity.

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1. Overview

This guide provides information to assist in managing risks associated with **general operational hazards** in live entertainment and events. Information in this guide is based on the *Work Health and Safety Act 2011* (WHS Act) and Work Health and Safety Regulations 2011 (WHS Regulations), which are operational in all states except Victoria and WA, where adoption of the legislation is not yet enacted (as at Jan 2018).

It is recommended that this information is referenced during the planning and delivery of events to assist in identifying hazards, assessing risks and determining appropriate control measures to eliminate and or minimise these risks, so far as reasonably practicable.

This guide does not replace the need to implement risk management strategies, undertake research or seek specialist advice.

Each worker and person conducting a business or undertaking (PCBU) has a responsibility to understand their obligations under WHS legislation. Codes of Practice and Australian and international standards provide approved guidance on how to meet work health and safety obligations. International standards also provide further guidance on ways to identify hazards and manage risks.

General operating hazards in live performance include a variety of activities and environments. This guide provides information on risks associated with:

- Event infrastructure
 - design
 - site order and housekeeping
 - crews and fatigue
- Work lighting
- Loading and unloading trucks
- Manual handling
- Slips and trips
- Impact and crush injuries
- Attaching or suspending items – not deemed as rigging
- Drapery
- Revolves and moving trucks
- Work on raked stages
- Hot works
- Vehicles on stage



- Restricted spaces within set pieces and stages

Further information:

- Stage Machinery and Automation Systems Hazard Guide
- Working at Height Hazard Guide
- Event Rigging Hazard Guide
- Part 1 Safety Guidelines for Live Entertainment and Events provides general information on duties, obligations and risk management.

2. Key Considerations

Consider the following questions during event design, planning and delivery	Yes	No	Comments/Action
2.1 Manual handling			
<i>Is there handling of heavy objects, awkward objects or objects that are difficult to grasp?</i>	<input type="checkbox"/>	<input type="checkbox"/>	
<i>Is there frequent or prolonged bending, reaching or twisting of the back, or awkward postures?</i>	<input type="checkbox"/>	<input type="checkbox"/>	
<i>Are loads moved or carried over long distances?</i>	<input type="checkbox"/>	<input type="checkbox"/>	
<i>Are loads unstable or unbalanced?</i>	<input type="checkbox"/>	<input type="checkbox"/>	
<i>Does the moving involve large push/pull forces?</i>	<input type="checkbox"/>	<input type="checkbox"/>	
<i>Is the object pushed or pulled across the front of the body?</i>	<input type="checkbox"/>	<input type="checkbox"/>	
<i>Do objects have sharp edges or protrusions?</i>	<input type="checkbox"/>	<input type="checkbox"/>	
<i>Does the object block the view of the carriers when being handled?</i>	<input type="checkbox"/>	<input type="checkbox"/>	
<i>Is the lighting adequate for safe manual handling?</i>	<input type="checkbox"/>	<input type="checkbox"/>	
<i>Is the work environment cluttered, uneven or slippery?</i>	<input type="checkbox"/>	<input type="checkbox"/>	
<i>Is the task performed in a defined restricted space?</i>	<input type="checkbox"/>	<input type="checkbox"/>	
<i>Are there sufficient competent people for the manual handling task?</i>	<input type="checkbox"/>	<input type="checkbox"/>	
<i>Do workers have the required skills for the manual handling task? Should a mechanical handling aid be used to move items?</i>	<input type="checkbox"/>	<input type="checkbox"/>	
<i>Is the correct appropriate PPE being used?</i>	<input type="checkbox"/>	<input type="checkbox"/>	



Consider the following questions during event design, planning and delivery	Yes	No	Comments/Action
<i>Is equipment maintained in good working order?</i>	<input type="checkbox"/>	<input type="checkbox"/>	
<i>Are the appropriate mechanical handling aides available?</i>	<input type="checkbox"/>	<input type="checkbox"/>	
<i>Is the work area free of excessive noise, wind, rain or any other impediment to safe manual handling?</i>	<input type="checkbox"/>	<input type="checkbox"/>	
2.2 Slips and trips – floors			
<i>Are there any floor surface transitions not easily noticed (any ridge that is as high as a footwear sole or higher)?</i>	<input type="checkbox"/>	<input type="checkbox"/>	
<i>Is the floor slippery at any time?</i>	<input type="checkbox"/>	<input type="checkbox"/>	
<i>Has any anti-slip paint, coating profiles or tapes been worn smooth or damaged?</i>	<input type="checkbox"/>	<input type="checkbox"/>	
<i>Are there any isolated low steps?</i>	<input type="checkbox"/>	<input type="checkbox"/>	
<i>Are there any trip hazards due to equipment and other objects left on the floor, raised carpet edges, loose tiles etc.?</i>	<input type="checkbox"/>	<input type="checkbox"/>	
<i>Are there any holes or unevenness in the floor surface?</i>	<input type="checkbox"/>	<input type="checkbox"/>	
2.3 Slips and trips – stairs and ramps			
<i>Is the lighting sufficient for ramps or steps to be seen clearly without glare?</i>	<input type="checkbox"/>	<input type="checkbox"/>	
<i>If the steps are all the same colour, have the edges been identified clearly?</i>	<input type="checkbox"/>	<input type="checkbox"/>	
<i>Do any steps have too small a rise or tread or an excessive step edge (nosing)?</i>	<input type="checkbox"/>	<input type="checkbox"/>	
<i>Are any step edges/nosing's slippery or hard to see?</i>	<input type="checkbox"/>	<input type="checkbox"/>	
<i>Are the steps uneven or are there excessive variations in step dimensions?</i>	<input type="checkbox"/>	<input type="checkbox"/>	
<i>Are handrails inadequate on stairs?</i>	<input type="checkbox"/>	<input type="checkbox"/>	
<i>Are ramps too steep or too slippery?</i>	<input type="checkbox"/>	<input type="checkbox"/>	
<i>Are there corners to navigate?</i>	<input type="checkbox"/>	<input type="checkbox"/>	
<i>Is there sufficient lighting in passageways, at flooring transitions, ramps or stairs?</i>	<input type="checkbox"/>	<input type="checkbox"/>	
<i>Does the lighting throw distracting shadows</i>	<input type="checkbox"/>	<input type="checkbox"/>	



Consider the following questions during event design, planning and delivery	Yes	No	Comments/Action
<i>or produce excessive glare?</i>			
2.4 Slips and trips – housekeeping			
<i>Are papers, rubbish, dirt or spills left on the floor?</i>	<input type="checkbox"/>	<input type="checkbox"/>	
<i>Are wet floor signs not available or not used correctly?</i>	<input type="checkbox"/>	<input type="checkbox"/>	
<i>Are aisles poorly marked or cluttered?</i>	<input type="checkbox"/>	<input type="checkbox"/>	
<i>Is there enough storage space when moving in equipment and sets?</i>	<input type="checkbox"/>	<input type="checkbox"/>	
<i>Are there any trip hazards present due to equipment and other movable objects left lying on the ground?</i>	<input type="checkbox"/>	<input type="checkbox"/>	
<i>Do spills (wet or dry) occur regularly during work processes?</i>	<input type="checkbox"/>	<input type="checkbox"/>	
2.5 Slips and trips – tasks			
<i>Do workers have to walk or work on greasy, oily or wet floors that are not adequately slip resistant?</i>	<input type="checkbox"/>	<input type="checkbox"/>	
<i>Do loads that are carried or pushed interfere with vision?</i>	<input type="checkbox"/>	<input type="checkbox"/>	
<i>Are the loads to be carried excessive or likely to upset a person's balance?</i>	<input type="checkbox"/>	<input type="checkbox"/>	
<i>Do heavy trolleys have to be pushed up ramps?</i>	<input type="checkbox"/>	<input type="checkbox"/>	
<i>Are workers hurried due to time constraints?</i>	<input type="checkbox"/>	<input type="checkbox"/>	
<i>Do workers require training in the procedures for dealing with slips and trips hazards?</i>	<input type="checkbox"/>	<input type="checkbox"/>	
<i>Do workers require slip resistant footwear?</i>	<input type="checkbox"/>	<input type="checkbox"/>	



3. General Guide – General Operational Hazards

3.1 Responsibilities

There are specific requirements in relevant state and federal WHS regulations for managing risks associated with general work operations. In particular, some sections may apply to live theatre and events including, for example, in the Model WHS Regulations, Chapter 3, General risk and workplace management; Chapter 4, Part 4.1 Noise, Part 4.2 Hazardous Manual Tasks and Chapter 6 Construction Work.

3.2 Training and competence

Appropriate training must be provided to all persons in the workplace to enable them to safely undertake operational tasks.

Workers must receive induction training to enable them to understand the hazards and risks associated with the required tasks and how to implement appropriate controls. Site-specific training should be provided on specific risks.

Further task-specific training must be provided to ensure personnel are competent to undertake hazardous tasks such as manual handling.

In addition to the relevant certification being sighted, management should make a determination of the competency/capacity of each worker for the tasks required.

3.3 Consultation, co-operation and co-ordination

The Model WHS Act makes consultation with workers a legal requirement. Consultation, cooperation and coordination between PCBUs is a requirement where they share a duty for the safety of a worker or for work to be done.

All PCBUs have a duty to consult, co-operate and co-ordinate with all other PCBUs and workers. They should use the information in this guide to consult with workers to determine hazards and risks in the operational environment and how to best eliminate or minimise these risks using the hierarchy of controls.

Consultation should start as early as possible, be acted upon and followed through. PCBUs and workers must determine what information needs to be shared and discussed.

This might include consultation with venue or site management, unions, production companies, event organisers, promoters, catering providers, security, subject matter experts such as structural engineers or safety officers, local authorities or governments, rigging companies, performers, suppliers of plant or equipment, etc. By legislation you must include consultation with designers.



If employees are represented by health and safety representatives, the consultation must involve those representatives.

Areas to address during consultation may include induction, schedules, floor plans, set, lighting and sound designs, site-specific requirements, risk assessments, SWMS, hazards and control measures, legislative requirements, licences, plant movement, traffic management, exclusion zones, key contacts, emergency procedures, permits to work, etc. Opportunities for consultation include toolbox talks, event briefings, site inspections, stakeholder meetings, post event reviews, working groups and forums.

3.4 Design and planning

In the early stages of design and planning for an event, the following criteria should be addressed:

- Consultation with relevant PCBUs and workers
- Selection of the plant and equipment required to complete the task
- Appropriate scheduling and allocation of resources to ensure safe work practices
- Design to suit the financial and logistical capabilities of the organisation
- Development of risk assessments and SWMS that include controls agreed to during consultation
- Work permit or engineering certificate requirements
- Rescue methods, including the persons and equipment required for any rescue
- Access to site and logistics
- Maintenance programs
- Legislative requirements
- Emergency procedures
- Communication methods

The design and planning phase should seek to eliminate or minimise general operational hazards and risks. For example, sets and props should be designed in a manner that eliminates or minimises the need for manual lifting and allows them to be handled in a safe way.

3.5 Event delivery

In the delivery phases of an event (bump in, rehearsal, show, bump out) the following criteria should be addressed:

- Consultation with relevant PCBUs and workers
- Site-specific inductions and toolbox reports



- Ensuring the correct infrastructure is in place
- Hierarchy of safety information flow
- Identification of direct supervisor of each worker
- Equipment inspections and/or maintenance
- Implementation and monitoring of controls identified in risk assessments or SWMS
- Compliance to legislative requirements
- Revision, consultation and adjustment of control measures as required on site
- Incident reporting and management
- Sign-off and handover procedures

3.6 Review

After an event, the following criteria should be reviewed in consultation with relevant parties:

- Incident reports and outcomes, including near-misses.
- Effectiveness of the risk control measures
- Scheduling
- Incidents of non-compliance
- Any new hazards or risks identified
- Possible improvements to safe work practices distributed to all planners

3.7 Documentation and records

The following documents and records should be created, maintained and kept on site when undertaking potentially hazardous work during an event:

- Emergency contact numbers
- Risk assessments and SWMS
- Manual handling injury prevention program information
- Training records, certificates of competency and licences
- Induction records
- Toolbox talk topics and attendance
- Evidence of consultation
- Incident reports, including near-misses
- Plant design specifications and maintenance records, including modifications
- Engineering certification, work permits and sign-off records
- SDS and hazardous substances register
- Site evacuation plan and procedure

Any of the above documents can be requested to be sighted by other PCBUs for verification or clarification and should be available at all times.

Various WHS documents and records need to be retained for a specific period of time – see relevant state and federal WHS legislation for details.

4. Suggested Control Measures

4.1 Event infrastructure – design, site order and housekeeping, crews

Planning is the critical factor in managing general operational hazards and risks, particularly the unloading and assembly of sets and event infrastructure. It is not an acceptable practice for staff to be unaware of what a truck contains until it reaches the venue or site.

Personnel coordinating bump-in or set up need to understand and plan for how materials will be received and handled on site or in the venue. They also need to take into account factors in the physical environment that may complicate materials movement and assembly, including access, weather, ground conditions, light levels, ambient noise levels and so on. These factors will also influence the number of workers and skill mix required to complete the task being undertaken.

4.1.1 Design of sets and scenery

Designers must consider the hazards and risks their set design introduces into the workplace and also how the set and elements will operate during a performance or event.

Designers have a duty under the Model WHS Act to ensure, so far as is reasonably practicable, that the set and elements are without risks to health and safety when used as intended. This includes providing information to others to enable them to manage hazards and risks. Organisers/PCBU have a duty under the Act to request this information from the designer. In general, consideration should be given to the design and installation options that eliminate or minimise hazards and risks associated with manual handling, slip, trip, crush or fall hazards, exposure to hazardous chemicals, flammability, access, etc.

Suggested control measures:

- Have sets, structures, scenic elements, fixings and loadings (during construction as well as when fully assembled) assessed by an independent engineering consultant
- Ensure all applicable parts of scenery have Safe Work Loads (SWLs) clearly marked and visible
- Ensure stairs and handrails meet the Building Code of Australia (BCA) and Australian/NZ standards
- Complete relevant SWMS and risk assessment documentation
- Determine and document load limits
- Minimise the risk of fall and falling objects hazards



- Undertake detailed planning for hoisting of sub-assemblies, construction and fixings of set pieces and structures
- Ensure construction follows a documented procedure developed in consultation with competent and experienced technicians responsible for construction and erection
- Assess potential crushing and entrapment risks and develop SWMS as required
- Conduct routine inspection of structures before all rehearsals and performances to ensure continued integrity
- Ensure designers and contractors provide information on paints and coatings used
- Allocate adequate time for testing complex technical elements
- Define all the parameters of the design, including, but not limited to, transportation, handling, assembly and operations

4.1.2 Site order and housekeeping during materials movement and assembly

The key to minimising risk is identifying and managing potential hazards.

Each task or work environment should be risk assessed on a case-by-case basis, and any control measures that are implemented should remain subject to review and revision as required. It should not be assumed that a generalised set of control measures will be sufficient in all instances.

Suggested control measures:

- Ensure a competent person (safety manager, event/site manager, production manager) provides supervision of all unloading and bump-in activity, according to venue or site requirements
- Confirm workers have received appropriate induction and hold necessary competencies including licenses
- Conduct pre event briefing with all relevant workers
- Agree and schedule all bump-in movements with all relevant stakeholders
- Provide isolation and exclusion zones, particularly for assembly work
- Identify persons who require access to work areas and limit area access to only those individuals
- Ensure general public is not able to access loading and assembly work areas
- Pay vigilant attention to housekeeping
- Provide decant and stowage areas as well as tools for fluid transfer
- Provide clear access for all movement of materials and equipment
- Reinforce appropriate manual handling methods
- Manage work areas to ensure public, construction activities and traffic do not mix
- Ensure workers are appropriately licensed to use movement devices, exclusion



barricades

- Ensure warning signage is installed, and where necessary a spotter accompanies vehicle movements into, on or off the site
- Eliminate or minimise the need to relocate any major equipment during the event
- Do not commence bump-out until patrons and public have left the area and exclusions zones have been established
- Ensure appropriate PPE is provided and used (e.g. fluoro vest and safety boots)

4.2 Staff welfare and fatigue

It is the responsibility of both the employer and the employee to ensure employees are fit and able to perform the work as required. Factors such as health, injury, mental health, infectious diseases, alcohol, substance abuse can all impair the ability and capacity of employees. Employers should have appropriate policies in place for these matters and ensure that all employees are aware of, and comply with, these policies.

Long shifts combined with time pressure mean fatigue can be a key factor in the incidence of injury and illness in the live entertainment and event industry. A key way to prevent the adverse effects of fatigue is to effectively plan for the technical and personnel requirements to safely deliver an event. It is critical to provide detailed and timely information to technical and event planning staff to enable them to schedule/allocate the necessary resources and skilled crews.

The following points are a useful guide and should be followed:

- No employee should work more than 12 hours in one shift
- Provide a minimum 10-hour turnaround time between shifts
- Ensure no employee works more than 3 consecutive 12 hour shifts
- Use multiple crews as an alternative to having one crew work multiple long shifts
- Provide sufficient hand over time between crews when complex or heavy work is required
- Reduce potential impacts of fatigue by closely matching worker skill levels and experience to the work requirements, including using buddy arrangements with less experienced workers
- Provide adequate supervision to enable monitoring of crew fatigue levels, particularly in the second half of shifts and heavy work
- Provide adequate meal/rest breaks during the course of any shift
- Provide freely available clean drinking water for all workers



- Provide toilet facilities
- Consider the safety/impact of workers' work-home travel arrangements following long shifts

4.2.1 Multiple employers

In the live entertainment and events sector workers may sometimes be engaged by more than one PCBU. This can present a challenge to PCBUs in that it can be difficult to obtain information from workers on the number of hours they are working elsewhere unless there is a contractual obligation for them to declare any potential conflict of interest, which includes working for other PCBUs.

Under the Model WHS Act workers are obligated to take reasonable care of their own health and safety, take reasonable care that their actions or omissions do not adversely affect the health and safety of other persons, comply with any reasonable instruction that is given by the PCBU, and co-operate with any reasonable policy or procedure of the PCBU. It is therefore reasonable to require a worker to inform a PCBU of a circumstance that may affect their capacity to perform their specified role safely.

Workers have a duty of care to guard against endangering themselves and others from fatigue resulting from excessive hours of work for multiple PCBUs. Workers should follow these guidelines and inform PCBUs when working for multiple PCBUs if the hours of work are potentially excessive. NOTE – Noise exposure should also be considered to ensure workers do not exceed maximum exposure over two consecutive periods of employment for two PCBUs.

All PCBUs should advise new workers of the policies in place to protect their health and safety. One of these policies should relate to the maximum allowable hours of work. There is a responsibility for the worker to advise the PCBU if they are engaged by more than one PCBU. The PCBU also has a responsibility to monitor the safety of all workers. Should a worker be exhibiting symptoms of fatigue that could impact on their ability to perform work safely, the PCBU has a responsibility to ask the worker about other employment and any other factors that could be contributing to their fatigue. A policy to send affected workers home should be developed in consultation with workers.

4.3 Work lighting

Low light is a common hazard in live performance and event environments. Risk assessments must be undertaken to determine site-specific hazards and controls. Care must be taken to ensure there are sufficient light levels to allow work to be undertaken safely. Safe access and egress from the workplace must be maintained at all times.

Suggested control measures:

4.3.1 General lighting

- Provide general work light that is adequate for all common tasks



- Provide temporary lighting as required, particularly for outdoor events
- Provide task lighting for critical cues
- Provide supplementary site-specific lighting for complex or potentially hazardous tasks
- Rehearse activities to be undertaken in low light, or where there is a sudden transition (such as between high and low light conditions or when moving between the stage and backstage)
- Provide warnings prior to changing lighting states
- Provide stage edge illumination/identification suitable for cast and crew movement
- Maintain and test emergency lighting

4.3.2 Blackout

- Develop a planned approach for blackout or very low lighting situations including review of risk to staff and patrons
- Seek advice from a professional building consultant
- Ensure lighting systems for stage, backstage, wings etc. prevent 'fade to total black' and preserve an apparent contrast between adjacent surfaces or edges including the use of contrast media, such as reflective tape, rope or LEDs
- Ensure performers who need to position themselves during blackout are 'conditioned' prior to blackout and are specifically rehearsed

4.4 Loading and unloading trucks

Consultation and forward planning are essential for the safe loading and unloading of trucks. The activities must be supervised by a competent worker with a clear plan of the items to be moved and how these movements will be undertaken. Planning must ensure adequate resources such as manual handling equipment and safe temporary storage areas are provided, and that sufficient numbers of skilled workers are available. All workers must be competent in manual handling including team lifts.

Suggested control measures:

4.4.1 Transport and packing control measures

- Include planning for transport requirements in the design stage, taking into account size, weight and manoeuvrability
- Consult with the designer to determine the most appropriate form of transport, as well as equipment requirements such as gates, ropes and clips
- Consider the destination, including specific venue requirements and site conditions, when determining the order of the load



- Complete a packing diagram and load manifest, including estimated weights, before the truck departs
- Ensure both the manifest and the packing diagram accompany the set and equipment and that these are provided to the manager of the next venue, prior to commencement of a bump in
- In most cases, load theatre scenery upright against gates or van walls and not stacked flat
- Ensure each individual flat is secure and cannot slip
- Apply sufficient load restraint so to prevent load shift during transport Ref: Load Restraint Guide <http://www.ntc.gov.au/heavy-vehicles/safety/load-restraint-guide/>
- Ensure appropriate manual handling equipment is available for loading of the truck
- Undertake risk assessments where necessary
- Ensure workers wear personal protective equipment such as high visibility vests and work boots

4.4.2 Traffic control measures

- Develop a traffic management plan in consultation with the local authorities if there is any possibility of interference with normal traffic flow
- Ensure all persons directing traffic are competent and hold the appropriate license
- Ensure all persons working near traffic wear high visibility vests
- Ensure that the truck is parked on even ground to ensure stability of scenic elements in the truck.

4.4.3 Unloading control measures

- Make contact with the venue and local authorities well before the production or load in
- Check the manifest and packing diagram to determine the most appropriate order for unloading
- Assess and plan storage requirements prior to the load in or production period
- Take local activities and conditions into account when scheduling the unload, including weather, adequate light, time of day
- Provide temporary lighting if required
- Confirm that load capacity of docks is known and not exceeded
- Ensure workers operating in the near vicinity of traffic wear personal protective equipment in the form of high visibility vests



- Provide lifting equipment that is suitable for the purpose
- Schedule adequate rest breaks, with consideration given to the order and intensity of the workload when determining the frequency and duration of breaks
- Use extreme care when opening trailer doors, removing tarpaulins, releasing side curtains, removing gates and releasing ropes/load binders as the load may have shifted during transit
- Ensure sections of the load that are secured to the side wall of a van or to side gates are made safe when removing ropes or load binders
- Confirm dock limitations at the venue i.e. side loading, rear loading, vehicle size, vehicle height
- Ensure that the placement of unloaded items, road crates or equipment enables accessibility for workers, adequate manoeuvring room and does not obstruct emergency exits or firefighting equipment such as hose reels and extinguishers

4.5 Manual handling

Manual handling refers to any activity requiring exertion of human force (lift, lower, push, pull, carry).

Hazardous manual handling is manual handling that involves repetitive or sustained forces, movement and postures, application of high force, exposure to sustained vibration, manual handling of live people or animals, manual handling of loads that are unstable, unbalanced or difficult to hold.

Manual handling can result in musculoskeletal complaints as a result of gradual wear and tear, or sudden damage caused by unexpected movements and strenuous activity, or from both.

WHS Regulations requires that PCBUs manage risks associated with hazardous manual tasks. The [Code of Practice for Hazardous Manual Tasks](#) provides guidance on identifying hazardous manual tasks, assessing the associated musculoskeletal disorder risks, and implementing and reviewing control measures.

Risk assessment is critical for managing manual handling hazards in live entertainment and events, particularly because new risks are introduced with each new show, set, scenic elements, event and venue. Sometimes not much is known about the set or scenic elements when they arrive at a venue or the build requirement of an event. Manual handling hazard identification and risk assessment templates can be found in the [Code of Practice for Hazardous Manual Tasks](#) and from state/territory safety regulators.

In live entertainment and events, designers and suppliers have a responsibility to ensure that, so far as is reasonably practicable, the risk of musculoskeletal complaints is eliminated



or minimised for the items they design or supply. The best opportunity to eliminate or minimise manual handling risks is in the design phase.

Induction training must be provided to enable workers to understand manual handling hazards and to select and implement specific control measures, including the use of mechanical aids and PPE and physical warm ups if required. Venue specific and task specific training, including manual handling techniques, should also be provided.

Casual and returning workers are at more risk of injury and appropriate training and supervision is required.

The following controls should be implemented when managing specific hazards associated with live entertainment and events:

- Risk assessment must be undertaken for all manual handling activities associated with set and scenic element transportation, storage, installation and removal
- SWMS should be developed and understood for all routine manual handling tasks particularly carrying and stacking of flats, seating, dance and other flooring
- The weight of all components must be known so that workers can make informed decisions about the safest way to handle (raise, lower or transport) them. This may involve the breakdown of elements for later assembly.
- Mechanical equipment must always be used to handle items when required by risk assessment
- Relevant manual handling training should be provided to workers
- Time pressures should be eliminated
- Controlled movement of items should be ensured by using
 - skids/rollers
 - tracked scenery
 - purpose-built trolleys, including for striking and setting props and sets between scenes
 - Control hazards associated with team lifts by ensuring
 - the number of workers in the team is in proportion to the weight of the load and the difficulty of the lift
 - one person is appointed to plan and take charge of the operation (lift master)
 - the environment is free of excessive noise so the lift master can be heard by all concerned
 - enough space is available for the handlers to manoeuvre as a group
 - team members are of similar height and capability, where possible
 - team members know their responsibilities during the lift



- training in team lifting has been provided and the lift rehearsed, including what to do in case of an emergency
- aids to assist with handling (a stretcher, slings, straps, lifting bars, lifting tongs, trolleys, hoists) are used where possible and training is provided in their use

4.6 Slips and trips

Some of the more common types of accident, slips, trips and falls can result in serious injury. **Slips** occur when a person's foot loses traction with the floor. **Trips** occur when a person unexpectedly catches their foot. In most instances, the objects people trip on are small and unobtrusive, such as cracks in the floor or electrical leads. Falls can result from a slip or trip, or falling from low heights, such as steps, stairs and curbs.

Slips are most commonly caused by:

- Slippery floor surfaces (e.g. highly polished, wet or greasy, dusty)
- Inappropriate footwear
- A sudden change to floor surface
- Loose or bumpy flooring
- Low light levels
- Time pressures

Trips are most commonly caused by:

- Cables and leads in work areas
- Obstacles in traffic areas
- Changes in floor level, at thresholds, on stairs
- Ridges in floor or carpets
- Low light levels

Control measures should be implemented in the event design and planning phase to eliminate any slip, trip or fall hazard, for instance, provision of suitable flooring surfaces, ramps and compliant stair design, as well as adequate storage areas.

Suggested control measures:

- Plan bump-in/bump-out and loading procedures and allocate adequate time for each procedure
- Visually inspect work area for hazards
- Use cable covers or rubber mats, or run cables overhead
- Pay vigilant attention to housekeeping, including managing walkways
- Ensure flooring transitions are smooth and joints between surfaces are flush



- Provide adequate work light
- Treat or isolate slippery surfaces
- Isolate and immediately clean up spills and residues, or during performance, as soon as practicable
- Ensure appropriate footwear is worn
- Control access to high risk areas
- Identify an alternative route

For information on managing slip and trip hazards in the workplace see Safe Work Australia [Slips and Trips Fact Sheet](#).

4.7 Impact and crush injuries

Impact injuries are injuries sustained as a result of a collision between a body, or part thereof, and a stationary or moving object. The degree and nature of any injury will be influenced by the velocity, direction and duration of the impact, as well as the area struck. Depending upon its severity, impact can lead to a wide range of internal and external injuries, including fracture, concussion, laceration, bruising and displacement of internal organs.

Crush injuries are injuries sustained as a result of a traumatic compression of a body or its extremities. Whilst some crush injuries may initially seem minor, there is significant potential for latent symptoms to arise.

There are many potential causes of impact or crush injuries, including:

- Poor manual handling of materials
- Collision with stationary or moving scenery, flown elements, vehicles or structures
- Entrapment under unsecured materials or scenery elements
- Structural failure of scenic elements or staging

Control measures should be implemented to eliminate any impact or crush hazard. These measures should be considered and actioned during the planning, design, assembly and delivery phases of a production or event.

Suggested control measures:

- Planning of bump-in/bump-out and loading procedures and allocate adequate time for each procedure
- Provision of adequate work light for tasks
- Use of signage and induction processes to notify workers about known obstructions or pinch points



- Risk assessment for all manual handling activities associated with set transportation, storage, installation and removal
- SWMS for all routine manual handling tasks particularly carrying and stacking of flats, seating, dance and other flooring
- Ensuring the weight of all components is known so that workers can make informed decisions about the safest way to handle (raise, lower or transport) them. This might involve the breakdown of elements for later assembly
- Implementation of vehicle or traffic control measures, including signage, SWMS and barricades
- Processes that ensure that large materials or scenic elements are properly secured when unattended
- Independent engineering advice regarding the suitability/structural integrity of scenic or staging elements

4.8 Attaching or suspending items – NOT deemed as rigging

Work tasks that involve attaching items to a pre-existing/proprietary system using a standard method are often referred to as ‘theatrical rigging’, such as ‘rigging a light’, or ‘rigging sound/AV’. It is not the high risk work rigging as defined in the WHS regulations Schedule 3. Workers must be competent to undertake the attachment tasks but are not necessarily required to possess a specific license.

The following are examples of tasks that are related to rigging but not deemed as rigging. They require a level of competence but not a high risk work licence.

Operation of flying systems – before operating the flying/hoisting system an operator of a flying/hoisting system (counterweight or powered) must:

- have received specific training in the use of the particular flying/hoisting system
- be competent to operate the equipment
- have undertaken a venue-specific induction
- Hanging or adjusting lights on a truss, flown bar or other lighting support
- Hanging technical elements (lighting, sound, AV equipment) from a fit-for-purpose clamp
- Attaching cloths, drapes, banners to any support flown
- Attaching scenery with a dedicated attachment point
- Attaching styling/design elements
- Attaching or running cables



Work should be undertaken following a SWMS and risk assessment. The site should be supervised and venue guidelines for allowable weights of items and information contained in proprietary system manuals should be followed. All suspended items should have a strategy for the risk of falls; secondary attachments should always be considered.

For further information see the Rigging Hazard Guide.

4.9 Drapery

Drapery is any curtain or large piece of cloth that is suspended above or around a stage (or elsewhere within a live performance or event venue). It may be constructed from a variety of materials and may be utilised for a wide range of purposes, including as masking, signage, scenic elements, cycloramas and scrims.

All drapery must have an appropriate fire rating, flame retardant treatment and labels indicating treatment and date

4.10 Revolves and moving scenery trucks

The movement of revolving stages and moving (trucked) scenic elements can occur through manual operation or automated processes. These elements introduce a wide range of risks and hazards into the work environment. The nature and extent of those risks and hazards is contingent upon many factors, including the weight of the elements being moved, the speed of movement, light levels and the nature of any action occurring in conjunction with the movement. The use of revolving stages and moving scenic elements should be risk assessed and appropriate control measures should be put in place.

Suggested control measures include:

- Position truck edges to minimise risks of entrapment involved in moving between adjacent surfaces
- Ensure a risk assessment has been conducted and SWMS for operation completed
- Highlight edges with suitable contrast medium (photo luminescent tape/recessed EL wire/LEDs)
- Ensure people are not able to step in between adjacent trucks/stage edges by minimising the gap between items
- Manage risk of falling from moving items by plotting, rehearsing, directing and stage managing moving sequences
- Ensure the set design and construction provides a safe separation distance between fixed and revolving edges
- Minimise any gap between moving edges on the revolve and 'fixed' edges where 'fixed' edges are pivoted at a relatively short distance from the revolve edges so



that if any body part is trapped in the space, the 'fixed' edge will swing away to allow safe escape so as to avoid any serious injury.

- Restrict the speed of revolves or moving trucks to minimum
- Ensure revolve drive is engineered so that it cannot be suddenly stopped or started, even in an emergency
- Ensure all movements of the revolve are conducted as designed and rehearsed
- Control audience interactions with revolve or moving scenery truck
- Ensure the revolve cannot move inadvertently
- Provide clear visual sightlines or closed-circuit monitoring (CCTV) of rostra area to/from the area the performer is transitioning to an automation operator who is able to stop the revolve
- Provide emergency stop capability, for any instance when the revolve does not respond as designed
- Ensure truly fixed and apparently 'fixed' set pieces are structurally stabilised by design/construction techniques
- Ensure emergency pivot action for sets does not de-stabilise any other set pieces
- Ensure entrances and exits from revolve are open and unhindered to minimise risk of falls in transition from moving revolve to fixed stage

4.11 Work on raked stages

Raked stage – a sloped stage often travelling down toward the auditorium seating to improve the audience view.

Raked stages/surfaces introduce a particular set of risks and hazards that need to be identified, assessed and controlled. The nature and extent of these risks can vary, dependent upon the action being undertaken on the rake, the pitch (slope) of the rake and the duration for which performers and other workers are expected to work on the raked stage. Due to these variables, the use of raked stages should be risk assessed on a case-by-case basis.

Suggested control measures include:

- Erect identical raked stage in rehearsal room to assist performers, technicians, stage managers, etc. to get familiar with conditions
- Ensure a risk assessment is completed for the activities being undertaken on the stage
- Treat floor surface to increase grip for shoes
- Stabilise all elements that are off-vertical, including specific arrangements for each item, taking into account the persons who have to interact with the item
- Provide raised forestage edge to prevent articles rolling into auditorium



- Provide additional rehearsal time
- Provide physiotherapy or similar consultancy to advise cast, crew or any other persons who may be physically affected
- Where possible, clearly mark the edges of the stage
- Ensure cast and crew have appropriate footwear, in good condition, with good grip for the raked surface

4.12 Hot works

Hot works refers to activities that produce flames, heat and/or sparks such as welding, flame or plasma cutting, grinding, heating and burning. Hazards associated with open flames or flying sparks include, igniting any flammable materials particularly vapours, creating toxic fumes and setting off emergency warning systems.

Activities such as sanding, drilling and high-pressure washing may simulate hot works due to increased levels of smoke and dust. Such works should be managed as for hot works.

Lack of supervision or management in regard to hot works has the potential to cause significant damage to property, injury to persons, or interruption to a performance or function.

Suggested control measures include:

- Ensure a specific risk assessment and authorisation for hot works is developed based on acceptance that the control measures for the risks are acceptable and the works pose no risk to the safety and health of any person, or damage to any property
- Ensure all hot works are carried out by an operator who has an authorised PERMIT TO WORK.
- Ensure firefighting equipment is be available in the immediate vicinity
- Do not allow hot works in hazardous areas where flammable materials exist
- Test for flammability
- Reduce flammability of materials (wetting down)
- Always use a look-out person
- Use Personal Protective Equipment (PPE)
- Before commencing hot works, ensure that relevant heat and smoke detection devices have been isolated in accordance with venue policies and procedures.
- The officer authorising hot works should ensure that the work area is safe at the completion of the works



4.13 Vehicles on stage

The use of vehicles should be risk assessed and appropriate control measures should be put in place prior to use.

Suggested control measures include:

- Complete a risk assessment for the activities being undertaken on the stage
- Ensure that the weight of the vehicle does not exceed the stage's work load limit
- Drain fuel tanks and purge to remove all fuel vapours, or fill completely to eliminate any vapour space in the fuel system of the cars
- Use appropriate lifting device, such as a heavy duty fork lift, to move vehicles onto the stage
- Ensure competent and sufficient workers are provided to move vehicles behind stage area and into their dedicated positions
- Ensure all vehicle movements are accompanied by a spotter
- Ensure once in position, wheels are chocked, vehicles are strapped down and not able to move from the 'spotted' locations
- Ensure no sources of ignition are permitted in the area where cars are secured
- Provide drip trays under vehicles for oil or fluids to prevent slip hazards

4.14 Restricted spaces within set pieces and stages

Restricted spaces within set pieces should be eliminated at the design stage. If this is not possible, no person should be required to enter them, unless the set element is specifically designed for that purpose.

The following control measures apply:

- Lock applicable areas and post warning signs
- Control access to applicable areas
- Conduct risk assessment of task prior to entry
- Ensure appropriate PPE is worn
- Provide standby person while any personnel are inside area
- Restrict the amount of time spent in the space as guided by the risk assessment
- Identify and control any hazardous substances as guided by the risk assessment
- Ensure there is a documented rescue plan



5. Legislation, Standards and Guidance

Codes of Practice available from the Safe Work Australia website are for review and development. To have legal effect in a jurisdiction a model Code of Practice must be approved as a code of practice in that jurisdiction. To determine if a model Code of Practice has been approved in a particular jurisdiction, check with the relevant work health and safety regulator. Your reference should be to the state based regulator, e.g. WorkCover NSW.

Safe Work Australia Hazardous manual tasks Code of Practice 2011

<https://www.safeworkaustralia.gov.au/system/files/documents/1705/mcop-hazardous-manual-tasks-v2.pdf>

Safe Work Australia 2011 Managing the Risk of Falls at Workplaces Code of Practice 2015

<https://www.safeworkaustralia.gov.au/system/files/documents/1705/mcop-managing-the-risk-of-falls-at-workplaces-v2.pdf>

Safe Work Australia 2011 How to Manage Work Health and Safety Risks Code of Practice 2011

https://www.safeworkaustralia.gov.au/system/files/documents/1702/how_to_manage_whs_risks.pdf

Safe Work Australia 2012 Safe design of structures Code of Practice 2012

https://www.safeworkaustralia.gov.au/system/files/documents/1702/safe_design_of_structures2.pdf

Safe Work Australia Slips and Trips Fact Sheet 2012

https://www.safeworkaustralia.gov.au/system/files/documents/1702/slips_and_trips_fact_sheet.pdf

SAA HB 59: Ergonomics: The human factor

AS 1657 – Fixed platforms, walkways, stairways and ladders – design, construction and installation

NOHSC *National Code of Practice for Manual Handling 2005*

https://www.safeworkaustralia.gov.au/system/files/documents/1702/nationalcodeofpractice_manualhandling_nohsc2005-1990_archivepdf.pdf



Sources:

Safe Work Australia Hazardous manual tasks Code of Practice 2011

<https://www.safeworkaustralia.gov.au/system/files/documents/1705/mcop-hazardous-manual-tasks-v2.pdf>

NOHSC *National Code of Practice for Manual Handling 2005*

https://www.safeworkaustralia.gov.au/system/files/documents/1702/nationalcodeofpractice_manualhandling_nohsc2005-1990_archivepdf.pdf

Worksafe Victoria: Slips, Trips and Falls

<http://www.worksafe.vic.gov.au/safety-and-prevention/health-and-safety-topics/slips-trips-and-falls>

Safe Work Australia Slips and Trips Fact Sheet 2012

https://www.safeworkaustralia.gov.au/system/files/documents/1702/slips_and_trips_fact_sheet.pdf