Technical Representative Standard Practices

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Contents

I Introduction: Production Risk Assessments at the ADC Theatre

Theatre at the ADC involves fantastic creative ambition, particularly in the technical department, but with that ambition comes the risk of serious injury. The first priority of anyone planning a production at the theatre must be to ensure it can be carried out safely, without endangering production members or audiences during the show's run, get-in, and get-out.

The process of ensuring that technical work onstage is safe begins at the planning phase. Here, each technical part of the production—set, lighting, sound—should be considered, and the risks associated with it identified and mitigated. This process takes place through risk assessments.

All shows at the ADC Theatre must complete a risk assessment for the technical aspects of their show, and have it approved by a member of the Theatre's management team ahead of technical work on stage commencing. This is done through the *Production Documentation and Risk Assessment* contained within each production's white folder in the Production Office. The document is separated into sections, three of which must be completed ahead of a show's get-in. These sections contain the bulk of the production's risk assessment:

Section Number	Description	Completed by
Section 1	(a.k.a. General Information Form) Completed online in advance – not stored in show folder.	Producer
Section 2	Outline of technical plans for a production, including set-plan, special permissions (strobe, weapon use, smoking, naked flame, etc.), and information on any particularly unusual effects or technical aspects. Foreseeable risks produced by these plans must be assessed here.	Primary show Technical Representative
Section 3	Details of technical plans, specifically with reference to set and lighting plans. Must include a complete grid plan, and details on construction of custom pieces of set. All risks related to the set plans and lighting rig must be assessed here.	All get-in Technical Representative(s)
Section 4	Details of stage performance, particularly with reference to use of set, props, fight and dance scenes. All risks related to stage activity during the performance must be assessed here.	Stage Manager
Section 5	Details of get-out. All risks related to the removal or deconstruction of a show's technical aspects must be assessed here.	Primary get-out Technical Representative

Once the Production Documentation is complete it should be kept onstage in the shelves under the Stage Manager's desk for the duration of the show's run. At the end of the run it should be returned to the Production Manager.

Standard Practice

To assist with the production risk assessment process, this document contains completed risk assessments for common stage activities that the Technical Representative (TR) would usually be responsible for overseeing. (A corresponding document, the **SM Standard Practice Guide**, details the standard practices for activities normally overseen by the Stage Manager - usually relating to activity onstage during performances.) The mitigations produced by these risk assessments are known as **Standard Practice**. Instead of completing a new risk assessment for these common activities, the Production Documentation can instead reference the standard practice risk assessments here. This is prompted on certain items throughout the Production Documentation via tickboxes, but can also be referenced in the 'Additional Risk Assessment' tables. Each line of the standard practice risk assessments have reference numbers to assist with this. **Referencing a Standard Practice commits a production to following all the mitigations specified by that standard practice**.

Standard Practices are considered to be the minimum safety requirement; additional safety checks and precautions are always welcome.

Any activities that produce hazards that are not specified within a Standard Practice risk assessment require an Additional Risk Assessment. These should take the same form as the risk assessment tables below and specify what hazards are produced, and how they will be mitigated. There are dedicated tables within the Production Documentation to assist with this process, though risk assessments can be added as separate sheets into the folder if preferred.

With all additional risk assessments, the Technical and Production Managers are able to advise on how to mitigate for them. However, it is always worth taking a crack at identifying risks in advance as your understanding of the plans is likely to be more complete than any member of management's.

Technical Representatives must be familiar with all the mitigations specified by both any relevant standard practices and any additional risk assessments completed for the production.

II Standard Practice Risk Assessments and Safe Operating Procedures

1 Lantern Rigging, Patching & Focusing

Risk Assessment

SP Ref.	Risk	People Affected	Likelihood	Severity	Calc. Risk	Mitigation	Likelihood	Severity	Calc. Risk
	Please see **TR Training – Rigging Electrical Items** for the safe operating procedure for rigging lanterns and other electrical equipment. Please see **TR Training – Operating Counterweights** and **Loading Counterweights** for the safe operating procedure for flying lanterns in the grid. Please see **TR Training - Using Lighting Bridges** for the safe operating procedure for rigging lanterns on the two overhead auditorium lighting bridges.								
1.1	Lanterns fall due to being rigged directly onto a boom (vertical bar) using a hook clamp	Stage users	2	4	8M	• All lanterns rigged onto booms (vertical bars), should be rigged onto a boom arm. • If there are insufficient boom arms, a short piece of scaff attached using a right-angle clamp is acceptable.	1	4	4
1.2	Lanterns struck by moving bars in grid leading to falling lighting attachments or other debris	Stage users	3	4	12 M	• Grid plan should provide sufficient space around LX bars for set to fly without contacting lanterns. ○ This will vary depending on the lantern's focus angle, but will usually be at least one counterweight (approximately 25cm) away. • Theatre Management to be consulted on grid plan during Section 3 of the Production Risk Assessment and to inspect grid before any technical rehearsal. • Communication between concurrent productions so sufficient space is left between lanterns and flying set of both shows.	1	4	4L
1.3	Proximity of lanterns to cloths or other flammable material may start a fire	Stage users; all building users	4	4	16 H	• Tungsten lanterns to be rigged such that they are not touching any cloth, or facing any cloth within one foot of the lantern, including fire retardant cloths (this does not apply to LED fixtures). • If the movement of cloths or lanterns during the show, or between shows, requires tungsten lanterns facing cloths within 1 foot, the relevant lanterns must be electrically isolated (e.g. disabling at the dimmer pack or un-patching circuits) during periods of this proximity. Simply excluding these lanterns from relevant lighting cues is not sufficient. • Communication between concurrent productions so lanterns from one show that become close to cloths in another show are electrically isolated.	2	4	8M

Other Notes

Please return any blown lamps to the Technical Manager, and leave any faulty lanterns in the corridor beside the Tech Office for repairs.

2 Temporary Rigging Positions, Booms and LX Ladders

Risk Assessment

SP Ref.	Risk	People Affected	Likelihood	Severity	Calc. Risk	Mitigation	Likelihood	Severity	Calc. Risk
2.1	**General**								

2.1.1	Positioning of booms and ladders could obstruct entrances.	All stage users, particularly during performances.	3	3	9M	• All hazards on stage are to be marked clearly, using white tape, or glowtape if there are frequent blackouts. • Where possible booms should be arranged such that they are close to the masking, whilst leaving a sufficient gap between lanterns and the masking. • All performers to receive safety walk from SM detailing boom locations.	3	2	6L
2.2	**Temporary Booms**								
2.2.1	Suspended boom attachments fail, dropping a boom to the ground.	All stage users	2	5	10 M	• All suspended booms are to have a secondary scaff arm clamped diagonally to the rigging point (on hemps), or a second clamp above the clamp to a second bar at the rigging point (on CWTs). This applies both to booms rigged on fly-bars and to booms rigged on galleries. • Where booms are full height (e.g. from galleries to stage), they should have bases on scaff feet, and then kicked in to be straight, ensuring the bar is under compression and not floating. This reduces the load on the attachments.	1	3	3L
2.2.2	Suspended booms fall while being rigged on galleries	All stage users	3	4	12 M	• Suspended booms should always be aluminium not steel to reduce weight lifted by stage users. • Where possible, two stage users should be involved in lifting the boom to the gallery level. • A scaff clamp should already be attached to the gallery railing when the boom is lifted to reduce the period of time it is lifted for. • Stage should be kept quiet while this happening to ensure good communication between boom-carriers and the rigger in the gallery. • All stage users in the vicinity of the boom should wear hardhats while it is being lifted. • If preferred, a boom may be hoisted using a line and rolling hitch, or other appropriate knot.	2	3	6L
2.3	**Temporary LX Ladders**								
2.3.1	Suspended ladders fall while rigged	All stage users	2	5	10 M	• All ladders to be suspended on two ropes, and have an additional steel safety line (e.g. a flywire) running back to the rigging point. • Suspended ladders should be inspected daily for security. This inspection should check that both ropes are still tied well and have not loosened.	1	3	3L
2.3.2	Suspended ladders fall while being rigged	All stage users during get-in	3	4	12 M	• No stage users to stand beneath ladder while it is being lifted. • All users in the vicinity of the ladder to wear hardhats during lifting. • If rigging onto galleries, at least one person to haul on each rope. • Stage should be kept quiet while rigging occurring to ensure good communication between stage crew and gallery users.	1	4	4L
2.4	**Tank Traps**								
2.4.1	Tank trap falls over sideways	All stage users	2	4	8M	• Tank trap bases must be weighted using stage weights. • All boom arms attached to tank trap booms should not extend beyond the footprint of the tank trap.	1	4	4L

3 Set

Risk Assessment

SP Ref.	Risk	People Affected	Likelihood	Severity	Calc. Risk	Mitigation	Likelihood	Severity	Calc. Risk
3.1	**Fire Exits and Precautions**								
3.1.1	Stage users unable to evacuate efficiently in event of a fire due to insufficient fire passages	All stage users, in particular performers and stage crew.	2	4	8M	• Set plans should account for a 1m wide safety passage, marked in white tape, from: • **OP**: counterweight gallery ladder to OP Quad door • **PS:** backstage door to SM desk to stage. If your production, or any concurrent production, flies hemps during the show, the fire passage should also include the hemps gallery ladder. • These passages should remain clear at all times, though items can briefly pass through them on their way to and from stage. Set designers should consider this when accounting for any trucks or set that needs to be stored in the wing during the show.	1	4	4L
3.1.2	Set piece prevents safety curtain flying in during an emergency	All stage and auditorium users	3	4	12M	• Set pieces should never be left obstructing the safety curtain, though light set-pieces may pass over it in some cases.	1	4	4L
3.1.3	Flammable set materials	All building users	3	4	12M	• All materials that might catch from exposure to sparks or a flame should be flameproofed. Particularly any cloths or thin materials that may be used in set construction. • Items should be left to dry for 8 hours following being flamechecked for the flameproofing to be effective. • Management will test the flammability of flamechecked materials before they are taken to stage to ensure they are safe.	2	4	8M
3.2	**Set on Forestage**								
3.2.1	Set on forestage catches fire	All building users	2	5	10M	• Set on the forestage is subject to stricter fire precautions than behind the safety curtain. In particular, all wooden constructions should have either: ○ sheet wood more than 18mm thick, with framing more than 22mm thick; OR ○ wood rated as Class 1 fire retardant. • Large cloths should be avoided on the forestage where possible, unless rated by the manufacturer as fire resistant.	1	4	4
3.3	**Visibility Backstage**								
3.3.1	Performances often require navigation around stage in low/no-light conditions	Performers, stage crew	5	2	10M	• Crew and performers to be made familiar with the space before navigating it in a blackout. • Blue working lights to be used at all times during rehearsals/performances. • Where necessary, additional working lights should be added. • All key routes and any hazards to be marked with white or glowing tape.	4	1	4L
3.3.2	Enclosed walkways or areas on stage may become very dark in the event of a power failure	All building users, in particular performers and stage crew.	3	3	9M	• Any area that is substantially enclosed to the point of not being covered by the theatre's installed emergency lighting is to have temporary emergency lighting fitted. • Backstage areas should have temporary working lights fitted. • All protruding edges under deck that present a hazard at head height should have pipe lagging taped over as protection.	1	2	2L
3.4	**Obstructions to Pathways**								

3.4.1	Low level set pieces intruding in to wings or passages back stage, as well as cables, represent trip hazards and could cause falls or injury.	All stage users, in particular performers and stage crew	4	2	8M	• Where possible, clearly marked routes through back stage areas are to avoid trip hazards. • Cables should not cross passages if at all possible, and where necessary should be clearly marked and covered by cable ramps. Taping cables directly to stage should be avoided where possible. • All hazards and protrusions are to be clearly marked with white tape. • All users to receive briefing of hazards from the Stage Manager before the technical rehearsal.	3	1	3L
3.4.2	High level set pieces, passages under decking, etc., pose hazards out of line of sight that may be walked in to.	All building users, in particular performers and stage crew	4	2	8M	• Where hazards are part of a passageway, they are to be protected with soft material (e.g. pipe lagging), and clearly marked with high-visibility tape. • All other hazards to be clearly marked with high visibility tape. • All users to receive briefing of hazards from the Stage Manager.	2	2	4 M
3.5	**Raised Platforms**								
3.5.1	**Raised Platforms** – edges represent trip or falling hazard.	All building users, in particular performers and stage crew	4	3	12M	• Any platforms or flights of treads over 3' high should be fitted with handrails compliant to Yellow Book (ABTT Technical Standards for Places of Entertainment) standards. • Railings on platforms should always be structural, never simply decorative, to prevent a stage user falling through them. • Platforms with risk of loose items (e.g. small handheld props) falling on stage users below should be fitted with toe-boards. • Platforms on which chairs are sat in should have toe-board fixed to any nearby edges (within 50cm of any chair legs) to prevent chairs toppling off the platform. • Edges to be marked with white or glow tape where possible. All edges that will be navigated in blackouts must be marked by white or glow tape.	3	3	9 M
3.5.2	**Raised Platforms** – due to access to the platform, escape may be difficult in an emergency.	All building users, in particular performers and stage crew	3	3	9M	• Any platform over 3' high with more than 2 people using it is to have at least 2 access points (only one of these may be a ladder).	2	2	4L
3.5.3	**Treads** – Stage users fall on stairs	All stage users	3	2	6	• All treads should be built with equal sized steps, usually 250mm.	2	2	4
3.5.4	**Treads and Ladders -** Access to raised platforms (e.g. treads and ladders) difficult to navigate due to costume restricting movement	Performers	2	3	6	• Set access should allow for costumes actors will be wearing, including restrictive clothing or high heels as appropriate.	1	2	2
3.6	**Trucking Set**								
3.6.1	**Trucking Set** – trucking set may move while in position on stage or in the wing space, potentially obstructing passages or falling off edges	Stage users, in particular crew and performers	3	3	9M	• Trucks are all to be fitted with brakes such that they are rendered immobile under the planned use on stage. • Brakes are to be applied both in the wings and on stage.	1	2	2L
3.6.2	**Trucking Set** – movement of trucked set may cause items to fall off it or instability for people standing on the truck	Performers, stage crew	3	3	9M	• All furniture on a truck while it is moving should be securely attached to the truck. • People standing on the truck to be carefully rehearsed and remain still while the truck is not securely braked.	1	2	2L
3.7	**Flown Set**								

	Please see **TR Training – Operating Counterweights** and **TR Training – Loading Counterweights** for the safe operating procedures for loading and flying counterweight bars. Please see **TR Training – Flying Dynamic Loads on Counterweights** and **TR Training – Flying Attachments** for the safe operating procedures for rigging and flying flats, cloths, and other items that change their load on the counterweights system as they fly. Please ensure you, or someone on your crew, has received **Hemps Training** if you plan to fly set or cloths on hemps.								
3.7.1	**Flown Set** – Set pieces fall due to flying attachments failing	All stage users	3	4	12M	• All set pieces should be flown with at least two points of attachment to the flying bar. • Flats and other large items should be flown where possible using flying irons, and arranged so that the weight of the flown piece is taken by the lip of the flying irons. • Where a large custom piece of flown set cannot be flown using flying irons, attachments must be secured with multiple bolts through structural parts of the piece, and not solely woodscrews. • When flying a wall of multiple flats connected together, one point of attachment connected to each flat is sufficient, as other attached flats can act as secondary points of attachment. All flats must be bolted or screwed together.	2	3	6L
3.7.2	**Flown Set** - Set could fall apart in grid, dropping things on to stage.	All stage users, particularly crew	3	4	12M	• All set to be of sound construction. If in doubt ask Management to check set piece prior to flying. • Management to inspect flown set at stage sign off. • All custom wooden items of set should be glued and the glue set, as well as screwed together, before flying.	3	3	9M
3.7.3	**Flown Set** – Movable or removable parts of set pieces (e.g. doors) could swing or detach in the grid, knocking other items.	All stage users	3	3	9M	• All movable parts of flown set pieces to be securely fastened such that they cannot move while flown. This fastening may be designed such that it can be released while the item is flown in. • All removable items of flown set must be secured before they are flown so they cannot be knocked loose and fall. Each feature must be secured so that if any one piece of equipment fails, it cannot fall.	2	2	4L

Other Notes

Painting

Where possible painting should be restricted to the scene dock and workshop areas. Painting on stage is only permitted with Management permission, and will typically require re-painting the stage at the get-out. This is because large amounts of paint falling on stage will become visible over time as the layers of black paint above flake away, making the stage less uniform and requiring more frequent repaints.

Absolutely no painting is allowed in the auditorium.

Flown Set

All sets will be inspected by the Management prior to the Technical Rehearsal. The Management reserve the right to refuse any set or part thereof on safety grounds, even if an identical arrangement has been allowed in a previous show. A balance will be achieved between artistic license and safety, with safety always taking priority in any decision.

Trap Flying

Large items of set can be flown up to stage through the trapdoors from the scene dock. All items to be flown should be securely constructed, and discussed with the Technical or Production Manager in advance. Management must supervise any trap flying, so it will usually take place on the morning of the get-in once management has arrived to the theatre. If required, flying at the end of the previous show's get-out shift may be doable - please speak to management in advance if you would like to.

The traps must never be opened, and trap flying must never take place, without a member of Management present on stage. For more information see the theatre's Health and Safety Policy, Appendices 10 c, d.

4 Forestage

The forestage can be configured in several different ways, and is it is entirely possible to change it between productions (though not productions occurring on the same night). However, this does require at least three physically able crew, at least one of whom should be experienced in using the forestage.

Pre-cut legs exist for the following arrangements:

- Stage height both with (Purple/Earth DS) and without (Blue/Earth DS) the pit rail (Red/Earth US)
- Juliette height (Brown/Earth DS, White/Earth US)
- Sitting on floor level (with optional stepped sections)
- Open (note that a handrail for the audience is required)

Risk Assessment

SP Ref.	Risk	People Affected	Likelihood	Severity	Calc. Risk	Mitigation	Likelihood	Severity	Calc. Risk
4.1	Workers underneath forestage while it is being altered have limited headroom and may have objects being moved above them.	Crew	5	3	15H	• All workers underneath forestage sections to wear hard hats at all times.	5	2	10M
4.2	Forestage may be taken apart and become unstable to walk on without this being obvious. Could result in falls to those walking on the stage or injury to anyone working underneath the stage.	All building users, particularly crew	3	4	12M	• TR to be present on stage at all times while forestage is being moved. • Rope or safety curtain to be raised where possible and appropriate to limit access to forestage.	2	4	8M
4.3	Removed sections of forestage may be knocked over, falling on to people or damaging property	All building users, particularly crew	4	3	12M	• Front rows of auditorium to be kept clear of persons not directly involved in forestage work	2	3	6L
4.4	The open pit, or lowered forestage is a significant fall hazard	Performers	5	3	15H	• White or glow-in-the-dark tape must be laid along the edge of the step/pit. • All users to receive briefing of hazards from the Stage Manager.	2	3	6L
4.5	Custom trap sections in the forestage could be opened into a performer, and if open are a fall hazard	Performers	4	3	12M	• Trap sections must fail safe (closed) • Trap sections must be operated from beneath by someone with communication with the Stage Manager and a video feed if necessary. • Trap sections should only be opened for the duration of the effect and not if someone is too close.	2	2	4L

Good Practice Guide

Changing the height of the forestage

- Where possible, practical and in such a way that it will not interfere with the work being carried out, erect a rope barrier across the proscenium arch or raise the safety curtain just over a meter to prevent people walking on the forestage.
- Remove all the bolts from the sections to be moved – there should be bolts between adjacent sections of steel deck, and to the back wall of the pit.
- Lift the sections out forwards in to the auditorium, and exchange legs for the desired length.
- If using the pit-rail:
  - **To remove**, take apart in to the three sections, undo the Kee clamps from the scaffolding legs. Lift the three sections off and place out of the way on the floor of the pit. Remove the legs from the Kee clamps on the wall.

- **To install**, place the legs in the Kee clamps on the downstage wall of the pit, lift the sections of rail in to place and lower on to scaff legs (note that it must be lowered evenly). Align the bolt plates with a podger and bolt the rail together, then do up all the Kee clamps.

- Replace the forestage sections, working from the PS end to the OP end. As each section is put in place, bolt it as appropriate to adjacent sections and the US wall of the pit.
- If performing this sequence each night, it is very useful to keep a set of tools and bolts together to make the change as quick as possible.

Get-in/Performance

5 Strobe Lighting and Stage Effects

Risk Assessment

SP Ref.	Risk	People Affected	Likelihood	Severity	Calc. Risk	Mitigation	Likelihood	Severity	Calc. Risk
5.1	**Strobe Lighting**								
5.1	Rapid lighting induces seizure in photosensitive audience member or cast member	All auditorium and stage users	3	4	12M	• TR to ensure there are no individuals with photosensitive epilepsy in the cast or crew. • Production to inform Theatre Management through the Production Documentation if strobe lighting is used so that appropriate signage and guidance can be provided to customers. • The frequency of strobe lighting should never exceed 5 flashes per second. • If multiple fixtures are to strobe, they should be synchronised and flashes kept regularly spaced. • Strobe lighting will only be used for the duration necessary to achieve the desired theatrical effect and not remain on for a prolonged period of time.	1	4	4L
5.2	**Smoke, haze, and other effects machines**								
5.2.1	Hot output from haze machine or smoke machine causes burns to nearby user or ignites flammable material	Stage users	2	4	8M	• Effects machine should be positioned so that stage users are never directly in front of its output nozzle • If effects machine is positioned onstage, stage users should be warned not to put a hand up to the output nozzle. • Space in front of output nozzle of effects machine should be kept clear to prevent it outputting directly onto set piece or cloth.	1	4	4L
5.2.2	Excessive use of smoke or haze irritates breathing of cast and audience members	All auditorium users	2	3	6L	• The smoke or haze emitted from the machine must be either remotely controlled via DMX by the lighting designer, or operated manually and monitored by a member of the stage management team. Only the amount necessary for the effect should be discharged. • Production to inform Theatre Management through the Production Documentation if smoke or haze is used so that appropriate signage and guidance can be provided to customers. • TR or SM to ensure there are no individuals with serious asthma or other respiratory conditions in the cast or crew prior to using effect.	1	3	3L
	If you are using any effects machines which produce carbon dioxide in large quantities (e.g. dry ice machines), please contact management for guidance. The ADC's smoke and haze machines do not produce large quantities of carbon dioxide.								