Student Robotics Risk Assessment Form

April 13, 2022

Activity being assessed: Student Robotics Competition (23 - 24 April, 2022)

Location: Southampton University Students Union (SUSU)

Persons at risk: Competitors, Team Supervisors, SR Volunteers, SUSU Staff, Visitors

Assessor's name: Thomas Scarsbrook

Responsible Persons: Health and Safety Lead, SR Volunteers, Team Supervisors

Date of assessment: 12/04/2022

1 Risks

The following risks have been considered for the Student Robotics Competition. This assessment is to be supplimented by the SUSU risk assessment. Further description of the meaning of risk ratings (presented in this section as $L \times S$) can be found in the final section.

Hazard	**Control Measures**	**Responsible Person**	**Risk Rating**
Injury while using manual or power tools	Tools should only be used in appropriate circumstances and in the manner they are designed to be used. All use should be supervised by a responsible adult. Loose hair or clothing to be tucked in or removed whilst operating power tools. Student Robotics will not provide any tools to Competitors. First aid provision available to manage any incidents.	Health and Safety Lead Team Supervisors	4
Interaction with robots: electric shock, minor injury	Team Supervisors to supervise work on robots in team pits, SR Volunteers will also intervene if work seems unsafe. Robots must be powered down and placed within the team pits if left unsupervised. Only sealed food and drink is permitted in team pit areas.	Health and Safety Lead SR Volunteers Team Supervisors	3

Hazard	**Control Measures**	**Responsible Person**	**Risk Rating**
Injury to Competitors, SR Volunteers, and Visitors due to unsafe robots	Robots subject to a safety inspection before entry into an arena. Robots re-inspected randomly throughout the event, entry into the arena or access to batteries can be revoked at any time. Anyone identifying a potential safety issue to report it to the safety inspector. Arena access controlled by SR Volunteers - maximum of 4 teams at a time, and modification of robots inside the arena is banned (this also applies to the test arena). Power cut off switch to be readily accessible on robots.	Health and Safety Lead SR Volunteers	3
Electric shock	Cables to be appropriately rated and fused. All powered equipment to be used in appropriate circumstances and in the manner they are designed to be used. Cabling to secured down and inspected at intervals for damage. Damaged equipment to be retired from use. No wires to be exposed on batteries or chargers.	Health and Safety Lead SR Volunteers Team Supervisors	4
Accidents due to fatigue from working long hours	Individuals suspected of excessive tiredness restricted from activities that may be consequently dangerous. Opportunity and space for breaks available.	Health and Safety Lead SR Volunteers	3

Hazard	**Control Measures**	**Responsible Person**	**Risk Rating**
Injury from improper manual handling	Individuals involved in manual handling trained and briefed. Manual handling only performed within an individuals ability. Appropriate protective equipment provided, if applicable.	Health and Safety Lead	3
Slips, trips, and falls	Extension leads taped down and inspected regularly, kept away from walkways where reasonably practicable. SR Volunteers and Team Supervisors to enforce teams keeping within their areas and that areas are kept tidy. Equipment to be kept out of walkways. Carrying of Robots or large or heavy objects on the stairs to be kept to a minimum. Running on the stairs is not permitted. No trip hazards to be left on or near stairs. Any identified slip or trip hazards to be signed and removed as soon as possible.	Health and Safety Lead SR Volunteers Team Supervisors	2
Battery failure - smoke, fire	All batteries to be charged in fire-proof bags and by trained volunteers. Competitors and Team Supervisors have been informed about safe use of the batteries throughout the competition year. SR Volunteers and Team Supervisors to identify batteries showing signs of damage or swelling and deliver to Helpdesk for safe disposal.	Health and Safety Lead SR Volunteers Team Supervisors	4

Hazard	**Control Measures**	**Responsible Person**	**Risk Rating**
Injury moving robots into/out of the arena	Doors into arena clearly marked, and any potential trip hazards highlighted with hazard tape. During matches, Competitors are not allowed in the arena whilst the robots are in motion. During tinker time, robots to be switched off on entry to the arena. This will also apply to use of the test arena. During matches robots will need to be powered up but inactive whilst entering the arena. All robots to be powered down when exiting the arena.	Health and Safety Lead SR Volunteers	4

Hazard	**Control Measures**	**Responsible Person**	**Risk Rating**
Injury due to persons or objects falling from height	Arena to be constructed and tested as per Method Statement, and will be subject to inspection by SR Volunteers throughout the event, with interventions for repair if deemed necessary. Work at height only conducted by suitably prepared individuals. Work at height only to be performed where absolutely necessary. Personnel clipped on where appropriate. Tools on lanyards where appropriate. Head protection to be worn when at height or underneath ongoing work at height. Area underneath work at height to be barriered off. Physical barriers to be at the back of tech desk to prevent objects being pushed over the edge. Leaning over barriers at heights not permitted. Objects are not to be held over the edge of the balcony. Objects are not to be passed down from heights where an alternative route is available.	Health and Safety Lead SR Volunteers	3
Hearing damage from excessive noise levels	Noise levels carefully monitored during event.	Health and Safety Lead SR Volunteers	2

Hazard	**Control Measures**	**Responsible Person**	**Risk Rating**
Reaction to theatrical effects utilised, such as lighting effects	Signage to be clearly visible in areas where theatrical effects are used. Flashing lights and smoke to be kept to a minimum. Any flashing to be at no greater rate than 4 flashes per second.	Health and Safety Lead SR Volunteers	4
Accidents due to being under the influence of alcohol or drugs	Alcohol consumption prohibited on site. Anyone clearly under the influence will be escorted off site.	Health and Safety Lead SR Volunteers	2
Injury due to marathon setup - staging and vehicles moving around in redbrick area	Volunteers assigned to manage teams and move them away from the hazardous area.	Health and Safety Lead SR Volunteers	2

2 Traffic Management

The following risks have been considered for managing traffic at the Student Robotics Competition. Further description of the meaning of risk ratings (presented in this section as $L \times S$) can be found in the final section.

Hazard	**Control Measures**	**Responsible Person**	**Risk Rating**
SR Volunteers injured by a vehicle	SR Volunteers to be briefed on how to manage traffic beforehand. High visibility jackets to be worn. Management only to be performed in areas where the traffic is moving at low speed, e.g. car parks or within road closures. SR Volunteers to never stand in front of moving traffic, always just off the drivers side.	Health and Safety Lead SR Volunteers	4
SR Volunteers injured moving road equipment	SR signage to be kept away from the traffic flow. SR Volunteers to not handle third party road equipment, where applicable this should be passed on to the contractor responsible for the equipment.	Health and Safety Lead SR Volunteers	2
Illness caused by weather conditions	SR Volunteers to be appropriately dressed for the weather conditions.	Health and Safety Lead SR Volunteers	3

3 COVID-19

The following COVID-19 risks have been considered for the Student Robotics Competition. This assessment is to be supplimented by the SUSU risk assessment. Further description of the meaning of risk ratings (presented in this section as $L \times S$) can be found in the final section. All severities are deemed to be '3 day' injury/illness. Current guidance advises isolating for 5 days, this is understood to be to prevent spreading rather than severity related.

Hazard	**Control Measures**	**Responsible Person**	**Risk Rating**
Airbourne Transmission	Anyone presenting symptoms or who has tested positive instructed not to attend. Anyone who lives with someone who has tested positive instructed not to attend. External windows and doors to be kept open as much as is practical. All attendees asked to wear a mask outside of their pits and power tools area. All attendees asked to respect each others personal space.	Health and Safety Lead Team Supervisors SR Volunteers	6
Contact Transmission	Anyone presenting symptoms or who has tested positive instructed not to attend. Anyone who lives with someone who has tested positive instructed not to attend. All attendees encouraged to wash hands regularly with soap or sanitiser. Hand sanitiser available throughout the venue. Common contact surfaces wiped down by SR Volunteers regularly during the event.	Health and Safety Lead Team Supervisors SR Volunteers	6

Hazard	**Control Measures**	**Responsible Person**	**Risk Rating**
Event cancellation due to lack of volunteers	Anyone presenting symptoms or who has tested positive instructed not to attend. Anyone who lives with someone who has tested positive instructed not to attend. All SR Volunteers to wear a mask during setup. All attendees encouraged to wash hands regularly with soap or sanitiser. All attendees asked to respect each others personal space. Additional signage to be set up during the setup days to prevent third parties accessing the venue.	Health and Safety Lead SR Volunteers	1

4 Assessment Guidance

The risk ratings of the risks in the previous section are calculated by multiplying L, the likelihood rating, by S, the severity rating.

Likelihood	Likelihood rating
Very unlikely	1
Unlikely	2
Likely	3
Fairly likely	4
Very likely	5

Severity	Severity rating
First Aid injury/illness	1
Minor injury/illness	2
'3 day' injury/illness	3
Major injury/illness	4
Fatality/disabling injury	5

The following should be used to rate the risk and plan corrective action:

Risk Rating	Category	Tolerability	Comments
1–2	Very Low	Acceptable	No further action is necessary other than to ensure that the controls are maintained.
3–4	Low	Acceptable	No additional controls are required unless they can be implemented at very low cost (in terms of time, money and effort).
5–7	Medium	Tolerable	Consideration should be given as to whether the risks can be lowered, where applicable, to a tolerable level, and preferably acceptable level, but the costs of additional risk reduction measures should be taken into account. The risk reduction measures should be implemented within a defined time period.
8–14	High	Tolerable	Substantial efforts should be made to reduce the risk. Risk reduction measures should be implemented urgently within a defined time period and it might be necessary to consider suspending or restricting the activity, or to apply interim risk control measures, until this has been completed. Considerable resources might have to be allocated to additional control measures.
15 and above	Very High	Unacceptable	Substantial improvements in risk control are necessary, so that risk is reduced to a tolerable or acceptable level.