

**GENERAL RISK ASSESSMENT TEMPLATE**

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| **Work area / operation** | CB11.10.403 | | **Assessor’s name** | Ash Mudaly, Andrew Goode | | | |
| **Other persons consulted** | Tom Dodgson | | | | **Date of safety assessment** | | 09/10/24 |
| Subject Coordinator’s Name | Gavin Paul | Lab Supervisor’s Name | | | | Michael Lee | |

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| **ACTIVITY**  - Describe hazardous activities related to the work area or operation. | **ASSOCIATED HAZARDS** | **INHERENT RISK**  - Harm that could occur from these hazards if controls fail or are not in place. | **EXISTING CONTROL MEASURES** | **PROPOSED CONTROL MEASURES**  - Proposed action to minimise risk to an acceptable level. | **TARGET DATE**  - To implement proposed controls | **RESIDUAL RISK LEVEL** (H,M,L) |
| Electrical cables mishandled | Exposed wires are not stored accordingly, left exposed | Potential risk of electric shock and/or damage to electrical property. | Review the wiring with the lab supervisor before use and ensure that wires are equipped with ferrules or heat shrink. | Enhance lab supervision, include training on the safe handling of robots, and increase the frequency of robot maintenance. | 09/10/24 | L |
| Leaving the robot arm unsupervised | The arm operates without supervision, potentially causing damage and malfunctioning. | Risk of property damage and injury to individuals in the area if they are unaware. | The robot should not be operated or moved without supervision, warning signs must be heeded, and a verbal alert should be given when the robot is in motion. | Keep the safety disarm switch nearby and have another person present as a backup observer. | 09/10/24 | L |
| Using inappropriate load on the robot | The robot arm breaks or becomes overloaded. | Potential for property damaged, error | Loads must not exceed 3 kg as specified. Ensure proper training on the correct use of the robot arm. | Signs indicating incorrect usage, specifications, and operational guidelines | 09/10/24 | L |
| Inappropriate environment of the robot | Robot Is placed in an environment unsuitable for operation | Risk of increased wear and tear of robot arm, may pose damage to surrounding area | Ensure the robot arm is in an environment that meets the operational requirements | Ensure that the operating environment complies with industry regulations and standards relevant to the robot arm’s use. | 09/10/24 | L |
| Robot arm moves incorrectly | Collision with surrounding environment (objects, people, itself etc.) | Potential risk of property damage and injury to individuals in the area | Emergency/safety switch to quickly cut power to the robot in the event of an incident. | Use and practice with the simulation before operation, and ensure it is functioning correctly before moving on to the robotic arm. | 09/10/24 | L |
| Incorrect manual handling | Collision with surrounding environment (objects, people, itself etc.) | Potential risk of property damage and injury to individuals in the area | Complete the required training for manual operation of the arm and review the instructional videos on Canvas. | The area of operation must be inspected with the lab supervisor before commencing work. | 09/10/24 | L |
| Operating robot when tired or distracted | If the arm operates unattended, it may cause damage, function improperly, and potentially injure individuals in the area. | Risk of property damage and injury to individuals in the area | Stay well-rested and avoid distractions from others; keep the area clear. | Implement a safety measure to ensure the workspace is free from distractions and restricts access to only one person in the operating area. | 09/10/24 | L |
| Slips, trips, or falls | Slips from spills, trips from wires or cables, or falls caused by objects left out | Potential risk to oneself and others, including sprained ankles and bruising | Do not bring water bottles, food, or any prohibited items into the Mechatronics Lab. Return everything to its original place and clean up after the session is finished. | Encourage others to clean up after themselves, avoid bringing food for yourself or others, and maintain a clean workspace for the next group as a matter of common courtesy. | 09/10/24 | L |
| Burns or slight singes to objects or person in contact | (Assuming it’s the [Gen3 Bot](https://www.universal-robots.com/articles/ur/safety/product-alert-safety-notice-for-all-ur3-ur5-ur10-cb3-generation-3-robots/)) An overloaded PSU may raise the system's temperature. | Risk of burns and singeing to individuals in direct contact. | Check Serial Number of robot (Less than 2019330933) | Keep the firmware up to date to ensure safe and proper operation. Double check code to not excessively overload robot. | 09/10/24 | L |
| Entrapment of various sized objects | During arm operation, there is a potential for objects to become entrapped at Joints 0, Wrist 1, Wrist 2 (Joints 3 and 4). | Potential for injury and damage to the robotic arm, as well as to foreign objects lodged in the joints. | Forced retraction, pulling on the robot arm hand, and manual brake release | "Keep objects and limbs away from moving components" sign and restrict access to the gate operation area. | 09/10/24 | L |

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| **Approval of assessment** | I am satisfied that the residual risk with existing controls is acceptable XYes ☐No  OR  I am satisfied that that the proposed controls will reduce risk to an acceptable level. ☐Yes ☐No | Signature |  | Date | 09/10/24 |

**Guidance notes for documenting General Risk Assessments**

**ACTIVITY**

**Briefly describe this hazardous work activity -** E.g. Operating, Handling, Using … (Include names) of hazardous equipment, substances or materials used, and any quantities and concentrations of substance(s) or reaction products.

**ASSOCIATED HAZARDS**

**Plant & Equipment** – noise, vibration, moving parts (crushing, friction, stab, cut, shear), pressure vessels, lifts/hoists/cranes, sharps

**Manual Handling** – repetitive movements, lifting awkwardly, lifting heavy objects

**Work Environment** – moving objects, extremes in temperature, isolation, work at height, allergies to animal bedding, dander and fluids, risk of fire/explosion, slippery surfaces/trip hazards

**People** – potentially violent or volatile clients/interviewees

**Communicable Diseases** – exposure to bodily fluids/infectious materials, animal bites and scratches,

**Environmental** – emissions to atmosphere, discharge to soil and water bodies (including stormwater run-off), nuisance noise & odour, poor ventilation/air quality

**Radiation (non-ionizing)** – including lasers, microwaves or UV light

**Electrical** – plug-in equipment used in ‘hostile’ work environment, exposed conductors, high voltage equipment

**Pathogens** – dealings with pathogenic microorganisms such as bacteria, parasites, fungi or viruses

**GMOs** – dealings with genetically modified organisms

**Cytotoxins** – carcinogens, mutagens or teratogens

**Radiation (ionizing)** – Ionizing radiation source such as radioactive substance or radionuclide, or irradiating apparatus

**Chemical** – hazardous substances, dangerous goods, fumes, dust, compressed gas, hazardous waste

**INHERENT RISK**

Provide details of the harm that could be caused to people or the environment if something goes wrong.

For example: inhalation of fumes, laceration, injury to back, infection, burns to skin or eyes.

Think about what could happen if controls fail or are not in place.

**CONTROL MEASURES**

Note the existing and proposed actions to reduce risk to an acceptable level. Apply the “Hierarchy of Controls”, listed below, when deciding the best control measure to apply. Control types closer the top of the list are preferable.

1. Eliminate the hazard. For example: use a different less dangerous piece of equipment, fix faulty machinery, use safer materials or chemicals

2. Isolate the hazard from the people. Separate people from the danger. For example: use shielding, use lifting equipment or trolleys, remove dust or fumes with exhaust system, lock-out machinery.

3. Change the way the job is done. For example: change work practices, provide training, information and signs, develop work procedures.

4. Use personal protective equipment (PPE), noting specific PPE is required for each job. For example: respirator, hearing protection, gloves. Training and information is required for the use of PPE.

**RESIDUAL RISK LEVEL (H, M, L)**

Estimate risk taking into account the way the activity is run and control measures put in place. The level of risk can be determined by combining consequence and likelihood using the risk matrix from below. Residual risk should be reduced to a level acceptable by management.

**CONSEQUENCE OF HARM -** This is how bad it will be if something does go wrong e.g. the number of people that could be harmed, the severity of injury.

**LIKELIHOOD OF HARM** - Chance of harm occurring is affected by the duration of the activity and its frequency; the number of people doing the activity and the level of exposure to the hazard.

