**Supplementary Risk Assessment** 

| **1** | **RISK ASSESSMENT NUMBER** | *K19069628* | **ISSUE NO.** | 1 |
| --- | --- | --- | --- | --- |

| 2 | **PERSON RESPONSIBLE FOR WORK (e.g. PRINCIPAL INVESTIGATOR)** | | |
| --- | --- | --- | --- |
| Name: Dr. *Yang Gao* | | Position: | Project Supervisor |
| School: Engineering | | Division: |  |

| 3 | **PERSON CONDUCTING THE RISK ASSESSMENT** | | |
| --- | --- | --- | --- |
| Name: Jonathan Wong | | Position: | Student |
| School: Engineering | | Date: | 27/11/2024 |

| 4 | **LOCATION OF WORK ACTIVITY** |
| --- | --- |
| *Quad Makerspace -1.47/-1.26* | |

| 5 | **ACTIVITY DESCRIPTION** |
| --- | --- |
| *Esp 32 microcontrollers will be used to control the motors and sensors, and process the readings from the sensors. Used for masters group project to great robotic space gripper.* | |

| 6 | **AT RISK GROUPS** |  |  |
| --- | --- | --- | --- |
| Type | | Y/N | Describe additional precautions required (if any) |
| Maintenance workers | | N |  |
| Young persons | | N |  |
| Other (describe) | | N |  |

| 7 | **HAZARDS** | | | |
| --- | --- | --- | --- | --- |
|  | | Present Y/N | Describe hazard or state whether a Specific Risk Assessment supplement is used (and attach) | Adequately controlled Y/N (refer to controls section 8B below) |
| Biological | | N | N/A | N/A |
| Chemical | | N | N/A | N/A |
| Physical | | Y | 1. Heat generated from internal chip burning fingers(only if excess voltage/current) | Y |
| Electrical | | Y | 1. Short circuit risk 2. Incorrect voltage connections breaking microcontroller | Y |

| 8 | **CONTROL MEASURES** | | |
| --- | --- | --- | --- |
|  | | | |
| 8A | **HIERARCHY OF CONTROL** |  |  |
| Type | | Used  Y/N | Justification |
| Elimination | | N | Cannot remove microcontroller as it is a critical part of the project, required to control motors and sensors. |
| Substitution | | N | Esp 32 is already a low voltage microcontroller and has a metal shielding around the chip to prevent burns. Other microcontrollers would have similar risks. It also completely satisfies the need for the project. |
| Engineering (local exhaust ventilation etc.) | | N | Risks associated with the microcontroller are not so dangerous or likely that specialised equipment is necessary to prevent them. |
| Behavioural/Administrative (SSW etc) | | Y | Risks associated with the microcontroller are most likely to occur during misuse so being familiar with the datasheet and having it open while working would greatly decrease risk. |
| Personal Protective Equipment | | N | Safety glasses are already mandatory while working in the makerspaces. Gloves can be worn in order to prevent small shocks and burns. |
|  | | | |
| 8B | **CONTROLS IDENTIFIED** |  |  |
| Type (for each hazard identified at 7 above a related control should be listed here) | | In place Y/N | Comments |
| Wires that connect into the microcontroller will not have a voltage over 3.3V. | | Y |  |
| Microcontroller will not be exposed to water or any liquids. | | Y |  |
| Microcontroller not directly soldered to power source. | | Y |  |
| Microcontroller not to be damaged and will be inspected before use. | | Y |  |
|  | |  |  |
|  | |  |  |

| 9 | **INFORMATION, INSTRUCTION, TRAINING AND SUPERVISION (DESCRIBE COURSES AND/OR SPECIAL ARRANGEMENTS REQUIREMENTS)** |
| --- | --- |
|  | Users must be trained by a technician |
|  | User should familiarise themselves with the datasheet |
|  |  |
|  |  |

| 10 | **MONITORING** |  |  |
| --- | --- | --- | --- |
| Type | | Required Y/N | Describe (include results of any monitoring carried out) |
| Maintenance | | N | N/A |
| Environmental monitoring | | N | N/A |
| Self inspection/reporting | | Y | Inspect |
| Health Surveillance | | N | N/A |

| 11 | **EMERGENCY PROCEDURES** |  |
| --- | --- | --- |
| Type | | Describe |
| Spillages | | N/A |
| First aid | | Apply bandage and burn cream to the affected area. |
| Other ( specify) | | If microcontroller starts smoking, then immediately disconnect power |
|  | |  |

| 12 | **PROCESS RISK ASSESSMENT** | |
| --- | --- | --- |
| Overall risk rating  (Low) | | | **RISK ASSESSMENT MATRIX** | | | | | | | --- | --- | --- | --- | --- | --- | | **SEVERITY** | Fatality | Medium | High | High | Unacceptable | | RIDDOR | Medium | Medium | High | High | | Moderate Injury | Low | Low | Med | Medium | | Minor Injury | Insignificant | Low | Low | Low | |  | | Unlikely | Possible | Probable | Certain | | **LIKELIHOOD** | | | | |
| Justification for rating | | If all controls are followed, any risks are unlikely to occur, and if the risks do occur, it will only cause minor injury. Risks will occur only during misuse of microcontroller. |

| 13 | **RECOMMENDATIONS FOR FURTHER ACTION** | | |
| --- | --- | --- | --- |
| Recommendation | | Who by | When |
|  | |  |  |
|  | |  |  |
|  | |  |  |

| 14 | **ASSESSMENT REVIEW** | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Review | | Date | Assessor name (PRINT) | Assessor  (signature) | Outcome of review Change/No Change | Managers name (PRINT) | Managers acceptance  (Signature) |
| 1 | |  |  |  |  |  |  |
| 2 | |  |  |  |  |  |  |
| 3 | |  |  |  |  |  |  |



**Guidance for completion of**

**GENERAL RISK ASSESSMENT FORM**

1. **RISK ASSESSMENT NUMBER**

This is a unique number to aid identification for amend purposes etc. System used is based on School/Directorate and 3 digit sequential number and year, e.g. MED/001(2009)\_is School of Medicine, Risk assessment form, 001. Refer to Safety Procedure SPR025-01-HSEPO. Alternatively if managed at department/ division level HR/HSEPO/001(2009)

2. **PERSON RESPONSIBLE FOR WORK**

The Head of Department or Principal Investigator is directly responsible for ensuring work involving hazardous substances are suitably risk assessed before work commences.

3. **PERSON CONDUCTING THE RISK ASSESSMENT**

This is the trained risk assessor.

4. **LOCATION OF WORK ACTIVITY**

The location of an activity can significantly alter the risk. Different levels of risk may arise from the same activity performed in different locations if there is also a difference in the standards of facilities of the location. State all locations where the activity(ies) will be conducted.

5. **ACTIVITY DESCRIPTION**

A brief description of process being undertaken should be included here.

6. **AT RISK GROUPS**

In some cases named individuals may be indicated in this section. In other cases it will be more appropriate to refer to groups of people such as cleaning staff etc. Identification of groups particularly at risk who may require additional safe guards is particularly important.

7. **HAZARDS**

It is extremely unlikely that a process will only involve a chemical related hazard, use of equipment, such as hot plates, evaporators etc will bring with it additional hazards. Other hazards such as biological agents may also be present. The assessment of risk in the process must take into account all the types of hazard.

8. **CONTROL MEASURES**

It is important that the hierarchy of control is followed. An assessment must be made as to why a higher level of control, e.g. substitution, cannot be used in this particular process.

Once determined all control methods, e.g. use of enclosed equipment, fume cupboards, safe system of work, personal protective equipment (PPE) etc must be detailed. Where appropriate, specify class of equipment, type of material and level of performance (particularly relevant for selecting suitable PPE).

9. **INFORMATION, INSTRUCTION, TRAINING AND SUPERVISION**

It is important to describe the level of competence expected and the identification of any special training or supervisory requirements.

10. **MONITORING**

Some equipment, e.g. fume cupboards require user checks and statutory testing. To ensure environmental standards, e.g. Workplace Exposure Limits (WEL) are not exceeded, monitoring may be carried out at specified intervals. Working with some substances, e.g. respiratory sensitizers, will require regular health surveillance programs to be introduced.

11. **EMERGENCY PROCEDURES**

The details given here must be compatible with your Schools emergency plan. The appropriate persons must be notified and suitably trained.

12. **PROCESS** **RISK ASSESSMENT**

Based on all the information gathered in sections 2-14 of the General risk assessment form, including any supplementary sheets, an assessment of risk and brief justification for rating should be made using the matrix below.

| **RISK ASSESSMENT MATRIX** | | | | | |
| --- | --- | --- | --- | --- | --- |
| **SEVERITY** | Fatality | Medium | High | High | Unacceptable |
| RIDDOR | Medium | Medium | High | High |
| Moderate Injury | Low | Low | Med | Medium |
| Minor Injury | Insignificant | Low | Low | Low |
|  | | Unlikely | Possible | Probable | Certain |
| **LIKELIHOOD** | | | |

**Please note**: The assessment should be based on conditions at time of assessment and not based upon the “ideal” controlled environment. There is nothing wrong in assessing a particular process “high” or “medium” risk. A process should not be assessed “low” or “insignificant” risk unless that is truly the assessment.

13. **RECOMMENDATIONS**

All high risks and most medium risks should have recommendations made to attempt to lower the risk rating where possible (although not possible in all instances).

Recommendations should be entered here and assigned to a person with a completion date. Upon completion of the action a review of the assessment should be undertaken.

17. **ASSESSMENT REVIEW**

Assessments should be regularly reviewed and if significant changes occur, e.g. after an accident or legislative requirements alter, a review must be undertaken. If no significant changes occur all assessments should be reviewed no longer than 3 years after initial assessment or previous review.

Where a change is indicated, the assessment should be rewritten to include the changes