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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Assessment Ref. No. | |  | 10778126 | | |  |  | Activity Assessed | | | Programmable DC Electronic Load | | | | |
| Assessment Date | |  | 18/03/25 | | |  |  | Faculty / Directorate | | | SECaM | | | | |
| Assessor | |  | Charles Warhurst | | |  |  | School / Service | | | School of Engineering | | | | |
| Version No. | |  | 1 | | |  |  | Additional individuals involved in developing the RA | | | | | |  | |
| Signature of Assessor | |  | | Charles Warhurst | |  |  | | Signature of Academic Supervisor / Approver | | | | | *Tamer Kamel 19/03/2025* | |
| Risk Score Matrix | |  | | | |  |  | | | Risk Score and Description | | | | | |
|  | | Severity | | | |  |  | | | Risk Score | | Risk Level | Category | | Description |
| Likelihood |  | Insignificant | | | Minor | Moderate | Major | | Fatal |
| Very Unlikely | 1 Green | | | 2 Green | 3 Green | 4 Green | | 5  Amber | 1 – 4 | | Low | Acceptable | | No further actions needed |
| Unlikely | 2 Green | | | 4 Green | 6  Amber | 8  Amber | | 10  Red | 5 – 9 | | Medium | Tolerable/Adequate | | Should be reviewed to ensure that there is nothing else which could be done |
| Possible | 3 Green | | | 6  Amber | 9  Amber | 12  Red | | 15  Red | 10 – 15 | | High | Undesirable | | Immediately review current control measures, and where appropriate decide on further actions |
| Likely | 4 Green | | | 8  Amber | 12  Red | 16  Red | | 20  Red | 16 - 25 | | Very  High | Unacceptable | | Stop activity and make immediate improvements |
| Almost Certain | 5  Amber | | | 10  Red | 15  Red | 20  Red | | 25  Red | *Likelihood (L) x Severity (S) = Risk Score (RS)* | | | | | |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| What is/are the hazard(s) involved with the activity being undertaken? | Who might be harmed and how? | What are you already doing to control the risk? | Risk Score with current controls in place | | | What further action is necessary? (Add these actions to the action plan below). | Target Risk Score Likelihood x Severity = Risk Score | | |
| L | S | RS | L | S | RS |
| Mains Voltage (230V  AC) – Wiring &  Handling | The project operator could receive an electric shock if exposed to live mains wiring. Faults may cause overheating or fire, potentially  harming others in the workspace. | Insulated tools are used, safe wiring practices are followed, power is always switched off before handling, and fuse protection is implemented. | 2 -  Unlikely | 5 - Fatal | 10 - High  Risk | Double-check grounding and insulation before live testing. If necessary, use an RCD (Residual Current Device) for added protection. | 1 - Very  Unlikely | 5 - Fatal | 5 -  Medium  Risk |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| High DC Currents (Up  to 100A on Busbars) | The project operator may suffer burns or electric shock from accidental contact with high-current busbars. Poor connections could lead to overheating or fire. | Fully enclosed busbars, all conductors are appropriately rated and insulated, hands/tools kept away from live circuits. | 2 -  Unlikely | 4 - Major | 8 -  Medium  Risk | Use insulated gloves for handling live connections. Ensure busbar mounting is secure. | 1 - Very  Unlikely | 4 - Major | 4 - Low  Risk |
| Soldering Hazards  (Burns, Fumes, Eye  Injuries) | The project operator may suffer burns from the soldering iron, exposure to fumes may cause respiratory irritation, and solder splashes could cause eye injuries. | A proper soldering stand is used, fume extraction or ventilation is ensured, safety glasses are worn, and hands are washed after handling solder. | 4 -  Likely | 2 - Minor | 8 -  Medium  Risk | Ensure adequate ventilation before prolonged soldering. Consider wearing gloves for hightemperature soldering work. | 3 -  Possible | 2 - Minor | 6 -  Medium  Risk |
| Short Circuits &  Overcurrent Failures | The project operator could be harmed by overheating  components or fire  caused by excessive  current draw due to a short circuit or incorrect wiring. | Proper PCB layout, inline fuses, thermal shutdown for transistors, and controlled current testing before full power operation. | 2 -  Unlikely | 4 - Major | 8 -  Medium  Risk | Always test circuits at low power first. Ensure fuse ratings match expected current draw. | 1 - Very  Unlikely | 4 - Major | 8 -  Medium  Risk |
| Component Lead  Clippings (Eye Injury) | The project operator or others in the  workspace may suffer eye injuries from  flying lead fragments when cutting components. | Leads are clipped downward or with a hand covering the area to prevent flying debris. Safety glasses are worn when necessary. | 4 -  Likely | 2 - Minor | 8 -  Medium  Risk | Ensure that all lead cuttings are properly disposed of in designated waste containers. | 3 -  Possible | 2 - Minor | 6 -  Medium  Risk |
| Hot Air Gun / Heat  Shrink Gun | The project operator may suffer burns from direct contact with the nozzle or hot air. There is also a risk of | The hot air gun is never left running unattended, kept away from hands and flammable  materials, and placed in a safe position when hot. | 2 -  Unlikely | 3 -  Moderate | 6 -  Medium  Risk | Store the tool safely when hot. Ensure proper ventilation when using on plastics. | 1 - Very  Unlikely | 3 -  Moderate | 3 - Low  Risk |
|  | fire if the gun is  directed at flammable materials. |  |  |  |  |  |  |  |  |
| Fuses & Overcurrent  Protection | The project operator may install an incorrectly rated fuse, leading to inadequate protection or overcurrent faults. | Fuses are correctly rated and installed. Fuse replacements are only performed when necessary and verified for correct ratings. | 2 -  Unlikely | 3 -  Moderate | 6 -  Medium  Risk | Double-check fuse ratings before replacement to avoid potential overcurrent damage. | 1 - Very  Unlikely | 3 -  Moderate | 3 - Low  Risk |
| Sharp Tools (Knives, Scalpels, Cutters) | The project operator may suffer cuts from improper handling of sharp tools or leaving  blades exposed in the workspace. | Blades and sharp tools are stored safely and disposed of properly. Used blades are placed in designated disposal containers. | 3 -  Possible | 2 - Minor | 6 -  Medium  Risk | Never leave unguarded blades on the workspace. Ensure a designated area for cutting operations. | 2 -  Unlikely | 2 - Minor | 4 - Low  Risk |
| Protective Earth (PE) /  Grounding | The project operator may suffer an electric shock if protective earth (grounding) is not properly connected to mainspowered devices. | All Class 1 mains-powered equipment is properly earthed, and protective earth connections are never removed or bypassed. | 2 -  Unlikely | 5 - Fatal | 10 - High  Risk | Confirm grounding continuity before applying mains voltage. | 1 - Very  Unlikely | 4 - Major | 4 - Low  Risk |

Refer to scoring matrix on page ¾

Action Plan and Monitoring

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| This section should be completed by the Risk Assessor and discussed with Manager / Academic Supervisor | | This section should be completed by the Manager / Academic Supervisor for monitor and review | | |
| Hazard | Action required | Action assigned to | Target date | Date Completed |
| Mains Voltage (230V AC)  – Wiring & Handling | Double-check grounding and insulation before live testing. | Charles Warhurst | 30/04/25 |  |
| Protective Earth (PE) /  Grounding | Double-check grounding and insulation before live testing. | Charles Warhurst | 30/04/25 |  |
| Short Circuits &  Overcurrent Failures | Proper Fuses & Overcurrent Protection | Charles Warhurst | 30/04/25 |  |

Review

When reviewing this risk assessment remember to move completed actions into the ‘what are you already doing.’ column, as these actions should be in place by the time you review the risk assessment. You should review your risk assessment if you think it might no longer be valid (e.g. following an incident in the workplace or if there are any significant changes to hazards, such as new work equipment, work activities, personnel etc.)

Severity Table Likelihood Table

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Severity of injury | Examples | Score |  | Severity of injury | Examples | Score |
| Insignificant | None or very insignificant injuries, health effects, damage or disruption to work. Short-term and/or localised environmental harm. | 1 | Very unlikely | Good control measures are in place. Controls do not rely on a person using them (i.e. personal compliance with safety rules). Controls are very unlikely to break down. People are very rarely in this area or very rarely engage in this activity. | 1 |
| Minor | Cuts bruises, mild skin irritations, mild headaches and pains requiring minor first aid treatment. Minor property damage or disruption to work. Notable contributor to environmental harm. | 2 | Unlikely | Reasonable control measures are in place but they do rely on a person using them (some room for human error). Controls unlikely to breakdown. People are not often in this area / do not often engage in this activity. | 2 |
| Moderate | More serious injuries or ill-health requiring time off work or a hospital visit for example burns sprains, strains, short term musculoskeletal disorders, cut requiring stitches, back injuries, fractures to fingers and toes. Short term absence relating to physical or mental health issues. More serious property damage or disruption. A significant contributor to environmental harm. | 3 |  | Possible | Inadequate controls are in place, or likely to breakdown if not maintained. Controls rely on personal compliance. People are sometimes in this area or sometimes engage in this activity and situations sometimes arise from this activity. | 3 |
| Major | Broken limbs, amputations, long-term health problems or longer absence. Acute illness requiring medical treatment. Loss of consciousness, serious electric shock, loss of sight. Major property damage, major disruption to work. A major contributor to significant environmental harm. | 4 | Likely | Poor controls in place. Heavy reliance on personal compliance (lots of room for human error). People are often in this area / engage in this activity on a regular basis / situation often arise from this activity. | 4 |
| Fatal | Injury or ill-health which leads to death either at the time, soon after the incident, or eventually, as in the case of certain occupational diseases, such as asbestos-related cancers. Catastrophic business losses. The major contributor to significant environmental harm. | 5 | Almost certain | No controls in place where there should be, exposure to the hazard is expected to occur in most circumstances. The activity is considered such high risk that it will `certainly lead to injuries. | 5 |