

| Risk Assessment | | | |
|--|---|-------------------|------------------------|
| Risk Assessment for the activity of | SUHPS Generic Risk Assessment Covers general manufacturing operations and standard meetings for the Human Powered Submarine | Date | 04/02/25 |
| Unit/Faculty/Directorate | SUSU SUHPS | Assessor | Matthew Hulbert |
| Line Manager/Supervisor | Matthew Hulbert | Signed off | |

| PART A | | | | | | | | | | | |
|--|--|--|----------------------------|---------------|--------------|---|----------------------------|---------------|--------------|---|--|
| (1) Risk identification | | | (2) Risk assessment | | | | (3) Risk management | | | | |
| Hazard | Potential Consequences | Who might be harmed (user; those nearby; those in the vicinity; members of the public) | Inherent | | | Control measures (use the risk hierarchy) | Residual | | | Further controls (use the risk hierarchy) | |
| | | | Likelihood | Impact | Score | | Likelihood | Impact | Score | | |
| Cutting of materials – Cutting saws and rotating machinery | Cuts, abrasions, amputations or breathing dust from cutting of materials | User | 3 | 3 | 9 | Training is provided to all users prior to commencing work. Competency in the use of hands tools is shown through training (EDMC workshop training, city college training or previous experience) | 1 | 3 | 3 | Emergency services/111 will be called should an injury require further medical attention Ensure that all participants make event coordinators aware of any potential injury they may have picked up Committee regular checks equipment to ensure this is safe to use. Any issues with equipment to be reported to President and this will not be used/activity will not go ahead until replaced | |

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| Cutting of materials – Cutting saws and rotating machinery | Flying debris | User | 3 | 2 | 6 | Eye protection is provided and must be worn. Training is provided and instruction is given to all new users | 1 | 2 | 2 | Emergency services/111 will be called should an injury require further medical attention Committee regular checks equipment to ensure this is safe to use. Any issues with equipment to be reported to President and this will not be used/activity will not go ahead until replaced | |
| Cutting of materials – Cutting saws and rotating machinery | Loud noises | User | 4 | 2 | 8 | Ear protection is provided and must be worn where applicable. Training is provided and instruction is given to all new users | 2 | 2 | 4 | Committee regular checks equipment to ensure this is safe to use. Any issues with equipment to be reported to President and this will not be used/activity will not go ahead until replaced | |

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| Airborne dust or sharp fragments | Breathing of small particles leading to respiratory issue or splinters from offcuts being left. | Users or others | 4 | 2 | 8 | Training and instruction is provided. Cutting saws are wiped down after each use to remove excess dirt and dust An appropriate ventilation and extraction system is used were required. A bin is provided for offcuts to be placed in. | 2 | 2 | 4 | Use of PPE | |
| Electricity and electric hand tools | Electrocution | User | 2 | 4 | 8 | PAT testing completed on electrical tools used. Visually inspect items before use. Use of non-electric tools is preferable | 1 | 4 | 4 | Committee regular checks equipment to ensure this is safe to use. Any issues with equipment to be reported to President and this will not be used/activity will not go ahead until replaced | |
| Chemical adhesives | Skin or eye irritation from contact, inhalation of fumes | User | 3 | 3 | 9 | Safety glasses and gloves must be worn and the procedure undertaken in the appropriate space. Safety Data sheets for each specific adhesive should be consulted prior use to ensure appropriate exposure controls are in place. | 1 | 2 | 2 | Emergency services/111 will be called should an injury require further medical attention | |

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| Manual handling of components and materials | Back injury, crushing injury or muscle pain | User | 2 | 2 | 4 | Most components or parts are small and light. Materials and components are stored appropriately and lifting/moving equipment is available if necessary. Handling of larger components should be done by two people if appropriate. Helpers will be told not to carry more than they can reasonably manage Anyone with relevant pre-existing conditions not to engage in manual handling activity | 2 | 1 | 2 | |
| Paint spraying | Harmful vapours causing breathing issues | User | 5 | 2 | 10 | Training provided and appropriate extraction systems used. | 2 | 2 | 4 | |

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| Use of flammable chemicals | Fire, burns | User | 2 | 4 | 8 | Aerosol spray cans stored in cabinet when not in use. No direct sunlight enters the cabinet where they are used. No heat sources nearby and the room temperature is below 25 degrees. Fire extinguishing media is located nearby. | 1 | 4 | 4 | Emergency services/111 will be called should an injury require further medical attention | |
| Paint spraying | Skin and eye irritation from contact with skin | User | 4 | 1 | 4 | Nitrile gloves and safety glasses are available to be worn. Eyewash station is located nearby | 2 | 1 | 2 | Emergency services/111 will be called should an injury require further medical attention | |

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| | | | Likelihood | Impact | Score | | Likelihood | Impact | Score | | |
| Use of hand tools | Cuts, bruises, abrasion | User | 3 | 3 | 9 | Training is provided to all users prior to commencing work. Competency in the use of hand tools is shown through training (EDMC workshop training, city college training or previous experience). Use of appropriate PPE. | 1 | 3 | 3 | Emergency services/111 will be called should an injury require further medical attention Committee regular checks equipment to ensure this is safe to use. Any issues with equipment to be reported to President and this will not be used/activity will not go ahead until replaced | |
| Use of adhesives | Joining of skin | User | 3 | 2 | 6 | Training to be provided prior to use. Use of appropriate PPE | 1 | 2 | 2 | | |
| Use of adhesives | Lung irritation from fumes | User | 2 | 3 | 6 | Use only in suitably ventilated location. Use of appropriate PPE | 1 | 3 | 3 | | |

| | | | | | | | | | | |
|----------------------------|------------------------------------|----------|---|---|---|---|---|---|---|--|
| 3D Printing - electricity | Electric shock Electrical burns | Operator | 2 | 2 | 4 | <p>Training provided to use the printer correctly.</p> <p>The 3D printer is sourced from a reputable supplier, with a genuine CE/UKCA mark</p> <p>The printer has protection circuitry built in</p> <p>The printer shall have an in-service inspection / test whenever it is moved, and according to schedule.</p> <p>The 3D printer is not moved regularly so risk of mechanical damage is minimal</p> <p>Operator shall visually look for damage prior to use</p> <p>The printer can be isolated quickly with plug easily identifiable</p> <p>Printer is located in an access control lab</p> | 1 | 2 | 2 | |
| 3D Printing – hot surfaces | Burns to fingers / hands | Operator | 3 | 3 | 9 | <p>Training provided to raise awareness on hot or sharp components. Appropriate PPE (gloves) if needed.</p> <p>The printer has been sourced from a reputable supplier and</p> | 1 | 3 | 3 | |

| | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|
| | | | | | <p>is marked with a genuine CE/UKCA mark</p> <p>The printer is inspected and maintained according to the manufacturers recommendations</p> <p>Only to be operated by competent people who are aware of the heated parts (Bed typically < 100C, extruder head >200C)</p> <p>When practical the printer should be let to fully cool before the removal of the part / servicing the machine</p> <p>Operator to have read the manual and familiarise themselves with warning signs before using machine. Only to be operated by competent operators</p> <p>Temperature of printer not set higher than needed.</p> <p>Printer is in an access controlled lab</p> <p>A sink is available next door to provide easy access to water to cool any burns</p> | | | | |
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| 3D Printing - Removal of print from printer / support material from print | Cuts, grazes, bruises | Operator | 4 | | 8 | Always push tools away from body parts If using a knife / blade to remove material cut resistant gloves are available If prising support material away from print make sure the print is stably supported on a steady surface Where possible use water soluble support material to reduce the need for mechanical removal Try to optimise the print to minimise the need for support material & for ease of support removal | 2 | 2 | 4 | |
| 3D Printing - Fumes / vapours | Possible lung and cardiovascular disease. | Any one in vicinity | 4 | 4 | 16 | Printing should be scheduled such that people are not due to be spending large periods of | 1 | 4 | 4 | |

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| from heated materials | allergic rhinitis. Aggravate existing lung conditions such as asthma. Systemic toxicity | Individuals most at risk include those with pre-existing asthma and breathing difficulties and those predisposed to developing asthma. | | | | time in the room while printing is happening The least hazardous filaments are selected when practicable. The extruder temperature should be optimised for the filament to avoid overheating Filaments should be purchased from reputable suppliers who supply Safety Data Sheets (SDS) The control measures specified in the SDS are implemented through the COSHH assessment process All users to be trained on safe use | | | | |
| 3D Printing - Fire | Smoke inhalation | Any one in vicinity | 3 | 5 | 15 | Where practicable schedule the printing of jobs such that | 1 | 5 | 5 | |



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| | | | Likelihood | Impact | Score | | Likelihood | Impact | Score | |
| | Burns Death Loss of infrastructure / resources / work | All building occupants | | | | they can complete during working hours The printer has built in safety threshold above which heating is automatically shut down The printer has been sourced from a reputable supplier and is marked with a genuine CE/UKCA mark. The main construction material of the printer is metal enclosing the bed Only adhesives specifically designed for 3D printers to be used Printer has successfully completed multiple supervised print runs No flammable chemicals to be stored immediately surrounding the printer When searched on 17/01/24 no reports of this model catching fire were found | | | | |

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| | | | Likelihood | Impact | Score | | Likelihood | Impact | Score | |
| | | | | | | The 3D printer is located away from the escape route so would not compromise the escape route if it does ignite When choosing the filament to be used consider minimising the working temperature to reduce risk of fire There is a fire sensor in the lab Filaments are bought from reputable suppliers Temperature settings to be set no higher than needed The printer is visually checked for damage prior to use The printer shall have an in-service inspection / test whenever it is moved. The printer is only operated by authorised people The printer is in an access controlled lab | | | | |

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| | | | Likelihood | Impact | Score | | Likelihood | Impact | Score | |
| | | | | | | A fire extinguisher is located outside the lab. Fire doors are kept shut. Fire drills are performed regularly | | | | |
| 3D Printer - Moving parts | Trapping injuries to fingers / hands Hair / long clothing entanglement | Operator | 3 | 3 | 9 | The printer has been sourced from a reputable supplier and is marked with a genuine CE/UKCA mark All operators to be trained on safe work practices Only to be operated by authorised users Printer is located in access controlled lab Printer is inspected and maintained according to the manufacturers recommendations | 1 | 3 | 3 | |

PART B – Action Plan

Risk Assessment Action Plan

| Part no. | Action to be taken, incl. Cost | By whom | Target date | Review date | Outcome at review date |
|--|--|------------------------------|----------------|---|------------------------|
| 1 | Annual review of all tools and PPE to check for wear and tear | Committee | 11/02/25 | 18/02/25 | |
| 2 | Training provided to all new volunteers | Committee | 11/02/25 | 18/02/25 | |
| 3 | Individual risk assessments for individual events with higher risk levels not covered by generic assessment. This includes: <ul style="list-style-type: none"> • Trips and Tours • Fundraising events e.g. Bake Sales • External Speaker Events | Appropriate committee member | 06/02/25 | 18/02/25 | |
| 4 | Committee to read and share SUSU Expect Respect Policy | Committee | 06/02/25 | 18/02/25 | |
| Responsible manager's signature:  | | | | Responsible manager's signature:  | |
| Print name: Matthew Hulbert | | | Date: 04/02/25 | Print name: Jazmin Choudhury | |
| | | | | Date: 04/02/25 | |

Assessment Guidance

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|------------------------|---|--|--|
| 1. Eliminate | Remove the hazard wherever possible which negates the need for further controls | If this is not possible then explain why | |
| 2. Substitute | Replace the hazard with one less hazardous | If not possible then explain why | |
| 3. Physical controls | Examples: enclosure, fume cupboard, glove box | Likely to still require admin controls as well | |
| 4. Admin controls | Examples: training, supervision, signage | | |
| 5. Personal protection | Examples: respirators, safety specs, gloves | Last resort as it only protects the individual | |

| | | | | | | |
|---|---|--------|----|----|----|----|
| | | 5 | 10 | 15 | 20 | 25 |
| 5 | 5 | 10 | 15 | 20 | 25 | |
| 4 | 4 | 8 | 12 | 16 | 20 | |
| 3 | 3 | 6 | 9 | 12 | 15 | |
| 2 | 2 | 4 | 6 | 8 | 10 | |
| 1 | 1 | 2 | 3 | 4 | 5 | |
| | | 1 | 2 | 3 | 4 | 5 |
| | | IMPACT | | | | |

Risk process

1. Identify the impact and likelihood using the tables above.
2. Identify the risk rating by multiplying the Impact by the likelihood using the coloured matrix.
3. If the risk is amber or red - identify control measures to reduce the risk to as low as is reasonably practicable.
4. If the residual risk is green, additional controls are not necessary.
5. If the residual risk is amber the activity can continue but you must identify and implement further controls to reduce the risk to as low as reasonably practicable.
6. If the residual risk is red do not continue with the activity until additional controls have been implemented and the risk is reduced.
7. Control measures should follow the risk hierarchy, where appropriate as per the pyramid above.
8. The cost of implementing control measures can be taken into account but should be proportional to the risk i.e. a control to reduce low risk may not need to be carried out if the cost is high but a control to manage high risk means that even at high cost the control would be necessary.

| Impact | | Health & Safety |
|--------|--------------------------------|---|
| 1 | Trivial - insignificant | Very minor injuries e.g. slight bruising |
| 2 | Minor | Injuries or illness e.g. small cut or abrasion which require basic first aid treatment even in self-administered. |
| 3 | Moderate | Injuries or illness e.g. strain or sprain requiring first aid or medical support. |
| 4 | Major | Injuries or illness e.g. broken bone requiring medical support >24 hours and time off work >4 weeks. |
| 5 | Severe - extremely significant | Fatality or multiple serious injuries or illness requiring hospital admission or significant time off work. |

| Likelihood | |
|------------|--|
| 1 | Rare e.g. 1 in 100,000 chance or higher |
| 2 | Unlikely e.g. 1 in 10,000 chance or higher |
| 3 | Possible e.g. 1 in 1,000 chance or higher |
| 4 | Likely e.g. 1 in 100 chance or higher |
| 5 | Very Likely e.g. 1 in 10 chance or higher |