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| **Risk Assessment** | | | | |
| **Risk Assessment for the activity of** | **Planeterrella demonstration** | | **Date** | **2017-11-09** |
| **Unit/Faculty/Directorate** | **FPSE** | **Assessor** | **John Coxon** | |
| **Line Manager/Supervisor** | **Robert Fear** | **Signed off** |  | |

| ***PART A*** | | | | | | | | | | |
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| **(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** | | |  | **Residual** | | | **Further controls (use the risk hierarchy)** |
| **Likelihood** | **Impact** | **Score** | **Control measures (use the risk hierarchy)** | **Likelihood** | **Impact** | **Score** |
| Improper use of planeterrella | Failure to observe and carry out control measures listed below | Demonstrators, those nearby | **4** | **4** | **16** | **Only trained persons will use the planeterrella; training will be provided either before operation or on-the-job by either John Coxon or Andrew Smith.** | **1** | **4** | **4** |  |
| Acrylic dome failure during operation. | Implosion due to vacuum. | Demonstrators, those nearby | **3** | **4** | **12** | **Acrylic used is 15mm thick (as opposed to 10mm in plans) and annealed to reduce risk of structural failure. Chamber is inspected before use.** | **1** | **4** | **4** |  |
| Exposure to high voltages | Electric shock or electrocution | Demonstrators, those nearby | **2** | **4** | **8** | **Electrical equipment meets the relevant safety regulations, has been PAT tested, and is regularly re-tested. Electrical components are inaccessible without disassembly of control box. High voltage can only be engaged with low enough pressure.** | **1** | **4** | **4** |  |
| Manual handling | Back injuries or other handling injuries, damage to planeterrella. | Demonstrators | **3** | **3** | **9** | **Equipment is mounted on a trolley to reduce manual handling required. Handles are provided to allow for easier movement of the acrylic dome. All demonstrators are required by the university to do manual handling videos.** | **1** | **3** | **3** |  |
| Transporting planeterrella on trolley | Hitting people and causing injury, damage to planeterrella. | Demonstrators, those nearby | **4** | **3** | **12** | **Trolley has locking wheels which will be locked when the planeterrella does not need to move. The dome can be locked onto the trolley and will be locked when it does not need to be removed. Ramps will be used where possible, including for loading and unloading the van.** | **1** | **3** | **3** |  |
| Driving the planeterrella to events | Traffic collisions, injuries due to insecure equipment in the van, damage to the planeterrella. | Demonstrators, other road users | **3** | **4** | **12** | **Demonstrators who drive the van will have full, clean driving licences and be covered by insurance. Demonstrators will be trained to use bungee cords/ratchet straps to secure the planeterrella.** | **1** | **4** | **4** |  |
| Tripping due to power leads | Fall-related injuries. | Demonstrators, those nearby | **4** | **3** | **12** | **Tape will be provided in the planeterrella kit to secure power leads, and planeterrella will be positioned as close to mains power as possible.** | **1** | **3** | **3** |  |
| Fire | Fire-related injuries. | Demonstrators, those in the vicinity | **3** | **4** | **12** | **Electrical equipment meets the relevant safety regulations, has been PAT tested, and is regularly re-tested. Planeterrella will be situated in order to avoid blocking fire escape routes, and demonstrators will follow fire evacuation procedures for the building/event.** | **1** | **4** | **4** |  |
| Bumping into the planeterrella | Injuries from bumping into trolley and ensuing motion of trolley, damage to the planeterrella. | Demonstrators, those nearby | **3** | **4** | **12** | **The trolley has rounded corners. The trolley will have its wheels locked on a flat surface to ensure its stability.** | **1** | **4** | **4** |  |
| Hot probes after demonstrations | Burns | Demonstrators | **3** | **4** | **12** | **Probes are not accessible during operation – oven gloves will be provided in the case demonstrators need to handle probes after demonstration.** | **1** | **4** | **4** |  |
| UV light emissions | Skin cancer, eye damage | Demonstrators, those in the vicinity | **1** | **5** | **5** | **The planeterrella’s UV emissions have been tested by James Gates, who has confirmed that they are at safe levels for human exposure.** | **1** | **1** | **5** |  |
| Working with children/vulnerable people/the public | Demonstrators are not required to have DBS checks and so cannot be alone with children or vulnerable people. | Demonstrators, children, vulnerable people | **3** | **4** | **12** | **Demonstrators will not be left alone with children or vulnerable people at any time during public engagement. Parents, teachers or group leaders will remain responsible for supervision of their children/group, as appropriate.** | **1** | **4** | **4** |  |
| Operation in the dark | Tripping injuries and damage to the planeterrella | Demonstrators, those nearby | **4** | **3** | **12** | **The planeterrella will normally be operated in an environment with the lights on but dimmed. If it is operated in total darkness, lights will be turned on as necessary when people need to move around the planeterrella.** | **1** | **3** | **3** |  |

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| ***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 | Include tape in kit box for securing power leads | John Coxon | 2017-11-24 | |  |  | |
| 2 | Include oven gloves in kit box for safe handling of probes | John Coxon | 2017-11-24 | |  |  | |
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| Responsible manager’s signature: | | | | | Responsible manager’s signature: | | |
| Print name: | | | | Date: | Print name: | | Date |

**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 |  |
| 1. Substitute | Replace the hazard with one less hazardous | If not possible then explain why |
| 1. Physical controls | Examples: enclosure, fume cupboard, glove box | Likely to still require admin controls as well |
| 1. Admin controls | Examples: training, supervision, signage |  |
| 1. Personal protection | Examples: respirators, safety specs, gloves | Last resort as it only protects the individual |

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| **LIKELIHOOD** | 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** | | | | |

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| 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. |

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.

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| 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 |