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| **Risk Assessment** |
| **Risk Assessment for the activity of** | **Submarine testing in the Hilsea Lido Pool** | **Date** | **06/02/2018** |
| **Unit/Faculty/Directorate** |  | **Assessor** | **Caroline Layzell, Nancy Cronin Coltsmann, Anna Harrison** |
| **Line Manager/Supervisor** |  | **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** |
| Electrical equipment used to film the submarine | Shorting of camera equipment, mild electric shocks. | Camera crew | **1** | **2** | **2** | No wires near pool. Keep camera equipment away from pool sides.  |  |  |  |  |
| Entrapment of pilot in sub | Drowning | Pilot | **2** | **5** | **10** | Ensure at least one support diver can see the pilot always- to communicate if assistance is required. Brief both pilot and support divers on evacuation protocol. Ensure the dead man’s switch is fully functional before descent | **1** | **5** | **5** | Brief all support divers on how to remove submarine door. Ensure all support divers are well acquainted with the points of attachment of the pilot into the sub / harnesses/cleated shoes. |
| Swimming in close proximity to sub and pool walls - Entrapment of divers between pool walls and sub | Bruising, getting trapped | Support divers | **2** | **3** | **3** | Ensure that there are multiple support divers in the pool at once to ensure submarine does not go off course |  |  |  |  |
| Submarine and parts in the water could cause potential contamination of water/debris falling off | sharp debris may cut people, contamination of pool/ damage to pool walls | Users of the pool after we have tested | **3** | **2** | **6** | Clean sub before entering pool. Ensure all components are well attached to the sub to avoid them coming off. Ensure all divers are aware of relatively sharp propeller blades. Submarine to be kept away from bottom/walls to prevent propeller blades from damaging the pool. | **2** | **2** | **4** | Completely disinfect the submarine and all parts and wash down before submerging in the pool. |
| Manual Handling – significant drop moving submarine from poolside into and out of water.  | Musculo-Skeletal injury due to inexperience in handling submarine and dive equipment. Feet (crush) injury. Trapped divers between submarine and pool-edge. Dropping submarine on diver’s head, disorientation and concussion. | Everyone | **2** | **2** | **4** | 4 people moving the submarine at once. Execute proper lifting practise (Lifting with the legs and keeping back as straight as possible). Do not attempt to move the submarine on your own. Those carrying the submarine will wear shoes with appropriate grip, with plastic covers if inside the pool area. Protective foam over pool edge. |  |  |  |  |
| Entry into water (stride entry) - Narrow 2m platform along length of pool | sprains/strains/broken bones/cuts/grazes.Disorientation/anxiety | Divers | **1** | **1** | **1** | Orientate and point out the deep, shallow water, and platform edge. Encourage rubber soled dive boots for safety. Supervised all deep entries only. Make sure BCD have air in. Disorientation Entrapment Out of Air distance to surface.  |  |  |  |  |
| Diving descent/ascent | Barotraumas/DCS injuries/Lung InjuriesDrowning | Divers | **1** | **4** | **4** | Rules to normal ascents and descents must be reinforced throughout all sessions.  |  |  |  |  |
| Using breathing equipment/Diving cylinders and equipmentManual Handling/ Malfunction /Sudden air release /Contaminated air  | Musculo-Skeletal injury, respiratory problems.  | Divers. People handling diving equipment | **2** | **2** | **4** | Regular service and visual inspection of all dive equipment to prevent malfunction. Sudden air release must be shut down and noted in the accident book. If contaminated air is suspected – remove from service and mark the cylinder to the effect. Vent off and have cylinder cleaned as soon as possible. Report in accident book. Divers reminded to follow training on how to lift heavy equipment. Encourage the use of buddy system in donning and doffing equipment. Ensure components are placed as near to the water entry point, prior to assembly. |  |  |  |  |
| Using diving equipmentExertion and fatigue Medical illness  | Exacerbation of respiratory and circulatory medical conditions | Divers | **2** | **2** | **4** | All participants to read and sign a medical statement. Where any issues are raised as a result of this statement, medical advice must be sought, and a written fitness certificate obtained from a medical practitioner.  |  |  |  |  |
| Walking around uneven poolside, likely around building works | Slips and falls | sprains/strains/broken bones/cuts/grazes | **3** | **1** | **3** | Warn all persons arriving at the site that the area can be slippery when wet. Warn all persons on the site of the hazard of moving around the site locations. No running. Encourage rubber soled dive boots for safety. |  |  |  |  |
| Moving dive equipment | Manual Handling can cause musculo-skeletal injury due to inexperience in handling dive equipment. Feet (crush) injury  | Divers | **2** | **2** | **4** | Encourage the use of buddy system in donning and doffing equipment. Remind divers to remember their training when lifting equipment. Ensure components are placed as near to the water entry point, prior to assembly. NOTE: BCD's with integrated weights or heavy twinsets should not be lifted by Staff or crew. Use very careful judgement.  |  |  |  |  |
| Contact with steel netting along pool-edge | Entrapment of diver between netting and submarine causing physical abrasions and anxiety. | Divers | **1** | **3** | **3** | Ensure all divers are briefed on the netting and leave sufficient clearance between submarine and wall.  |  |  |  |  |
| Gradual slope from 1m – 1.8m then steep drop to 4.5m  | Trapped hands/feet under submarine at shallow depths. Accidental overprofiling of submarine and divers into deeper areas.  | Divers | **3** | **1** | **3** | Brief all divers on correct carrying technique from shallow to deeper areas, where neutral buoyancy must be sufficiently achieved before moving over 4.5m depth. All divers must stay conscious of their depths and that of the submarine from computers/surface cues, not based on distance from floor. |  |  |  |  |
| Work station next to deep area of pool – passing of tools between dry team & divers | Dropped/fallen tools on divers/submarine. Diver bruises and pool damage. Falling into water, drowning. | Everyone | **2** | **2** | **4** | Ensure entire pool-side team is aware of the depth and risk of falling, and that care is taken when handling tools both in and out of the water. |  |  |  |  |
| Other members of the public occupying pool | Swimmers or submarine breaching set limits, resulting in collision/abrasions to divers and swimmers. | Everyone using pool | **1** | **3** | **3** | Refer to a clear line dividing submarine testing and public areas, and brief all divers to leave plenty of clearage between edge of zone and submarine. Put up signs warning public of our presence in the pool and asking to respect the sectioning in the interest of SUPHS & public safety. |  |  |  |  |

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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** |
|  | brief all participants in submarine lifting, poolside risks, and coordinate all aspects of poolside protocol | Joanna (president) | 15/2 |  |  |
|  | Divers will have had training and been briefed about handling equipment and where the pilot is attached to the submarine. | Nancy (Dive officer) | 15/2 |  |  |
|  | All team members briefed on first-aid station upon arrival to site, and provided with contact details of local emergency services and at least 1 member of staff.  | Anna Harrison (Dive officer) | 12/6 |  |  |
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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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| 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.  |

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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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| Likelihood  |
| 1 | Rare  |
| 2 | Unlikely  |
| 3 | Possible  |
| 4 | Likely  |
| 5 | Very Likely  |

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.