**Definitions**

1 This form may be used to conduct and record MACHINERY RISK ASSESSMENTS, for machinery in **use** at work (whether exclusively or not

**Definition of "use"** in relation to machinery means: “any activity involving machinery and includes installing, commissioning, starting, stopping, programming, setting, transporting, repairing, modifying, maintaining, servicing, cleaning, decommissioning”

2 Persons who conduct machinery risk assessments must be **competent** to do so.

**Definition of “competent”** in relation to machinery risk assessment: someone who is knowledgeable of the associated hazards, precautions, and foreseeable risks of the machinery, its proposed environment, any associated materials - and of the machinery risk assessment process. You should also view RAFT <http://www.imperial.ac.uk/safety/raft/> Section 5 Workshops and Section 6 Lone working.

3. Persons who **supervise** others who **use** the equipment must be competent to do so – ie must have adequate training, knowledge and experience in the use of the machinery, and full understanding of its attendant hazards, risks and precautions.

Persons who use the machine must be trained in the use of the machinery, and demonstrate a full understanding of its attendant hazards, risks and precautions.

**Definition of Machine:** an assemblage of parts that transmit forces, motion, and energy one to another in a predetermined manner

* “An assembly of linked parts or components, at least one of which moves, including, with the appropriate actuators, control and power circuits, joined together for a specific application, in particular for the processing, treatment, moving, or packaging of a material.” eg A pump, motor, and starter unit are not machines as individual components, but they are integral components of a independently functioning machine capable of moving a material (fluid).
* “An assembly of machines which, in order to achieve the same end, are arranged and controlled so that they function as an integral whole”. eg A pumping skid containing two or more of the assemblies above tied into a common outlet line for the purpose of boosting flow volume is also a machine.
* “Interchangeable equipment modifying the function of a machine which is supplied for the purpose of being assembled with a machine (or a series of different machines or with a tractor) by the operator himself in so far as this equipment is not a spare part or a tool”. eg Farm equipment, which modifies the function of a tractor when attached

**Instructions for using the form: The five phases of machinery risk assessment (best done as a group activity)**

1. **PAGE ONE: RECORDING BASIC INFORMATION**
   1. **Is the machine being used for - and is it still fit for - the purpose and environment for which it was designed?** It may need replacement or retro-fitting if it no longer meets current safety standards; it may be unsafe because of its age and design and location, or may not be suitable for the proposed user(s) if specialist skills are required to use it; what aspects of **use** is the assessment covering? You will need to use your knowledge to make an initial risk assessment for the normal use of the machine, continuing if necessary to consider the following. ***Turn to PAGE TWO***
2. **PAGE TWO** – **Phase one** – use COLUMN ONE to **identify hazards** - environment, interface / ergonomic, intrinsic and extrinsic etc.
3. **Phase two -** use COLUMN TWO and COLUMN THREE to determine **HOW harm would occur, WHO would be affected** by the hazards you indentified.
4. **Phase three – EVALUATING THE RISK** 
   1. **Use the risk matrix table on the last page below and complete** COLUMN FOUR **to determine the SEVERITY of outcome would be if no control measures were in place (minor, serious, major, fatal). You will also need to consider the competency of the person using the machine, and the degree of supervision in place, and if controls rely on human behaviour.**
   2. **Use** COLUMN FIVE **to consider any risk increasing factors** (such as lone work or work outside normal hours, or ability)and use the tables to decide what is the **PROBABILITY**for injury or incident (very unlikely, unlikely, possible, likely)
   3. **Use** COLUMN SIXto determine whether the **existing control measures would remove the hazards or limit the risk as far as possible?** Check if guards and interlocks are in place and effective, observe operators during machine use; check if actuators work as designed -
5. **Phase four –** 
   1. **Are there extra controls that you need to put into place?** Eg banning lone working, limiting entry to carry out work in the area only by Permit to Work; instigating a PPM regime, foot rest mats, personal protective equipment, extra task lighting, limiting work periods etc, training, supervision, monitoring.
   2. **How are users warned about residual risks?** Eg warning signs, symbols, audible and written warnings and instructions for operators, installers and maintenance engineers?
   3. **Are there other precautions required in the event of control failure or unforeseen incidents?** Eg first aid, medical assistance, spillage kits, evacuation procedures?
6. **Have you recorded your risk assessment and implemented any actions you identified? *TURN TO PAGE THREE-Phase 5***
7. **PAGE THREE - Phase 5 – Communication, review, monitoring and sign off - if there are significant findings, you will need to inform your** Safety Offcer and Head of Department - and department risk register. In any case **you** will need to check actions are carried out and are effective. **REVIEW** your assessment regularly - **and** if there is a significant change or an incident or accident. YOU MUST get the assessment signed off by the person in charge **and** train all relevant persons in the hazards, risks, outcomes and emergency procedures, keeping a training record.

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| **Faculty and Department** | | **Location (building/floor/room)** | | | | | **Machine supervisor** | | | | | |
|  | |  | | | | |  | | | | | |
| **Machine type** | | **Manufacturer** | | | | | **Model number** | | | **Serial number** | | |
|  | |  | | | | |  | | |  | | |
| **Year purchased** | | **Date last serviced / Next service due** | | | | | **List any statutory testing requirements and current status** | | | | | |
|  | |  | | | | |  | | | | | |
| **What is this machine used for?** | |  | | | | | | | | | | |
| **What materials are used with or within it?** | | **None Please describe:** | | | | | | | | | | |
| **Is there a linked COSHH/DSEAR risk assessment for the associated materials?** | | Yes – it is attached  No they are not hazardous to health, environment and do not carry an explosion or flammable risk. | | | | | | | | | | |
| **Is machine fit for its original purpose and current environment?** | | Yes | | **Please continue with the risk assessment** | | | | | | | | |
|  | | **No** | | If not, when will the item be disposed of and what arrangements are in place for this? (decontamination, WEEE etc – see link on Estates FM web pages <http://www3.imperial.ac.uk/facilitiesmanagement/softservices/rechargedservices/weee> | | | | | | | | |
| **Are manufacturer’s operating instructions and manual available?** | | Yes | | **Please continue with the risk assessment** | | | | | | | | |
|  | | **No** | | If not, how is the operations and maintenance schedule derived and who keeps maintenance records? | | | | | | | | |
| **Are all operatives trained and deemed competent to use the machine by the supervisor?** | | Yes | | **If yes, who keeps the training records?** | | | | | | | | |
|  | | **No** | | If not, what arrangements are in place to ensure that users are aware of any hazards, precautions, outcomes report faults, know what to do in an emergency? | | | | | | | | |
| **Is the use of this machine prohibited outside department normal working hours?** | | Yes | | **Please continue with the risk assessment** | | | | | | | | |
|  | | **No** | | If not, what procedures are in place to ensure there is no risk to the operator **and** who has details? | | | | | | | | |
| **This risk assessment is for the *normal operation of the machine*. In your opinion, is a further risk assessment required for setting, maintenance, repair, inspection or testing?** | | No Other comment  **Yes** a further risk assessment(s) / procedure(s) must be in place for setting  maintenance  repair  inspection  testing  Please attach when complete  Who is responsible for conducting this? (Give name)  Please continue with this risk assessment | | | | | | | | | | |
| **In your opinion, what level of risk would the normal use of this machine pose to operators, others in the vicinity or to the environment?** | | High  Medium  Low  Other comment  If High or Medium, please continue with the risk assessment **Note: if guards are not / cannot be used for all procedures, the risk is high** | | | | | | | | | | |
| **Phase One: Hazard identification (Complete A-E below and then Phases 2- 4)** | **Phase Two –**  How does harm occur and who might be affected? | | | | **Phase Three –**  **Evaluate the risk** | | | | **Phase Four –**  **Implement your findings** | | | |
|  | How does harm occur?  **Eg entrapment, exposure to noise, vibration, inhalation of fumes, skin contact with chemicals etc** | | Who might be affected?  **Eg Cleaners, maintenance staff, contractors, engineers, students, staff, visitors etc** | | What is ***severity*** of foreseeable injury or illness? (minor, serious, major, fatal) if NO controls were in place? | Consider any risk increasing factors and decide what is the ***probability*** for injury or incident (very unlikely, unlikely, possible, likely) | | Are the existing control measures effective and sufficient? Describe what is in place and if monitored or tested.  eg are all guards in place and functioning/used as designed? | **LIST OF ACTIONS**  **(add action owner and date to be closed out)** | | | |
|  |  | |  | |  |  | |  | Describe any extra controls required | | If there are residual risks, describe any additional warnings /information /instruction needed | What is your emergency action if control measures fail or there is an unforeseen incident? |
| **A. Environment and location hazards**  **Eg Extremes of temperature**  **High humidity, Noisy, busy, high, limited space, adjacent to water, lighting**  **A** |  | |  | |  |  | |  |  | |  |  |
| **B. Task-related hazards**  **Eg Repetitive, awkward movements**  **B** |  | |  | |  |  | |  |  | |  |  |
| **C. Machine/user interface / ergonomics hazards**  **Eg Emergency controls out of reach of operator, missing guards, illegible instructions/warnings reported RSIs or recurrent injuries?**  **C.** |  | |  | |  |  | |  |  | |  |  |
| **D. Hazards within the machine (Intrinsic)**  **Eg Sharp, stabbing, puncturing, entrapment, shears, lasers, radiation sources**  **D.** |  | |  | |  |  | |  |  | |  |  |
| **E. Hazards relating to use, but external to the machine (extrinsic hazards – note these may require a separate risk assessment)**  **Eg What materials are you using? Could there be contamination with hazardous substances, radioactive materials, machine oils, fuel, gas, swarf etc?**  **E.** |  | |  | |  |  | |  |  | |  |  |

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| **Phase Five**  **Are there any significant findings (8-16 on matrix)?** | Yes | **Inform HoD and other relevant persons immediately. The work may need to be stopped or halted until further controls are in place.** | | |
| **No** | **Plan, prioritise and carry out actions, monitor that they are implemented; keep local copy of this RA *and* add a copy of this assessment to dept risk register** | | |
| **Name and signature of person conducting risk assessment** | **Date of assessment** | | **Review Date** | **Name and signature of competent person signing-off risk assessment before issue** |
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| **Training record** – Note personnel may need to be retrained if the risk assessment changes – ie a control or emergency procedure | | | | |
| Name of person trained | **Signature** | Name of trainer | Signature of trainer | **Date trained** |
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**Risk matrix to assist with risk evaluation**

