# **Ionisation Radiation Risk Assessment**

Prior to initiating any new activities that involve the use of ionising radiation, Regulation 8 of the Ionising Radiations Regulations 2017 (IRR17) mandates that the University undertake a thorough and adequate risk assessment. This assessment is essential for identifying potential risks to employees and other individuals. The primary objective is to determine the measures that the University must implement to minimise the exposure of employees and others to ionising radiation.

The IRR17 Approved Code of Practice (ACoP) can be viewed here: <http://www.hse.gov.uk/pUbns/priced/l121.pdf>.

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| --- | --- | --- | --- |
| **Project title** | | | **Project Reference** |
|  | | |  |
| **Author (Project Proposer)** | | | |
| Name & position | Date | Signature | |
|  |  |  | |
| **Description of work and scope of this assessment** | | | |
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**Justification of work with ionising radiation**

**Please check the relevant justified practice box(es) that applies to this Risk Assessment.**

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|  | **Area** | **Class or type of practice** |  |
|  | Production of radioactive products | Manufacture of radioactive sources, substances & radiopharmaceuticals. |  |
|  | Non-destructive testing | Use of radioactive sources, substances & radiation generators for radiography. |  |
|  | Radiation processing of products | Use of gamma, x-ray or electron beam radiation sources to reduce bacterial levels, sterilise, disinfect or modify materials. |  |
|  | Detection & analysis | Use of sealed sources & x-ray generators for analysis. |  |
|  | Safety Devices | Use of ionising radiation in smoke and fire detectors and other safety instruments. |  |
|  | Equipment producing ionising radiation incidentally | Use of electron beam welders, electron microscopes, radar, thermionic valves, cathode ray tubes, ion implantation machines & high voltage switchgear. |  |
|  | Radioactive tracers | Use of radioactive tracers for medical or biological techniques. |  |
|  | Medical & biomedical research | Use of ionising radiation in radiography, fluoroscopy, interventional radiography, computed tomography, in-vivo nuclear medicine, in-vitro nuclear medicine, teletherapy, brachytherapy & neutron activation analysis. |  |
|  | Teaching, including further & higher education & training | Use of radioactive sources, substances & radiation generators. |  |
|  | Ionising radiation metrology | Use of calibration sources in the testing of equipment. |  |
|  | Use of Uranium and Thorium (other than for its fertile, fissile or radioactive properties) | Use of Uranium and Thorium compounds as laboratory reagents.  Other uses of Uranium and Thorium other than for their fertile, fissile or radioactive properties. |  |

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| **Where the University (****Principal Investigator/Supervisor/RPS) is required to carry out a radiation risk assessment, the following matters should be considered, where they are relevant. These are stated in Paragraph 70 of the IRR17 ACoP.** |
| **Nature of the source(s)** |
|  |
| **Estimated dose rates (and dose) to which anyone can be exposed** |
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| **Likelihood of contamination arising and being spread** |
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| **Results of previous personal dosimetry and area monitoring** |
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| **Advice from manufacturers or suppliers about equipment about its safe use and maintenance** |
|  |
| **Engineering control measures or design features already in place or planned** |
|  |
| **Planned systems of work** |
|  |
| **Estimated airborne and surface contamination levels** |
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| **Effectiveness and suitability of PPE** |
|  |
| **Unrestricted access to significant dose rates** |
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**Possible accident situations**

|  | Possible accident situation(s) | Who is affected | Effect of failure of control measures | Likelihood | Severity | Unmitigated Risk (H/M/L) | Steps to prevent accident or limit its consequences | Mitigated Risk  (H/M/L) | Comments / Notes / Recommendations / Actions |
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**This radiation risk assessment should help the Principal Investigator/Supervisor/RPS decide on the following matters: These are stated in Paragraph 71 of the IRR17 Approved Code of Practice.**

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| **Actions needed to keep exposures As Low As Reasonably Practicable (ALARP)** |
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| **What engineering controls, warning signals, other safety systems are necessary** |
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| **Whether PPE is appropriate and if so, what type is adequate and suitable** |
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| **Dose constraints** |
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| **Protection of those who declare themselves pregnant and / or breastfeeding** |
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| **Dose investigation level** |
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| **Maintenance and testing schedules** |
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| **Contingency plans** |
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| **Training needs** |
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| **Designation of areas and local rules** |
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| **Access restrictions and other precautions for designated areas** |
|  |
| **Classified persons** |
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| **Dose assessment programme** |
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| **Requirements for leak testing** |
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| **Responsibilities of managers and workers** |
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| **Monitoring and auditing programme** |
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| **Person(s) completing this assessment:** (Person carrying out or managing/supervising the activity day-to-day) | | | | | | | |
| Name |  | Title |  | Signature |  | Date |  |
| **Other person(s) commenting on this assessment ((Radiation Protection Supervisor (RPS), Radiation Protection Officer (RPO), Radiation Protection Adviser (RPA)** (Line Manager or Supervisor responsible for the activity, others involved in the decision-making process, others advising on the activity e.g. Health & Safety Manager, Health & Safety Local Officer) | | | | | | | |
| Name |  | Title |  | Signature |  | Date |  |
| **Person approving this assessment:** (Person with overall responsibility for the activity e.g. PVC/Faculty Operating Officer/Director of Professional Service, Head of Dept./Senior Academic or Manager/Supervisor) | | | | | | | |
| Name |  | Title |  | Signature |  | Date |  |

**Review of assessment, and revision if necessary**

(For continuing work: the assessment must be reviewed for each visit in a series; when there are significant changes to work materials, equipment, methods, location or people involved; and if there are accidents, near misses or complaints associated with the work. If none of these apply, the assessment must be reviewed at least annually)

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| REVIEW DATE | --/--/---- | --/--/---- | --/--/---- | --/--/---- |
| Name of reviewer |  |  |  |  |
| Signature |  |  |  |  |
| No revisions made |  |  |  |  |
| Changes to activity, hazards, precautions or risks noted in text. |  |  |  |  |

**Appendix 1 – Risk Matrix**

The hazards identified within the risk assessment should be assigned a risk rating – this should be assigned for any control measures which are currently in place and any further control measures which will be required.   
You should assign a value for the likelihood of an incident occurring based on the hazard from 1 to 5 and a value for the severity / impact of the hazard from 1 to 5. These should then be multiplied together to give a final risk rating e.g. 3 x 2 = 6.

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|  | **SEVERITY or IMPACT** | **5**  **CATASTROPHIC** | **5** | **10** | **15** | **20** | **25** |  | **The Risk Score**  for a hazard causing harm is calculated as follows:  **Likelihood x Severity or Impact** |
| **4**  **MAJOR** | **4** | **8** | **12** | **16** | **20** |  |
| **3**  **SERIOUS** | **3** | **6** | **9** | **12** | **15** |  | **High (RED) - Rating 15 or more**  Immediate action is required to control and/or lower the level of risk. Exposure to the identified hazard is prohibited or severely restricted |
| **2**  **MODERATE** | **2** | **4** | **6** | **8** | **10** |  |
| **1**  **MINOR** | **1** | **2** | **3** | **4** | **5** |  | **Medium (AMBER) - Rating 5 - 12**  Continue to review the equipment, activities and systems of work, with the aim of lowering the risk to the lowest possible level. Scores below 9 are considered tolerable, as per current University Risk appetite. |
|  |  | **1**  **RARE** | **2**  **UNLIKELY** | **3**  **POSSIBLE** | **4**  **LIKELY** | **5**  **ALMOST CERTAIN** |  |
|  |  |  | **LIKELIHOOD** | | | | |  | **Low (GREEN) - Rating 1 – 4**  Usually, no further action will be required except for monitoring to ensure the risk does not change and controls remain in place. However, if it is possible to reduce the risk levels still further, by using controls that are “reasonably practicable”, then this should be done. |
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**Scoring Criteria**

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| **Likelihood** | **Criteria** |
| 5 Almost Certain | >90% likely (e.g. regularly, in the next 12 months) |
| 4 Likely | 51-90% likely (e.g. at least twice within the next 2 years) |
| 3 Possible | 21-50% likely (e.g. once in the next 2 to 5 years) |
| 2 Unlikely | 6-20% likely (e.g. once in the next 20 years) |
| 1 Rare | 0-5% likely (e.g. once in the next 100 years) |

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| **Severity or Impact** | **Criteria** |
| 5 Catastrophic | Irreversible multiple injury or multiple deaths |
| 4 Major | Irreversible injury or death |
| 3 Serious | Major reversible injury |
| 2 Moderate | Minor reversible injury |
| 1 Minor | Discomfort or minor illness |