The Australian National University has a range of radiation monitors and contamination detectors that contribute to the overall risk management strategy associated with ionising radiation work that is undertaken on campus. This equipment can be divided into three groups:

1. Radiation monitors
2. Standard radiation contamination detectors
3. Special radiation detectors

To provide user confidence and assurance that the equipment is performing as expected, the following guidelines are recommended.

**Radiation Monitor efficiency checks and calibration**

Radiation monitors are those devices that measure radiation in terms of an exposure assessment. That is, they are dose rate meters. They may read µSv/hr, mREM/hr etc.

These monitors must be calibrated by an accredited or approved calibration service annually. Efficiency checks must be conducted annually and recorded in a logbook.

**Radiation Contamination Detector efficiency checks and calibration**

Radiation detectors are those devices that simply measure count rate for example counts per second.

These monitors must be calibrated by an accredited or approved calibration service every 5 years. Efficiency checks must be conducted annually and recorded in a logbook.

The simple detector test is to ensure that the probe is capable of detecting the radiation being used.

**Efficiency check**

This involves determining the detector's response to relevant radioactive sources.

A pure beta sources (e.g. 90Sr/90Y)

A gamma source (e.g. 137Cs/137Ba)

One of these sources should be used at two (or three) activity levels to check the linearity of the detector. Distance may also be used to achieve different count rates.

**Calibration** can be undertaken by -

* Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) calibration services, NSW
* Australian Radiation Services, VIC
* Gamma Sonics, NSW
* Safe Radiation Australia Pty Ltd, QLD
* Others

**Special Radiation detectors**

The special radiation detectors may be those associated with low energy x-ray detection or neutrons.

These detectors should be calibrated as per manufacture’s recommendations. Simple checks and/or detector operation should be checked regularly.

**Results**

All radiation monitors and contamination detectors must be identified by -

* + Make
  + Model
  + (Probe model)
  + Serial Number (and/or year of manufacture)
  + Date of test/check
  + Pass (Failed detectors shall be repaired/serviced and calibrated, or replaced)
  + Initials of person testing

All radiation detectors (not monitors) must be entered into a central database along with their efficiency check test results (maintained by the WEG). Those detectors with a larger than normal variation from the average reading (for that type of detector probe) must be repaired/checked and calibrated by an approved external service.

**Radiation Detector Efficiency Check**

The local area radiation safety officer must conduct the following radiation detector efficiency checks. General ionising radiation safety protocols must be followed while performing the check.

1. Enter the equipment's details in the attached form.
2. Visually inspect the detector for cleanliness, damage and wear. If damaged, have the detector serviced by a qualified repairer.
3. Switch on the detector and confirm that the battery is OK.
4. If the probe is covered with a protective film -remove it.
5. Uncover one radioactive source at a time.
6. Place the detector probe on top of the source to best obtain a maximum reading. Allow at least 20 seconds for the probe to respond, taking note of the upper and lower count rates. Record the average or medium count rate in the appropriate column on the form. Reject the detector if the count rate is too unstable.
7. Cover the radioactive source.
8. Repeat step 4-6 with the other two radioactive sources.

Radiation detectors that fail the efficiency test must be labelled and removed from service, checked by a qualified person, and repaired or replaced as appropriate.