

# Gamma irradiation

The Gamma irradiation capability operates a range of  $^{60}\text{Co}$  irradiators for small scale irradiation studies to various doses, from 1 milli-gray (mGy) to several mega-gray (MGy). This unique capability enables ANSTO to accurately deliver radiation doses with a precision not achievable in industrial-scale irradiators. Controlled dose rates and temperatures allow users to test ideas, develop applications and perform irradiations under non-standard conditions.

This capability has multiple applications from radiobiology and radiotherapy dosimetry (low dose), to food biosecurity, agriculture, horticulture, material radiation hardness studies, polymer science, immunology, medical sciences and biotechnologies (high dose).

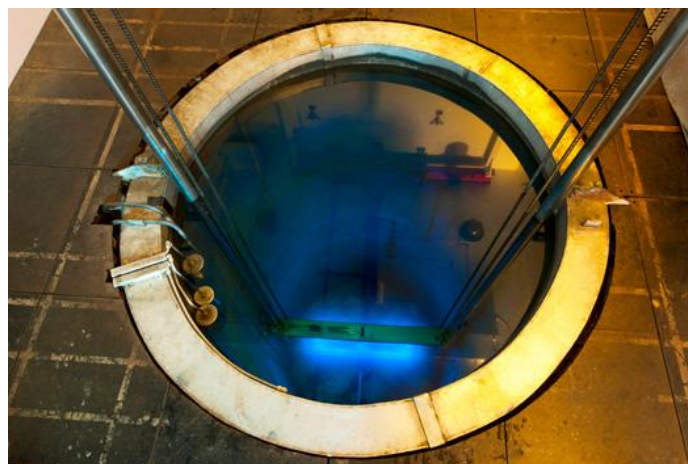
Low dose gamma irradiation enables research in radiobiology with animals and cells. This facility consists of an irradiation room and PC1 animal/biology rooms. Biological research staff are available for project support. The irradiation room is equipped with a cobalt-60 collimated beam (Theratron). Gamma dose rates are up to 0.1 Gy/min, accurately delivering doses as low as 1 mGy to several Gy. The irradiation period can run from seconds to days.

High dose gamma irradiation enables research and industry applications including plant breeding, food irradiation, sterile insect technique, verification dose experiments for medical devices (to ISO 11137), sterilisation of frozen human tissue, vaccine development, polymer modification and Australian quarantine treatments. Dose rates range from 1 – 40 Gy/min with dose delivery from 1 Gy to several MGy. Irradiation may be carried out at temperature ranges from – 78°C (under dry ice) to ambient.

This precision irradiation is enabled by dosimetry systems traceable to the Australian standard for absorbed dose. Systems in use are ionisation chambers, Fricke and ceric-cerous dosimeters.

## Capability Selections

- Low dose gamma irradiation
- High dose gamma irradiation.



ANSTO's cobalt-60 radioactive source at Lucas Heights

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