



FACT SHEET

About Molybdenum-99 and Technetium-99m

Molybdenum-99 (Mo-99) is a radioisotope used in hospitals and medical centres to make Technetium-99 (Tc-99m), the most widely-used radioisotope in nuclear medicine, which accounts for around 80 per cent of all nuclear medicine procedures.

Tc-99m is used mainly for selective imaging of organs and soft tissues such as the lungs, bone, brain, liver and kidneys – enabling an effective diagnosis.

The Mo-99 is supplied to some 250 hospitals and medical centres in Australia and the region utilising an ANSTO-designed radiopharmaceutical generator, the Gentech Generator[®], a shielded device which enables the radionuclide to safely undergo its radioactive decay to become Tc-99m, while in transit. ANSTO's Mo-99 is also shipped to overseas generator manufacturers in the US, Japan and elsewhere.

Project completed: \$1 million capacity increase of existing medicine factory at Lucas Heights

'Building 54' at ANSTO's Lucas Heights campus could be politely described as 'unassuming' from the outside, but it's what's on the inside that counts: modern nuclear medicine production technology. It is from here that nuclear medicine is created, and then distributed to 250 hospitals and nuclear medicine centres across the country and region.

World demand for nuclear medicine is today some 9,000 6-day Curies a week (which translates to 30 – 40 million doses a year), and up until recently 1,100 a week have come from this building, with focus predominantly on domestic supplies estimated at 10,000 potential doses a week. ANSTO has completed a \$1 million, year-long upgrade to this facility to almost double its output to 2,100 6-day Curies a week, and maintain this level until the facility is decommissioned in a couple of years. It has involved:

- Upgrading irradiation rigs to handle 12 target plates, up from eight previously. After entering the OPAL reactor, they are brought to building 54 and undergo chemical separation to create Mo-99.
- Engineering changes to the separation technology in the hot cells in building 54, so they can deliver on the higher capacity potential from the increased rigs.
- Staffing and roster changes – including increasing manufacture rates from four 'runs' to five 'runs', which are spread throughout the week.
- Achieving regulatory approvals from the Therapeutic Goods Administration (TGA) and the Australian Radiation Protection and Nuclear Safety Agency (ARPANSA).

Project underway: \$168.8 million ANSTO Nuclear Medicine Production Facility

In 2012 ANSTO announced that it would deliver a \$168.8 million nuclear medicine and co-located waste treatment plant that will position Australia as a global leader in the manufacture of nuclear medicine. Testing and commissioning will start early next year, and the plant is scheduled to reach full capacity by the end of 2017 – producing up to 3,500 6-day Curies a week. On an average year, we expect to supply around 25 per cent of world demand.

The investment will position Australia as a global leader in the manufacture of nuclear medicine. The project includes:

- *An export scale nuclear medicine manufacturing plant* to secure Australia's ability to produce international-scale Mo-99, long into the future.
- *An Innovative Synroc waste treatment plant* – Synroc, an Australian innovation, is a cost-effective, low risk solution for treatment of radioactive waste. Synroc will deliver a permanent, safe and economical way of treating waste from past, current and future manufacture of nuclear medicines. It mimics rock's natural ability to contain radioactivity, and reduces by volumes on average by up to 90 per cent compared to traditional waste treatment methods such as cementation.

As of October 2016, more than 800 contractors and subcontractors had been inducted, more than 486,000 hours of work performed, 5,558m³ of concrete poured and 861 tonnes of steel installed.