

The sustainment of an Australian nuclear forensic capability through collaboration

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A robust and sustainable nuclear forensic capability will generally not, and does not in Australia, fall wholly within the ‘business as usual’ capabilities of a single organisation. Instead, it draws upon the capabilities of multiple organisations, with dedicated effort needed to bring and keep these capabilities “into touch with one another”.

Exercise Cosmic Curie, held at ANSTO in November 2019, was an opportunity to evaluate the operability of the shared Australian Federal Police (AFP) and ANSTO capability for the examination of forensic evidence contaminated with radionuclides. This key capability is maintained on behalf of Australia in order to support investigations and prosecutions. This ensures that the results of the characterisation of nuclear or other radioactive materials can be accepted as evidence by the courts. Collaboration between the AFP and ANSTO draws upon the distinct characteristics of each organisation in domains ranging from techniques and processes to organisational cultures, which are critical to the success of this capability.

Glove box engineering

The centerpiece of the joint capability is two glove boxes housed at ANSTO, which were utilised in Exercise Cosmic Curie. These have been developed with the benefit of ANSTO’s decades of experience in the nuclear industry to contain radioactive material, keeping the operators safe. The glove boxes have also been uniquely designed to house the exploitation of traditional forensic evidence contaminated with radionuclides. Features include:

- Camera, Polilight™ and fuming cabinet for latent fingerprint location, development and capture
- Facilities for extraction of DNA
- Cables for connection to various digital devices of interest (phones, laptops, memory storage devices) located inside the glove box to external devices, enabling data acquisition



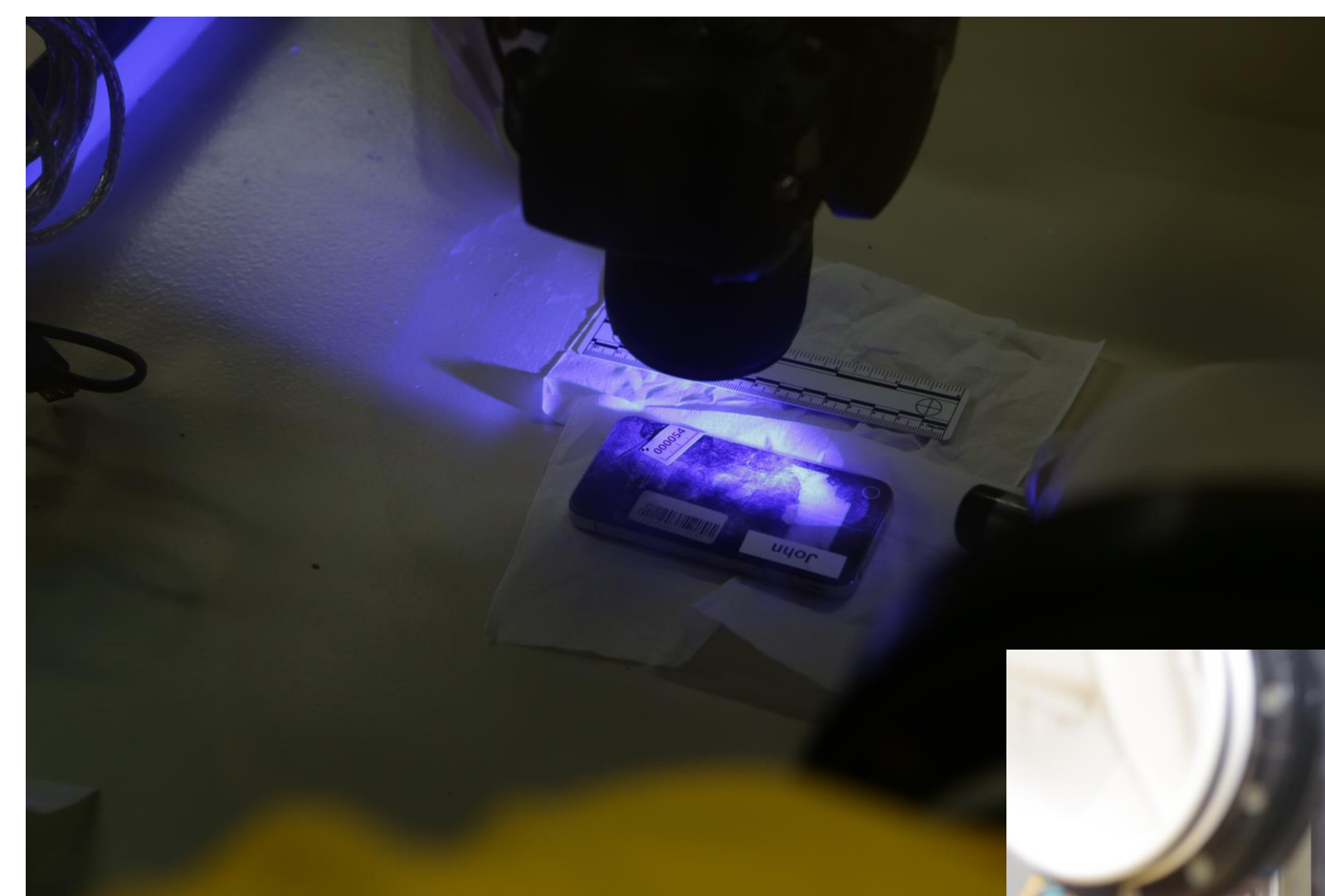
Forensic processes informing operations

Crucial to nuclear forensics is nuclear science and technology organisations working together with law enforcement to ensure that their respective processes can be integrated, such as chain of custody, in support of investigations and prosecution. This ensures that the results of both the characterisation of nuclear or other radioactive materials and the exploitation of traditional forensic evidence can be accepted as evidence by the courts. Exercise Cosmic Curie was an opportunity to assess the functionality of these processes.

Cross training of staff

Our people and connections are critical to the success of nuclear forensics in Australia. Exercise Cosmic Curie was an excellent opportunity to test both the ANSTO and the AFP staff in a simulated radiological crime event. Fingerprints, Digital Evidence and Biology examiners applied their expertise to analyse evidence while working closely with the expertise of the ANSTO nuclear forensic staff. The exercise highlighted the importance of regular refresher training of AFP and ANSTO staff to enable them to perform under investigative pressure when called upon.

ANSTO’s nuclear forensic team consists of a high proportion of members with tertiary education in forensic science. This provides a knowledge base for facilitating the needs of forensics while cultivating and maintaining ANSTO’s unique nuclear knowledge and the associated technical proficiencies which are fundamental to the national nuclear forensic capability.



“The history of science is rich in the example of the fruitfulness of bringing two sets of techniques, two sets of ideas, developed in separate contexts for the pursuit of new truth, into touch with one another”

J. Robert Oppenheimer