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Neutron Tomography of Sealed Radioactive Materials

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Neutron imaging is a non-destructive method for investigating objects in science, engineering and archaeological study. Tomography is an imaging technique which reconstructs the three-dimensional structure of the object. Because of the interaction properties of neutron with materials, neutron imaging often provides complementary information in related to X-ray imaging.

For safety, radioactive materials are usually shielded by high atomic number materials (e.g. a gamma source in a lead container), and non-destructive inspection are greatly preferred. The high penetration in most materials makes neutron a unique tool to inspect shielded radioactive material, and particularly neutrons have good penetration in lead and bismuth, while both are good shielding materials for ionizing radiation. The neutron image facility at Atomic Energy of Canada Limited will be outlined, and a representative application of the tomography technology to inspect an encapsulated radioactive sample will be discussed.

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