



CASE STUDY

Innovative Technology for Decommissioning

Decommissioning is an integral part of the management lifecycle of nuclear facilities. The characterisation of components and infrastructure inside a nuclear facility is essential to inform planning and to ensure safe and cost effective projects. By accurately identifying and segregating radioactive materials, non-radioactive building waste can either be recycled or disposed of at lower cost waste management facilities, significantly reducing overall project costs.

THE CHALLENGE

Currently, around 300 nuclear power plants and research reactors are either undergoing or awaiting decommissioning. In addition, over two thirds of the world's nuclear power plants in operation today are already in the last decade of their lifetime. Advanced technologies capable of operating in complex environments are required to ensure safe and effective decommissioning can be undertaken.

THE SOLUTION

CORIS360® is an advanced radiation imaging system that was demonstrated and assessed at a nuclear facility in the United Kingdom containing a reactor that is currently entering a decommissioning and repurposing phase. CORIS360® accurately identifies and localises sources of radiation in complex environments and can be used to closely examine equipment of interest or search a wide area in a single acquisition. With the added ability to detect neutrons, CORIS360® is the most advanced gamma imaging technology for decommissioning.

Over two days, CORIS360® was deployed in numerous locations around the reactor and across labs at the nuclear facility.

Figure 1 displays the results from imaging over the ^{58}Co 811 keV peak with the imager positioned at the top of one side of the reactor. CORIS360® imaged this entire side of the reactor in one acquisition and identified a significant hot spot, determined to be coming directly from the reactor chamber, as no external equipment around the reactor shielded the radiation path.

Figure 2 displays the results from imaging on the ground floor on the outside of another section of the reactor. The figure again displays the data from imaging over the ^{58}Co 811 keV peak, scanning a wide area and identifying another hot spot coming directly from the reactor chamber.

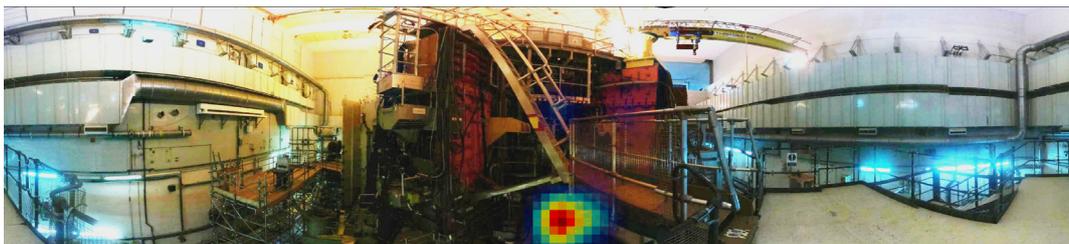


Figure 1. 360° gamma image from the ^{58}Co 811 keV peak at the top of one side of the reactor, identifying a hot spot coming from the reactor chamber.

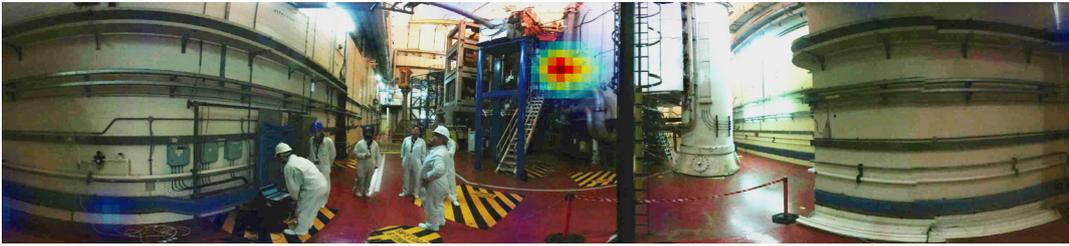


Figure 2. 360° gamma image from the ⁶⁰Co 811 keV peak from the ground floor around another section of the reactor, identifying a hot spot coming from the reactor chamber.

CORIS360® Benefits

- 360° × 90° gamma ray imaging allows for a wide area assessment and accurate characterisation of complex radiological environments.
- Remotely and non-destructively detect, identify, and localise gamma emitting radiation across a wide energy range (40 keV to >3 MeV) and dose rate environments - 0.5 µSv/h – 40 mSv/h (0.05 mrem/h – 4 rem/h).
- Determine the location and type of multiple radiation sources from a single acquisition.
- Enhanced characterisation of complex radioactive environments enables better planning and decision making, saving both time and money
- Ease of setup and remote operation helps keep worker radiation exposure as low as possible.
- Easy to use interface with optical overlay aids data interpretation.
- Ability to detect the presence of neutrons.

CORIS360® delivers value. Better data improves decision making for anyone working in radioactive environments.

Contact us

For further information on CORIS360® including case studies and technical reports please visit:

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CORIS360® is a product of ANSTO, the Australian Nuclear Science and Technology Organisation, with over 60 years of experience in meeting the nuclear needs of industry.

