

Completing the high-energy analysis system for accelerator mass spectrometry at iThemba LABS in South Africa

The challenge...

Radionuclides and radioisotopes are of immense value to technicians, researchers and experts in a wide range of scientific disciplines. Radionuclides of familiar elements, such as carbon, are deployed as radioactive tracers, used in the diagnosis and treatment of cancer, applied to root crops to kill parasites and preserve food, and employed in mining and industrial operations to detect leaks and measure corrosion. In combination with an accelerator mass spectrometer (AMS), specific radionuclides are used especially for geosciences and environmental analysis, including hydrology.

The Government of South Africa requested IAEA assistance to complete construction of an AMS facility. The AMS would position South Africa among those countries with advance knowledge and expertise in accelerator-based research. The new facility would also widen access to this vital technology for countries in the region.

The project...

Following the request from the Government of South Africa, the IAEA launched a technical cooperation project to help complete the AMS at the iThemba Laboratories hosted by Wits University in Johannesburg in 2012.

Under the project, assistance was provided for the procurement of essential equipment, necessary for the effective operation of the spectrometer. Two national staff received IAEA fellowships, focusing on the preparation of samples, and measurement operations.

In addition, two expert missions were arranged with consultants from the Vienna Environmental Research Accelerator (VERA) and the Lawrence Livermore National Laboratory (LLNL), who visited Johannesburg to help strengthen the understanding and capacities of the counterpart experts.

The impact...

As a result of the project, the South African Ministry of Science and Technology officially launched the new Accelerator Mass Spectrometry Facility in Guateng, at the iThemba Laboratories.

The newly-inaugurated facility acts as a valuable resource for the scientific communities, interested in, for example, biomedical, archaeology, isotope hydrology, and paleo-sciences research. It also provides an excellent environment for training purposes. The benefits of the operational AMS are not limited to South Africa's borders—experts throughout the region will have access to a faster and more efficient method of sample analysis.

During an official mission to South Africa, which included a visit to the AMS facility, IAEA Director General Yukiya Amano noted, “[South Africa] provides an excellent example of how modern technology can be used effectively to advance development and improve people's lives.”



Director General Amano visits the iThemba Laboratory.