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RA-10: a New Argentinian Multipurpose Research Reactor

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Abstract

A new multipurpose research reactor to replace RA-3 reactor has been decided to be built in Argentina to satisfy the increasing national and regional demands for radioisotopes. The project, supported by the National Administration, has started in 2010 and is planned to be operative in 2018. The expertise acquired in the country, in the design and licensing of nuclear reactors, encourage the National Atomic Energy Commission (CNEA) to face the challenge. INVAP S.E. is involved in the design and construction of the reactor facility and related installations, playing the role of main contractor. The RA-10 is a 30 MW thermal power reactor and is designed to achieve high performance neutrons production to fulfill the stakeholder's requirements in compliance with stringent safety regulations. The principal objectives of the facility are: to consolidate and increase the radioisotope production in order to cover future demands, to provide fuel and material testing irradiation facilities to support national technology development on this field, to offer new applications in the field of science and technology based on modern neutron techniques. The reactor is an open-pool facility with a compact core with MTR (Material Testing Reactor) low enriched uranium (LEU) fuel assemblies consisting of uranium silicide fuel plates, clad in aluminum. Reactivity control is performed by hafnium plates. A heavy water reflector tank surrounds the core. It provides a high thermal neutron flux adequate to house irradiation facilities. A diverse and independent shutdown system is engineered through its drainage. The fundamental safety objective of the design is the radiological protection of the public, the personnel and the environment and consequently the design is based in three main principles: responsibility in safety management, defense-in-depth and safety features. Engineered Safety Features are provided which are capable of maintaining the reactor in a safe condition under all anticipated operational conditions and design basis event.