SnT 2023
CTBT: SCIENCE AND TECHNOLOGY CONFERENCE
HOFBURG PALACE - Vienna and Online
19 TO 23 JUNE

RA-10 multipurpose Argentine research reactor for medical isotope production

Eduardo Quintana
Comisión Nacional de Energía Atómica (CNEA)

Comisión Nacional de Energía Atómica

INTRODUCTION

Argentina is one of the producers of radioisotopes and the construction of RA-10 reactor responds to the increase of the world demand.
Medical isotopes production contribute to the background of radioxenon in the atmosphere

METHODS/DATA

Argentina leads the OPAL Project, which follows the technological evolution of research reactors for the production of radioisotopes. Project RA-10 includes design, construction, assembly and operation of the reactor

START

RESULTS

The RA-10 operation license is scheduled for the first half of 2024. The main activity of this reactor will be the production of Mo-99. The expansion of radioisotopes production for medical and industrial applications, will put the CNEA in the ranking of large scale producers in the global market

CONCLUSION

Technical discussions are needed on the impact of radioisotopes released by civilian sources on monitoring nuclear explosions and how to maintain the detection capability of the International Monitoring System (IMS)

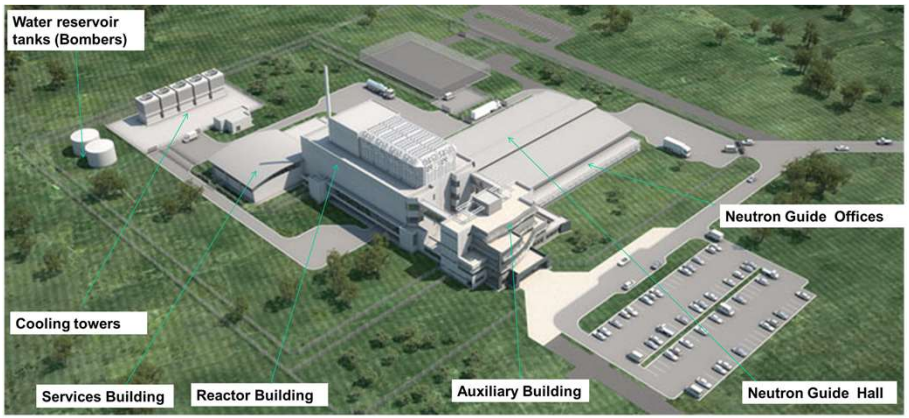
Please do not use this space, a QR code will be automatically overlayed

P2.4-473

Introduction

The RA-10 Multipurpose Argentine Nuclear Reactor is a 30 MW power reactor, located at the Ezeiza Atomic Center, near Buenos Aires city. This modern reactor is conceived as a multipurpose facility suitable for radioisotopes production, materials and fuel irradiation research and neutron techniques applications. The planned expansion of radioisotopes production will put the CNEA in the ranking of large-scale producers in the global market. Neutron techniques will allow the developing of fuel elements for research reactors and biotechnology and radiopharmacy studies among others.

The design began in early 2010. The Safety Preliminary Report was technically evaluated and approved by Nuclear Regulatory Authority (ARN) in 2014. CNEA has started the building in 2016 after the Environmental Impact Certificate has been granted by Buenos Aires Province.



RA 10 Layout 3D

Objectives

Comisión Nacional de Energía Atómica

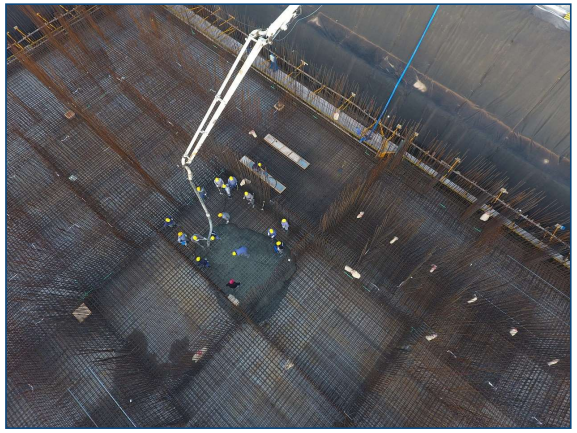
Construction Stage: In progress (97% concluded)

The construction of the base of the reactor building was finished in May 2017. 3200 tons of concrete type H30 in the concrete slab were used.

The assembly of the main pool of the nuclear reactor was carried out in August 2018.

The pool is one of the fundamental parts of the RA-10, since it will house the core of components formed by of fuel elements, control rods and other devices that constitute it.

This container is 14 meters high and 4.5 meters wide. Its design is the result of the work of engineers and technicians from CNEA and INVAP Co.



Base of the reactor: To complete the concrete slab was used a similar amount to raise a building of 10 floor

FQ 2018. Auxiliary building excavation finished. Reactor Building construction advanced. Neutron Beam Building started

View of reactor pool – which is equivalent to the pressure vessel if it were a power reactor

INTRODUCTION
OBJECTIVES
METHODS/DATA
RESULTS
CONCLUSION

Please do not use this space, a QR code will be automatically overlayed

Methods

Comisión Nacional de Energía Atómica

Assembly Stage: In progress (70%):

Due to the COVID 19 Pandemic, the scheduled work during 2020 and 2021 were delayed.
In 2020, the decay tank and the service pool were assembled, which are, together with the main pool, the three largest components of the reactor.
During 2022, the assembly of the pumps of the primary cooling system and the completion of the reactor block were carried out.
The installation and assembly of equipment, followed by the tests of equipment and circuits are planned for the coming months.

View of the main entrance (auxiliary building). March 2022

Northwest view of Neutron guide building. March 2022

Panoramic view of RA 10 reactor. October 2023

INTRODUCTION
OBJECTIVES
METHODS/DATA
RESULTS
CONCLUSION

Results

Comisión Nacional de Energía Atómica

Operation Stage::Future activity

The initial Operation License is scheduled for the first half of 2024.

The expansion of radioisotopes production for medical and industries use will put the CNEA in the ranking of large-scale producers in the global market (10%). Weekly production of Mo-99 will be increased from 900 6 days-Ci to 3500 6 days-Ci.

Noble gases background

The rise of production of Mo-99 could increase the noble gas emissions. During the Mo-99 purification process, fission gases containing Xe-133 and Xe-135 are released into the atmosphere.

IMS uses fission gases such as Xe-133 and Xe-135 for monitoring the earth for signs of nuclear explosion and the main factor contributing to the background of Xe-133 and Xe-135 in the atmosphere is the production of radiopharmaceuticals and these releases pose a potential problem for monitoring nuclear tests if not addressed.

INTRODUCTION
OBJECTIVES
METHODS/DATA
RESULTS
CONCLUSION

Conclusion

GOALS

- By 2024 the CNEA expects to operate the RA-10 research reactor and increase the production of Mo-99.

- Engineering and devices improvements are necessary to minimize the radionuclide emissions from radioisotopes production plant.

- IMS uses Xe-133 and Xe-135 for monitoring nuclear explosion. Technical discussions are needed on the impact of Medical Isotope Production emissions and how to maintain the detection capability of the IMS.