

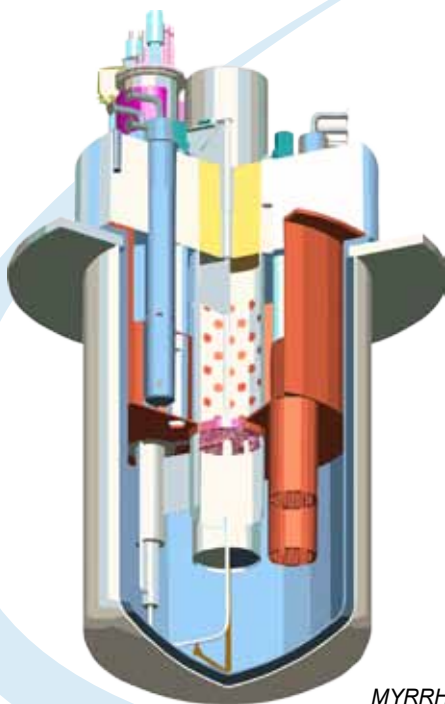
The institute for Advanced Nuclear Systems (ANS) develops and tests technologies and instrumentation for innovative reactor concepts, in collaboration with industry and research groups. The institute also provides services and support to the industry and authorities on a national and international level.

The main objective of ANS is the development of a multifunctional experimental irradiation facility named MYRRHA. Furthermore ANS strives to extend the Belgian technical expertise and involvement in the field of fourth generation fission reactors (Gen IV) and fusion technology.

Strategic priorities

MYRRHA

ANS is developing MYRRHA, a large scale flexible fast spectrum irradiation facility conceived as an Accelerator Driven System (ADS) with a European dimension destined for the Mol site. The institute will complete the conceptual design, conduct the necessary R&D support programme and prepare the licensing of the facility. The R&D support programme executed within ANS covers liquid lead-bismuth technology, advanced control and instrumentation for MYRRHA and a code validation programme. ANS also develops activities in the field of fundamental physics at MYRRHA: the ISOL@MYRRHA project.



MYRRHA



GUINEVERE

Fusion technology

In collaboration with international partners, ANS contributes to fusion research projects such as the fusion test reactor ITER in France, the International Fusion Materials Irradiation Facility IFMIF and the future fusion power plant DEMO. SCK•CEN will be prepared to participate in the realisation of large components for ITER and DEMO. ANS contributes largely to the Belgian effort in the framework of the Broader Approach for IFMIF.

Gen II & Gen III reactors

ANS provides support to the Gen II & Gen III industry and promotes the commercialisation of the SCK•CEN research activities in this area. The institute delivers assistance and services to the nuclear sector and authorities on a national and international level.

Gen IV reactors

ANS strives to extend the Belgian technical expertise and involvement in the field of fourth generation fission reactors (Gen IV). The aim is a more active and pronounced participation in the related research activities. The main focus is on the further development of Gen IV Lead Fast Reactors.

Irradiation devices

ANS develops and tests new irradiation devices for present-day and innovative materials test reactors such as the BR2 reactor, the Jules Horowitz reactor (France) and the MYRRHA facility. ANS develops new instrumentation to better characterize the irradiation conditions and to make new experiments possible.

ANS expert groups



Within the institute for Advanced Nuclear Systems (ANS), 5 expert groups develop and test technologies and instrumentation for advanced reactors. New nuclear measurement techniques, reactor modelling and safety are also examined. These competences will contribute to the realisation of innovative research facilities such as MYRRHA.



Nuclear Systems Physics

- Comprising experts in reactor physics, neutronics, reactor safety, radiation shielding and thermal hydraulics.
- Services in the fields of:
 - Neutronic calculation of critical and subcritical reactor cores.
 - Gamma and neutron shielding calculations.
 - Thermal hydraulic calculations for reactor safety evaluations.
- Development and maintenance of neutronic codes.



Nuclear Systems Research

- Comprising physicists, chemists, engineers and highly qualified technicians with expertise in the fields of nuclear physics, thermal hydraulics, electronics and advanced instrumentation.
- R&D support for the development of the fast spectrum facility MYRRHA and the construction of new irradiation devices. The MYRRHA R&D support is related to liquid lead-bismuth technology, advanced control and instrumentation and a code validation programme. ANS also develops activities in the field of fundamental physics at MYRRHA: the ISOL@MYRRHA project.



Nuclear Systems Exploitation

- Comprising reactor engineers, physicists, operators and technicians.
- Safe operation of the BR1 and VENUS research reactors.
- Maintenance and modification of the installations, particularly in the framework of the GUINEVERE project.
- Experimental programmes at the research reactors such as BR1 and VENUS.

Nuclear Systems Design

- Comprising project engineers with expertise in mechanical, electrical, nuclear and chemical engineering.
- Conception, design, fabrication and testing of irradiation devices for large research reactors, particularly BR2.
- Conception of the MYRRHA primary system and coordination of the accelerator design and Balance of Plant activities for MYRRHA

Design & Engineering Office

- Comprising design engineers and technical draughtsmen with expertise in mechanical, electro-mechanical, thermal and nuclear engineering, and design codes.
- Technical assistance during the design of new items and production of detailed drawings of the new designs.

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