

Belgian Nuclear Research Centre – SCK•CEN

As a research centre dealing with peaceful applications of nuclear energy, the Belgian Nuclear Research Centre (SCK•CEN) is playing a key role in our society. We perform forward-looking research and develop sustainable technologies for socially valuable purposes. With more than 750 employees, SCK•CEN is one of the largest research centres in Belgium. Throughout all of our work, we are focussing on three research topics: safety of nuclear installations; management of radioactive waste; human and environmental protection against ionising radiation. Our researchers are currently developing a pan-European large research infrastructure MYRRHA based on cutting-edge science and technology to address research and innovation in the fields of advanced treatment of spent nuclear fuel and high level waste, medical radioisotopes, research and production, development of advanced materials and nuclear energy systems.

Thanks to its thorough experience in the field of nuclear science and technology, its research approach and the availability of large and unique nuclear installations, SCK•CEN is recognized worldwide and shares its knowledge through numerous training courses in order to keep up this exceptional pool of talent. This worldwide recognition was again confirmed by the designation of the Belgian Nuclear Research Centre (SCK•CEN) as one of the four International Centres based on Research Reactor (ICERR) in the world. ICERR was granted by the International Atomic Energy Agency (IAEA) in September 2017.

Our unique facilities

The Belgian Nuclear Research Centre (SCK•CEN) commits itself to facilitate access to efficient research infrastructure and to develop skills in the nuclear sector. These five research reactors are included in the ICERR programme:

1. BR1

Belgian Reactor 1 (BR1) is an air-cooled graphite reactor that runs on natural uranium. BR1 is extremely flexible and frequently used for the calibration of measurement instruments, radiation tests on materials and training for nuclear experts.

2. BR2

Belgian Reactor 2 (BR2) is amongst the most powerful and flexible research reactors in the world. It operates on enriched uranium with slightly pressurized water as coolant and moderator. BR2 plays an important role in material and nuclear fuel testing, the production of radioisotopes and neutron transmutation doped silicon.

3. VENUS

VENUS is a zero power critical reactor. It was initially used to study the optimal nuclear fuel configuration for various reactors. In 2008, in the framework of the MYRRHA project, SCK•CEN rebuilt VENUS into GUINEVERE as world's first scale model of a subcritical reactor with a total lead core driven by a particle accelerator. With these construction, SCK•CEN has made a significant step forward in the further development of MYRRHA, the next generation research reactor based on Accelerator Driven Systems (ADS).

4. MYRRHA

MYRRHA (Multi-purpose hYbrid Research Reactor for High-tech Applications) is world's first prototype of a subcritical lead-bismuth cooled reactor driven by a proton linear accelerator. The particle accelerator is used as an external neutron source to create the chain reactor and thus to maintain nuclear fission. This new multipurpose research facility will replace BR2 for production of radioisotopes and material research. MYRRHA will play an important role in training of nuclear experts and conducting research on technologies allowing to process long lived radioactive waste through transmutation.

Furthermore, SCK•CEN opens its research reactors ancillary facilities to IAEA State Members, among which hot laboratories with various well-instrumented hot cells, radiochemical labs, advanced neutronic tools for detailed calculations of irradiation conditions and our underground high level waste research lab.

Fostering knowledge, building nuclear competence, and developing nuclear safety culture

SCK•CEN values knowledge sharing in order to make nuclear technology progress in many areas. We provide to other IAEA Member States:

1. Education & Training

Our team of Education & Training gives Nuclear Academic courses, offers PhD positions and internships, establishes programs, gives guidance to young scientists, provides educational material and organizes workshops and events.

2. Professional Hands-On Training



SCK•CEN offers customized training courses covering a wide range of topics, such as nuclear technology, nuclear materials, radiation protection, emergency management, decommissioning and decontamination, waste disposal, radiation biology and ecology, and radiochemistry. We also give lectures and practical sessions, where the participants are invited to visit our nuclear labs and research reactors. Furthermore, we give aid to regulatory activities.

3. R&D Joint ventures

SCK•CEN can be your partner for international collaborations and networking, for consultancy and advice on nuclear research infrastructures. Furthermore, scientists and companies have the opportunity to use BR2 in a structural manner thanks to the BREASY concept (BR2 Reactor Experimental Access and Scientific Yield). Within BREASY, SCK•CEN invites institutes and countries to engage in a capacity participation in BR2 and makes the capacity available to the academic world, as our researchers work on an ad hoc basis with PhD students who are carrying out research (projects) with external partners.

Beyond ICERR

SCK•CEN provides scientific and strategic support to the European and international nuclear community for the benefit of society:

In the energy sector, having the necessary skills and experience for evaluating the safety and lifetime of current and future nuclear facilities.

In the medical field, providing at least 25% of the world's production of radioisotopes for medical imaging and therapeutics isotopes for diagnostics or the treatment of different types of cancers.

In space, collaborating with the European Space Agency developing a system of life support for long-term trips and looking at the radiation resistance of components and living species.

In the waste and disposal domain, sharing over 40 years of knowledge of all the relevant elements for the safe storage and disposal of radioactive waste.

BR3- PWR power plant in decommissioning, selected as European pilot decommissioning project

Underground high level waste research laboratory in collaboration with the Belgian Agency for Radioactive Waste and Enriched Fissile Material (ONDRAF/NIRAS)

Contact

Do you have a project? Our experts guide you along your research program and help end users to optimize the operation of their existing research reactors. Contact us!

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