The future is now

01

Clear vision of the future

New strategic plan for SCK•CEN

‘We cannot predict the future. But we can be prepared for it.’ Frank Hardeman, Deputy Director-General, explains why SCK•CEN updated its strategy. ‘It’s not a break with the past, but it does mark a shift in focus. Our strategic plan forms a balanced vision that supports future decisions about research, installations and employees.’

Everything at SCK•CEN used to revolve around nuclear power. But that’s no longer the case, Frank Hardeman explains: ‘Research, the provision of services and the accumulation of knowledge related to the safe application of nuclear power remains a cornerstone of our work. But the world is changing. As a result of the ageing population and a greater focus on health, we are increasingly involved in medical developments. We are also a leading knowledge centre for nuclear waste management and decommissioning aspects.’

High-performance infrastructure

SCK•CEN can only provide its expertise if the infrastructure performs effectively: ‘For that reason, we’ve just finished refurbishing reactor BR2 and we’re now carefully preparing MYRRHA. Innovation is important. Other installations are also important: the post-irradiation research in the Laboratory for High and Medium Activity (LHMA), the HADES underground laboratory, the future campus for medical nuclear research and about a dozen smaller installations.’

“As a result of the ageing population and a focus on health, we are increasingly involved in medical developments.”

“Our young and international workforce is buzzing with energy.”

‘Sharing knowledge, both nationally and internationally, is something SCK•CEN has always been big on’, Frank Hardeman explains. ‘We want to structure our knowledge activities – acquiring, maintaining and distributing knowledge – even more within our organisation via our Learning Centre and our Academy. Our Human Resources department will contribute by further developing the competence management of our staff.’

Modern context

At the same time, SCK•CEN wants to maintain constructive relationships with the scientific world, security authorities, government and industrial partners, both in Belgium and further afield: ‘We are working towards structural partnerships with leading countries globally that may wish to use our infrastructure or expertise that they don’t have.’

People enjoy working at SCK•CEN. Frank Hardeman points out: ‘Staff turnover is low. But we want to offer our employees a modern context, financial security and opportunities for development. For that reason, we intend to improve their soft skills, give middle management more responsibility, fully develop the integrated management system, and so on.’

Frank Hardeman comments: ‘The balance between commercial applications and pure science will form a common thread through our decisions. We support our employees in engaging in research and development as an activity that results in income for SCK•CEN. But we remain a balanced institute and explicitly maintain the scientific components of our activities.’

‘In 2017, we’re putting our strategic plan to music’, Frank Hardeman explains. ‘We’re devising an action plan and setting up a follow-up tool. This is the perfect moment to make things concrete. Our young and international workforce is buzzing with energy. You will be hearing more from SCK•CEN. Much more, and often too!’

Looking boldly to the future in uncertain times

What role does SCK•CEN play in our society?

Or does SCK•CEN still have a role to play in our society? It does, and more so than ever, Secretary-General Christian Legrain explains. The research centre needs to gain even greater stature as a beacon of objectivity and innovative scientific research.

These days, the energy issue isn't always viewed with due consideration for the facts. In Western Europe, the tone is certainly set by ideologists and gurus. What is the role of SCK•CEN in this era?

Christian Legrain: 'I think it's crucial that we remain serious. We need to reliably support our activities. This means research, acting as an expertise centre, substantiating facts, providing figures, articulating complex science in a comprehensible manner... in short, practising science in a mature manner. SCK•CEN always carries out thorough research and wants to provide an objective view on everything related to nuclear energy. Never biased, always responsible. This is important in a society that's spinning out of control due to the wealth of information that we're inundated with from the internet and social media. It's crucial that the role of the expert remains central in fields such as energy and healthcare, in which nuclear technology undoubtedly has a key role to fulfil.

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Terrorism, as well as anti-terrorism measures, influence how SCK•CEN operates. What are your thoughts on this?

Unfortunately the world has changed, and we need to learn to live with this new situation. I find the security measures necessary, but we need to remain approachable, because we have a social responsibility. The 'borders' aren't there to protect us, but to protect the citizens – so that they can't fall victim to an act of terrorism on our site.

How does SCK•CEN make sure its employees remain highly committed?

We're doing more and more in the field of human resources. We've provided training sessions in people management, for example. And a pathway has been established for 135 more experienced colleagues so that they can pass on their knowledge and expertise to younger employees. This creates prospects for young people, a resource we also tap into via our Academy. We motivate young people to study sciences, we present projects for competitions – our Inspiration project is a good example of the numerous initiatives that we have undertaken – and we take part in events for students such as the Creativity Marathon. Science is engaging and relates to various aspects of our society. Through all these efforts, we aim to attract young people to work at SCK•CEN.

It will certainly be important to communicate intensively then...

Of course. It doesn't help that SCK•CEN is hidden away in the quiet Kempen region. We may well be better known outside of Belgium than in Belgium itself. For that reason, we want to continue acting as an independent scientific expert in the media and to motivate people to choose sciences, especially those with which we are involved at SCK•CEN. Just look at MYRRHA, an exceptional project that is so sophisticated that we will amaze the whole world.'

Greater site security implemented quickly

International incidents increase controls

Security at SCK•CEN has been tightened significantly in 2016. You can't avoid the presence of armed soldiers on the site, the controls have been tightened at the main entrance and the respective entrances to the secured zones, and the Boeretang has been closed off to through-traffic. However, these aren't the only modifications.

The plan had been to divide the campus into one area for SCK•CEN and one area for VITO. 'As a result of the increased need for security, we sped up this process,' explain Benny Carlé and Jan Veraghtert, who are coordinating the operations. 'This reinforcement of security measures is part of an international evolution. And of course, there are international guidelines for nuclear sites that have also been adopted by Belgian legislation. You can see the physical security measures, but intensive work is also being carried out on improved cyber security by internal employees and external specialists.'

At various locations, access security has been stepped up. Benny Carlé and Jan Veraghtert explain: 'We changed the traffic situation on the Boeretang so that it once again became a private road for the Boeretang industrial area, we have had a new fence built in order to protect the site and we have considerably updated and extended the security infrastructure of the internal perimeters and secured zones.'

In order to ensure that everything went according to plan, we organised an information campaign for the entire workforce: 'We held a series of training sessions in order to improve the security awareness of our employees and to make them familiar with the new security initiatives. An Information Security Officer has been appointed, and a second information campaign will also be held with regard to protecting confidential information.'

Jan Veraghtert and **Benny Carlé,** responsible for security works

More responsibilities for security staff

A number of new responsibilities have been assigned to the security office: 'Our security staff have been given extra operational tasks, including access control with metal detection, X-ray scanners and explosives detection. We expanded the team two years ago to include female security staff, so that searches can be carried out on females. These are extremely competent security staff who have in the meantime become well-integrated.'

In addition to the security staff, permanent military staff are also present on the SCK•CEN site: 'They form a type of mini barracks, with their own accommodation and vehicles on site. The military also train here on site.'

There were no incidents in 2016: 'A suspicious package – a false alarm - was discovered, nothing else. Every now and then a driver causes trouble because he's no longer allowed to drive along the Boeretang. These incidents as well as the overall progress of the security policy are reported in 'Nuclear Security Summits'.'

Planned upgrades

Various upgrades to security within the secured zones on campus have been planned for 2017. We are also planning the construction of a new main entrance on the southern side of the site.

Security policy, both in terms of physical protection as well as on the ICT side, will be monitored by a newly established Security Risk Committee. This committee will be responsible for handling threat analysis, identifying potential risks and suggesting structural improvements.

Security

Attention to security

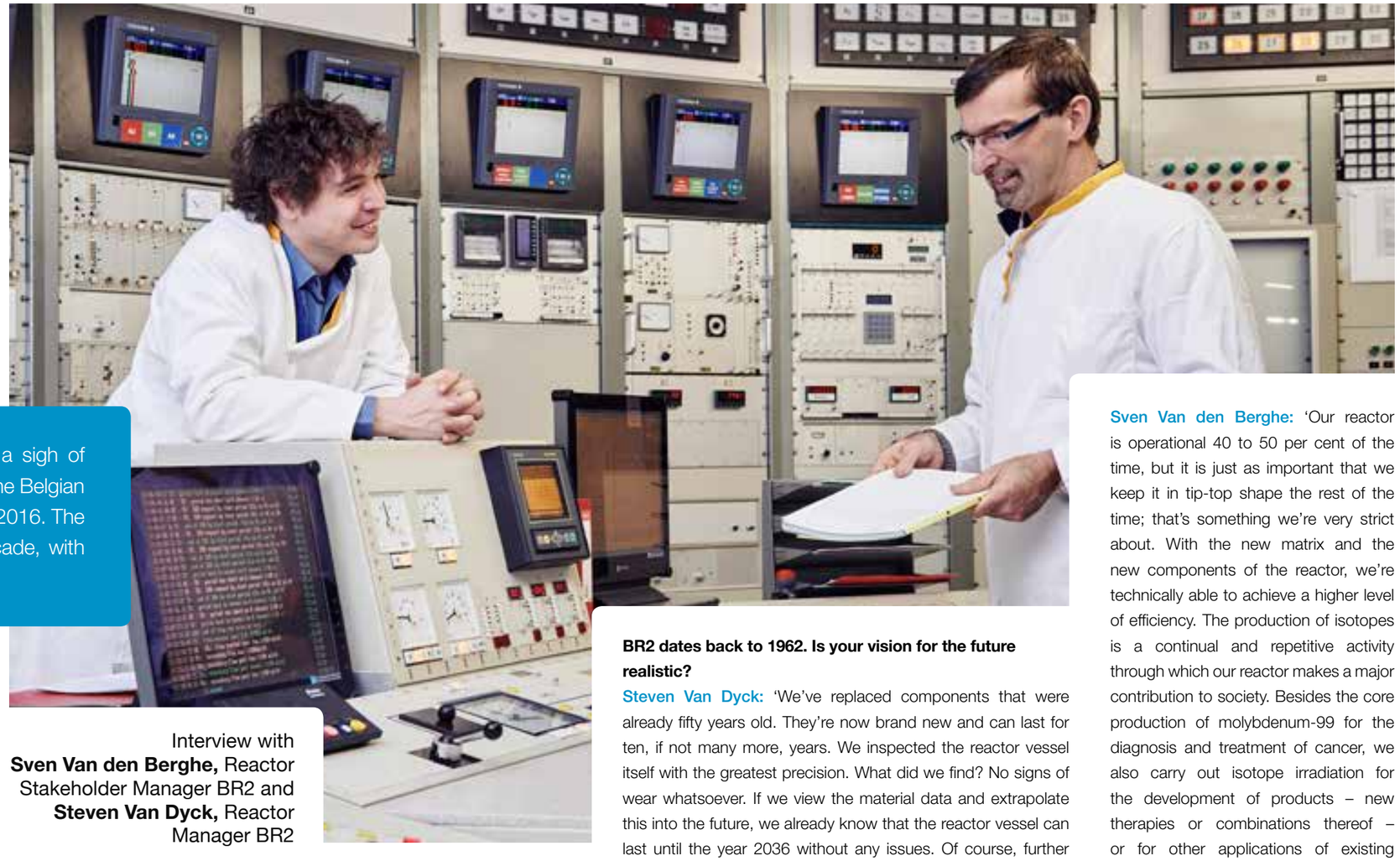
SCK•CEN's management is fully aware of how important it is to operate every facility in a safe, secure and environmentally friendly way. In view of the growing security requirements, efforts have been stepped up over the past year as part of our integrated approach to risk management.

Fernand Vermeersch

Head of the Internal Service for Prevention and Protection at Work

Reactor BR2 has a big future ahead

The scientific and medical worlds are breathing a sigh of relief. After a thorough service lasting 16 months, the Belgian Reactor 2 (BR2) was successfully restarted in July 2016. The research reactor is ready for at least another decade, with ambitious perspectives in sight.



Interview with **Sven Van den Berghe,** Reactor Stakeholder Manager BR2 and **Steven Van Dyck,** Reactor Manager BR2

Steven Van Dyck: 'It wasn't just a service. Many internal mechanisms were updated, all underground pipes and cables were replaced, the ventilation ducts were reinforced and the beryllium matrix on the inner side is also brand new. We carried out all anticipated interventions and BR2 was restarted right on the scheduled date, 19 July 2016.'

Sven Van den Berghe: 'This kind of timing is unique in the nuclear world, where unfortunately you often have to deal with significant delays. Precision remains a hallmark of BR2: we provide quality in a safe way and in the shortest time possible. Even when BR2 was being built, it was delivered with only six months' delay after four years. As scientists and technologists, we're always cautious with our communication. But this refurbishment was a success.'

How long can BR2 now run for?

Steven Van Dyck: 'We've submitted a dossier for the ten-year safety review. That gives BR2 the prospect of another ten years. But we're looking further ahead, because in a following step we want to prepare the period from 2026 to 2036.'

"7 million patients in the world yearly get a diagnostic research thanks to the Belgian radioisotope production."

BR2 dates back to 1962. Is your vision for the future realistic?

Steven Van Dyck: 'We've replaced components that were already fifty years old. They're now brand new and can last for ten, if not many more, years. We inspected the reactor vessel itself with the greatest precision. What did we find? No signs of wear whatsoever. If we view the material data and extrapolate this into the future, we already know that the reactor vessel can last until the year 2036 without any issues. Of course, further studies are needed in order to verify that, but we have time.'

For which objectives does SCK•CEN want to turn on BR2?

Steven Van Dyck: 'At this time, there aren't many places in the world where isotopes are being produced. This highlights how necessary it is that BR2 be reliable. We need to guarantee sufficient production. Doctors all over the world are counting on us. The BR2 routinely produces around a quarter of annual requirements for the most important medical isotope, molybdenum-99. When the reactor is operational, it can cover two thirds of the weekly global demand. 7 million patients in the world yearly get a diagnostic research thanks to the Belgian radioisotope production.

Sven Van den Berghe: 'Our reactor is operational 40 to 50 per cent of the time, but it is just as important that we keep it in tip-top shape the rest of the time; that's something we're very strict about. With the new matrix and the new components of the reactor, we're technically able to achieve a higher level of efficiency. The production of isotopes is a continual and repetitive activity through which our reactor makes a major contribution to society. Besides the core production of molybdenum-99 for the diagnosis and treatment of cancer, we also carry out isotope irradiation for the development of products – new therapies or combinations thereof – or for other applications of existing products. This type of qualification process from development to routine production can take years. The isotope market is extremely dynamic. Supply and demand fluctuate and new applications are constantly emerging.'

Steven Van Dyck: 'In the three cycles that were provided for 2016, 6 tests were carried out to produce isotopes that we hadn't previously supplied or to validate known isotope production for new applications and clients.'

However, isotope production isn't the only objective...

Sven Van den Berghe: 'The reactor is, and will remain, available for a range of applications. The specifications for the design of the BR2 stated: 'a reactor with the greatest overall usefulness'. That's exactly what we got. BR2 is a versatile and flexible irradiation machine that is able to do many different jobs at the same time.'

Steven Van Dyck: 'Besides the production of isotopes, BR2 also functions as a materials testing reactor. At this time, research reactors are hardly being built anywhere in the world, but there is need for research. This is only possible in a high-performance research reactor. That's why BR2 is so successful.'

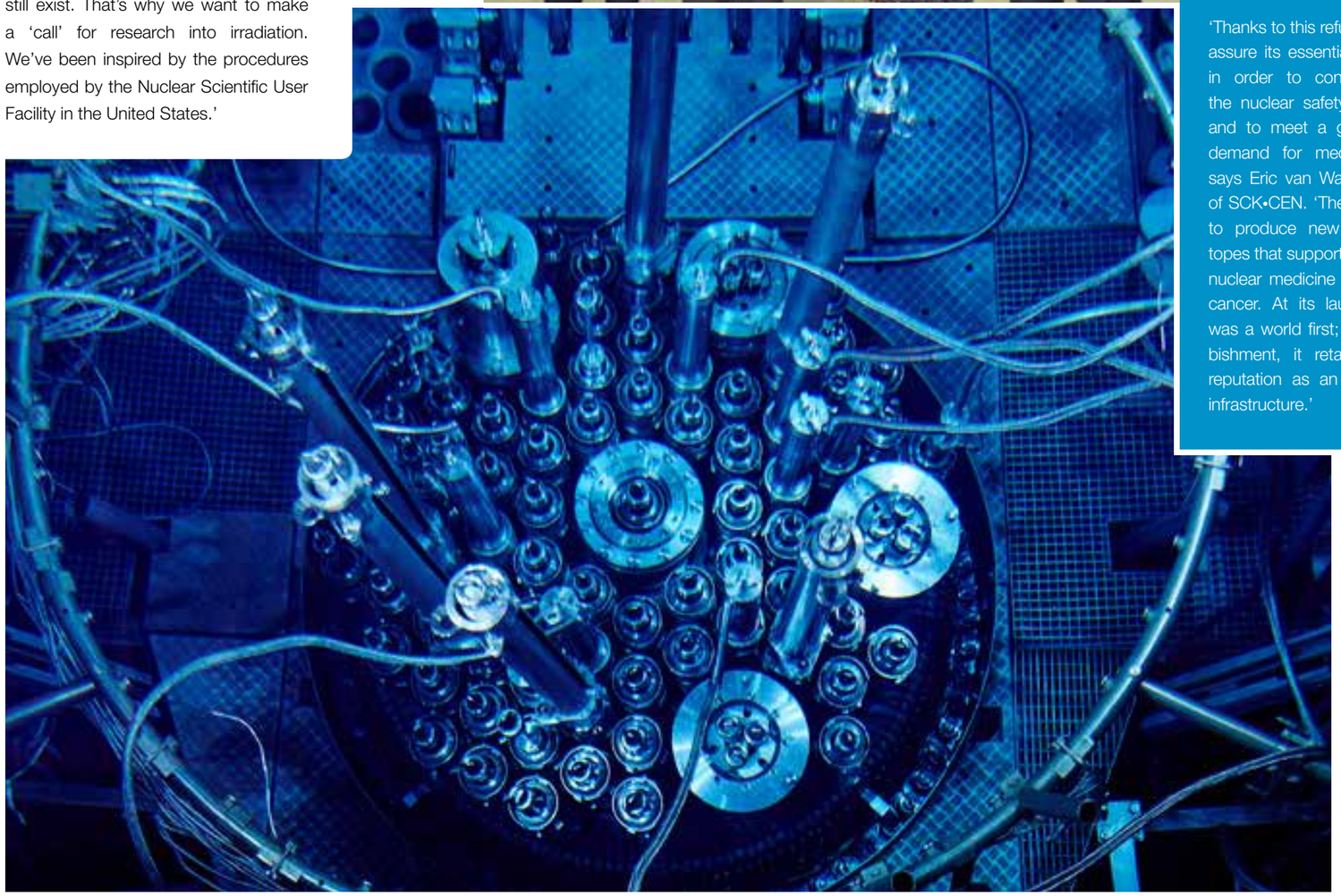
SCK•CEN wants to provide scientists and companies with the opportunity to use BR2 in a structural manner. That's possible thanks to the new concept of BREASY (BR2 Reactor Experimental Access and Scientific Yield). What exactly does this involve?

Sven van den Berghe: 'With BREASY, we are making the capacity of BR2 available to scientists all over the world so that they can carry out experiments. In concrete terms, we are inviting institutes and even countries to engage in a capacity participation in BR2. They purchase some of our neutrons, thereby buying part of the research reactor as it were. We also want to make part of our capacity available to the academic world. We call it our 'user facility'. We used to work on an ad hoc basis with PhD students who were carrying out research or research projects with external partners.'

"With BREASY, we are making the capacity of BR2 available to scientists all over the world so that they can carry out experiments."

What's the difference?

Sven Van den Berghe: 'We are now moving towards a more structural partnership: a community of users who enter into a permanent relationship with us. They will retain access to our infrastructure, so that their research can develop. For us, as the operator, this provides continuity in terms of levels of usage. Various European universities used to have research reactors on their campuses, but that's no longer the case. The departments of nuclear engineering still exist. That's why we want to make a 'call' for research into irradiation. We've been inspired by the procedures employed by the Nuclear Scientific User Facility in the United States.'



ACADEMIC SESSION ATTENDED BY HRH PRINCESS ASTRID

On Friday 28 October 2016, SCK•CEN in Mol organised an academic session in the presence of Her Royal Highness Princess Astrid to celebrate the successful start-up of its BR2 research reactor after a 16-month refurbishment.

'Thanks to this refurbishment, BR2 can assure its essential role in technology in order to continue to guarantee the nuclear safety of power reactors and to meet a growing international demand for medical radioisotopes,' says Eric van Walle, Director General of SCK•CEN. 'The reactor is also able to produce new types of radioisotopes that support the advancement of nuclear medicine in the battle against cancer. At its launch in 1961, BR2 was a world first; thanks to this refurbishment, it retains its international reputation as an advanced research infrastructure.'