2014: AN ANNIVERSARY YEAR FULL OF ENERGY

Belgoprocess celebrated its thirtieth anniversary in 2014. We have come a long way since our inception in 1984. A brief history would therefore not come amiss, although in this sustainability report we will naturally be focusing on the main accomplishments of 2014. During the past year, we were able to realize many of our ambitions in the area of waste processing and dismantling operations.

DISMANTLING EUROCHEMIE: FROM PIONEER TO INTERNATIONAL EXPERT

Mid-2014, Belgoprocess demolished the last part of Eurochemic. In the nineteen sixties, the former reprocessing plant epitomized the optimistic belief in progress. Today, in 2015, the dismantled installation is proof that Belgoprocess is in the vanguard of nuclear dismantling technology. ‘The knowledge and experience we have gained with this project are of tremendous significance to society,’ says Bart Ooms, Manager Dismantling Operations.

REMEDIATION OF SITE 2: AMBITION IN ACTION

The ambitions of Belgoprocess are probably most evident on site 2. Last year, a lot of work went into dismantling a number of installations and the disposal of historical waste. ‘We hired extra staff and are on schedule to have the Frisomat sheds empty by the end of 2015,’ says team leader Nic Zanni. In the long term, Belgoprocess even hopes to release most of site 2 for industrial use.

THE PROVISIONAL END OF A CAMPAIGN

The end of 2014 saw the last of the processed waste from Dounreay, Scotland, arrive at building 136. This marked the provisional end of the shipments of Belgian intermediate and high-level waste to Dessel, after 14 years and just under a thousand waste packages. At the same time, operator Jan Gijs went into retirement. ‘The adrenalin rushed through my body when the first shipment arrived in 2000. We were still unfamiliar with that high-level waste, so it was a thrilling moment.’

SPECIAL CARE FOR MAN AND THE ENVIRONMENT

Belgoprocess renewed and expanded its ISO 17025 accreditation. This is a recognition of the scientific method with which we investigate our environmental impact. For many years now, Belgoprocess has carried out measurements of air and water, and in all that time emission levels have stayed far below the legal limits. ‘This accreditation proves that we deliver reliable results,’ according to Naddy Van Hoof and Ulla Van Bylen.
SAFETY IS AN ATTITUDE

The fact that safety is an absolute top priority for Belgoprocess emerges from all activities. Improvements and innovations are constantly being made to the organization and infrastructure, while the safety culture is a constant priority too. The individual behaviour of our employees is just as important for safety as the technical reliability of our installations,’ says Jan Van Looke, who is in charge of the Integrated Management System.

REMEDIATION OF EUROCHEMIC LANDFILL: GOING THE EXTRA MILE

As much as 18,000 m³ of soil was excavated and just under 5000 tonnes of waste was disposed of. Belgoprocess clearly made a very thorough job of the remediation of the former Eurochemic landfill site. It should be noted that this was not a dumping ground for radioactive materials, but for concrete, wood and other building materials. ‘Such a dumping ground would be unthinkable today,’ says Jan Corvers.

THE UF6 INSTALLATION: AN OPPORTUNITY IN SEVERAL RESPECTS

‘UF6 is a commercial project with which we primarily gain knowledge we did not have before,’ Niels Huijs explains. In 2014, the cleaning installation for international UF6 containers was started up. This commercial activity is not exactly Belgoprocess’s core business. ‘Yet this project does help us to broaden our field of action,’ says Huijs.

A FORMIDABLE JOB UNDER PRESSURE

With the processing of broken cobalt-60 rods, Belgoprocess not only confirmed its expertise; it also played its role as a public service provider to perfection. This was a tricky job from shipment to processing. ‘We needed all the knowledge and experience we had for this mission,’ says team leader Bert Corvers. ‘The different departments of Belgoprocess that were involved worked closely with Sterigenics, FANC and NIRAS. It was a most instructive experience.’

INVESTMENT PROGRAMME: FOUNDATIONS FOR THE FUTURE

A whole range of investments are planned at Belgoprocess over the next few years. Upgrades, replacements, new installations, new buildings, more remediation works etc, all designed to improve safety and increase efficiency. ‘Belgoprocess has become an essential link in the run-up process to the disposal of radioactive waste,’ says contract manager René Goetschalckx. ‘We are making those investments as part of that responsibility.’
Belgoprocess celebrated its thirtieth anniversary in 2014. We have come a long way since our inception in 1984. A brief history would therefore not come amiss, although in this sustainability report we will naturally be focusing on the main accomplishments of 2014. During the past year, we were able to realize many of our ambitions in the area of waste processing and dismantling operations.
On Monday, 26 November 1984, Belgoprocess was founded as successor to the Eurochemic reprocessing plant. Restarting the reprocessing operations, however, was economically impracticable, and in 1986 Belgoprocess came under NIRAS. From then on, Belgoprocess specialized in the processing of radioactive waste. Within a matter of a few years, Belgoprocess had built itself an excellent reputation, giving rise in the nineteen nineties to the launch of large-scale investments. The CILVA plant was built for the processing of low-level waste, while a start was made with the dismantling of Eurochemic. More about the dismantling operations of Eurochemic can be found further in this sustainability report (see page 10). We would like to emphasize here that Belgoprocess owes a great deal of its international reputation in the dismantling of decommissioned plants to this particular project. Belgoprocess has grown along with the dismantling of Eurochemic. Over more than 25 years, our experts have acquired in this former reprocessing plant the knowledge and experience needed to dismantle large-scale and complex installations in the utmost safety.

**KNOWLEDGE STILL PAYS OFF**

In the new century, too, Belgoprocess continues to specialize in the processing of Belgian radioactive waste. A sorting installation for alpha-containing waste and a concrete sampling installation were put up. A favourable political decision was made in 2006, allowing Belgoprocess to process waste from other countries under strict conditions through commercial contracts. Belgoprocess has powerful installations, of which some are underutilized because there is too little Belgian waste to keep them running. That situation increases
the operating cost. By sourcing waste from other countries for processing, efficiency can be improved and overheads spread over a larger volume. The UF6 installation discussed further in this report (p. 46) is part of this policy, as well as being a project of strategic importance. The installation is used to clean and recertify foreign transport cylinders used in the nuclear industry. Such commercial projects stimulate Belgoprocess to acquire and further develop its knowledge. Expanding its range of activities is a strategic choice in order to become less dependent on contracts that are coming to an end. In this context, commercial activities such as the UF6 project remain important for Belgoprocess, even though commercial contracts are not our top priority.

**BASIC PRINCIPLE AS OUR AMBITION**

In 2013, we began to refocus on our role as a public service provider. Our ambition is to strengthen our basic principle, which is to protect society and the environment against the risks of nuclear waste, and to do so in a professional way (p. 24). We have therefore put the accelerated remediation of our own sites and the processing of the historical waste first and foremost in our corporate objectives. In 2015, the remediation programme is well on schedule. You will have read that the last section of Eurochemic was demolished last year, while work also progressed well on site 2 last year (p. 18). The dismantling of the Evence Coppée
The incinerator was completed and the historical waste, including the radium-containing waste on site 2, was processed. In the past, the FANC had criticized the presence and storage conditions of the historical waste. ‘We cannot be satisfied, although obviously there is no immediate nuclear risk’: those were the exact words of the FANC at the time. Belgoprocess took those remarks very seriously and took action immediately. The FLITS inspection in 2012 was actually a follow-up to a safety audit that was carried out in 2010. The outcome of that audit was that a number of points needed improvement. In response, we set up and implemented an extensive strategic safety programme. All items in that action plan have been realized since last year. At the same time, we also made every effort to reinforce the safety culture at Belgoprocess (p. 36). This means approaching safety from a broader angle. Besides technical and organizational improvements, we focused more deeply on the individual behaviour of our employees with a view to enhancing safety. In 2014, we also made substantial progress in the area of environmental monitoring (p. 28). Our discharges have for years now remained well below the legal limits, but now we have also been accredited for the scientific way in which we monitor the environmental impact of our operations. This ISO 17025 accreditation is very important for a company with a major social responsibility. It shows that Belgoprocess is very serious about its efforts to minimize its environmental impact. We have therefore oriented our ambitions to the needs and expectations of society. With a view to the future, Belgoprocess wants to dispose of the historical waste. We had already outlined this change of course in 2013, and last year we were up to speed.’
Dismantling Eurochemic: FROM PIONEER TO INTERNATIONAL EXPERT
Mid-2014, Belgoprocess demolished the last part of Eurochemic.

In the nineteen sixties, the former reprocessing plant epitomized the optimistic belief in progress. Today, in 2015, the dismantled installation is proof that Belgoprocess is in the vanguard of nuclear dismantling technology. ‘The knowledge and experience we have gained with this project are of tremendous significance to society,’ says Bart Ooms, Manager Dismantling Operations.

Eurochemic was established in 1957 as an experimental reprocessing plant; but what is a reprocessing plant? This question is best answered with a brief history lesson. The nineteen fifties and sixties were characterized by an optimistic belief in progress. Modern technology was to make life a lot easier, but that modern life demanded a lot of energy. It was in that context that Eurochemic was founded. Top scientists from all over the continent came together here to create a nuclear energy circle. A highly ambitious objective involving the ‘reprocessing’ of spent nuclear fuel in order to recycle as much fuel as possible. Reprocessing means recycling; the recycling of fissile material from spent nuclear fuel. In 1984, Belgoprocess was set up as successor to Eurochemic; just two years later, preparations were already under way for the dismantling of the plant. At that time, however, the know-how to dismantle nuclear installations was lacking. Eurochemic was the first nuclear plant of that size in the world to be dismantled, and Belgoprocess had to build up the necessary know-how on the factory floor. ‘It was far from being routine work where you could just switch on to autopilot,’ says operator Nabil Willems.
The dismantling process took nearly three decades. Can you give a brief overview of the operations?

**Bart Ooms:** 'We began preparations in 1986. As we said, this was a pilot project, so we had no existing knowledge to fall back on. No one knew how to go about such a dismantling operation. So it took a great deal of preliminary study: making plans and calculations, developing methods and techniques, etc. In 1989, we carried out a pilot project on buildings 6A and 6B. Those were the Eurochemic buildings where the end products of the reprocessed fissile material were stored. That test case permitted a better assessment of the risks, cost and timing. On the basis of that, we outlined a strategy, and in 1992 we finally began the main work. Between 1992 and 2008, we focused on the dismantling and decontamination of equipment and remaining structures of the plant, and on the decontamination of the waste flows produced. Again, this took us so long because we had no previous experience to fall back on. In 2008, we demolished the eastern section of the building, in 2010 the central section, and in 2014 the western section. By phasing the demolition, we were able to prepare the area of action much better and contain the risks. Diligence was our best safety guarantee.'

What did a working day at the plant look like?

**Nabil Willems:** 'We started at eight thirty on an operation that we had prepared the day before. We worked in the factory for two hours, after which we were cleared, took a shower and a break. It was very hard work, both mentally and physically. It was a combination of hard labour and technological precision. We also wore an airtight protective suit and of course a full face mask. We carried 15 kg around with us. Some of my colleagues would lose up to two litres of fluid per shift while working in the factory. Just to show how tough working conditions were. In the afternoon, another two-hour operation followed at the plant. We worked 'only' four hours on the factory premises because the work was so exhausting and safety could be threatened.'
Exhaustion causes loss of concentration, which can have major consequences for your own safety as well as that of your colleagues. Working in such a factory, you depend on each other. There was a strong team spirit. Everyone was imbued with the necessity of being responsible for each other. When we were not working in the units, we cleaned and maintained the equipment, prepared the work for the next day, and attended training and instruction sessions.

This project put Belgoprocess on the map as an international expert in complex and large-scale nuclear dismantling operations. Where exactly do you make the difference?

Nabil Willems: ‘We built not only the knowledge, but also the tools. When we hit a problem, we had to come up with the solution ourselves. That is how we developed an array of instruments that did not exist before.’

Bart Ooms: ‘Our great expertise lies in limiting the volume of radioactive waste. We have the know-how to recover as much demolition material as possible from a dismantling operation. More than 30,000 tonnes of material were recovered from Eurochemic, mainly concrete and metal. More than 90 percent of that volume...’
was unconditionally released for recycling. We are internationally acclaimed for this free release strategy. Whatever can be recycled is not waste and does not have to be processed and disposed of. That means a substantial saving, since processing and disposing of radioactive waste costs a great deal of money.'
‘We were able to recycle 90 percent of the demolition material.’

— Bart Ooms
Remediation of Site 2:

AMBITION IN ACTION
The ambitions of Belgoprocess are probably most evident on site 2.

Last year, a lot of work went into dismantling a number of installations and the disposal of historical waste. ‘We hired extra staff and are on schedule to have the Frisomat sheds empty by the end of 2015,’ says team leader Nic Zanni. In the long term, Belgoprocess even hopes to release most of site 2 for industrial use.

Here is some background first. Site 2 holds mainly the so-called historical waste. This is waste from the past that primarily originated from the former waste division of SCK (Nuclear Research Centre), industrial companies and the medical sector. Since the nineteen sixties, that waste has been stored in several buildings on site 2. The most controversial depots are the Frisomat sheds 270M and 270L. The FANC paid an inspection visit to those Frisomat sheds in 2012 and came to the conclusion that the storage conditions there needed to be improved. Belgoprocess immediately made a priority of clearing up the historical waste; today, most of the radium-containing waste
from the Frisomat sheds has been processed. Most of the non-radium containing waste from the Solarium has also been processed by now. The dismantling operations of the 'Chaud', an old installation for the treatment of radioactive effluents, have been started up. The Evence Coppée incinerator has already been completely removed by the Dismantling staff. 'We have worked hard,' says Bert Geboers, operator Operational Activities on site 2. 'A project-based approach has been adopted here for several years now (see also section on safety culture on p. 36). Once we start something, we finish it. By rigorously observing the timetable, we can get the work done. Our mission is clearly defined: to clean up the Frisomat sheds.'

The Frisomat is an arch-shaped shed the size of a football field, full of containers holding radioactive waste. How did you go about the disposal process?

Bert Geboers: ‘First we went through the logbooks to see what kinds of waste we might come across. We soon discovered that the waste records had not been kept all that meticulously. I suppose that was fairly typical of the time. As there were no computers in those days, we had to rely on sheets of paper with numbers that referred to the numbered containers in the Frisomat shed. The contents of the containers, however, never exactly matched the description on the documents. For that reason we took test samples to get a better idea of what was in the containers. It shows how much preparation there was involved. For the actual work, we devised a kind of assembly line system. We open a container in the Frisomat shed, transfer the sealed waste packages to a transport container, which is then taken to the alpha room where the packages are opened and the waste sorted. The sorted waste is then stored in a sealed canister. Pending final processing, those canisters are brought together in the Stelcon hall. The end result is a semi-finished product, but what is most important is that the waste has been put in an improved, physically stable storage condition.’
DISMANTLING THE EVENCE COPPEE INCINERATOR

After two years of study, dismantling operations on the Evence Coppée incinerator started in 2012. In a first phase, the installations around the incinerator were removed, such as pipes, ducts, metal structures and the chimney. In 2014, the incinerator itself was dismantled and processed. The dismantling operations generated a volume of 110 tonnes of waste, mainly concrete (64 tonnes) and metal (45 tonnes). The bulk of this waste has been cleared for recycling.
You mentioned logbooks. Did you come across anything special among the batches of waste?

Bert Geboers: ‘Yes, definitely; I am in my twenties, the waste packages gave me a very good idea of how attitudes have changed in our sector. Some packages contained items which nowadays would not possibly enter the controlled area. Newspapers, for example, or documents from the former Union Minière. How could they let this happen? How does a newspaper end up with the radioactive waste? Not only did we sort the waste; we also created a digital waste record system. We now know perfectly what is in each canister.’

Was this waste an environmental hazard?

Nic Zanni: ‘Naturally we took readings first, and those containers have been under our supervision for years now. We had the situation firmly under control, but the storage conditions were not ideal. We are now addressing this issue. When classifying this historical waste, we make a distinction between radium-containing waste and non-radium containing waste. Most of the waste packages contain radium. Radium is a problematical isotope for us because it decays to a gas called radon. Radon is fairly harmless in small concentrations, but higher concentrations in unventilated rooms can cause health problems (e.g. lung cancer). According to the World Health Organization, radon gas is the second leading cause of cancer after tobacco in many countries. The canisters in which we have now stored the radium-containing waste are sealed airtight so that no radon gas can escape. We have also given the canisters containing radium a different colour to make them visually identifiable for subsequent processing.’

The Solarium (roofed depot for the concrete containers with intermediate-level waste) is almost empty too?

Nic Zanni: ‘The non-radium containing vessels have virtually all been processed. The radium-containing vessels are next. We want to keep the radium-containing waste strictly separate from the other radioactive waste for metrology reasons and with a view to subsequent disposal. For that reason, proper sorting of radium-containing and non-radium containing concrete caissons was so important. That way, we can first decontaminate the non-radium containing vessels and, at a later stage, the radium-containing vessels, and finally the installation proper, without the risk of getting the two types mixed.’

What will eventually happen to site 2 once all the waste has been processed?

Nic Zanni: ‘Belgoprocess ultimately wants to bring all its operations together at site 1. This is far better in terms of logistics, safety and administration. Site 2 could to a large extent be released for other industrial uses. This is a realistic goal, although it will take more than a decade.’
Building 136:
THE PROVISIONAL END OF A CAMPAIGN

Jan Van Bijlen • team leader
The end of 2014 saw the last of the processed waste from Dounreay, Scotland, arrive at building 136.

This marked the provisional end of the shipments of Belgian intermediate and high-level waste to Dessel, after 14 years and just under a thousand waste packages. At the same time, operator Jan Gijs went into retirement. ‘The adrenalin rushed through my body when the first shipment arrived in 2000. We were still unfamiliar with that high-level waste, so it was a thrilling moment.’

Between 2000 and 2014, 42 foreign shipments, of which 29 dual shipments, of high-level and long-lived waste arrived at Belgoprocess. That waste is now safely stored in building 136 pending disposal. It should be pointed out that this is not waste from other countries, but waste generated by Belgium’s own nuclear power stations (Doel and Tihange) and by the neighbouring SCK site. Why does this waste come from abroad, more particularly from La Hague in France and Dounreay in Scotland? First, the waste from La Hague. This coastal town in Normandy has a reprocessing plant (similar to Eurochemic, see p.10), besides installations for processing radioactive waste. Electrabel shipped part of its spent fuel to La Hague to have it reprocessed for reuse. This recycling process, however, generates waste which is conditioned in vitrified or compacted form and then shipped to Belgoprocess. Every country is obliged to take back its own radioactive waste once it has been processed elsewhere. The most suitable installation to process the spent fuel from the research reactor of SCK is in Dounreay. After it has been processed there, it is shipped over sea and by road back to Dessel. That is the background behind the foreign shipments. Operator Jan Gijs was there when the first shipping container arrived and went into retirement after the last shipping container left empty last December. Bart Ghys is currently in charge of the incoming shipments and storage process at Belgoprocess.
In the beginning, there was a lot of protest against the shipments. That protest gradually died away. What was your view on that protest?

Jan Gijs: 'I'd rather be driving behind a shipping container with radioactive waste than behind a tank lorry carrying fossil fuel. In our sector, safety measures are so strict that the risk of an incident is very small indeed, and the consequences non-existent. The shipping container itself is built like a thick-walled steel vacuum flask that shields the radiation of the waste. The radioactive waste is not deposited directly in the container, but is conditioned first. That means vitrified or cemented.'

Bart Ghys: 'If people want to protest against nuclear shipments, they can. Everyone is entitled to their own opinion. But even if we stop generating nuclear power today, there still remains radioactive waste to be managed tomorrow. It is precisely in the interest of man and the environment that this waste is taken to Belgoprocess. We have the know-how and the infrastructure to store this type of waste safely.'

Jan Gijs: 'We are renowned worldwide for that know-how. Belgoprocess is simply a world leader in this area.'

Who is responsible for such a shipment?

Bart Ghys: 'The consignor is, for both the content and the packaging of the shipment. NIRAS is always on hand when the containers are filled, as NIRAS has to accept the waste.'

Jan Gijs: 'We take over responsibility when we unload at building 136. In that case, too, there is someone of NIRAS present to oversee proceedings. When it comes to safety, the professionalism in our sector is without equal.'

Have there been hazardous situations? After all, we are dealing with high-level waste here.

Jan Gijs: 'Every situation is potentially hazardous, but there has never been an incident during shipment and unloading. As you rightly point out, foreign shipments have gone on for 14 years, but for us they have
been going on for 20 years. Before the first shipment arrived here in 2000, we had already been preparing for six years. We knew very well what was expected from us. Although I must admit that I felt the adrenalin rush through my body at the first shipment. Even though I was very well prepared, it was still thrilling to wait and see whether our preparations would actually work smoothly in practice. But, as I said, everything went without a hitch in those 14 years. The most important thing is to keep your mind on the job and to be aware that not only your own safety is at stake, but that of your colleagues and the wider neighbourhood as well.

**The last shipment has now finished. What will happen with the extra high-level waste?**

**Bart Ghys:** ‘The provisional end of the shipments simply means that our contract has expired. But Electrabel continues to produce nuclear power and therefore also spent nuclear fuel. But, as we said, Electrabel recycled a substantial part of its spent fuels. Uranium and plutonium are fissile materials, so it is only normal to get out all the energy that is in them. Ultimately you always produce waste, but that can take several years. It is therefore not inconceivable that we might have to extend building 136 in the future. But the decision whether or not to reprocess spent fuel is a political decision.’

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**STORAGE OF CONDITIONED WASTE**

<table>
<thead>
<tr>
<th>Year</th>
<th>Low active waste</th>
<th>Middle active waste</th>
<th>High active waste</th>
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<td>2008</td>
<td>15,344 m³</td>
<td>3,918 m³</td>
<td>273.7 m³</td>
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<td>3,748 m³</td>
<td>280.9 m³</td>
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<tr>
<td>2010</td>
<td>16,763 m³</td>
<td>3,789 m³</td>
<td>295.3 m³</td>
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<tr>
<td>2011</td>
<td>17,127 m³</td>
<td>3,839 m³</td>
<td>324.1 m³</td>
</tr>
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<td>2012</td>
<td>17,656 m³</td>
<td>3,856 m³</td>
<td>358.4 m³</td>
</tr>
<tr>
<td>2013</td>
<td>18,131 m³</td>
<td>3,877 m³</td>
<td>430.7 m³</td>
</tr>
</tbody>
</table>
ISO 17025:
SPECIAL CARE FOR MAN AND THE ENVIRONMENT
Belgoprocess renewed and expanded its ISO 17025 accreditation.

This is a recognition of the scientific method with which we investigate our environmental impact. For many years now, Belgoprocess has carried out measurements of air and water, and in all that time emission levels have stayed far below the legal limits. ‘This accreditation proves that we deliver reliable results,’ according to Naddy Van Hoof and Ulla Van Bylen.

From its inception, Belgoprocess has implemented an environmental surveillance program which constantly monitors the environmental impact of its operations. Protecting man and the environment against the risks of radioactive waste flows is the top priority of Belgoprocess. The environmental surveillance programme shows that all efforts made in that respect are paying off. For several years now, Belgoprocess's discharge values have remained well below the legal limits. To give two examples: in 2015, 27,090 m$^3$ purified wastewater was discharged in the river Nete. This is less than half the permitted 60,000 m$^3$/year. The weighted radioactivity discharged amounted to only 0.3% of the permitted limit, namely 0.382 GBq compared to the permitted 150 GBq/year.

Since 2011, Belgoprocess has also been accredited for a substantial part of the tests from the environmental surveillance programme, more particularly the renowned ISO 17025 accreditation. This standard confirms that the laboratory tests at Belgoprocess are carried out according to best practices. ‘This is very important given the nature of the activities of Belgoprocess,’ says Naddy Van Hoof, head of Laboratory and Environmental Monitoring.
Belgoprocess has already been certified for some time for its laboratory tests and has now also been accredited. What exactly is the difference?

Naddy Van Hoof: ‘We have indeed been certified for quite a time for quality, environment and safety (ISO-9001, ISO-14001 and OHSAS-18001), and now we have also been accredited for a large number of analyses and for environmental and personnel dosimetry (exact and systematic determination of the external radiation in personnel). The accreditation acknowledges that we deliver reliable results using validated methods. More specifically, ISO 17025 confirms that our people work in total independence according to a method that meets all scientific requirements. This accreditation is certainly not the finishing line. Quite the opposite. Now we have been accredited, we will be checked more frequently and strictly during audits, and we will also have to take part in regular inter-laboratory comparisons. This is a kind of examination in which unknown samples have to be analyzed.’

You are making things more difficult for yourselves. So what exactly is the added value of the accreditation?

Naddy Van Hoof: ‘Until recently, critics could dispute our laboratory results by arguing that Belgoprocess checks itself. We carry out the environmental surveillance. With ISO 17025, our test methods are now scientifically approved. No one can now call our results unreliable or unscientific. ISO 17025 confirms that our environmental measurements have been done correctly for several years now. This is important for our stakeholders and partners too. Given the earnestness of our activities, Belgoprocess attaches great importance to a good relationship with the stakeholders and partners. This accreditation is particularly beneficial, as it is a quality label for our credibility and reliability.’
Belgoprocess’s emission levels have stayed well below the legal limits for many years now. Has this always been so?

**Ulla Van Bylen:** ‘A lot has changed in the 25 years that I have worked here. Not that we ever exceeded the emission limits; but the technological progress has helped us to reduce our emissions dramatically. I remember a time when effluents were discharged on a daily basis. Today we discharge once or twice a week on average. Technology has made all this possible. With today’s equipment we can filter out pollutants which we could not even measure before.’

Suppose too much of a particular radioactive pollutant were to be discharged in the Nete. What happens then?

**Ulla Van Bylen:** ‘This can practically be ruled out. The purified and filtered water first flows into a tank before it is discharged. The water in the tank is tested and purified again if it is not up to standard. The wastewater will never reach the Nete if it does not satisfy the standards. We also have two monitoring points on the Nete where the water quality is continuously tested. This water holds no secrets for me.

We also monitor the atmospheric emissions. The conclusion is that our activities have little impact on the environment. The disadvantage of the nuclear industry lies in the waste that is generated rather than in the emissions, and it is the mission of Belgoprocess to manage those risks. In any case, living next to Belgoprocess or a nuclear power station is not unhealthy. Some industries or a busy highway can have a far more direct impact on health and the environment.’
Is there still much room for improvement in terms of emission reduction?

**Naddy Van Hoof:** ‘As long as we have not achieved zero emissions, there is still room for improvement. Progress in this field is very closely connected with technological developments. Technology enables us to measure and deal with pollution with increasing accuracy, and of course legislation evolves with that technology. Since 2014, the limit value for mercury has been reduced from 5 ppb to 0.5 ppb, which is one two-thousandth of a milligram per litre of water. This means that, for mercury, the law is based on the lower limit of what can be measured. In order to meet this strict discharge standard, we have set up an ultrafiltration installation in the wastewater treatment plant. But mercury is not a radioactive element. Our radioactive discharges have remained far below the legal limits for many years now. For chemical discharges we naturally conform to the legal limits, but the results are less spectacular. However, I expect that in the future we will have the technology to do even better in that respect.’

‘I have seen a lot change here for the better. There was a time when we discharged on a daily basis. Now once or twice a week on average’

— Ulla Van Bylen
‘Discharges of polluted water can be ruled out. The purified and filtered water first flows into a tank and is tested before it is discharged’

– Ulla Van Bylen
Safety culture:

SAFETY IS AN ATTITUDE
The fact that safety is an absolute top priority for Belgoprocess emerges from all activities.

Improvements and innovations are constantly being made to the organization and infrastructure, while the safety culture is a constant priority too. The individual behaviour of our employees is just as important for safety as the technical reliability of our installations,’ says Jan Van Looke, who is in charge of the Integrated Management System.

The safety measures at Belgoprocess are focused on two areas: man and the environment. The figures show that the efforts made are paying off. Elsewhere in this sustainability report you can read that, for many years now, the emissions from our operations have remained well below the legal limits, and that their environmental impact is negligible (p. 32). How about the wellbeing of the employees who are on the site every day? Here, too, the figures say it all. The average individual radiation exposure of the employees was
0.47 millisievert (mSv) in 2014. The maximum individual yearly dose of an employee was 5.64 millisievert, while the maximum permissible legal limit is 20 millisievert and the internal regulations of Belgoprocess stipulate a maximum limit of 10 millisievert. In comparison, a CT scan at a hospital exposes the patient to a dose of 5 to 10 millisievert.

Last year there were three accidents at work. ‘When we take a closer look at the figures for work-related accidents, we see that the number of accidents at work has halved over the past decade. But as there is always scope for improvement, we have set up a team of five staff members to work on safety culture,’ says Annick Gielis of the safety department.

**What exactly is safety culture?**

**Jan Van Looke:** ‘We also asked ourselves this question when we carried out a self-assessment in 2012 to define the culture and to test its impact on safety. Why are things as they are, why do we react in a certain way, what are the underlying values and standards that unconsciously guide our actions? Assessing the outcome (= description of the culture) for its impact on safety gives a picture of our safety culture. This is precisely what we wanted to know. Not in order to form an opinion on it, but because we need that knowledge to steer the behaviour of our employees with a view to improving safety. This is how you mould a new corporate culture that is even more focused on safety. Hence the term ‘safety culture’. It is all about ‘improving’ the individual behaviour of our people. Safety is an aspect involved at three equally important levels: technical, organizational and individual.’
What were the main results of this assessment? In other words, what kind of behaviour did you work on?

Jan Van Looke: ‘We at Belgoprocess put forward four values: Safety, Reliability, Responsibility and Cooperation. It is our ambition to streamline the culture with those values. In the area of Safety, for example, we emphasized the need for greater commitment. We should be ready to call each other to account for undesirable behaviour. This was a sticky point in the old corporate culture because it was quickly perceived as criticism. An example in the area of Cooperation is the exchanging of information. In the past, the different departments worked too much on their own island. The technical means to exchange information easily were available, but they were underutilized. There, too, we worked to achieve a change of attitude.’

Annick Gielis: ‘This is not always easy. People tend to hold on to their behaviour. Furthermore, Belgoprocess has mostly technical staff, people who like working with quantifiable data. A safety culture, however, is difficult to quantify. You cannot convince people of the right behaviour by using an equation. A change of attitude takes time, but last year we made substantial progress.’

Nevertheless, incidents are reported daily.

Jan Van Looke: ‘Those figures actually prove that everyone realizes the importance of their own behaviour. We ask our people to report anything that might have gone wrong. Even if nothing has actually happened. The possibility that something might go wrong is enough to report it, so that we can take action before something actually happens. For instance, if a pipe is hanging so low that someone might hit his head against it, this is reported. This may seem trivial, but by correcting small anomalies you can avoid serious risks with potentially major consequences. We also encourage our people to report their own errors or mistakes. By doing so, they look at their own behaviour and learn from their mistakes. The daily reports show that our people are working on their behaviour.’

This brings to mind the earlier SAVE programme (Samen Actief voor Veiligheid en Efficiëntie – Active Together for Safety and Efficiency).

Annick Gielis: ‘Yes, our work is a continuation and extension of that programme. SAVE was limited to two departments, whereas we want to roll out the improved safety culture over both sites according to a clear methodology. Naturally the efforts surrounding safety culture are not new. We have been working on this much longer. We just speeded things up since the inspection visit by the FANC in 2010. Eleven staff members

The fact that incidents are reported daily shows precisely that our employees are working on their behaviour.’

– Jan Van Looke
of Belgoprocess attended a specific training course organized by the IAEA (International Atomic Energy Agency), from which the Safety Culture team emerged. It seems we are doing a good job, because today we are helping to organize workshops at the IAEA.

**A Strategic Safety Plan was formulated after the FANC visit. What progress has been made here?**

**Annick Gielis:** ‘The action points from that programme have all been realized. Here, too, it was essentially a matter of a change of culture. Today, Belgoprocess stands for a project-based approach. Before, it sometimes happened that many different assignments were worked on simultaneously. This is now a thing of the past. Nowadays, projects are finished on the basis of priorities before we start on something else. What is happening on site 2 is actually a good example of that new approach (p. 18). The Strategic Safety Programme has in the meantime been finalized. Safety, however, is an ongoing concern, and it is teamwork. We continue to work on this. That is precisely the kind of culture we want to achieve.’

![TREND ACCIDENTS AT WORK](image)

The **frequency rate** is the ratio between 1 million times the number of accidents and the number of hours worked.  
The **severity rate** is the ratio between 1,000 times the actual number of calendar days lost and the number of hours worked.  
The **safety rate** = frequency rate × severity rate.
Jan Corvers • maintenance supervisor

Remediation of Eurochemic landfill:

GOING THE EXTRA MILE
As much as 18,000 m$^3$ of soil was excavated and just under 5000 tonnes of waste was disposed of.

Belgoprocess clearly made a very thorough job of the remediation of the former Eurochemic landfill site. It should be noted that this was not a dumping ground for radioactive materials, but for concrete, wood and other building materials. ‘Such a dumping ground would be unthinkable today,’ says Jan Corvers.

As was common practice in the nineteen sixties, the former Eurochemic had a landfill on its site for dumping waste. This was neither unusual nor illegal. It was a landfill of the kind that every industrial site had. But times have changed, and so Belgoprocess decided to clean up this landfill site as well. ‘Although cleaning up a conventional landfill is not a high-tech specialist job like processing radioactive waste, we went about this job in a thorough way too. Radioactive or not, Belgoprocess has set itself the task of cleaning up all the historical waste on our sites,’ says project leader Jan Corvers.
The remediation was completed at the end of this year, which was later than planned. How did this happen?

Jan Corvers: ‘The delay was primarily due to the fact that we had little idea how much and what kind of waste we would find under the ground. In those days, the waste was simply dumped and covered with sand. So we had no idea what kind of waste we would find. Before starting on the remediation work proper, we dug a few trenches to get an idea of the concentration of waste. We wanted some test samples, although as the work progressed we found that the waste from the trenches did not give a representative picture. The waste was far more mixed, which made the work of sifting and separating far more difficult. In some places the waste lay far deeper down than we thought. That was one reason for the delay. The figures say it all. We had originally planned to excavate 5,000 m$^3$ of soil; that eventually became 18,000 m$^3$ of soil. That accounted for just under 5,000 tonnes of waste. We also came across a number of test bitumen barrels. Nowadays, radioactive waste is cemented at Belgoprocess, whereas in the Eurochemic period waste was bituminized. But since they were test barrels, they never contained radioactive waste. Yet in order to rule out any risks, we carried out additional readings, which was another reason why we ran behind schedule.’
Most of the waste has been disposed of for recycling.

Corvers: 'Yes, that's true; OVAM (Public Waste Agency of Flanders) oversaw the remediation process as part of land mining to see whether the subsoil contained any valuable raw materials. We were able to actually dispose of more than 90 percent of the waste for recycling, although the payback was fairly marginal. The waste consisted for the most part of concrete, along with just a few containers of iron. Sadly enough, you get far less for concrete than for iron. As a result, the remediation of this landfill cost us 375,000 euros.'

So why is Belgoprocess making this investment? After all, this has nothing to do with processing radioactive waste?

Corvers: 'It's true that we were under no obligation to do so, yet we had put the remediation of our own sites at the forefront of our corporate goals. Last year we finished dismantling the Eurochemic plant. It would then be unprofessional to clean up the reprocessing plant and forget about the conventional dumping ground. We did not want to leave a job half-done. Moreover, it would simply become a bigger problem for the next generation if we left the waste where it was. That is why today we are cleaning up the historical waste on our sites. Despite the cost, we believe the remediation programme is a success. We are still awaiting a number of soil tests, but we would be surprised if there was any pollution worth mentioning. There might possibly be some minor pollution here and there, but if that is the case, we will certainly clean that up as well. By doing more than is strictly necessary, we want to show that we are serious about remediation.'
The UF6 installation:

AN OPPORTUNITY IN SEVERAL RESPECTS
‘UF6 is a commercial project with which we primarily gain knowledge we did not have before,’ Niels Huijs explains.

In 2014, the cleaning installation for international UF6 containers was started up. This commercial activity is not exactly Belgoprocess’s core business. ‘Yet this project does help us to broaden our field of action,’ says Huijs.

Uranium hexafluoride or UF6 is a compound that is used in the uranium enrichment process that produces nuclear fuel. This radioactive product is transported in shipping cylinders, which can now be cleaned and recertified by Belgoprocess. This technology and infrastructure opens up many opportunities on the nuclear market. UF6 is an essential step in the nuclear industry, and worldwide there are only a few nuclear sites that have a UF6 cleaning installation. Moreover, Belgoprocess has the newest installation. Belgoprocess has already cleaned and certified a number of containers of the French firm Daher/EDF. Our long-term goal is to clean and recertify around 400 UF6 containers per year. ‘The installation has been started up, and initially we will make further technical and operational improvements,’ says Niels Huijs, manager Operational Activities. ‘We will also finalize the commercial policy. We have every confidence that the UF6 installation for the cleaning and recertification of shipping cylinders will bring added value to our activities.’
The UF6 installation costs 11 million euros. This is quite a substantial investment.

Niels Huijs: ‘It is indeed a lot of money, more than we initially thought, but not unusual when compared to other capital expenditures. Building nuclear installations is an expensive proposition. It is high-tech, difficult and time-consuming work that must satisfy the strictest safety standards. In addition, UF6 is a complex compound that holds chemical as well as nuclear risks, for which solutions have to be found. And that takes time.’

Does Belgoprocess need such a commercial activity to keep the books balanced?

Niels Huijs: ‘The nuclear market is an atypical market. For Belgoprocess, safety rather than profit maximization is paramount. The strict safety standards and the shrinking Belgian waste volumes keep increasing our costs. By developing commercial operations on the site, we can spread part of the costs over several parties. It’s a win-win situation. We can charge our Belgian customers (which include the public sector) less, and we help foreign companies by making it unnecessary for them to invest in such an installation. The more so since several of our installations are underutilized. The cost is virtually the same whether we have to start up an installation for one tonne of our own waste, or for one tonne of our own waste and one tonne of foreign waste. With the foreign waste we can increase the efficiency of our installations and at the same time pass on part of the cost. In the commercial activities, Belgoprocess focuses on optimization rather than on maximization.’
Are there more commercial contracts in the pipeline?

Niels Huijs: ‘Commercial activities will always be subordinate to our role as public service provider. Since we have intensified our focus on the remediation of our own sites and the disposal of historical waste batches, we are not really looking for new major international projects. Apart from providing a service, focus lies on attracting more waste for our CILVA incinerator and/or on developing new incineration technologies such as plasma (incinerator operating at very high incineration temperatures to yield a smaller and very stable end product).

But UF6 is a different story because it offers us a unique opportunity. We are operating in a market with a small number of players, while at the same time we expand our know-how in a specific field. Both these assets offer prospects of engaging in a recurrent activity for which the know-how is based here at the site.’

‘Even if a nuclear exit is decided, there is still the waste. That is why investing in knowledge is so important’

– Niels Huijs

And now you can market this know-how?

Niels Huijs: ‘It does not seem like a good idea to market our know-how in order that a UF6 installation is built somewhere else. We would undermine our own market position that way. But all the knowledge we gather may come in useful later on in our role as public service provider. Suppose the nuclear exit were to be effectively decided. You can phase out nuclear energy, but the waste still remains. To find sustainable solutions to this issue, we need to keep investing in research into waste processing and disposal. Belgoprocess has been doing so for 30 years now. For 30 years we have been building knowledge and experience to process radioactive waste safely. Commercial contracts help us because they enable us to further expand and validate our knowledge. Nuclear know-how and experience will remain very important in the future as well.’
Sterigenics:

A FORMIDABLE JOB
UNDER PRESSURE

Stefan Mol • 1st operator engineer
With the processing of broken cobalt-60 rods, Belgoprocess not only confirmed its expertise; it also played its role as a public service provider to perfection.

This was a tricky job from shipment to processing. ‘We needed all the knowledge and experience we had for this mission,’ says team leader Bert Corvers. ‘The different departments of Belgoprocess that were involved worked closely with Sterigenics, FANC and NIRAS. It was a most instructive experience.’

Processing the six damaged cobalt-60 rods was definitely not a routine kind of job. The rods came from Sterigenics, a company that sterilizes food by irradiation. The gamma radiation from cobalt-60 rods kills all the bacteria and microbes in food. Don’t worry, this is perfectly safe for human health, since the gamma radiation does not remain in the food. It’s like a CT scan in hospital. You are not radioactive after such a scan. Six of those cobalt rods were damaged and had been kept immersed in a water tank for 15 years. There was no radiation risk, but neither was it a sustainable way to store radioactive waste. Belgoprocess was therefore asked to take action, and so the cobalt rods were taken to Dessel for processing. It is Belgoprocess’s mission to process and safely store historical waste.
The actual processing of the cobalt rods took just a few days, whereas the preparations took months. Isn’t that unusual?

Bert Corvers: ‘It’s normal practice in our line of business. We painstakingly prepare every job. We leave nothing to chance. We were also dealing with exceptional material here. Prolonged exposure to such a cobalt rod would cause serious damage. The radiation level was also well above the authorized building limit. This means that the radiation can generate a higher dose for the employees. Since internal safety is our top priority, we first had to take measures to ensure that our operators would not be exposed to excessive radiation. As this type of waste exceeded our operating limit, we had to justify and request an extension of our operating permit. We also had to develop new techniques and tools that had to be cold-tested first. During such a cold test, we stage the situation with a dummy canister without radioactive material, and perform all actions as if we were processing the real canisters. In that way, everyone knew what was expected of them when it was time to work with the real cobalt canisters. That kind of preparation takes time, but the better prepared you are, the safer the situation is.’

How were the rods safely transported to the site?

Bert Corvers: ‘That was the first challenge. You just asked about the long preparation, but the preparation and authorization of this transport was done in record time. The special shipping container was the property of an Argentine firm and was only available for a short time. So we really had to get moving, especially as a lot of work was involved: examining the material, planning the route, requesting additional permits, and all the other paperwork.’

Once at the site, how did you go about processing the material?

Bert Corvers: ‘As the shipping container was available for only a short time, transport had to take place within a certain period. Unfortunately we had not yet finished developing the processing tools. Although our people in the drawing office had done a tremendous amount of work, the nature of this waste called for a lot of new designs for processing tools. That is why after shipment we put the cobalt rods in controlled storage for about two months. When it came to the actual processing, we had to open the canisters by remote control. We were not physically present in the unit, but stood behind lead glass and used manipulators to do the work. This does not make handling any easier, especially as we had to watch out for po-

‘The radiation level was higher than the authorized building limit, but there was never any risk to the environment.’

– Bert Corvers
tential pressure build-up in the canisters. The water in the canisters could develop hydrogen gas. First we used a specially designed saw to allow a controlled release of pressure. An additional complication was that we had to prevent water leaking from the canisters. We opened the canisters very carefully and caught the water. The last canister, which contained the six cobalt rods, was filled with lead, then put into a V3 canister, and cemented. We then covered this with an absolute filter to allow release of pressure without letting contamination escape. This cemented barrel is now safely stored pending final disposal.

Would you do that kind of job again?

Bert Corvers: ‘Yes of course, such jobs form part of the mission and responsibility of Belgoprocess. Who else has the expertise to bring off that kind of challenge? Of course such assignments do not come along all that often. Luckily situations like that are quite rare. Should we come across that kind of waste again in the future, we will in any case be even better prepared thanks to this experience. We have learnt a lot from the intensive teamwork. Because of the complexity of this assignment, all the departments of Belgoprocess worked together closely. This exercise went very well and was inspiring for our subsequent day-to-day operations.’
Foundations for the Future

Investment programme:

Foundations for the Future
Tom Snyers • draughtsman • designer
A whole range of investments are planned at Belgoprocess over the next few years.

Upgrades, replacements, new installations, new buildings, more remediation works etc, all designed to improve safety and increase efficiency. ‘Belgoprocess has become an essential link in the run-up process to the disposal of radioactive waste,’ says contract manager René Goetschalckx. ‘We are making those investments as part of that responsibility.’

A dioxin filter in the CILVA plant, ultrafiltration for wastewater treatment, and additional safety measures are just a few examples of the investments that have been made at the site in recent years, and substantial funds will be earmarked in the next few years as well for the ongoing modernization. Before we discuss this in more detail with contract manager René Goetschalckx, however, an important qualification should be made. The investments at the Belgoprocess sites should be seen in conjunction with parent company NIRAS. NIRAS usually directs the investment projects, while Belgoprocess takes care of the technical aspects. ‘The planned investments at our sites are in fact integrated projects where NIRAS acts as initiating authority,’
Goetschalckx explains. ‘NIRAS issues the public contracts. Our responsibility lies with the actual works on our sites. Belgoprocess also has its own particular investments, mainly knowledge projects such as the UF6 installation (p. 46).’

**A great deal of work is in progress at site 1. What is going on exactly?**

*René Goetschalckx:* ‘The car park is being extended, and we are reinforcing the perimeter fences with razor wire. These are fairly small adjustments with nevertheless a significant impact on security. As soon as the necessary public contracts can be awarded, we will also start building a multifunctional security station. The design of this security station takes on board all the recommendations from the stress test. That means the building can withstand earthquakes, tornadoes and terrorist attacks. An internal perimeter will also be put up on site 1 to strictly separate the nuclear from the non-nuclear. This will make the protection of the nuclear zone far more efficient, while the operational cost for the non-nuclear zone will diminish substantially. This project involves an expenditure of 17 million euros. A similar amount has been earmarked for the construction of the ROC, a new incoming shipments and storage centre. Those works will start in 2016.’

**When we look at the investment cost of the different projects, building 5/22 stands out. As much as 40 million euros is earmarked for the dismantling of a fairly small building.**

*René Goetschalckx:* ‘Now that the dismantling of Eurochemic (p. 10) has been completed, building 5/22 is the main remediation project. Building 5/22 is in fact part of the former Eurochemic plant. This building – actually they are two buildings – holds tanks containing high-level liquid material from the previous reprocessing activities. Those storage tanks have in the meantime been emptied, but still contain radioactive residues.'
Those tanks have to be removed before we can dismantle and decontaminate the building. Technically it will be quite a challenge to set about the remediation process. After a great deal of study, it was decided to encase the building by putting up a second building over it and carry out the dismantling operations from the top. In this way, the remediation can be done in shielded conditions. In any case, it will be a high-tech undertaking.

A total of more than 150 million euros has been earmarked for investments over the coming years. Why such an intensive investment programme?

René Goetschalckx: ‘The reason for those large-scale investments is to be found in Belgoprocess’s ambition to do a professional job. We are investing in a modern incoming shipments and storage centre where the ordinary waste will be received on a daily basis. This centre will act as a hub where the waste is inspected and inventoried, and sent from there to the different installations for processing. The processing of historical waste batches, such as the Na/NaK waste, requires special installations that have yet to be built. Today we can clearly see how Belgoprocess is successfully disposing of the old waste batches. We are also investing in the renewal of our existing installations in order to improve our environmental performance even further. There are also investments under way to raise the general security of the site to a higher standard. The site is being more clearly subdivided, and a central security building will be put up shortly. These are fairly simple measures that represent a fairly considerable investment because of their scale.’

To sum up, Belgoprocess is an essential link in the sequence of activities involved in the process of radioactive waste disposal. The investments in the requisite infrastructure are necessary to keep pace with our mission and ambition. We also plan to build a new wastewater treatment plant, and we will upgrade the
supercompactor and the heat exchanger in the CILVA plant. We are actually catching up, because within a matter of a few years we have evolved from a fairly small-scale firm with a 200-strong workforce to an ambitious company with more than 300 staff and great social responsibility.

‘The infrastructure must keep pace with the ambition. That is why those investments are necessary.’

— René Goetschalckx

Those investments also generate local employment?

René Goetschalckx: ‘We have already hired extra people for the remediation assignments. So this certainly means more employment within our own organization. Once all the planned projects have been carried out, this will definitely open up opportunities for the whole area. This site will look totally different in 10 to 15 years’ time.’
‘Building 5/22 will be encased so that dismantling can be done from the top!’

René Goetschalckx
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## LIABILITIES (IN 1,000 EUR)

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<tr>
<td>Remuneration and social security</td>
<td>4,057</td>
<td>3,975</td>
<td>82</td>
<td>2.07</td>
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<tr>
<td>Other debts</td>
<td>300</td>
<td>0</td>
<td>300</td>
<td>0.00</td>
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<tr>
<td>Accruals</td>
<td>6,884</td>
<td>6,578</td>
<td>306</td>
<td>4.65</td>
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<tr>
<td><strong>TOTAL LIABILITIES</strong></td>
<td>58,760</td>
<td>71,314</td>
<td>-12,554</td>
<td>-17.60</td>
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<tr>
<td>INCOME STATEMENT (IN 1,000 EUR)</td>
<td>2014</td>
<td>2013</td>
<td>Δ EUR</td>
<td>Δ %</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>------</td>
<td>------</td>
<td>-------</td>
<td>-----</td>
</tr>
<tr>
<td>OPERATING INCOME</td>
<td>53,866</td>
<td>51,181</td>
<td>2,685</td>
<td>5.25</td>
</tr>
<tr>
<td>Turnover</td>
<td>59,378</td>
<td>46,693</td>
<td>12,684</td>
<td>27.17</td>
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<tr>
<td>Changes to order in progress</td>
<td>-6,886</td>
<td>1,683</td>
<td>-8,569</td>
<td>-509.04</td>
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<tr>
<td>Produced fixed assets</td>
<td>737</td>
<td>744</td>
<td>-7</td>
<td>-0.95</td>
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<tr>
<td>Other operating income</td>
<td>638</td>
<td>2,060</td>
<td>-1,423</td>
<td>-69.05</td>
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<tr>
<td>OPERATING CHARGES</td>
<td>53,807</td>
<td>50,428</td>
<td>3,379</td>
<td>6.70</td>
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<td>Commodities</td>
<td>6,278</td>
<td>7,668</td>
<td>-1,390</td>
<td>-18.13</td>
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<td>Purchases</td>
<td>6,338</td>
<td>7,511</td>
<td>-1,173</td>
<td>-15.61</td>
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<tr>
<td>Increase/decrease in stock</td>
<td>-60</td>
<td>158</td>
<td>-218</td>
<td>-138.02</td>
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<tr>
<td>Services and other goods</td>
<td>12,947</td>
<td>13,452</td>
<td>-505</td>
<td>-3.76</td>
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<td>Remuneration, social security and pensions</td>
<td>28,406</td>
<td>28,047</td>
<td>358</td>
<td>1.28</td>
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<td>Depreciation and amounts written off</td>
<td>3,888</td>
<td>522</td>
<td>3,365</td>
<td>644.16</td>
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<td>Depreciation of stock</td>
<td>206</td>
<td>-9</td>
<td>216</td>
<td>-2331.51</td>
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<td>Appropriation/use provisions</td>
<td>-439</td>
<td>-1,488</td>
<td>1,049</td>
<td>-70.49</td>
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<tr>
<td>Other operating costs</td>
<td>2,521</td>
<td>2,235</td>
<td>286</td>
<td>12.80</td>
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<tr>
<td>OPERATING PROFIT (-LOSS)</td>
<td>59</td>
<td>753</td>
<td>-693</td>
<td>-92.12</td>
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<tr>
<td>Financial result</td>
<td>216</td>
<td>310</td>
<td>-95</td>
<td>-30.58</td>
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<td>PROFIT ON ORDINARY OPERATIONS</td>
<td>275</td>
<td>1,063</td>
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<td>-74.15</td>
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<td>Extraordinary result</td>
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<td>42</td>
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<td>-93.96</td>
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<tr>
<td>PROFIT BEFORE TAXES</td>
<td>277</td>
<td>1,105</td>
<td>-828</td>
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<td>Withdrawal deferred taxes</td>
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<tr>
<td>Tax on result</td>
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<td>576</td>
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<td>-100.00</td>
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<td>PROFIT OF THE FINANCIAL YEAR</td>
<td>279</td>
<td>531</td>
<td>-251</td>
<td>-47.37</td>
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<td>Transfer to tax-free reserves</td>
<td>-750</td>
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<td>-750</td>
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<td>Withdrawal to tax-free reserve</td>
<td>3</td>
<td>3</td>
<td>0</td>
<td>0.00</td>
</tr>
<tr>
<td>PROFIT APPROPRIATION FOR THE YEAR</td>
<td>-468</td>
<td>534</td>
<td>-1001</td>
<td>-187.62</td>
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