

New challenges, new future



orano

Giving nuclear energy its full value

June 2018

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Giving nuclear energy its full value

The nuclear sector is an industry of the future. Its ability to supply powerful, safe, low carbon and competitive electricity places it in prime position at the heart of the energies of tomorrow. It is an energy needed to address global challenges: doubling power generation while halving the production of greenhouse gases.

Our unique expertise in the nuclear fuel cycle is recognized worldwide.

We offer our customers efficient products and services that suit their needs, from mining to dismantling, including conversion, enrichment, recycling, logistics, engineering, and nuclear medicine.

This expertise underpins the trust-based relationship that we have developed over time with our customers.

Our priority is value creation for our customers and for society as a whole. Nuclear energy is an energy resource that is cost-effective and creates jobs. It is a resource of the future, and our 16,000 employees are driven by the same conviction: giving nuclear energy its full value.

Overview

Orano transforms nuclear materials so that they can be used to support the development of society, first and foremost in the field of energy. The group offers high value-added products and services throughout the entire nuclear fuel cycle, from raw materials to waste treatment. Its activities contribute to the production of low carbon electricity.

16,000

EMPLOYEES

€30.8

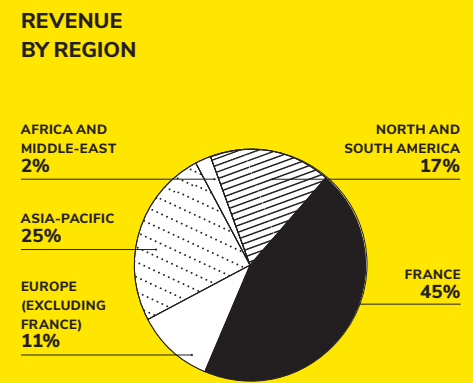
BILLION IN BACKLOG
OR 8 YEARS OF REVENUE

€3,926

MILLION
IN REVENUE

55

% OF REVENUE FROM
INTERNATIONAL MARKETS



Top 3

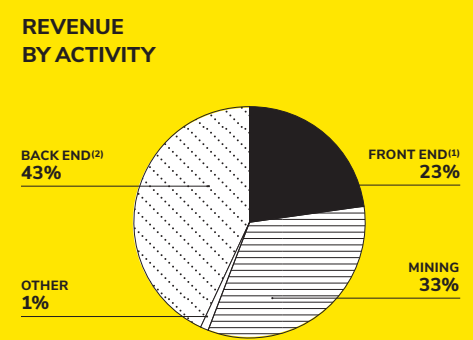
IN ITS 6 ACTIVITIES




Mining




Conversion and Enrichment







Used fuel recycling



Nuclear Logistics



Dismantling and Services



Engineering

(1) Conversion and Enrichment.
(2) Recycling, Logistics, Dismantling and Services, Engineering.

Board of Directors

as of May 3, 2018

The Board of Directors sets the direction for the company's activities and oversees its implementation. For the purposes of the company's management, it can take up any matter of interest to the smooth operation of the company. It applies controls and checks as it deems necessary. Lastly, the Board has specific powers such as the approval of the financial statements and the annual management report, as well as the appointment of the Chairman and the Chief Executive Officer.

Members of the Board of Directors

Philippe Varin

Chairman
of the Board of Directors

Philippe Knoche

Chief Executive Officer

**The French State,
represented by Bruno Vincent**
Director

Reynold Prévost de La Boutetière
Director appointed upon
a proposal by the French State

Marie-Astrid Ravon-Berenguer
Director appointed upon
a proposal by the French State

Marie-Solange Tissier

Director appointed upon
a proposal by the French State

François Jacq

Director appointed upon
a proposal by the French State

Maurice Gourdault-Montagne
Director appointed upon
a proposal by the French State

Claude Imauven
Independent Director

Patrick Pelata
Independent Director

Marie-Hélène Sartorius

Independent Director

Catherine Deiana

Director representing
the employees

Alexia Dravet

Director representing
the employees

The Board of Directors is supported by four specialized Committees

Strategy and Investment Committee

Chaired
by Philippe Varin

Audit and Ethics Committee

Chaired
by Marie-Hélène Sartorius

Compensation and Nominating Committee

Chaired
by Marie-Solange Tissier

End-of-Lifecycle Obligations Monitoring Committee

Chaired
by Claude Imauven

Message from Philippe Varin

Chairman of the Board of Directors

“Orano is at the core of the drive for responsible energy.”



The French government has decided to engage with citizens through a public debate on the energy transition, which started on March 19 and will end on June 30, 2018. An implementing decree will be adopted by the end of this year. It is an important debate on a matter of public interest. Faced with the global challenges of halving greenhouse gas (GHG) emissions by 2050 while doubling electricity generation to face growing demand, nuclear energy remains vital. It is not about nuclear energy against renewable energies, but rather nuclear energy and renewable energies. The French energy transition must be compatible with climate protection, security of supply and economic competitiveness.

Today, France can be proud of its nuclear industry, which produces 97% of our country's low carbon electricity. According to a recent study by the World Economic Forum, France ranks ninth among 114 countries in terms of low greenhouse gas emissions, and it tops the global ranking for the quality and security of its power system.

Its electricity is competitive with the industrial electricity price, 25% lower than the European average, and the lowest in Western Europe for households.

The nuclear industry is the third largest industrial sector in France today. An industry that employs 220,000 workers, that cannot be sent offshore, and is made up of 2,500 businesses across the country. An industry of excellence with jobs requiring twice the skill level above the average of the French industrial sector, and which forecasts 7,000 recruitments per year in technical jobs by 2020. Moreover, the nuclear industry's current contribution to the French trade balance is a favorable €6 billion per year.

Our industry can be proud of its achievements and its know-how. We must maintain these. Now refocused on the nuclear fuel cycle, Orano is at the heart of responsible energy. With digital technology, the nuclear sector can take on ambitious projects to attract young talent interested in industry 4.0 and further enhance our competitiveness and capacity for innovation.

Let us stop playing low carbon energies against one another: there is room for nuclear and renewable energies. My hope is that France becomes the champion of low carbon energy. If we can achieve that, we will have two winners: the climate and our country's industry.

Interview with Philippe Knoche
Chief Executive Officer

“The creation of Orano is complete. With a stronger financial structure and solid strategic partnerships, our group now has the means to achieve its ambition: to be the leading player in the production and recycling of nuclear materials, waste management and dismantling.”



Can you tell us about the group's major achievements?

Philippe Knoche: The year 2017 and the first months of 2018 were marked by the completion of the creation of Orano. After the State recapitalization to the tune of €2.5 billion, two large Japanese industrial groups, MHI and JNFL, invested €500 million in the company's capital at the end of February 2018. It is an expression of confidence that supports our strategic development in Asia. Orano's shareholding structure is now: 50% for the State and CEA, 40% for AREVA SA, and 5% each for JNFL and MHI.

We have also successfully rolled out our performance plan, the objective of which was to reduce

our costs by €500 million in 2018 compared to 2014. This is a significant factor for our group's competitiveness in a highly competitive market environment.

As of 2018, Orano has the technological, human and financial enablers to ensure its future development.

What do the results look like?

P. K.: We already have tangible results, despite a challenging market environment, as can be seen by the significant decline in market prices at the front end of the cycle. Our backlog, close to €31 billion, remains strong and represents almost

8 years of revenue. This confirms both the continued confidence achieved with EDF and with all our international customers, which account for more than 55% of our revenue.

The net cash flow comes out at –€1,066 million, marked by the end of our restructuring. We are, however, reaching the turning point of our guidance, thanks to our performance plan and sustained operating profit. The cash flow includes a one-off contribution of €812 million to end-of-lifecycle liabilities. The group's loss of –€252 million is similar to that of last year. The group's results are still significantly impacted by impairments.

What are the priority actions?

P. K.: To tackle the difficult environment for the main business lines and seize the opportunities available in the nuclear energy industry, Orano has started to roll out its strategic action plan, which hinges on three objectives:

- **To generate a net positive cash flow as of 2018**, thanks primarily to the group's managerial transformation and, secondly, to the launch of a new performance plan for the period 2018-2020. Called "Value 2020", it aims at achieving recurrent savings of €250 million on the company's net cash flow from operations by 2020. This ambitious objective calls for the development of digital

“For Orano, the nuclear energy industry is an industry of the future that will create jobs and effectively combat climate change.”

technology, which should lead to a significant streamlining of operations, and for actions by our corporate departments, technical innovation, control of our procurement and our real-estate costs, and the simplification of our ways of working.

- **To achieve a balanced development between production and services** with the objective of having one out of every two employees in services as of 2020. This will require the development of businesses and new sources of profitability. This development will affect mainly the businesses at the back end of the cycle: engineering, logistics, dismantling and waste management, as well as the ancillary services of the group's industrial platforms.

- Lastly, Orano's objective is to generate more than **30% of its revenue in Asia** as of 2020, in particular by leveraging solid partnerships in China, Japan and South Korea.

This new strategic action plan will allow us to seize the opportunities of the nuclear energy industry and, to do this, we need resources in specific business lines. After 700 hires in 2017, we will again recruit 700 people this year, and train many work-study employees. 2018 is year 1 of Orano.

Despite a situation of moderate decline in revenue, we aim at a resilient gross operating surplus (GOS) with a target margin between 20% and 23% in 2018 and between 22% and 25% by 2020, this time with a view to revenue growth.

Orano. Why a new name?

P. K.: We rebranded on January 23, 2018, to mark a new start after the numerous transformations we had undertaken: new organization, new corporate development plan, new strategic action plan, new labor agreement. Now that Orano has refocused on the nuclear fuel cycle, it has a new ambition: to be, over the next ten years, the leading player in the production and recycling of nuclear materials, waste management and dismantling. We are already among the Top 3 in the world in our main businesses; in France we operate the largest recycling plants in the world. We also have, under partnership,

the most advanced uranium enrichment technology, and we dismantle the most complex plants, such as in Marcoule.

Orano is today a clear and simple model geared to the culture of innovation, industrial excellence and value creation. We want to offer competitive products, technologies and services which meet the current and future needs of our customers. We need to have an agile, efficient and innovative group, driven by all employees.

How will you roll out this new model?

P. K.: We are ready to leverage new growth drivers and we will tackle challenges wherever they exist, starting with the Asian market, which is the most dynamic in our sector. This is the direction of our current discussions with China for the construction of a recycling facility. Other than China, the acquisition by Japanese partners of a stake in the group is a major driver of our strategy in Asia.

While our facilities are firmly rooted in our regions, our experts are mobile, and they are always on the lookout for new challenges. Our Engineering and Dismantling & Services operations are growth drivers, and we have geared ourselves to go out and conquer markets across the world.

This is also the case in the medical field with Orano Med. We are capable of extracting a billionth of a gram and purifying radioelements to be used for medical research against cancer. We are pursuing our research toward the development of new treatments in oncology.

Is industry 4.0 a reality at Orano?

P. K.: Innovation is everywhere in Orano, from mining technology to waste vitrification, not only to continuously improve our competitiveness and the security of our facilities but also to project ourselves into the future and invent the businesses of tomorrow. We use drones for mining research (detection of deposits), for dismantling (remote radiological measurements), and inside our plants (remote visual checks). Our operators use a number of virtual reality applications for training and the preparation of work sites. We already have virtual reality rooms, which

realistically reconstruct the environment of a nuclear facility or a site to be worked on. Over time, we want to create a true database in virtual and augmented reality of our work sites.

The connected plant – plant 4.0 – is already a reality. Thanks to intelligent sensors, connected objects, and data analysis, new technologies allow the streamlining of processes, such as for more predictive maintenance. We take a disruptive approach to operations relating to waste management and dismantling. Our objective is to find innovative solutions, think out of the box and speed up our innovation cycles, explore new models and profitable activities.

We also need to be at the cutting edge of technology and maintain our skills. This is why, in 2017, we inaugurated near Cherbourg the largest training center for nuclear energy professionals in France, and one of the largest in Europe. Dedicated to our employees, but above all to the entire

nuclear industry, 2,000 persons can be trained every year. This center exactly replicates all types of nuclear facilities: nuclear reactors, cycle plants, nuclear powered submarines. Its objective is to enhance skills and train the engineers, technicians and operators of tomorrow.

Innovation is our legacy and our future.

What is the future of nuclear?

P. K.: Our new Orano brand symbolizes our conviction: nuclear has a future; it is a low carbon, competitive energy that can provide powerful and safe electricity. Moreover, our industry creates jobs. Our group is positioned at the forefront of energy transition issues.

By 2040, more fuel will be required to supply power plants, whose capacity will increase by 25%, solutions will need to be developed to recycle

“Starting in 2018, we want to generate a positive net cash flow. This requires an ambitious performance plan, Value 2020, as well as the continued transformation of our group.”

used fuel from reactors, which will double, and lastly, almost 150 reactors will have to be dismantled.

We will also be, with renewable energies, at the forefront of the transformation of energy into carbon-free electricity to support changing needs. We have also industrialized the recycling of nuclear fuel, the cornerstone of a carbon-free and responsible energy mix.

Today, we are the only ones who can recycle 96% of the used fuel, and 1 light bulb out of 10 in France is powered with this recycled nuclear fuel. Thanks to this technology, and depending on market conditions, 25% of natural uranium resources can be saved. Orano has what it takes to succeed in nuclear energy and make it successful.

Executive Committee

as of March 31, 2018

The Executive Committee sets the direction and ensures the coherent implementation of decisions under the leadership of the Chief Executive Officer. It supports the Chief Executive Officer in leading the company and in the implementation of the strategy and overall policy as determined by the Board of Directors.

■ **Philippe Knoche**
Chief Executive Officer

■ **Jacques Peythieu**
Mining BU

■ **Antoine Troesch**
Chemistry – Enrichment BU

■ **Pascal Aubret**
Recycling BU

■ **Alain Vandercruyssen**
Dismantling and Services BU

■ **Frédéric de Agostini**
Logistics BU

■ **Patrick Jacq**
Projects BU

■ **Guillaume Dureau**
Customers, Strategy, Innovation and R&D

■ **Stéphane Lhopiteau**
Finance and Legal

■ **François Nogué**
Human Resources, Communications, Property and the Work Environment

■ **Patrick Champalaune**
Performance

■ Permanent members

■ **Dominique Guilloteau**
Safety & Health, Security and the Environment

■ **Jean-Michel Romary**
Dismantling and Waste Contracting Department

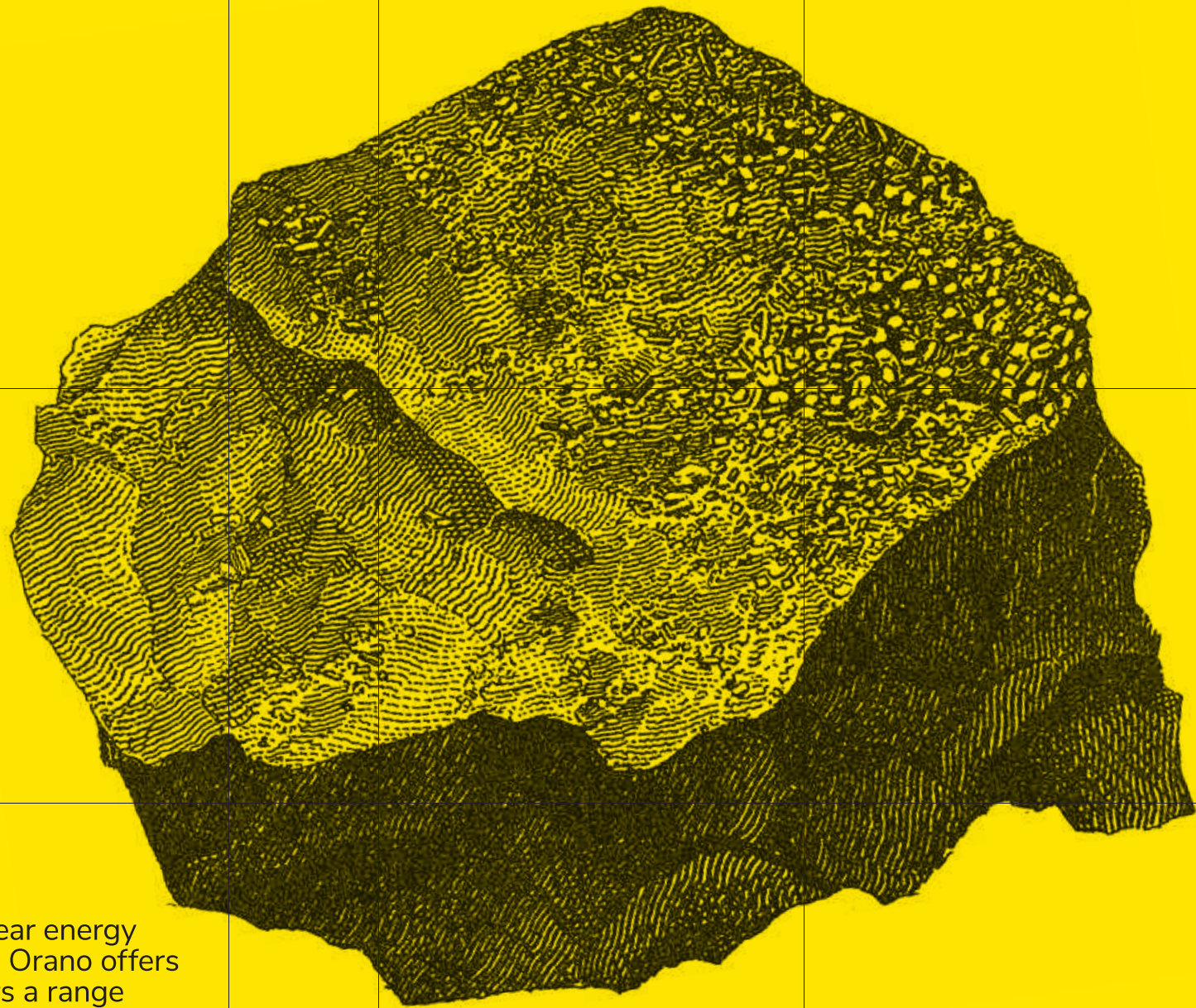
■ **Olivier Thoumyre**
Internal Audit

■ **Florence Ascher**
Compliance

■ **Jean-Michel Chereau**
Protection

Energy & expertise

To give nuclear energy its full value, Orano offers its customers a range of integrated products and services ensuring that they benefit from Orano's unique expertise and mastery of the nuclear fuel cycle.



With mines in Canada, Kazakhstan and Niger, Orano is one of the leading global producers of uranium, thanks to competitive production costs and highly innovative and environmentally friendly extraction techniques. The diversity of its resources and 20 years of reserves guarantees its customers long-term access to uranium.

3,560
employees

3rd-

largest global producer of uranium

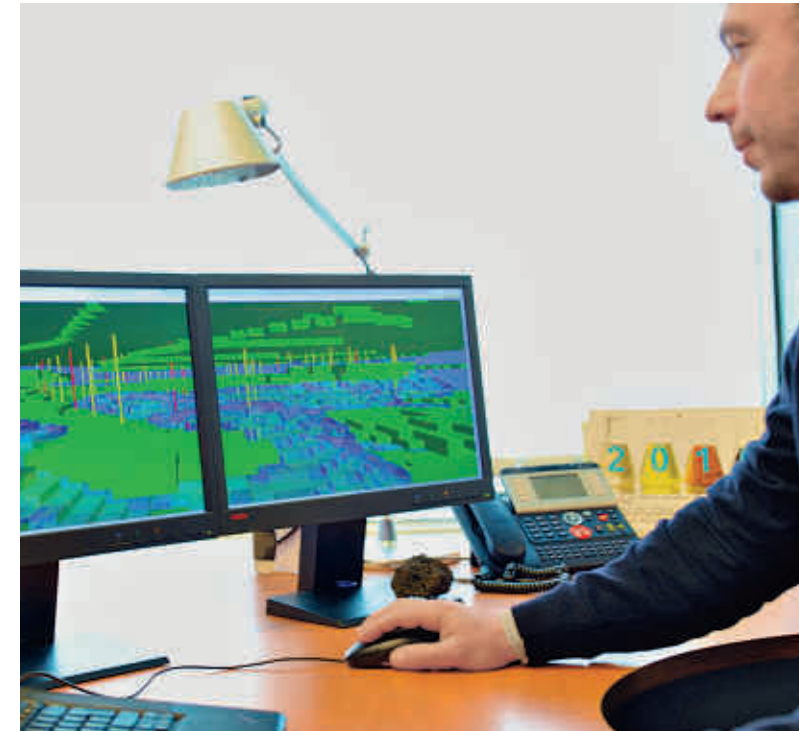
10,531
TONS OF URANIUM PRODUCED IN 2017

AREAS OF EXPERTISE

- Exploration
- Development
- Production
- Rehabilitation



Mining



Did you know?

Machine Learning
The use of intelligent learning algorithms helps to analyze data from treatment processes and identify weaknesses, thus contributing to optimizing their operation. –

The connected mine

Innovation and digital transformation are at the heart of Orano's mining activity to create value, maintain the profitability of operations, better control the environmental impact, and develop unprecedented extraction methods. They cover all phases of mining from exploration to rehabilitation, including the modernization of workstations, reliability of processes, optimization of resources and industrial processes, predictive maintenance and site rehabilitation.

3D modeling
Used during ISR⁽¹⁾ extraction, HYTEC is a simulator that contributes to modeling the development of a deposit right up to its environmental rehabilitation. It is used to simulate the acidification of the deposit, dissolution and transportation of uranium within two layers of watertight floors, and thus forecast uranium recovery.
Connected mining equipment
The objective of processing the data from sensors positioned on trucks is to improve the productivity of the mining cycle

and the application of predictive equipment maintenance.
Drones
Drones lend themselves to numerous applications, such as photogrammetry to obtain a topographical survey for estimating ore volumes. Drones can also be embedded with radiometric probes for conducting geophysical exploration campaigns.

(1) In-Situ Recovery.

Uranium conversion



URANIUM CHEMISTRY

- Conversion
- Defluorination
- Denitration

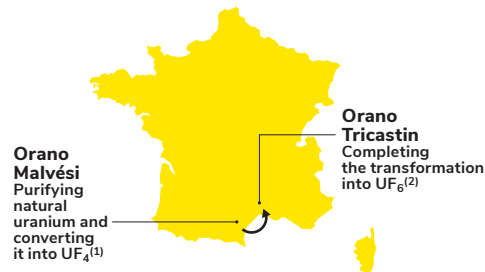
Equipped with an integrated industrial platform, which is unique in the world, Orano is the world leader in uranium conversion. After the extraction of natural ore, conversion is a key step in the cycle to supply to utilities with fuel that suits the needs of their nuclear reactors.

CONVERSION

Largest in the world

FRANCE

2 completely renewed conversion sites



(1) Uranium tetrafluoride. (2) Uranium hexafluoride.

ANNUAL PRODUCTION CAPACITY OF UF₆

15,000 tons

SHARE OF GLOBAL PRODUCTION

25%

The new facilities at the Malvési site have been fully operational since June 2016. On the Tricastin nuclear platform, the new uranium conversion plant, Comurhex II, will be commissioned at the end of 2018. It takes over from the original plant, Comurhex I, which stopped production in December 2017. With Comurhex II, Orano has the only renewed industrial conversion equipment in the world, with the highest standards of safety and the latest technological innovations, thus ensuring

continued supply to customers over the long term. These new facilities contribute to reducing the environmental footprint for the use of chemical reagents, and the reduction of greenhouse gas emissions. Between 2004 and 2018, Orano will have reduced GHG emissions from its conversion activity by 85%. This technological feat is the result of Orano's decision in 2006 to significantly invest and establish its conversion platforms as true global benchmarks.

Did you know?

The purification performance of Orano's conversion process is such that it allows for the processing of any type of uranium ore regardless of its source and extraction technique. –

Facilities at the cutting edge of innovation



Using the uranium hexafluoride (UF₆) obtained from the conversion process, the enrichment plant produces enriched uranium that meets the specific needs of reactors. The new enrichment platform, Georges-Besse II, offers better guarantees in terms of competitiveness, energy savings, technical reliability, and the reduction of environmental impact.

PRODUCTION CAPACITY

7.5 million SWU⁽¹⁾ per year

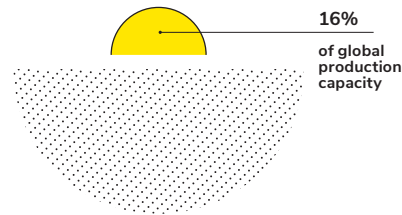
(1) Separative work unit.



60

CUSTOMERS AND PARTNERS

3RD-LARGEST IN THE WORLD



Industrial yield above 99%

Recognized as the largest enrichment complex in Europe, Georges-Besse II reached its full production capacity at the end of 2016 with 7.5 million SWU⁽¹⁾. Its support facility, called RECII, which receives and checks materials and packaging at the start and the end of the processes, completed its ramp-up in mid-2017. The industrial equipment operated by Orano is fitted with the latest generations of centrifuges commissioned anywhere in the world. Due to its module-based flexible operation, it can enrich 14 different uranium contents simultaneously with precision.

The Georges-Besse II plant is authorized to enrich natural uranium, reprocessed uranium and depleted uranium. It meets the highest standards of safety (reinforced seismic resistance, materials containment), coupled with exceptional industrial performance and a reduced environmental footprint. The centrifuge technology reduces energy consumption by 98% and water consumption by 100% compared to the gaseous diffusion technology previously used.

Did you know?

The uranium enriched by Georges-Besse II, exclusively for civilian use, can power the equivalent of 70 reactors and supply carbon-free electricity to around 90 million households, i.e. the equivalent of France, Germany and the United Kingdom. –

(1) Separative work unit.



GEORGES-BESSE II

The largest enrichment complex in Europe

Uranium enrichment

Used fuel recycling



The leading industrial platform for recycling the world's used fuel, the site at La Hague is renowned for the efficiency of its facilities. Besides the volumes processed, it is a model of technology and a place of continuous innovation.

96%

of recyclable materials in used nuclear fuel

25% of natural uranium saved

Volume of waste **cut by 5** and **radiotoxicity by 10**

THE LA HAGUE PLANT REPRESENTS:

more than 34,000 tons of used fuel processed

50 years of industrial advancement

The largest employer in Cotentin

- 4,000 Orano jobs
- 1,000 sub-contracting jobs

IN 2017

983

TONS OF USED FUEL PROCESSED

808

CONTAINERS OF VITRIFIED WASTE PRODUCED

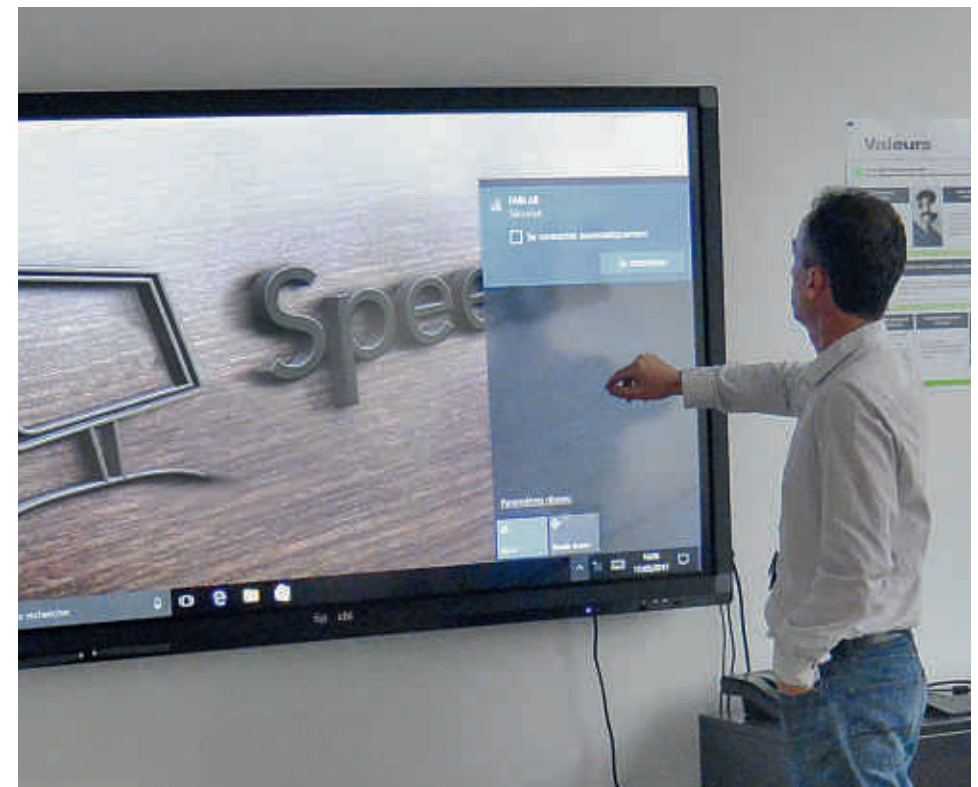
Created to develop the spirit of initiative by promoting the "Do it yourself" approach, FabLab is a place where it is possible to implement innovative solutions, from prototyping to the final product. It is equipped with 3D printers, software (video editing, modeling, etc.) and connected objects, and it

brings together all the skills necessary for their use. In this innovative space, all employees are invited to participate in an actual project, develop an idea, or share their know-how. Developments relate to many fields: multimedia, electronics, IT, mechanics, communication, and more.

Did you know?

The new Opéra application facilitates the work and mobility of operators in the control room by placing all operating procedures at their disposal on a tablet. Equipped with streamlined ergonomics and interface, Opéra also reduces updating time. It will soon be expanded to all facilities at La Hague. —

At La Hague, a FabLab dedicated to innovation



Located in Marcoule (France), Melox is the world's leading MOX fuel fabrication facility⁽¹⁾. Made of a mixture of depleted uranium powder and plutonium powder, MOX is the second most used nuclear fuel in the world.

WORLDWIDE

Since 1972, **45** nuclear reactors have generated electricity using MOX fuel



(1) Mixed OXide Fuel.

700

EMPLOYEES

300

JOBS CREATED IN SUBCONTRACTING

MOX fuel supplies **10%** of nuclear electricity in France

A MOX fuel assembly can power a city of **100,000 inhabitants** for one year

1 gram of plutonium generates more power than a ton of oil



MOX fuel fabrication



Melox, a plant geared to 4.0

In order to remain technologically ahead of its markets and make its facilities “the model plants of tomorrow”, Orano places innovation at the core of its industrial processes. 3D modeling, virtual reality, robotics, data analysis, etc.: new technologies are a firm part of the Melox plant. They help prepare servicing operations, train operators and ensure proper risk management. A digitized process is also used to monitor each step of the fabrication process in real time, providing an overall view of the plant.

It is coupled with a performance monitoring tool through a number of indicators accessible to everyone. In the control rooms, the management of operations has also improved with the acquisition of touch-screen tablets—enhancing ergonomics and responsiveness. A FabLab will be set up in 2018. As at La Hague, this laboratory will give employees and subcontractors the opportunity to test their innovative solutions.

Did you know?

An enhanced command station, operational in 2019, will enable employees to manage a crisis in a totally independent manner for 48 hours, regardless of the scale of an extreme natural hazard. It will reinforce the security and control system at the Melox site. –

Dry storage of nuclear materials



Orano is a world leader in the supply of dry storage systems for used fuel and of high value-added services for its customers. The group also offers a comprehensive range of innovative solutions in nuclear waste logistics.

400+

PATENTS REGISTERED WORLDWIDE

MORE THAN

1,500

LOADED DRY STORAGE SYSTEMS WORLDWIDE

Nearly **50,000** used fuel assemblies stored
150 packaging models from 1 to 130 tons

UNITED STATES

no. 1

The NUHOMS® horizontal dry storage system for used fuel is the leader in the American market

With improved capacity and efficiency, the NUHOMS® MATRIX offers Orano's utility customers the ability to store their used fuel safely, effectively and competitively. Its unique configuration – horizontal on two levels and modular – reduces by 45% the storage pad space occupied by the storage storage modules. The MATRIX design can contain casks of different sizes and store high burn-up and rapid cooling used fuel, which is an advantage for

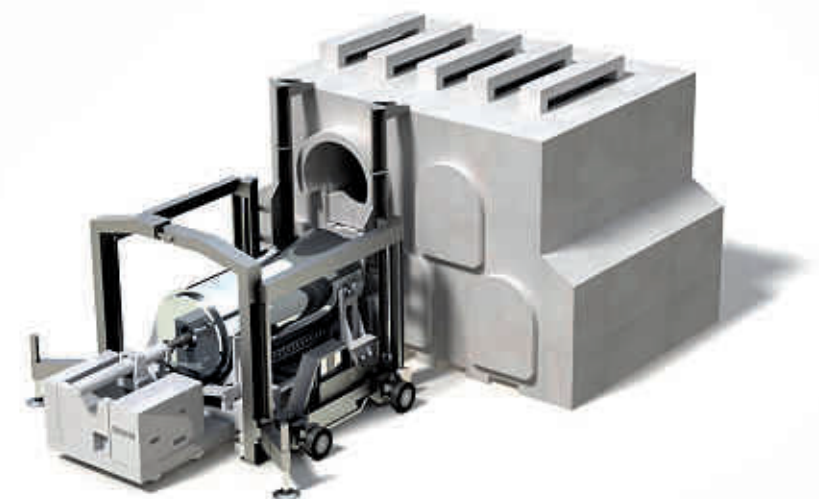
nuclear reactors when shut down. New systems also allow full inspection of the cask without the need to remove it from the module. This addresses the issue of monitoring the aging of the casks. MATRIX advances the design features of the NUHOMS® storage system, now available for more than 20 years: dry storage of used fuel in a horizontal position, in a robust reinforced concrete structure and of reduced height.



Did you know?

TN® MW, a Triple purpose cask
By designing the TN® MW (for "multi waste"), its latest creation, Orano undertakes to provide its customers with a robust solution for on-site storage, terminal waste storage (sludge, resins, metals, etc.) and transportation from nuclear sites under operation or dismantling to a processing site, or directly to a terminal storage site. This versatility does away with intermediate waste repackaging operations, ensuring safety and cost control. –

MATRIX, for even more innovative storage solutions



Nuclear transportation



Orano is the only nuclear player to offer a comprehensive transportation service, from uranium mines to recycling plants, anywhere in the world, with the highest level of security and safety control. The group is a leader in the design and manufacture of transportation casks and in the organization and supervision of road, sea, rail or air transport. Its high value-added services, such as risk management, technical assistance, regulatory monitoring and training are its differentiating factor.

WORLD

no. 1

for the transportation of nuclear materials

5,000 transportation operations per year

Over 55 years of experience

Unprecedented expertise in fuel transportation

Close to 10,000 transportation operations of used fuel to Orano's recycling plant in La Hague

FLEET

50

SPECIAL WAGONS FOR THE TRANSPORTATION OF HEAVY CASKS

200

INDUSTRIAL VEHICLES

The first core fuel assemblies for the Taishan EPR in China reached the power plant in April 2017, after traveling more than 2 months from France. An exceptional operation which demonstrates Orano's know-how, both in the design of casks and in the control of complex transportation operations. To transport close to 250 fuel elements of natural enriched uranium between the

Framatome site in Romans, France, and that of Taishan, in China, Orano's teams have, since 2013, designed and manufactured or adapted a dedicated fleet of 125 casks and 32 flat-racks, containers for their carriage by sea. These casks meet special specifications for the EPR reactor, including additional shock absorption capacities. They had to obtain transportation permits both

in France and in China, and will allow the shipment of subsequent fuel recharges to Taishan. The transportation by road and sea, monitored in real time by Orano's teams, called for a complex logistics organization with exceptional guarantees of security and reliability.

Taishan EPR fuel delivered safely



Did you know?

In China, the delivery of fuel assemblies from the port of Daya Bay to the EPR site involved more than 32 trucks. –

The French leader in nuclear dismantling, Orano leverages the experience acquired by its teams over the last decades at complex and varied sites, including CEA, EDF and the group's own facilities. This unique expertise includes the management of all phases of dismantling, from the design of the project and the technologies to be deployed to its implementation on the ground and packaging of the resulting waste.

PROVEN EXPERIENCE

160

DISMANTLING AND DECOMMISSIONING PROJECTS UNDERTAKEN WORLDWIDE OVER 40 YEARS, INCLUDING PROJECTS IN

64

NUCLEAR REACTORS

AREAS OF EXPERTISE

- . **Design**, supervision and execution of projects
- . **Expertise** in clean-up and dismantling of all types of nuclear facilities
- . **Servicing operations** in highly radioactive environments

A MARKET ESTIMATED AT MORE THAN €200 BILLION OVER THE COMING DECADES

5

strategic countries

- France
- Germany
- United States
- United Kingdom
- Japan

More than 200

reactors worldwide will be shut down by 2030



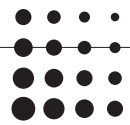
Expertise in high-level activity

Orano has developed specific technologies to facilitate complex servicing and dismantling operations in the highest radioactive areas, called "high-level activity", guaranteeing the best conditions of safety and security. This was evidenced by the operations conducted for CEA on evaporators at the shutdown of the UP1 recycling plant in Marcoule (Gard département), for which an intrusive investigation arm fitted with different heads provided a wide spectrum

of measurements and samples prior to future dismantling operations. At its site in La Hague, Orano is managing one of the largest dismantling work sites in the world. Leading-edge laser-cutting equipment was used to dismantle an evaporator. The teams used the remote-controlled arm fitted with a customized cutting head and multiple cameras. Agile, it is well-suited to the narrowest of spaces and can operate in environments with high-level radiation and high temperatures.

Did you know?

"Dismantling" does not mean "destroying a building." Most facilities being dismantled are located on sites which contain facilities still in operation. Buildings that are decontaminated after dismantling a work site can take on a new industrial activity, instead of being destroyed. —



Dismantling

Services to operators



2,000

EMPLOYEES SPECIALIZED IN OPERATIONS SUPPORT FOR NUCLEAR SITES

80

TECHNICIANS SPECIALIZED IN THE MAINTENANCE OF SENSITIVE EQUIPMENT IN NUCLEAR POWER PLANTS

A DIVERSIFIED RANGE OF SERVICES

- **Integrated services** for work site assistance and industrial logistics
- **Specialized maintenance** of sensitive equipment
- **Radiological security** of workers and the environment
- **Training** in nuclear professions

NO. 1 IN TRAINING IN NUCLEAR PROFESSIONS IN FRANCE

OVER

30,000

TRAINEES PER YEAR

700

CUSTOMERS LISTED

Orano supports French nuclear operators in the daily operation of their facilities. Its wide range of integrated and customized services, in the areas of industrial logistics, specialized maintenance of sensitive equipment, radiological security of operators or training, positions Orano as an experienced partner to help ensure the security and safety of nuclear operations at every stage of a facility's lifecycle.

Innovation is Orano's primary factor of differentiation and expertise for its customers. The objective is to develop technical solutions to improve the safety/security of operations and productivity at work sites and to offer new services. Dozens of products at the cutting edge of modern technologies are developed, tested and implemented in nuclear areas. The innovations leverage robotics, virtual reality and information technology, as well as chemistry, nuclear instrumentation, the mechanics, etc. **A polar crane driving simulator⁽¹⁾** is fitted in a cabin fully equipped with screens, with a sound system to reproduce the environment

of a reactor together with semi-artificial intelligence. It allows polar crane drivers, whether junior or experienced, to maintain their technical skills at the highest level. **MANUELA™⁽²⁾ is a portable radiological and topographical mapping device that operates in real time.** After a scan of the environment to be digitized, the measurements are positioned in space and instantaneously transcribed in 3D onto a control screen. The data can be used in post-processing to prepare virtual reality servicing scenarios of operators and limit their exposure to radioactive sources. They can also prepare servicing operations inside the recreated environment with

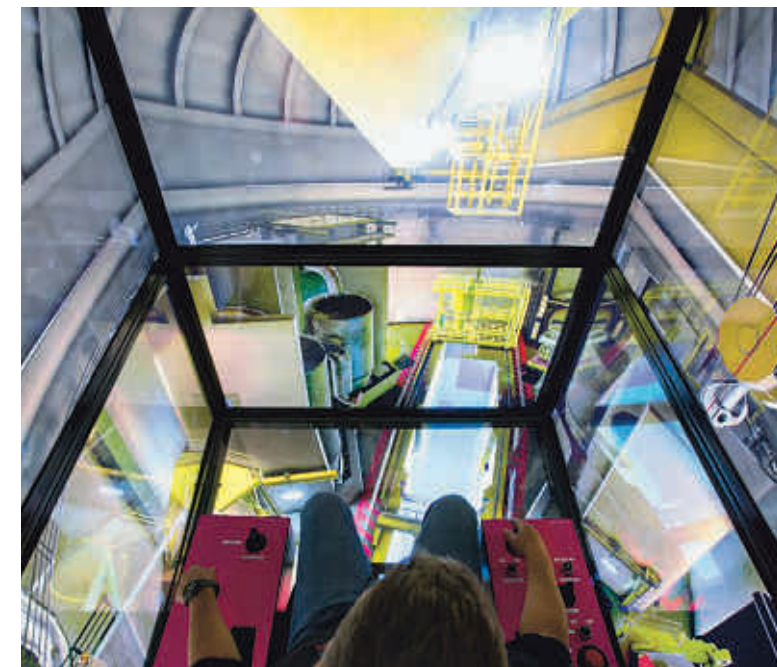
a virtual reality module and the associated 3D glasses. **Our employees are mobile and connected.** The digitization of processes, equipment and logistics is at the heart of the productivity of work sites: use of tablets, geolocation of containers with RFID chips, digitization of building plans, etc. Thanks to a special program accessible with 3D glasses, operators can also prepare a sensitive servicing operation, alone or in a team, via a virtual scenario before going into the field.

(1) Detachable and rotating crane under the dome of the power plant's main building enables heavy loads to be moved inside the reactor.
(2) Mobile apparatus for nuclear expertise and localization assistance.

Innovation to boost performance

Did you know?

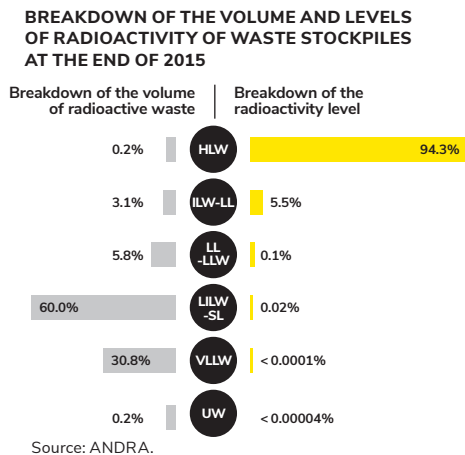
More than 40 patents held by Orano DS Numerous technical developments designed in Orano's laboratories are covered by patents aimed at protecting the disruptive and differentiating know-how of the Dismantling and Services business. –



Orano has leading-edge expertise in the management of all types of radioactive waste – from low- to average- or high-level radioactivity, solid or liquid, conventional or exotic, with or pending a disposal route. This know-how ensures that Orano's customers benefit from end-to-end management of their problems and the development of technical and technological solutions that take into account their constraints.

MORE THAN
€100 billion
 IS THE INDUSTRY'S ESTIMATE OF THE LOW LEVEL RADIOACTIVE WASTE DECONTAMINATION MARKET ALONE BY 2030

Nearly
91%
 of French nuclear waste already has a sustainable storage solution



Waste management

INTEGRATED SOLUTIONS

- Retrieving legacy waste
- Sorting and packaging
- Shipping to appropriate disposal routes
- Opening dedicated disposal routes, obtaining specific waste



Customized operations

Since 2015, at the CEA site in Saclay, greater Paris area, Orano DS has been conducting a project relating to the radiological cleanliness of an old plant, ADEC⁽¹⁾, which has been shut down since 2011. The building, covering 2,300 m², contains radioactive waste stored in solid and liquid forms. The team's task is to conduct an inventory of all waste, catalog it and then ensure it is properly

packaged to be sent to ANDRA's storage facilities. Thanks to its integrated services, Orano was able to propose customized solutions to CEA, which met their expectations in terms of project management, facilities maintenance and radiological characterization.

(1) Decontamination, analysis and packaging plant.

Did you know?

Quantity does not equate to intensity. The bulk of the volume of radioactive waste does not account for the major part of radioactivity: 94.3% of radioactivity is from only 0.2% of so-called high-level waste. Its management requires special expertise available in only a few companies in the world, Orano being one of them. –

Engineering



SERVICING SECTORS

- Nuclear: mining, chemical and uranium enrichment, recycling, waste management and dismantling
- Non-fuel nuclear
- Non-nuclear applications

PROVEN EXPERTISE

40

years of feedback from users on the design and execution of complex projects, and on support to the operation of large work sites

1,452

EMPLOYEES WORLDWIDE

A recognized expert in the nuclear fuel engineering cycle, Orano services its own facilities and those of external customers. Services range from engineering for operator support to full engineering, procurement, construction and management (EPCM) assignments. Recognized as a leading partner due to the excellence and the effectiveness of its solutions, the group reinvents more competitive, agile and innovative engineering with a strong international dimension.

A CULTURE OF ON-TIME DELIVERY

OTD⁽¹⁾ > 90%

DURING THE LAST 4 YEARS

(1) On-time delivery.

Engineering teams are made up of 145 experts (30% of the group's experts), including six Level III experts – the highest level. The skills of these experts cover more than 27 engineering functions, in particular the fuel cycle. Their expertise is recognized not only by the group, but also by its customers and external stakeholders, and internationally. They have an in-depth

knowledge of their line of work, and a cross-functional view of the different engineering projects and of the group's challenges. More generally, the engineering operation leverages the skills of its 1,452 employees. Project managers, functional heads, engineers and technicians, support functions: all put their experience at the service of projects and customers.

Expanding workforce

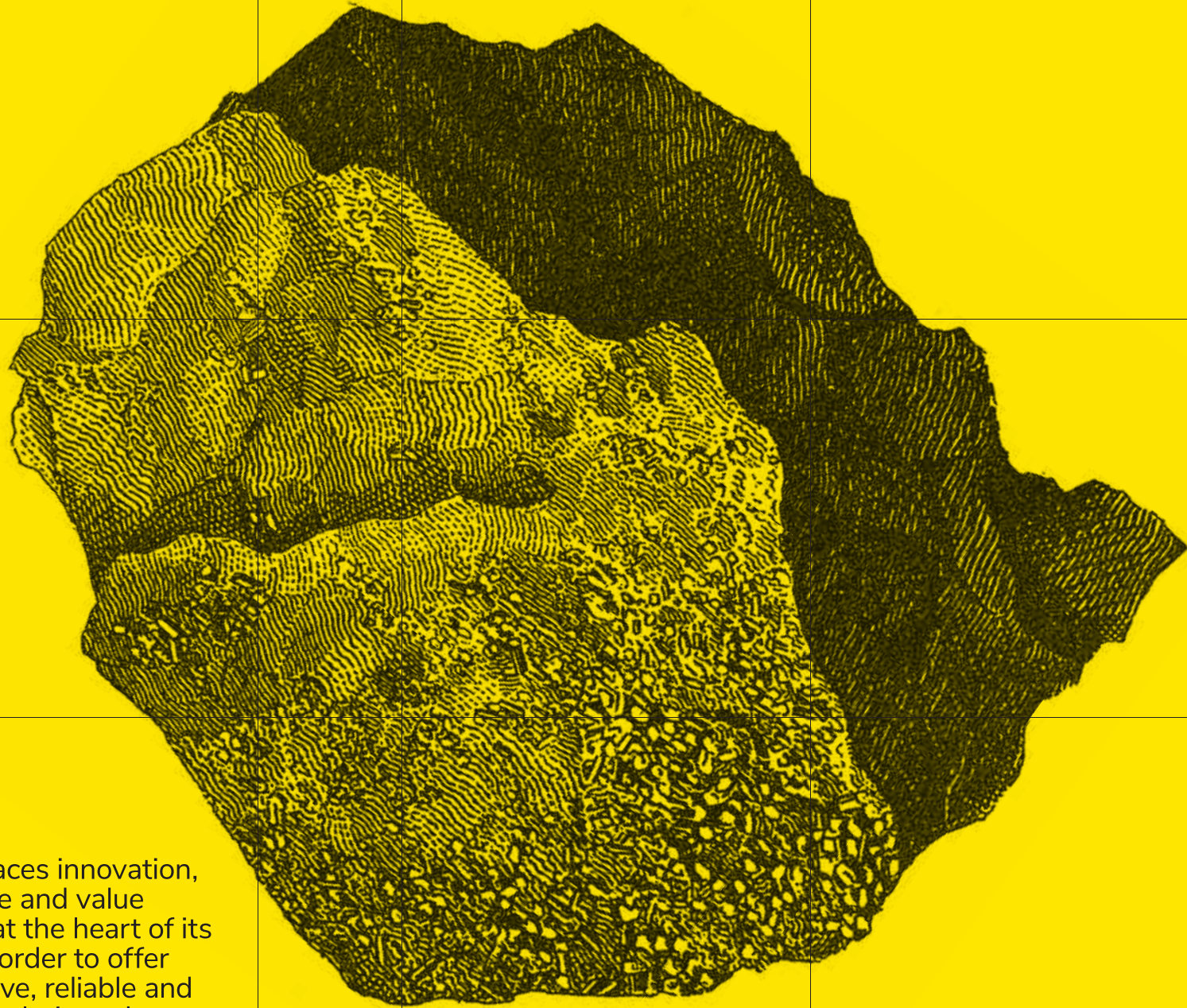


Did you know?

As a result of the numerous engineering projects under way, in 2018, Orano is recruiting for 220 permanent jobs in France across the 3 sites of Équeurdreville, Saint-Quentin-en-Yvelines and Bagnols-sur-Cèze. These recruitments concern junior as well as experienced profiles, 2/3 of which for engineering and design functions and 1/3 for project management. –

Nuclear and value-added

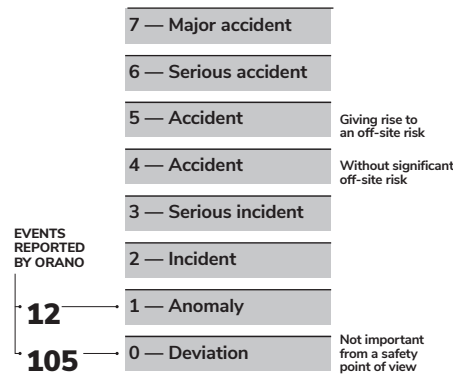
Orano places innovation, excellence and value creation at the heart of its model in order to offer competitive, reliable and efficient solutions that meet the expectations of its customers.



Safety and environment

Every day, Orano acts to ensure the highest level of safety at its facilities with an uncompromising level of focus. This commitment drives the implementation of a continuous improvement approach and the sharing of a common culture of risk prevention and environmental protection.

REPORTING OF EVENTS RATED ON THE INES SCALE



SAFETY OF FACILITIES

42

INTERNAL INSPECTIONS CARRIED OUT IN 2017

92

RECOMMENDATIONS ISSUED AND AS MANY ACTION PLANS IMPLEMENTED BY THE ENTITIES IN 2017

INVESTMENTS IN SAFETY
Over €300 million per year

ENERGY CONSUMPTION
12,026,198 MWh

Based on the feedback and the outcome of the 2012-2016 policy, the Safety-environment policy for the period 2017-2020 sets out 12 priority actions in regards to the safety of the facilities, the safety of operations and the performance of management:

- the mainstreaming of security and environmental issues in investment programs;
- the continued compliance of risk management systems;
- the prevention and limitation of the environmental impact of industrial activities;

- the execution of dismantling programs and the rehabilitation of sites;
- the strict application of standards and operating procedures;
- the enhanced control of subcontracting activities, in particular of monitoring;
- the development of REX⁽¹⁾, particularly in the implementation of the related improvement plans and upon return to design;
- the production of security documents in line with regulatory changes;

- stronger presence of operational managers in the field;
- the development of the Independent Security Sector at every level of the organization;
- the practice of self-assessment of safety skills and of the culture of safety;
- the increased recourse to practices to increase reliability of servicing (PRS).

(1) Processes aimed at organizing feedback.

A new strong commitment

Did you know?

Orano created FINA, an intervention force that can provide support to a crisis-affected site both in terms of human and material resources. —



Focusing on operational excellence, Orano has created a business dynamic focused on agility, value-add and efficiency. Its Excellence system aims at achieving the best performance in terms of safety, security, quality, costs and lead-times to better service customers.

OPERATIONAL EXCELLENCE

100%

OF ORANO EMPLOYEES: PRODUCTION, ENGINEERING, SERVICES, SALES AND MARKETING, SUPPORT FUNCTIONS

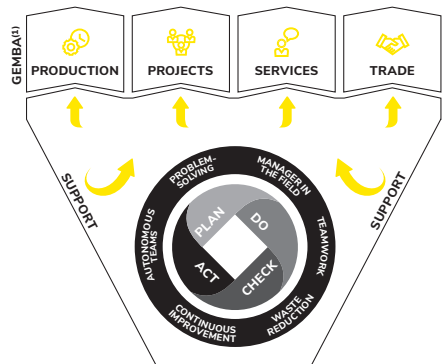
10

PROJECTS IN MODEL AREAS UNDER IMPLEMENTATION IN THE GROUP AT END JUNE 2018

THE BUILDING BLOCKS OF OPERATIONAL EXCELLENCE

- . Visual management
- . Visual management of performance and the management of standards
- . Standards
- . 5S method
- . Management cycle
- . Management in the field
- . Waste reduction
- . Problem solving (A3)

A CUSTOMER-CENTRIC EXCELLENCE SYSTEM



(1) Place where value-added takes



Model areas: showcases of excellence

Set up over a geographical and activity region, a model area aims at applying the Excellence System comprehensively and at the right level, with the support of dedicated teams. This area, where a maximum of one hundred employees work, aims at significantly improving the KPI chosen for security, quality, cost and lead-time by

applying the building blocks of operational excellence. The model area shows that the comprehensive and rigorous application of operational excellence standards yields concrete results. As a true showcase of excellence, it allows entities to share their best practices.

Did you know?

Thanks to the application of the 5S method, the model area of the *Hall de Recherche de Beaumont* has increased its storage capacity and thus, indirectly, its revenue. –

Operational excellence

Performance culture

At Orano, performance has taken the form of a managerial and cultural revolution to boost competitiveness and customer satisfaction.

PERFORMANCE INDICATORS

- . Safety, Security
- . Customers
- . Quality
- . Costs
- . Leadtimes
- . Skills

VALUE 2020 TARGETS

€250

million of recurrent savings on the net cash flow by 2020



Value 2020

Besides its strategic pillars – operational excellence, innovation and value creation – Orano is pursuing its efforts for the reduction of operating costs and for the efficiency of productive investments as part of a new performance program covering the period 2018-2020. It hinges on several drivers:

- the reduction of operating expenses achieved through procurement efforts, digital transformation and wage cost control;

- efficiency of investments and end-of-lifecycle expenditure achieved through the digitization of the group's systems, while focusing on forward-looking investments for performance improvement or the development of new activities.

The Value 2020 plan aims at achieving recurrent savings of €250 million on Orano's net cash flow from operations by 2020 and generating a positive cash flow as of 2018.

Did you know?

Go simply!

The aim of this program is to implement concrete ideas for simplification at all levels of the company. Thanks to the dedication of employees to the simplification of the organization, the number of procedures and documents has been cut in half since 2016. –

Value 2020: generating a positive cash flow starting in 2018



Innovation is one of the priorities of the group in order to:

- continuously improve competitiveness and guarantee the safety of the nuclear fuel cycle;
- develop new products and services that meet the needs of customers, as closely as possible;
- explore today the growth opportunities of tomorrow.

467

EXPERTS IN 12 AREAS,
INCLUDING 14 LEVEL III EXPERTS

COLLABORATION
WITH MORE THAN

70

STARTUPS

Open innovation is an essential component for Orano

RESEARCH AND DEVELOPMENT

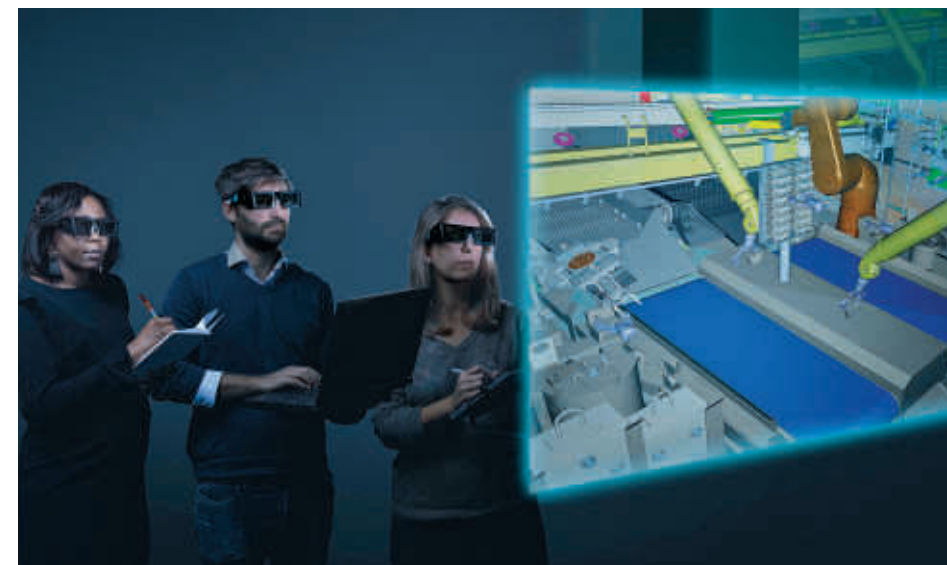
€87 million

invested in 2017

THE 3 PILLARS OF THE INNOVATION STRATEGY

- Innovation at the heart of people
- Industrial innovation
- Business innovation

Innovation



Taking a fresh look at the world

To better meet the expectations of its customers, anticipate their needs and develop new offers while stepping up its innovation cycles, Orano relies on collective intelligence and on open innovation initiatives. The group promotes sharing with, opening up to and collaboration with innovative and inspiring ecosystems. Employees are engaged on a daily basis to accelerate the transformation of the group and make the organization more agile. In particular, they leverage efficient technological solutions developed by other players, diversify the forms of intelligence and also link up

with research organizations and industrialists in other areas of activity. Orano collaborates, among others, with SMEs and startups recognized for their agility and their innovative capacity. The "Orano Innovation PME" platform connects the group with a network of more than 1,000 French startups and SMEs, an initiative which results in a number of joint developments.

Did you know?

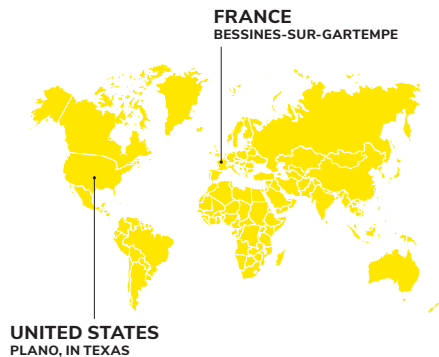
The 10 key technologies to accelerate industrial innovation at Orano:

- Intelligent sensors
- IIOT and secure communication networks
- Instrumentation, characterization, nuclear instrumentation
- Modeling and simulation
- Additive manufacturing
- Data analysis and artificial intelligence
- Immersive technologies including virtual reality
- Robots, drones, autonomous and tele-operated robotics
- Mobile and collaborative devices, including augmented reality
- Advanced materials and coatings –

Nuclear medicine

For several years, Orano Med has brought together biotechnologies and nuclear technology to develop new therapies to fight cancer. The group's subsidiary has developed a process for the production of lead-212 (^{212}Pb), a rare radioactive isotope, used in targeted alpha therapy, an innovative approach of nuclear medicine, whereby cancer cells can be targeted and destroyed while limiting the impact on the surrounding healthy cells.

TWO LEAD-212 PRODUCTION SITES



MORE THAN

20

patients have received lead-212 treatments during 2 clinical trials

10%

FORECAST OF ANNUAL GROWTH OF THE NUCLEAR MEDICINE MARKET OVER THE NEXT 10 YEARS

\$100 billion

THE MARKET FOR CANCER TREATMENT IN ORANO'S TARGET MARKET

Orano Med and its partner RadioMedix have obtained the FDA's⁽¹⁾ authorization in the United States to start the Phase I clinical trial of AlphaMedix™, a treatment under development for patients suffering from neuroendocrine tumors (NETs) which express specific receptors called "somatostatin receptors." AlphaMedix™ is composed of a somatostatin (SST) analogue radiolabeled with lead-212, whereby the tumor cells can be targeted and destroyed.

The objective of Phase I is to determine the safety, bio-distribution, and preliminary effectiveness of AlphaMedix™ in adult patients with NETs by gradually increasing the treatment doses. AlphaMedix™ will be entirely produced by the Orano Med teams located in Plano, Texas, and then sent to a clinical center in Houston specializing in this type of tumor.

(1) Food and Drug Administration.



A new clinical trial launched in 2018

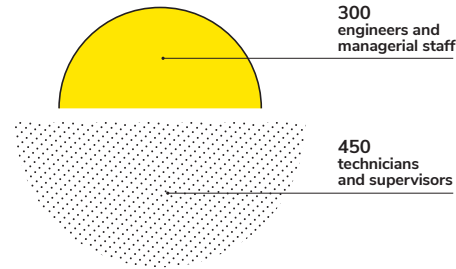


Did you know?

The treatments developed by Orano Med will only contain a few nanograms of lead-212! It is the natural emission of very energetic alpha particles during the isotope decay that will allow it to be effective at such low quantities. —

Orano offers high technology solutions through its employees' know-how. Hence, the maintenance and development of skills is a high priority for the group. Protecting skills, identifying those that Orano will need tomorrow, stepping up training, attracting new talent, young or experienced, adapting the workforce to current and future needs, are some of the key issues for the group in terms of human resources.

**RECRUITMENT
750 NEW HIRES UNDER
PERMANENT CONTRACT IN 2017**



ATTRACTING NEW TALENT

- Special relations with **26 targeted engineering schools** and **universities**, **22 Bac/DUT schools** and **8 American universities**
- **20 partnerships** outside of Paris
- **26 student forums**
- A network of **60 junior and experienced ambassadors**

MORE THAN

250

SPECIALIZED TRAINING MODULES
IN NUCLEAR FUEL

15

LEADING TECHNICAL COURSES

Human resources



Did you know?

An in-depth assessment of Orano's 16 leading business lines was carried out to identify key skills and the related needs. –

A skills management policy

In order to have access to a pool of skills relevant to the group's technical skills and identify the objectives in terms of training, internal mobility and recruitment, Orano launched a skills initiative in 2016. It is built around a network of Key Discipline Leaders and the involvement of managers in the field. Beyond this assessment, it is Orano's objective to promote career paths through a wide range of training courses. The group's different trade

schools in each employment pool look after the protection and enhancement of technical skills. Some fifteen "technical skills courses", from Mining to Dismantling, have been set up to provide better visibility of the skills associated with Orano's core activities and the paths to acquiring these skills and progressing within these activities. Some of these courses lead to qualifications or diplomas. At the same time, recruitments are made to

support activities under development. After 750 recruitments in 2017, of which 50% are experienced recruits, 700 people will be recruited in 2018 and as many work-study employees will be trained. The employer brand was rolled out in order to attract young talent to a promising sector, promoting carbon-free and competitive energy, driven by digital technology, innovation and industry 4.0.

Security and health

Orano's strengths are its people. It is the group's priority to protect their security and their health, promote their personal development and the participation of each and every one in a continuous improvement initiative.

LOST-TIME OCCUPATIONAL INJURY RATE
(EXCLUDING COMMUTING ACCIDENTS) IN 2017

2.4

or **10-times** less than the average of the industry

AVERAGE EMPLOYEE DOSE FROM RADIATION EXPOSURE OVER 12 CONSECUTIVE MONTHS

0.8 mSv

AVERAGE SUBCONTRACTOR DOSE FROM RADIATION EXPOSURE OVER 12 CONSECUTIVE MONTHS

0.5 mSv

with the regulatory limit at **20 mSv**

SEVERITY RATE OF WORKPLACE ACCIDENTS IN 2017

0.07

Renewed for the period 2017-2020, Orano's health & security and radio-protection policy aims at continuously improving the group's results and strengthening preventive actions. It covers three main areas:

- **prevention**, through risk assessment and control as well as the adoption of a culture of anticipation at all levels of the company;
- **control over operations** in compliance with the rules, rigorously and with shared vigilance. This requires the commitment, assumption of responsibility and involvement of each employee;
- **feedback and sharing of experience**, which consists

of dedicating the necessary time to understanding facts, in order to share at the group level and in a transparent manner the lessons drawn from the use of common tools and assessments. As regards occupational health, Orano also undertakes proactive actions through the medical monitoring of occupational hazards, quality of working life and the prevention of occupational stress, the quality of occupational health and consideration of the specific issues associated with expatriation in the medical monitoring of employees.

Did you know?


Orano's occupational health service leverages the skills of a multi-disciplinary team: occupational physicians, nurses, psychologists, ergonomists and assistants. It aims at providing effective, preventive occupational healthcare that meets the needs of all employees. –

A culture of shared vigilance



Learn more at
www.orano.group



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