

# EPC FOCUS

News on  
concentrated  
energy

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## CENTRAL THEME

**125 years  
of human  
adventure**... p.4-9



### CHALLENGES / Storage

EPC-UK and EPC Spain still closer to their customers with two new warehouses... **p.12**



### TECHNICAL / Career

Feedback on the partnership with Novacarb to integrate blasting into a turnkey digital solution... **p.13**



### PROJECT / Heritage

Close-up on EPC Demolition's sterling work at the Hôtel de la Marine... **p.18-19**



**EPC**  
GROUPE



## EDITORIAL / 2018

One hundred and twenty five years. From the Industrial to the Big Data Revolution, our Groupe has witnessed everything that has happened over the 20th century.

Our latest solutions include digital blasting software, GPS-guided multiblend trucks and electronic detonators, and we still offer dynamite, detonating cords and slow detonating fuses, proof that the traditional way has improved over time and is still alive today. Over the years, the Groupe has evolved and expanded throughout the world on all continents offering further services (drilling, mining, optimisation engineering, etc.) as well as products. This has been an industrial adventure, but above all a human one driven by continued development.

We started with a French chemist and an Italian shot-firer, now we have Guinean drillers and Chilean IT engineers. Perhaps it is this clever mix of tradition and innovation, respect of customs and a quest for progress that makes our business different.

One Hundred and Twenty Five years = five generations. These five generations of EPC men and women (sometimes from the same family, as shown in the "Special Feature" of this issue) have contributed to this development including managing within the decline of the European mining industry; supporting the African mining boom in the 2000s; being involved in major infrastructure projects in France and abroad; participated in the digging of tunnels; development of cities and deployment of high-speed trains. So, from the 'Belle Epoque' to the era of networking, these five generations have, at our Groupe's modest level, contributed to the development of the world while making EPC a genuine point of reference.

From the founding of the company to the present day, in the good times and in the bad, the personnel of the EPC Groupe have worked hard to build the foundations of its future.

That is what we wanted to illustrate in this Anniversary issue.

**Olivier Obst**  
Chairman and CEO



**EPC**  
**GROUPE**

## CONTENTS



## CENTRAL THEME

## 125th birthday

1893 - 2018: 125 years of passion and exacting standards that make EPC a key player in explosives worldwide... [p.4-9](#)

## BUSINESS

## Service

In Niger, two trucks turn EPC from an explosive supplier to a solution provider... [p.15](#)

## US activity

Feedback on the US ambitions of EPC Groupe and the resources committed to achieving them... [p.16](#)

## PROJECT

## Tunnel

On 26 March, works on our first gallery began in Peru... [p.10](#)

## Heritage

The cleaning of the Hôtel de la Marine, an operation revealing the level of excellence of EPC Démolition... [p.18-19](#)

## SOCIETY

## Sponsorship

EPC Groupe partnering a 4L Trophy crew ... [p.16](#)

## PORTRAIT

## Rokhaya Sall Mbaye

Meeting with the Managing Director of Mineex, our new Senegalese ambassador... [p.11](#)

## CHALLENGES

## Storage

Strengthening geographical proximity with EPC-UK and EPC Spain... [p.12](#)

## Health

Everyone rallying for well-being in England... [p.14](#)

## Safety

Formalising studies on process safety to reinforce the prevention of major accidents... [p.17](#)

## BUSINESS

## Diversification

Using its safety know-how to the benefit of other customers ... [p.10](#)

## TECHNICAL

## Expertir®

All the computing power of our blasting software to the service of underground... [p.11](#)

## Career

With its customer and partner Novacarb, EPC anticipates the digital quarry ... [p.13](#)

## Drilling

A drill equipped with GPS inevitably leads to better results ... [p.13](#)

## Challenge

First equipment and technology contract in Vietnam: deadlines met... [p.17](#)



## NEWS

EPC, leading manufacturer of civil explosives certified ISO 22301 ... [p.12](#)

EPC wins a big contract in Saudi Arabia with MCS ... [p.14](#)

EPC Nordex becomes EPC Canada ... [p.15](#)

EPC keeps its promises in New Caledonia ... [p.19](#)

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**Front cover:** on the left, an operator at the Boceda plant in Italy (early 20th century) faces his counterpart from Bramble Island (2017)

**Back cover:** Topographic survey by drone. The Digital Quarry by EPC

## CENTRAL THEME



## EPC, a 125-year-old hyperactive!

In keeping with the dynamic fostered by its founder, EPC has constantly developed its business. Without ever denying its fundamentals, the explosives and chemicals company has gone through the years with innovations and challenges, always guided by a constant concern for safety and efficiency. Although not exhaustive, a small reminder is needed.

### EXPLOSIVES, THE CORE BUSINESS

Founded in 1893 after Eugène-Jean Barbier had fully grasped the potential of the explosive, EPC, like its competitors, began by making dynamite. Made of nitroglycerin, the manufacture

### Generations of explosives in search of efficiency and safety

and use of the product proved to be extremely dangerous due to being highly sensitive. A first stage was reached in 1910 with the development of frost-proof dynamites, so insensitive to cold. This innovation was the result of research and development present from the company's birth. "EPC has created a lot of formulas to improve the existing solution, often prepared to design unprecedented solutions to adapt to the specific constraints of customers", recalls Laurent Casagrande, Deputy CEO EPC France Explosives Division. In 1957, EPC filed the ANFO patent which builds on the massive production of ammonium nitrate in agriculture. A safer product, the explosive is based on sensitisation with the separate active principles (fuel or oil). A new stage would be reached in 1974 with explosive gels and then in 1988 with packaged emulsions, definitively pointing EPC Groupe towards bulked



→ Explosive charge in 1930.

### Chemistry and autonomy

Not wanting to be dependent on prices and the supply of the chemical products required for the manufacture of explosives, EPC decided very early on to manufacture its own raw materials. This was the case in 1907 with ammonium nitrate or glycerine in 1918. Investments were absorbed to the maximum extent possible, with the sale of surplus or derivatives, like the ice produced from the treatment of sodium bisulphate with artificial cold, sold on to the seaside resort near the Villafranca plant in Italy. Over the years, a fine chemistry business would be set up, particularly in England, with customised products for the pharmaceutical, oil and agrochemicals industries etc.

explosives production. For Thierry Rousse, HSE Director, "the gradual disappearance of explosive raw materials has made great improvement in safety possible." A phenomenon accentuated by increasingly safe manufacturing processes, where automation significantly limits contact with hazardous materials. Particularly, but not only, within our production plants.

### ON-SITE MANUFACTURE

In the very early 90s, EPC developed its own mobile emulsion production units (abbreviated to MEMUs).

### R&D from the beginnings ensuring greater independence

Safety again makes another leap forward as products are no longer sensitised in the factory but directly on site, when they are pumped into the blast hole MEMUs underwent a number of evolutions, in the form of the MORSE in 1997 and more recently the even more compact SPUR. Evolutions seemingly representative of small revolutions, especially in the world of

underground blasting, which had gradually become used to the packaged technology. "In 125 years, we have reduced the risk by 300, emulsion being 300 times less sensitive to shocks than dynamite" sums up Laurent.

**FROM MINING TO BLASTING**

EPC started its activities in the middle of the golden age of coal, installing its first plants as close as possible to the large coal basins in France, Spain, Italy, England, Russia, etc. In the 50s, the company expanded its horizons with mining companies mining precious metals and ores of all kinds. EPC also made a name for itself very early on in infrastructure works. In 1896, it began supplying large quantities of explosives for the excavation of the Simplon tunnel. This collaboration marked the start of a long partnership with major civil engineering players who would shape our territory by developing motorways and railways. The 60s would see EPC focused on surface activities, notably with increased activity in both quarries and open cast mines. The new millennium, however, marked a return to its roots with the development of deep underground mining, this sector perfectly illustrating the changing requirements of customers vis-à-vis explosives: they are the miners and we are the blasters. And even the drillers and blasters, an area of expertise that would make all the difference.

**The mine, our history and our future, with the development of underground**

**FAR MORE THAN THE EXPLOSIVE**

"A large-volume product, the explosive can no longer rely on its intrinsic quality alone to set itself apart. If we want to grow, we must above all provide our customers with solutions." This is the EPC conviction summarised by Bertrand Pougny. Whether mining operators, quarry operators, civil engineers, cement manufacturers etc., our customers

want to focus on their core business, with solutions allowing them to optimise costs and production. This is why EPC, at the end of the 90s decided to integrate its

drilling service with blasting, two interdependent activities of the same value chain which require perfect mastering. "We developed the know-how and the tools to grow from an explosives producer to a global solution provider says Bertrand. Mixing trucks, technical support, training, Expertir software, collection and processing of multiple digitised data... over the last thirty years, the Groupe's activity has positioned itself around this evidence: the effectiveness of an explosive resides both in its implementation and in the explosive itself. •



**When EPC played in defence**

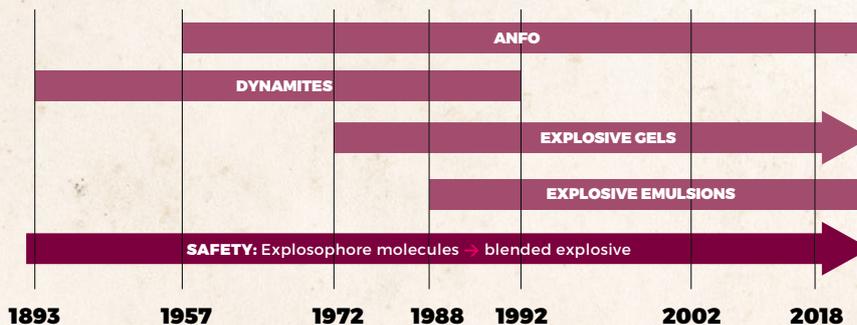
Our company has known several periods during which it produced military explosives. The first two coincided with the two World Wars. But it was notably at the end of the 70s, with our Italian subsidiary, that our defence activity was strongest. Acquired by EPC Groupe in 1967, SEI became an official Italian defence supplier in 1980. With advanced laboratories and equipment, the company even obtained the highest certification of the US Navy. The United States, Italy, Japan, India, Australia, Sweden, United Kingdom, France... the world's armed forces entrusted it with contracts, becoming a cutting-edge company in the production of underwater defence systems. Wanting to focus exclusively on the civil explosives market, EPC Italy decided to sell its defence branch in 2010. •



→ Packaging and weighing.

**Demolition, construction activity**

During its first 100 years, EPC would participate in many spectacular projects including the controlled demolition of buildings in urban areas. An activity that saw the creation of the Demolition division in 2002, with highly sophisticated know-how going far beyond explosives implementation.



→ Evolution of product families over time

# The founder's fundamentals

Founder of the EPC Groupe, Eugène-Jean Barbier, held the reins of the company until his death in 1944. It is difficult to sum up more than half a century of presidency in such a short article. Nonetheless, here are some personality traits and anecdotes to discover more about the person it all started with.



Born in 1851 near Saint-Étienne, fifth child of a (very) large family of twenty-one. Eugène-Jean Barbier left school at 15 to support his family. In 1878, when he was a representative of the Centre Midi coal mines for Northern Italy, he met two civil engineers, who explained to him the point at which dynamite would speed up the excavation of the Simplon tunnel. For Eugène-Jean Barbier, it was the turning point: understanding its formidable potential, his future would be in this new explosive.

### BRAVE AND INTUITIVE

Eugène-Jean Barbier may only have had his studies certificate in his pocket, but he was a self-taught genius with a keen nose for business. Armed with determination alone, he offered his services to a certain Alfred Nobel. This daring move would earn him a role in the construction of an explosives factory for the Swedish inventor before deciding to strike out on his own. An initial experience, in which the keywords: efficiency, safety and innovation, would guide him throughout his life. This would not prevent our young entrepreneur from feeding a formidable ambition combined with the true talent of a blagger. Buying a bankrupt factory in Great Oakley in 1905 is a perfect example. Spreading the word he was going to set up in the Indies thanks to his new British subsidiary, he caused panic with local competitors, who granted him access to the English market if he refrained from selling in the colonies!

### MARKETER BEFORE TIME

Surrounded by the best engineers and capable of immediately perceiving the potential of a discovery, Eugène-Jean Barbier filed patents by the dozens. He never hesitated to make large investments to produce

## 4 presidents in 125 years

- 1893: Eugène-Jean Barbier**
- 1944: Jacques Chatel**
- 1987: Paul de Brancion**
- 2014: Olivier Obst**

his own raw materials such as nitrated cottons, ammonium nitrate etc. He was also the first to set store by packaging and discounts to develop sales of his dynamites. As you might have guessed, the man was everywhere. Wanting to retain control, he delegated little. He visited all his factories and stayed put if there was something he didn't like! Two years after its creation, the company fell victim to industrial espionage. It was Barbier who

conducted and successfully completed the investigation! Feared yet loved, Eugène-Jean Barbier was

### Determination, ambition, passion and boldness in a single man

completely and entirely devoted to his business. •

## Unity in identity

In 1893, Eugène-Jean Barbier founded the SAEPC "Société Anonyme d'Explosifs et de Produits Chimiques". Very quickly, these three words become the cornerstone of our identity. They

break down according to the subsidiaries and countries (Franco-Hellénique d'Explosifs et de Produits Chimiques, Société Franco-Espagnole d'Explosifs et de Produits Chimiques



→ **Miner:** 1st logo of the brand, registered in 1891



→ **The salamander** appeared in 1996 which, for Paul de Brancion, "symbolises our ability to adapt, our long-term integration, our strength."



**EPC**  
GROUPE



→ From the 1897 World Exhibition to current trade shows, EPC Groupe is rewarded for its work.

etc.), until being abbreviated to three letters: EPC. More than an acronym, this name transcends borders and time, reflecting the unity of a group around the same vision of the business. EPC. Servicios Perú or EPC Canada are contemporary examples of this universal identity of the Groupe, meriting it the recognition of its peers on all five continents. •

125th BIRTHDAY



## BRAMBLE ISLAND, UNITED KINGDOM



→ The Three Sisters barge carries the explosives by sea (1916).



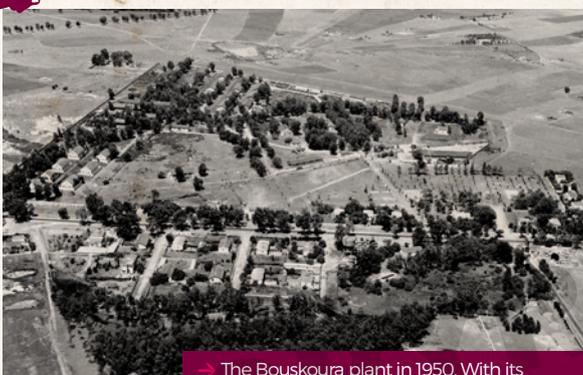
→ A railway system connecting the warehouses to the quay (1916).



→ The "power plant" with the acid hangar and the boiler unit (1917).



## BOUSKOURA, MOROCCO



→ The Bouskoura plant in 1950. With its imminent relocation, a page of our Moroccan history is turned.

# EPC, a well-established company

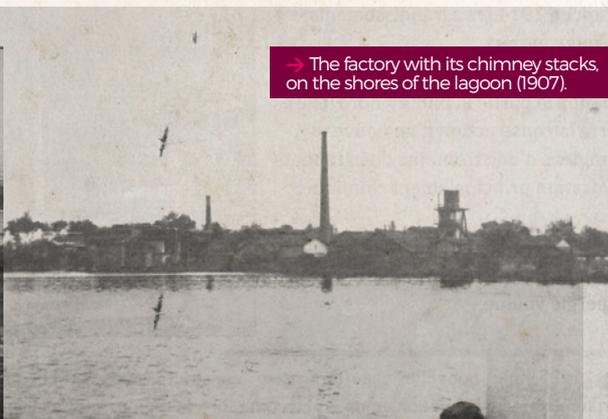
The presence of EPC Groupe throughout the world is not simply through the acquisition of other companies or the creation of partnerships. It is first and foremost based on the construction of production sites of strategic value to our development. Villafranca and Bocéda in Italy, Billy-Berclau in northern France, Chterovka in Russia, Alumbres in Spain, Ktipito in Greece... Many factories have marked the Groupe's history. Here are three of the most emblematic.



## SAINT-MARTIN-DE-CRAU, FRANCE



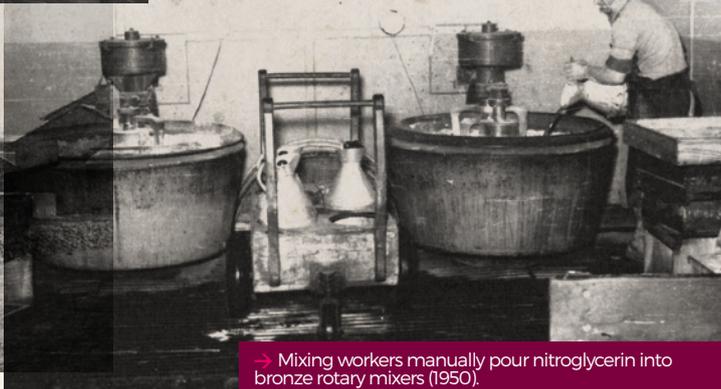
→ Nitration Acid Castle (1894).



→ The factory with its chimney stacks, on the shores of the lagoon (1907).



→ The working-class suburb of the dynamite district and its 110 or so residences (1915).



→ Mixing workers manually pour nitroglycerin into bronze rotary mixers (1950).

# A history of families

EPC's is a human adventure. Its fate has always been closely linked to that of hundreds of men and women from different backgrounds who share the same values, A mutual commitment between the company and its employees passed on through years and generations. Stories.



→ Crouching on the left, Roger Avis, son of Joseph and grandfather of Patrick and Denis, still working in his role today.

## EPC FRANCE: THE AVIS FAMILY

Avis is among the names that have long resonated in the history of the Saint-Martin-de-Crau site. No fewer than four generations have followed! It all began with the great-grandfather, Joseph, mason and plasterer. Highly committed, he served as Secretary General of the Arles local union. His son Roger, caretaker at the end of his career, perfectly illustrates the incredible community spirit that reigned over the working-class Dynamite district. Here, he met Rose, a wrapping worker from an Italian family with several members already working at the plant. Together they had a son, André, who joined EPC in 1959, on his return from the Algerian war. Alongside his elders, André learned several business skills and integrated all of them to the plant's maintenance services. He too was very involved in union life, and would finish his career in the store in 1992. His sons Patrick and Denis would follow in his footsteps at the end of the 70s and 80s, as did their children on a number of temporary assignments! Like the five generations of Avis, many families would actively contribute to this workers' journey, which is strongly linked to the history of the Saint-Martin-de-Crau plant.

## AREX: THE MATHEW FAMILY

Jemy Mathew's father worked for AREX for thirty years. In 2016, when moving to Ras Al Khaimah, Jemy learned that there was a vacancy for an accountant within the company. She applied for the position and would be hired in November of the same year. When asked what she liked about AREX, the answer sounds familiar: "the corporate culture at AREX is incredible. Feeling like a true member of a team, it's really motivational."



→ Jemy Mathew joined AREX in 2016 as an accountant. She filled the position initially held by her father in 1978!



→ In the foreground, Peter, followed by his son Richard and his nephew Daniel.

Strongly convinced that the sense of belonging she feels comes from her father, Jemy, who "had always seen AREX as a very strong community united." In her view, this explains in part why people choose to work there for as long as they do. She adds: "the company's values, the commitment of its employees. It supports them and their families even offering the opportunity of a career with AREX to their children."

## EPC-UK: THE NORMAN FAMILY

Now 62 years old, Peter Norman joined EPC in 1990 within the "multiblend" loading teams. His interest in the business was such that he never wanted or needed to look elsewhere. A loyalty to the company he most likely inherited from his father William, the first EPC employee of the family who worked for a long time

## Several generations of committed employees

in storage. Since then, a third generation set to work with Richard and Daniel, Peter's son and nephew respectively. Arriving in 2003 as apprentice driller, Richard immediately saw the career prospects of his new job. "I very quickly got involved. My growing interest in blasting and the creation of laser profiles led to me becoming the youngest mine blaster in the United Kingdom. I was twenty-one years old at that point!" explains Richard. Now supervising all operations in the Leicestershire region, he is more than a little proud of his career. A feeling shared by his cousin Daniel, electrical systems engineer within EPC Innovation since 2012. His career progression was also rapid: "I was able to finish my studies at the University of Derby and take various courses." Bolstered by his new skills, Daniel now manages entire projects and works currently with EPC Sweden on the development of a MEMU for up-hole applications. •

# International in the genes

Within EPC Groupe, history and geography are intrinsically linked. Shortly after its creation, the company already demonstrated ambitions which transcended French borders. A look-back with Bertrand Pougny over some key dates that have marked the EPC adventure across the world.

"Thanks to the daring and foresight of its founder Eugène-Jean Barbier, EPC was very soon characterised by its international vocation" recalls Bertrand. While the Société Anonyme d'Explosifs et Produits Chimiques was created in Paris on 18 April 1893, Italy was already home to the first factories at Cengio. Villafranca was to follow in 1893, along with Saint-Martin-de-Crau.

## A LANDMARK DEVELOPMENT

Faced with competition from well-established explosives manufacturers, the founder of EPC seized and created opportunities. Between 1893 and 1895, he founded three companies with manufacturing plants in Greece, Spain and Russia. Its presence abroad also involved plant acquisitions, as in 1903 in Boceda in Italy or in 1905 with the English company Explosives and Chemical Products Ltd. With its presence in Morocco initially, followed by extensive development in Africa in the sub-Saharan west, EPC had exceeded the limits of Europe by 1952. This would be followed by the Middle East and then, more

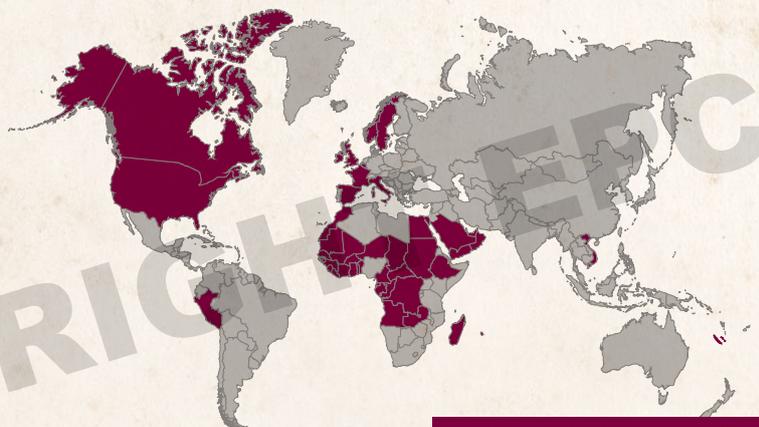
recently, the Americas, Asia and Oceania.

## CONSISTENCY AND COHERENCE, TWO INTERNATIONAL VISAS

The geographic development of the group has always been governed by the same requirement: to be as close as possible to its markets and its customers. In terms of their location and their needs. This wish, which is historically reflected by the repeated choice of installation rather than export, is the same that underpins our development strategy today:

## International: installation rather than export

target markets/projects where we can add value. Business acquisition, as in Canada, greenfield site, as in New Caledonia, partnership or joint venture, as in Peru or Ivory Coast etc., the resources are diverse and adapted to specificities of the target market. Whether financial, industrial or even government, our partners all provide a complementarity function crucial to the success of each site. Not a standard method, but rather a common thread with a relevance and coherence to the Groupe's DNA. •



→ EPC's worldwide presence after 125 years.

## Andalusia, the stage for our development

With the creation in December 1893 of the Société Franco-Espagnole d'Explosifs et Produits Chimiques, Spain was one of the the first countries to have witnessed the beginning of the EPC adventure. An adventure punctuated by a mining activity in Andalusia, with Serafina Ortega.

CEO of the family business Serafina Ortega, which has been part of EPC Groupe since 1997, Maria del Mar Laborda Ortega considers herself both a witness and privileged player in the economic development of Andalusia. "Mining was one of the most dynamic sectors of the nineteenth century Spanish economy, with the production of lead, mercury, copper, manganese etc. This industry was at the origin of cultural integration and civilisations came to look for work in Andalusia" explains Maria del Mar. And work there was! The mining sector of this region of southern Spain has always offered opportunities, and continues to do so today. It is

estimated to generate more than 47,000 direct and indirect jobs

## A SHOWCASE OF OUR TECHNOLOGY AND VALUES

True to its vocation to be as close as possible to the markets, EPC Groupe has demonstrated all its major technological advances in Spain. "From 1865 to 1910, there was dynamite but many other products were developed such as nitrate or chloride explosives," recounts Maria del Mar. Of course, Andalusia did not escape the surge of ANFO from 1955 before the arrival of emulsions in the 80s. The same goes for detonators and drilling solutions, aimed always at control and

blast optimisation. "Despite all these innovations, blasting is still considered an art, born from long experience" says Maria del Mar. But for her, the heart of EPC's Spanish journey lies elsewhere. In the women and men who have been able to adapt to changes to ensure the Groupe's growth... without ever changing its values or focus. •



→ Serafina Ortega Molina and her father Maximiliano Ortega Carrillo.

**PROJECT / Tunnel**

# Peru: EPC ready to widen the gap!

To say that we are eagerly anticipating our first ever project in Peru would seem an understatement. Between the ambitions of our partner IESA and the mistrust of local competitors, EPC Servicios Perú must make this project a complete success!

After several years of development and preparation, Peru has become a concrete new market for EPC Groupe. The first project will be conducted under the entity EPC Servicios Perú, a joint venture created with our partner IESA, one of the country's leaders in excavation of galleries and mines. The project consists in constructing a water supply tunnel to supply a hydroelectric plant in Santa-Lorenza, in the province

of Ambo. With a total length of 6.8 km, the excavation of the tunnel began in the traditional manner, using packaged explosives. "It's a first for IESA and Peru in general. Until now, none of the local operators has been able to demonstrate that the manufacture of explosives on site could make the difference in the excavation of galleries. Our aim is to prove it's possible!" insists Pascal Lacourie, Director Europe and Latin America Regions.

### GAINING TIME ON EXCAVATION CYCLES

EPC Groupe is clearly committed to IESA's performance indicators, which has eighteen months to complete the excavation. If the work is ahead of schedule, the gains will be shared fifty-fifty. As Pascal explains, "the goal is to gain time on excavation cycles through our unique experience in the on-site manufacture of explosives." To achieve this, he has access to the usual tools for success: matrix from Saint-Martin-de-Crau, latest generation Morse and SPUR MEMUs integrating the Hose Pusher Puller innovations, management team made up of underground specialists from EPC France and EPC Groupe, training of local operators... what better way to run

operations! In France, 100% of tunnels of more than 500 m are excavated using explosives bearing the EPC signature. Why not do the same in Peru? •



→ The Morse team during the string charging qualification tests: Edwar Moreano, Moctar Abdallah, Pascal Montagneux, Fabien Boussahel.

**BUSINESSES / Diversification**

# EPC builds on safety

Here is a fine example of diversification, outlined to us by Javier Muñoz, Managing Director EPC Spain. Or how to put our unique safety experience to the service of activities outside the world of explosives.

Several years ago, EPC Spain incorporated Silex Seguridad, a company specialising in the transport and surveillance of explosives delivered to our customers. "This was an internal service used exclusively for our products. However, since October 2017, we decided to diversify this business by leaving the field of explosives" explains Javier. Based in Seville and

Malaga, Silex Seguridad today employs twenty-five people, including several dog handlers. A team with a long experience in the Groupe's quality standards and requirements in terms of service and safety. And so why not use this experience by applying it to other sectors of activity?" Silex Seguridad has a strong legitimacy in the world of safety, with regularly trained security guards, the latest-generation detection



→ EPC's professionalism at the service of all safety needs.

### Safety, an activity in its own right

equipment etc. This has allowed us to provide protection for new markets and win contracts quickly", says Javier. Among these new customers, light years away from our core business, is Real Madrid Basketball, even though the atmosphere of the arena is often explosive! For its first year of activity, Javier projects target revenues of EUR 600,000. A great external source of income for EPC Spain, which has ambitions of developing this new activity throughout the country. •

## **PORTRAIT** / Rokhaya Sall Mbaye

# Smiled at by the mine

**Through her company Mineex, Rokhaya Sall Mbaye embodies the new face of EPC Groupe in Senegal in the drilling and blasting sector. Interview with a determined woman, passionate about mines.**

### Your journey to Mineex?

I have a degree in geological engineering and a master's in quality management. After completing my studies, I joined a construction and civil engineering company in Mali and then in Guinea Conakry. In 2011, I decided to form my own drilling and blasting company.

### Why mining?

Like many of my fellow engineers, I turned to civil engineering which presented more opportunities. But at the time of writing my end-of-studies thesis, I discovered the world of mining. I immediately realised the potential of this sector. That's when I decided to specialise exclusively in drilling and blasting. I like the drive and needs of this business.

### Your missions at Mineex?

They are many: I'm responsible for team management, administrative management and ensuring the regulatory compliance of our activity, while seeking to guarantee the optimal quality of our services. I also focus on commercial

development, through both acquisition and winning customer loyalty.

### The link between Mineex and EPC?

In 2017, EPC Groupe acquired an interest in the capital of my company. This interest is the culmination of long-term cooperation, fostered over many years. In fact, my links with EPC date back to my very first experience with blasting since I wrote my end-of-studies engineering thesis within the local subsidiary of the Groupe in 2002-2003.

### What do you like most?

I like to contribute to this permanent research for innovative solutions and tools. By continuously improving our services, we will maintain our leadership position. Beyond purely technical aspects, blasting is a business involving contact and exchanges with employees, customers, government authorities etc.

### The qualities required?

Good organisational skills and ultra-responsiveness! Our contacts must be able to rely on us at any time. You also need an attention to detail, never leaving anything to chance. It means relying on trusted employees and knowing how to uncover talent which we can train and retain according to our values. Faced with the skills shortage in this sector, it's not always easy!

### Projects?

In 2018, I'm focused on the triple safety-quality-environment certification of our

integrated management system. This would be a definite asset when prospecting for fast-growing mining operations. In the medium term, we will need to develop our own explosives production tool to alleviate certain logistical difficulties. And then the ongoing strengthening of our corporate culture, in particular by encouraging exchanges with the Groupe's other subsidiaries! •

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**I like this business for its drive, dynamism and potential**

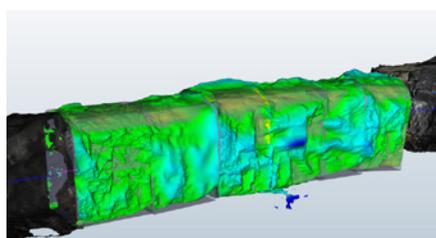


→ **Rokhaya Sall Mbaye**,  
Managing Director of Mineex

## **TECHNICAL** / Expertir®

# Underground with Expertir® is now!

**The Expertir® family is growing. An EPC innovation, this software suite designed for the management of drilling through to explosives in surface mines or quarries will soon have its underground counterpart.**



→ Digital technology at the service of underground blasting engineering.

Logically christened Expertir® UnderGround, this software is designed to monitor drilling and blasting operations in underground galleries. For this, it uses two main indicators: progress and overbreaks/underbreaks. "Thanks to photogrammetry, the software can recreate a 3D geometric model of the tunnel from just a few photographs. Its precision is comparable to that obtained with a laser, plus the additional texture" explains Ricardo Chavez, Technical Director. The software then simply analyses this geometric model to measure the progress between blasts as well as the overbreaks/underbreaks in relation to the theoretical section of the project. Expertir UnderGround can even complete

### **Modelling of galleries within blast range**

its analysis by adding the drilling data and external data such as the duration or quantities drilled.

### **BLASTING ENGINEERING TOOL**

Thanks to a simple and rapid measurement technology (photo), our underground teams can continuously monitor quality indicators at any site. This will result in a more detailed assessment of the gains made by our MORSE and SPUR technologies as well as greater efficiency in supporting our customers.

This innovation was developed by Pierre Bouffard-Vercelli, who joined the technical management team

in July 2017, in close collaboration with the EPC Sweden teams working on the Björkdal gold mine. Many thanks to its operator, which has enabled us to collect all the data needed to model a complete gallery! •

# United Kingdom, Spain: two new warehouses for EPC

Key elements of our logistics strategy, storage solutions allow us to best fulfil our customers' needs. Proximity is a gauge of efficiency, economy and safety which two of our subsidiaries have recently strengthened.

## A WAREHOUSE BORN OF THE NEW BRITISH REGULATION

EPC-UK has eight sites dedicated to the storage of explosives. Some, like Bramble Island and Alfreton also house production activities. In 2014, a change in the regulation of ANBI (Ammonium Nitrate Bulk Intermediate) explosive licences necessitated the relocation of the old Settle Coal warehouse, which was judged to be too close to a number of dwellings. Our British friends took advantage of the three years granted by the authorities to build a brand-new warehouse located at Dunald Mill, less than



→ The new English Dunald Mill warehouse.

an hour away to the north. With a surface area of 4,000 m<sup>2</sup>, the warehouse was commissioned in September 2017. Dedicated to the storage of bulk emulsion and packaged explosives, it represents a strategic support point for supplying our customers and projects throughout the north of England.

## THE REBIRTH OF AN OLD SPANISH WAREHOUSE

The birth of the new Spanish warehouse is of a different nature. It was not a change to the regulation but rather the market that created this opportunity. The warehouse in question is located in Boñar, in the province of León. Owned by the Soto Villapadierna group, it faced serious economic difficulties in early

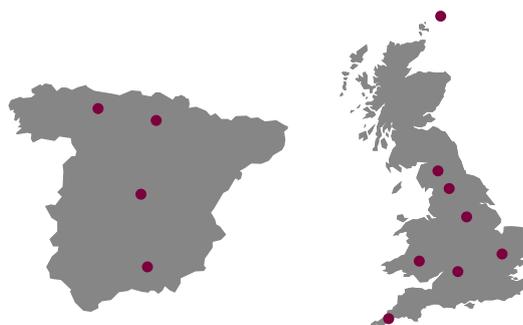
## Transforming opportunities into new warehouses

2010 after more than fifty years of activity. Contacted by Alfredo Soto, EPC Spain decided to acquire the site in March 2016. An acquisition that brings the number of warehouses of our Spanish subsidiary to three, wishing to exploit the potential of the north-west of the country with products and a service of a high quality. With a capacity of 50 tonnes and 500,000 detonators, the Boñar site employs eight people, two at the warehouse and six dedicated to transport - security via Silex Seguridad (see article on page 10). Operational since December 2017, this warehouse will be the object of investments next year in order to be able to deliver bulk explosives from MEMU trucks. •



→ Pascal Lacourie, Alfredo Soto and Javier Muñoz at the opening of the new Spanish warehouse.

Sites of the EPC-UK and EPC Spain/ Serafina-Ortega warehouses



# Business continuity, the fruit of a certified approach

In November 2017, after three years of collective work, EPC Groupe became the first civil explosives production, marketing and implementation company to obtain ISO 22301 certification - Business continuity. Reflecting high sustainability, this standard attests to a company's ability, in a degraded environment, to manage a return to normal operation under optimal conditions for all critical activities identified. There are five of these within EPC Groupe: supply, traceability, financial monitoring, maintenance of key functions and support for travelling personnel. Much more than a

new ISO standard, this certification embodies the involvement of the teams led by the operational directors and is translated into practical measures adapted to the constraints on the ground. Valid for three years, it will be the subject of an annual monitoring audit. •



## TECHNICAL / Quarry

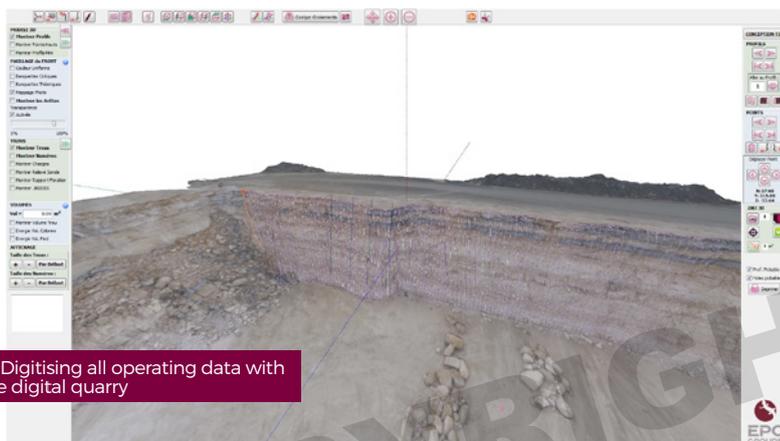
# The digital quarry, a new seam

Our business is built by technological innovations. With the arrival of digital, our approach to blasting has improved in terms of safety, performance and quality of service. What if the next step were to interconnect this 2.0 blasting with the rest of the operating process?

This is an idea in which Pascal Lacourie, Managing Director of EPC France firmly believes. And he is not alone. Novacarb, operator of a limestone quarry and a long-standing customer, is also convinced. So much so that together, our two companies decided to launch a pilot project. As everything on an operating site

is connected and the drilling and blasting is key to performance of the extraction process, EPC has developed the concept of the Digital Quarry.

The contribution of the drones and the big data revolution allow our new EXPERTIR® 3D software to design each blast with an unrivalled accuracy. And Novacarb? Its operations manager has equipped its various production tools with digital sensors for a number of years. "The idea is to have a global approach that integrates all the stages of the process and takes into account their interactions," explains Pascal.



→ Digitising all operating data with the digital quarry

## The digital quarry, a connected whole

And thanks to the integration of downstream data, we are able to offer our customers a unique optimization tool to facilitate the decision making process. This fully integrated approach, based on continuous improvement, demonstrates our innovation capability in bringing solutions to our customers, impacting the whole of their value chain. This is the future! •

## TECHNICAL / Drilling

# The drill with on-board GPS is smart!

As we saw in the article above, the interaction between all stages of the production chain is the key to optimised operation. And to achieve this goal, nothing beats a navigation system when drilling!

On 22 March, the CBS quarry near Maubeuge was the stage for a "smart" drill demonstration: the new Flexiroc equipped with a 3D navigation system. On this occasion, Julien Janssen and Jean-Paul Lopes of EPC France were accompanied by representatives of Atlas Copco and Carlson/L5, partners specialising respectively in mining and quarrying equipment and in the development of navigation systems. The DTI engineers and EPC-UK's John Mellor and Mark Roberts also joined them.

### (GREATER) PRECISION DRILLING FOR (YET FURTHER) OPTIMISED BLASTING

Once the drilling site is defined on computer, the coordinates of each hole (top and bottom) are imported directly into the drill via Wifi or 4G from the Expertir software. Thanks to GPS guidance equipping its machine, the driller can position itself precisely at the location of the holes to be drilled, without preliminary marking. On-board sensors will also allow the drill mast to be correctly oriented and tilted to reach the desired position at the

bottom of the hole. Guarantee of speed and precision, this new technology will make it possible to better design and carry out drilling plans adapted to the

geometry of the formation. One step further in the optimisation of concentrated energy! •



→ Enzo Oger at the controls of the GPS-equipped drill.

## Feeling good with EPC-UK

As part of its *commit-to-be-fit* campaign, the management team of our English subsidiary has been trained to better prevent and manage psychosocial risks.

Each year, it is estimated that one in four people suffers from a psychological disorder. While the causes of these disorders are diverse and varied, their consequences are often similar. But

### Training to raise awareness and act on psychological well-being

they still need to be identified. This is why Ben Williams, Atlantic Area Director, has decided to set up training with the help of Mental Health First Aid England. The objective: to be able to identify the initial symptoms of

suffering and direct the person to the appropriate help to limit the effects on physical health and professional performance.

"This training helped us become

more aware of the psychological dimension of health. It has given us the confidence and the tools needed to better support our colleagues," explains Ben. Ben also plans to repeat the training with a number of managers and employees in order to raise awareness among as many people as possible on this subject. "We need to eliminate all forms of stigma by encouraging exchanges" emphasises Ben. A fine initiative that reminds us that we are all different, with our own sensitivities. •



→ Left to right, Ben Williams, Ben Coppock, Bob Woolley, Paul Butler, Ashley Haslett, Jo Altoft (MHFA).

## Saudi Arabia: At the service of Ma'aden!

At the end of 2015, EPC Groupe won a major contract on a phosphate mine through the joint venture MCS created with its Saudi partner MCC. Belonging to the Ma'aden group, this mine represents a six-year contract for around €45 million. The first eighteen months focused on building storage infrastructures (20,000 m<sup>2</sup> for 200 tonnes of explosives, 200,000 detonators and 1,500 tonnes of ammonium nitrate).

The supply of explosives, which began in April 2017, is estimated at an average of 5,000 tonnes per year. An ambitious contract in terms of both safety (HCIS and KSA standards, access constraints linked to the Jordanian border) and business (plan to develop the mine in 2021) that we owe to the cooperative work of the EPC teams and our local joint venture MCS. •



**BUSINESS** / Service

## Niger: Bulk emulsion arrives

This contract with the Somaïr uranium mine, an AREVA subsidiary, today ORANO, is an excellent illustration of teamwork. Thanks to the joint work of its subsidiaries EPC Innovation and EPC Côte d'Ivoire, EPC Groupe has just seen its position in Niger evolve from an explosives supplier to a solutions provider.

Two years ago, EPC Groupe was present in Niger as a supplier of cartridges and detonators for the mining industry, in this case the Arlit surface uranium mine. Its customer, the AREVA Group, had also purchased three ANFO production trucks. However, in July 2016, the group reached a landmark by helping its customer handle a new constraint. "As the blasting took place, water began to rise to the surface. The characteristics of the ANFO were therefore no longer fit for purpose. The use of packaged emulsion provided better volume energy, even in water. But implementation was quite complex and expensive," recalls Stéphan Mencacci, Managing Director of EPC Innovation. Faced with this problem, the bulk emulsion proposal quickly became the best alternative.

### DEPTH CHANGES TO THE TRUCKS

Somaïr asked EPC to adapt its latest technologies to two emulsion trucks available in France at AREVA. "The on-board production technology of these two trucks was very different from that of our MEMUs" explains Stéphan. The changes, made by EPC Innovation, were rather onerous. While the chassis and the tank were retained, everything else was replaced according to

### Transforming two trucks into a development opportunity

EPC standards: pumps, static mixers, control commands, safety equipment, etc. The EPC France teams in Saint-Martin-de-Crau were responsible for the transformations. The acceptance report of the first truck was signed in July 2017, the second in September. As the mine is located in a very isolated sector, the contract also included the supply of a number of critical spare parts.

### SERVICE AND EXPERTISE MAKING THE DIFFERENCE

Consistent with its business approach, EPC offered its customer a turnkey solution with support. Necessitated by new technology, training was given on each truck on its commissioning, led by Yves Sarrey. EPC Innovation also supported Somaïr in the design and construction of a logistics base adapted to the storage and loading of the matrix manufactured by EPC Côte d'Ivoire (see insert). Isotanks, pumps, fittings, hoses... no stone was left unturned to get the best out of these new trucks. And this was indeed the case, judging by the customer's very positive feedback! •



→ Trucks loaded with emulsion from Yamoussoukro.

→ One of the two trucks transformed for emulsion pumping.



→ Célestin KONAN, Maintenance Manager and Philippe AKPA, Production Manager.



### EPC Côte d'Ivoire: very close despite the distance

The matrix to be pumped into the Arlit Mine comes from our Yamoussoukro plant. In 2017, two 75-ton shipments were completed, as well as a third in March of this year. Each requires three trucks crossing 2,600 km across Côte d'Ivoire, Burkina Faso and Niger. For Jean-Jacques Koua, Managing Director of EPC Côte d'Ivoire, there were other challenges besides transport. "After introducing our installations to Somaïr for a week, we sent the production and maintenance managers to the customer to supervise the new logistics base," he recalls. Once the matrix was delivered, another visit was carried out to test the product under real conditions.



### NEWS / EPC Canada

## New name for new ambitions

Part of EPC Nordex since 2016, Nordex Explosives Limited, located in Kirkland Lake, Ontario, has recently been renamed EPC Canada. The construction of this new identity is based on the values and level of expertise across continents

conveyed by the EPC brand over the years. In Canada, one of the largest mining markets in the world, this new positioning is intended to guarantee both visibility and performance among all operators in the country. •



# EPC sets its sights on the 4L Trophy

There are adventures that give you wings... And the one below gives you at least four... the 4L Trophy!

Much more than a car rally, the 4L Trophy is a great opportunity to surpass oneself, with simplicity, humility and generosity.



→ Léo Marcontier and Julien Courreges, contenders for the 2018 4L Trophy in EPC colours.

So when Léo and Julien, two students from the ECE engineering school in Paris, asked us to help them make this dream a reality, we said yes! Their crew, number 1527, named Cam'I Tro' Frais, won't easily forget this inimitable journey from Biarritz to Marrakech! Mechanical and physical challenges, the discovery of new horizons, beautiful encounters, mutual support... some of the values shared by drivers from all over the world, which align perfectly with the Groupe's CSR approach!

### HUMANITARIAN AID BEFORE THE RACE

The 4L Trophy reflects a strong dimension of solidarity and eco-citizenship, an integral part of the adventure. The donation of educational material by the participants over the years has led to the opening of classrooms and the education of young Moroccans in partnership with the association Enfants du désert (Children of the desert). And French people aren't forgotten. Since 2011, the "4L solidaire" association asks each crew to bring ten kg of food to the village of departure to send to the Red Cross and the food bank. Finally, throughout the race, participants and organisers are committed to leaving not a trace of rubbish behind them! •

# KEMEK US extends its territory

Born of a joint venture between CRH and EPC Groupe, Kemek US has been operating in the north-east of the United States since 2011 around the Harrisburg, Pennsylvania sector. In 2016, the operation of a new warehouse in Ohio allowed us to extend our business to this State as well as those of New York and Michigan.

Beyond geographic proximity, the development of the North American market also and notably involves the ability to best meet

### Expanding our territory through our service offering across north-east US

customers' needs. A principle important to EPC Groupe and rolled out to the Atlantic Area by Rob Farnfield and his team of engineers. "Our expertise provides valuable technical support in the implementation of the gaseous emulsions technology", explains Rob. Awareness of best blasting practices,

especially during seminars organised by Kemek LLC, is also a means of strengthening ties with our customers across the Atlantic. "Kemek US is a key company to expand our north-east US operations.

We will continue to provide it with all the support it needs to exploit new opportunities across this strategic territory" concludes Ben Williams, Director Atlantic Area. •



→ The Kemek warehouse in Ohio, which has been operational for two years.

## CHALLENGES / Safety

# Process safety: the requirement as standard

Since 2015, the core of EPC Groupe's policy, process safety, has been formalised in order to improve our level of major accident prevention.

In addition to the prevention of the risk of injury associated with our activities, EPC Groupe has recently integrated a "process safety" standard into its safety management system. This approach concerns all our subsidiaries and covers both new and existing installations. "These studies go beyond the regulatory framework, which can vary between countries. They demonstrate the desire to reach a high level of proactivity to danger explains Thierry Rouse, Health, Safety and Environment Director.

### ASSESSING ALL POSSIBLE RISKS

Among the risk analysis methods associated with processes, EPC Groupe has chosen to use the HAZOP method (HAZard and OPerability Study). In practical terms, this systematic review method helps to identify all scenarios leading to major accident risks (cause,

frequency, severity, etc.) and the existing or necessary safety measures. Once the consequences have been assessed, the risk levels are defined to determine the safety barriers (alarms, procedures etc.) to be put in place so that each risk is considered acceptable. As Ashley Haslett recalls, HSE Director Atlantic Area, "the safety studies are conducted by local multidisciplinary teams made up of a field operator, a production and maintenance manager, a representative from the design phase and an HSE representative under the responsibility of a manager."

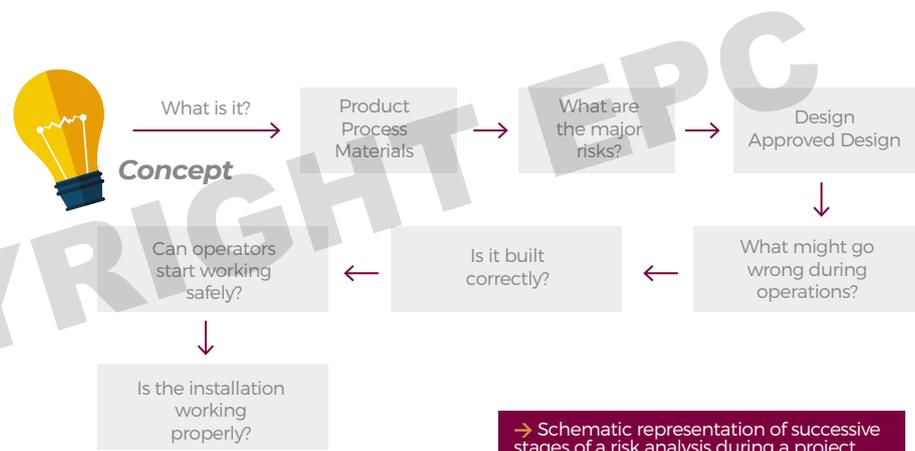
### MOBILISATION TOOL

With seven levels of assessment both before and after commencing the

### Formalising our studies on process safety

installations, the safety studies provide valuable insights into the potential risk of a configuration which might not have emerged at the design stage. "Serving as a training and collective reflection tool, these studies allow the teams in situ to grasp the level of complexity of an installation by together considering and measuring all possible parameter sequences against the planned outcome" explains Thierry Rouse. In the Groupe as a whole, great efforts have been made to reduce frequent accidents with negligible consequences. Major accident prevention

marks a new ambition And the formalisation of our studies on process safety is the best way to achieve it. •



## TECHNICAL / Challenge

# Vietnam waits for no one!

A successful mission for EPC Groupe, which met the deadlines imposed by the ambitious equipment and technology contract signed in April 2016 with Vietnamese company Z21.

Stéphan Mencacci, Managing Director of EPC Innovation can breathe again. After two marathon years, he and his team made every effort to meet the demands of our very first Vietnamese customer. "We worked in program mode, divided into ten separate projects mobilising various resources of the Groupe. In addition to EPC Innovation were the head office financial and administrative services, the safety studies and training of EPC France, the support of the EPC Groupe Safety service etc." details Stéphan. To recall, the project involved the construction of a bulk and packaged emulsion plant with the provision of a laboratory and a MEMU.

The first challenge was the design and delivery of all the equipment in ten months..

"We only had ten months, with penalties for each day of delay. We were able to deliver on D Day despite maritime freight problems", recalls Stéphan. The second stage concerned the development of the site and the construction of the eight buildings intended to accommodate the EPC equipment. The contract required the provision of

### On time... after 20,000 hours of work

two EPC personnel for four months to assist the work..work where eight months should

have been necessary, were Vietnamese determination not factored in. Up to 80 people worked on this project which commenced in early September 2017! Result: On 15 December, Stéphan signed an acceptance report recording the end of the mechanical assembly of the plant, followed by another on 9 February 2018 certifying that commissioning could go ahead. Various tests

were then launched. "Production of eight packaged emulsion formulas, bulk emulsion, MEMU tests on the ground, control and R&D laboratory... all performances in terms of safety and productivity demonstrated compliance with the requirements set out in contract" says Stéphan happily. •



→ A solution chartered by boat from France via twelve containers.

# EPC Demolition: sterling work at the Hôtel de la Marine

In September 2017, two companies from our demolition division, ATD and Sigenci, began a very delicate operation removing, lead and asbestos on this prestigious Parisian monument. Look-back at a surgical demolition operation with Benoît Lanfy, Managing Director of ADT.

Built between 1758 and 1774 by Louis XV to house the Garde-Meuble de la Couronne, the building, over 226 years old, houses the National Navy Staff. Following the relocation of the military in 2015, the government launched an ambitious indoor and outdoor restoration project. Behind the imposing façade looking onto Place de la Concorde, fifty or so ATD/Sigenci operators were hard at work until the 2018 summer. Their key mission was the cleaning of 12.700 m<sup>2</sup> of the building. This involved removing all the secondary elements such as windows, door frames, plinths, carpets, wallpaper, paint work etc. to expose the bare structure. That was the theory. But the reality is that the Hotel de la Marine set the bar very high!

## DEMOLITION WITH ALL THE NECESSARY PRECAUTIONS...

### ... HEALTH AND SAFETY ...

The lead found in old paint work but also in the interior atmosphere due to air pollution, led to the implementation of "curage rouge" (high-risk) cleaning. As

Benoît explains, "the operators, mainly from demolition, worked in conditions almost identical to asbestos removal, with breathing masks, hermetic jumpsuits, decontamination chamber etc." Obviously, once the premises have been cleared of contaminated materials, bringing contaminated dust back inside is out of the question! And so no fewer than forty footbaths had to be installed at the site entrance.

### ... HERITAGE ...

This iconic building contains many treasures that the contracting authority, the French Centre of National Monuments, plans to share with the Public. Among these treasures, some are visible... others less so. "Extensive efforts to raise awareness and educate the operators were therefore made. For this project, the customer asked us for preventive and archaeological demolition!" insists Benoît. A strip revealing 18th century polychrome traces, an umpteenth layer of wallpaper under which the decoration of the

original covering emerges... no detail can be neglected. Explanatory booklets and even a colour coded identification system are all management tips illustrating a very delicate approach to demolition.

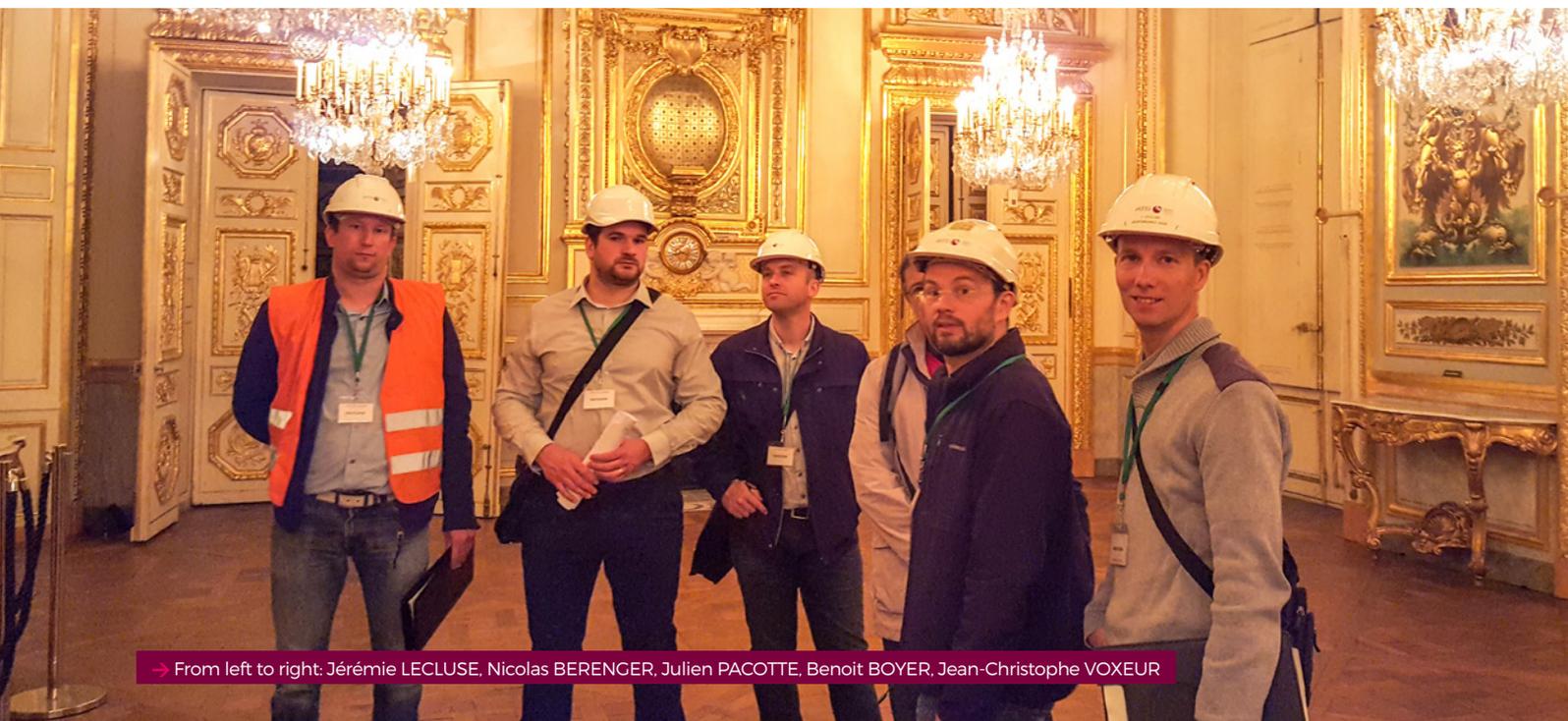
### ... SPACE ...

The building may be bigger than 12,000 m<sup>2</sup>, but the ATD/Sigenci teams had to deal with a cruel lack of space. Imagine: a project in the heart of Paris with only two inner courtyards occupied by the site portacabins and the waste skips! Add to this particularly confined spaces, all sprinkled with a generous dose of co-activity with other contractors, and you have an idea of the logistics and organisational constraints imposed by the project.

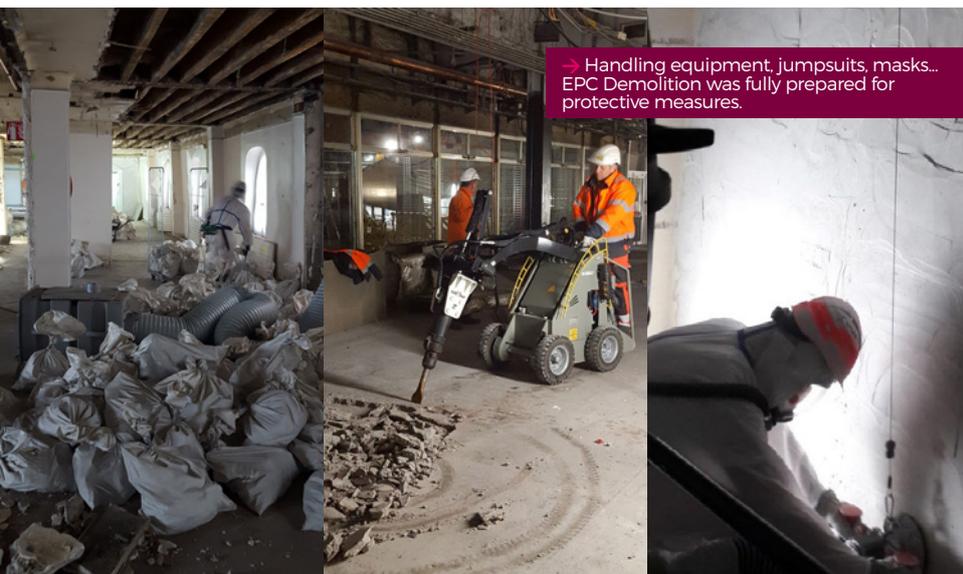
### ... TEAM ...

Jimmy Loncle, ATD Demolition Director managed the respective skills of ATD and Sigenci with, for ATD, Jean-Christophe Voxeur as lead supervisor and Benoît Boyere as site manager and, for Sigenci, Olivier Lemaire and Dominique Caporusso. Together, they will eventually have coordinated 80,000 hours of work over one year.

## Preventive and archaeological demolition



→ From left to right: Jérémie LECLUSE, Nicolas BERENGER, Julien PACOTTE, Benoit BOYER, Jean-Christophe VOXEUR

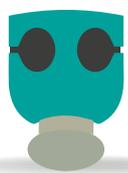
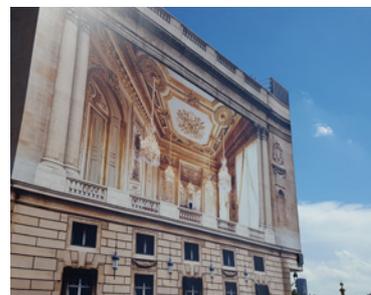


→ Handling equipment, jumpsuits, masks... EPC Demolition was fully prepared for protective measures.



### The Hôtel de la Marine post-restoration

After its restoration, half of the building will be used as office space, the other half will be open to the public, including the 18th century apartments which are unparalleled in Paris.



**12,700 sq. m.**  
OF CLEANING,  
LEAD AND  
ASBESTOS REMOVAL



**50-80**  
SITE OPERATORS



**5,5 million**  
IN REVENUES



**40**  
FOOTBATHS

#### ANTICIPATING THE CONSTRAINTS... AND THE STANDARDS

On this particularly demanding project with its heritage dimension, EPC Demolition demonstrated exemplary mobilisation of personnel. "This is a subject which represents a major challenge. We got several people around the table from our two companies and the Demolition division to ensure its success" remembers Benoît. It started with understanding the customer's expectations. The answers

**A success that heralds an increasingly sensitive approach to the business**

provided couldn't have been more relevant, from the implementation of fire safety protocols to the frequent Quality, Safety and Environment audits,

not forgetting the extensive operator protection and awareness-raising work. "The contracting authority was reassured by our ability to do and our ability to manage, and the implementation of the necessary procedures and safeguards to anticipate problems rather than react to them" says

Benoît. Following the decontamination work of the Hôtel des Invalides, the Chapelle du Lycée Corneille in Rouen and even the Banque de France, EPC Demolition confirms its mastery of complex projects and its sensitivity to heritage challenges. Better than that, our subsidiary predicts what tomorrow's business will be, "a business in which every project to restore old buildings will be carried out under enhanced protection conditions". There is no doubt that the Hôtel de la Marine represents a true benchmark and a showcase of the know-how of the future. •



## NEWS / Mining

### Challenge in New Caledonia

When EPC is committed, nothing, not even distance stops it! This was what our customer Valé, the second largest world producer of nickel, saw on the Goro mine in New Caledonia. Neither the 20,000 km separating the island from mainland nor the unfavourable mining context on the signature of the contract in February 2016, affected the determination of

our teams in situ. Using the Expertir technology and an innovative ammonium nitrate-free emulsion concept (Blendex 100), they fulfilled our contracted performance indicators with ease. One million m<sup>3</sup> drilled already, how better to optimise the customer's costs... and ensure future collaboration together. •



→ François Platre, Michel Grappin, Pascal Lacourie, Jean-Marc Guénette, Philippe Cappello, Maxime Paramel.



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