



2014 ACTIVITY REPORT



SOLETOANCHE FREYSSINET

2014 ACTIVITY REPORT



SOLETANCHE FREYSSINET



“This success confirms the quality and the positioning of our soil, structural and nuclear techniques and services.”





EDITORIAL



All five Soletanche Freyssinet Group entities significantly increased their revenue and order intake in 2014. Overall orders came in at €3.2 billion, an all-time record for our Group that heralds a strong outlook for our business in the foreseeable future.

This success confirms the quality and the positioning of our soil, structural and nuclear techniques and services. It also reflects the engagement of each of our employees, in each of our 160 companies and on each of our projects. Throughout the year they went the extra mile that makes the difference, enhancing safety on our worksites, ensuring the quality of our structures, applying integrated engineering to devise innovative, robust technical solutions and planning construction methods to control risk.

We worked on outstanding projects in 2014. The iconic, high profile and technically challenging operations handled by our three major business segments should not, however, cause us to lose sight of the many smaller projects – more than 8,000 every year – that call for similar ingenuity and audacity. We cultivate the diversity in range and size of our projects as an essential of feature of our approach to our business.

Our Excellence⁶ business plan has now been rolled out on a broad scale. It enables each of our companies to continue to make steady progress in delivering outstanding solutions for our clients, based on a spirit of dialogue and partnership.

The year also saw major achievements in Research and Development. Soletanche Bachy worked on a large number of processes for deep foundations, Freyssinet continued to develop its systems for new construction and repair, Menard made further headway in in-situ soil characterisation, Terre Armée designed new connection solutions to further diversify the use of Reinforced Earth[®] and Nuvia developed new techniques for measuring radioactivity and conditioning waste.

Business is expected to hold steady at a good level in 2015. The Group will continue in the coming year to expand its geographical reach. We will continue to work closely with our clients to steadily optimise their projects in an unremitting quest for increasing value.

Jérôme STUBLER
Chairman of Soletanche Freyssinet



SOLETANCHE FREYSSINET

5 BRANDS, 3 BUSINESS SEGMENTS

As a world benchmark in soil, structural and nuclear engineering, the Soletanche Freyssinet Group brings together an unparalleled array of specialised civil engineering expertise.

The Group's 21,500 employees, operating in some 100 countries, devise and implement solutions tailored to the specificities of each project, whatever its complexity and size, to meet the client's requirements.

Every year they help design, build, maintain and repair a wide variety of structures on thousands of worksites around the world. Their expertise, culture of technical excellence and strong technological creativity come together to help boost the performance and durability of the structures on which they work.

SOILS



STRUCTURES

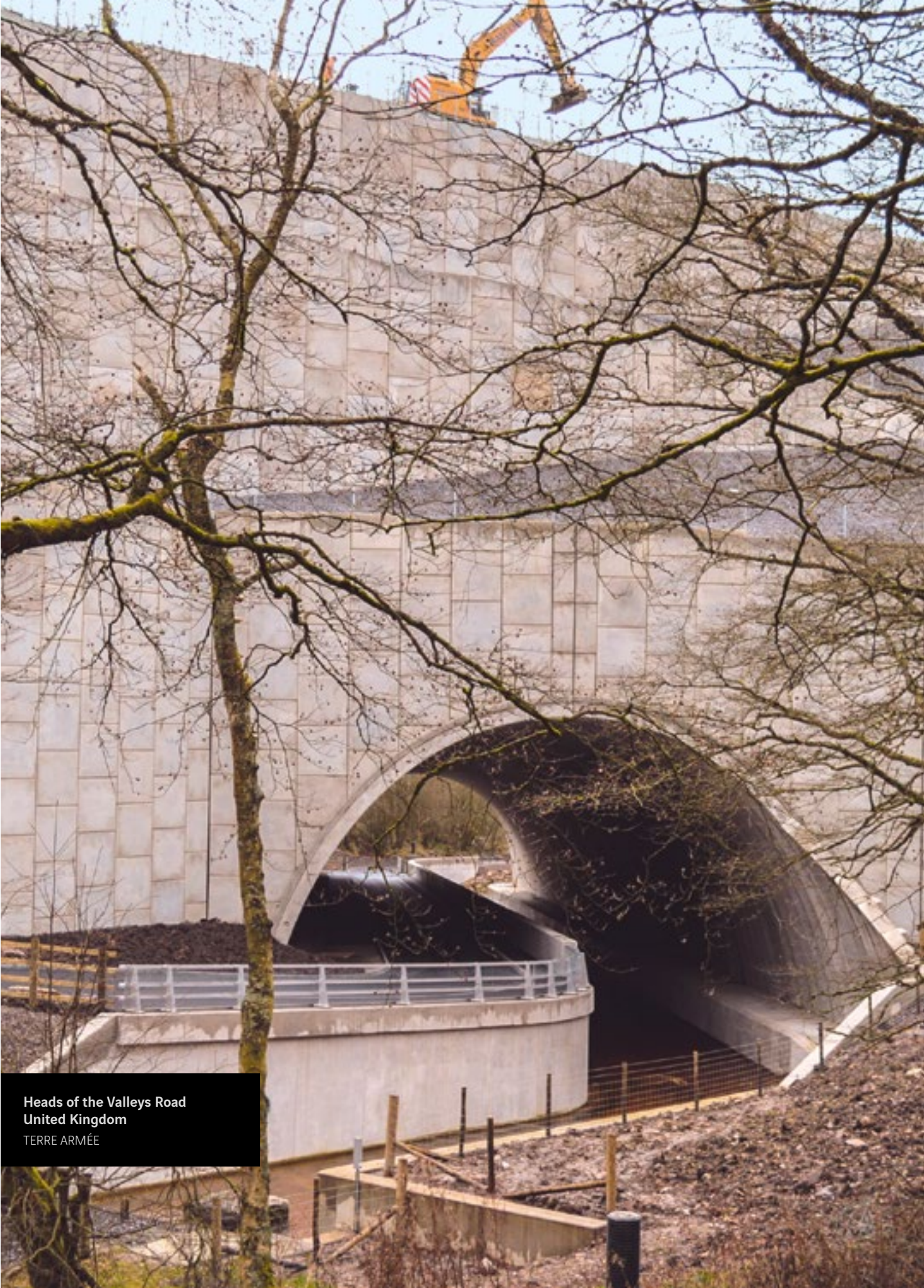


NUCLEAR

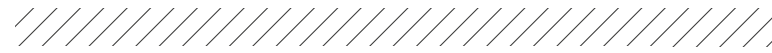




Puymorens Tunnel
France
SOLETANCHE BACHY, FREYSSINET, TERRE ARMÉE



Heads of the Valleys Road
United Kingdom
TERRE ARMÉE



CONTENTS

I. PERFORMANCE AND KEY FIGURES

Pages 8 to 15

COORDINATION COMMITTEE
KEY FIGURES
LOCATIONS

II. STRATEGY AND COMMITMENTS

Pages 16 to 31

HUMAN RESOURCES
SAFETY
CLIENT RELATIONS
EXPANSION
ENVIRONMENT
INNOVATION AND R&D

III. BUSINESS ACTIVITY AND OUTLOOK

Pages 32 to 59

SOILS
SOLETANCHE BACHY
MENARD
STRUCTURES
FREYSSINET
TERRE ARMÉE
NUCLEAR
NUVIA



Posnania shopping centre
Poland
MENARD



I. PERFORMANCE AND KEY FIGURES

COORDINATION COMMITTEE

Page 10

KEY FIGURES

Page 12

LOCATIONS

Page 14

COORDINATION
COMMITTEE



JÉRÔME STUBLER

Chairman, Soletanche Freyssinet

"We are fully satisfied when the solutions we propose optimise our clients' projects. Our early involvement in the project and work with the client in a spirit of partnership are important factors ensuring the joint success of the sites."



BENOÎT DE RUFFRAY

Chief Executive Officer, Soletanche Freyssinet
(effective March 2015)

"Soletanche Freyssinet is unique. Each of its five entities has its own business model and is a leader in its field. They all share a single goal: to be the pre-eminent specialist."



YANN GROLIMUND

Executive Vice President / Chief Financial Officer,
Soletanche Freyssinet

"2014 was an excellent year in terms of order intake and revenue. Our results increased. This good performance boosts the Group's resilience going forward."



PIERRE-YVES BIGOT

Human Resources Director,
Soletanche Freyssinet

"We stepped up recruitment on all five continents, particularly by working with 20 university campuses around the world. We put a similar effort into our in-house training programmes."



DIDIER VERROUIL

Managing Director, Soletanche Bachy

“Everyone must make a constant, concentrated effort to ensure the full success of our projects. They constitute our core business.”



JEAN-PHILIPPE RENARD

Executive Vice President, Soletanche Bachy

“In an increasingly urbanised world, our capabilities and expertise help meet the challenge of designing and building increasingly complex projects.”



MARC LACAZEDIEU

Managing Director, Menard

“Our Group is built on the ability of our founders to transcend traditional construction methods. We continue to think outside the box – our clients expect that of us.”



MANUEL PELTIER

Managing Director, Freyssinet

“We design innovative solutions to extend the service life of our clients’ structures. Because our integrated model combines design, fabrication and works, we are able to provide an overall guarantee of the service we deliver.”



ROGER BLOOMFIELD

Chief Executive Officer, Terre Armée

“Our products and applications hold out huge potential for value-added solutions extending well beyond our traditional markets. Curiosity and creativity drive diversification.”



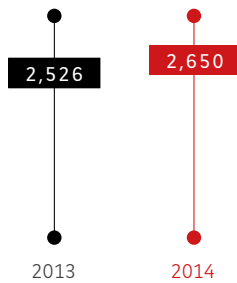
BRUNO LANCIA

Managing Director, Nuvia

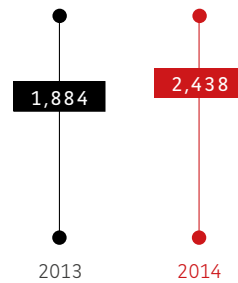
“Nuvia continues its international expansion in nuclear services, where safety and security are key factors in the success of our clients’ projects.”

KEY FIGURES

REVENUE



ORDER BACKLOG



OPERATING PROFIT FROM ORDINARY ACTIVITIES



IN € MILLIONS

TOTAL WORKFORCE

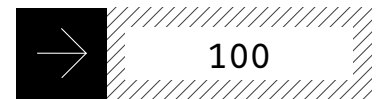


MANAGED WORKFORCE

LOCATIONS (COUNTRIES)



OPERATIONS (COUNTRIES)



REVENUE / BUSINESS SEGMENT

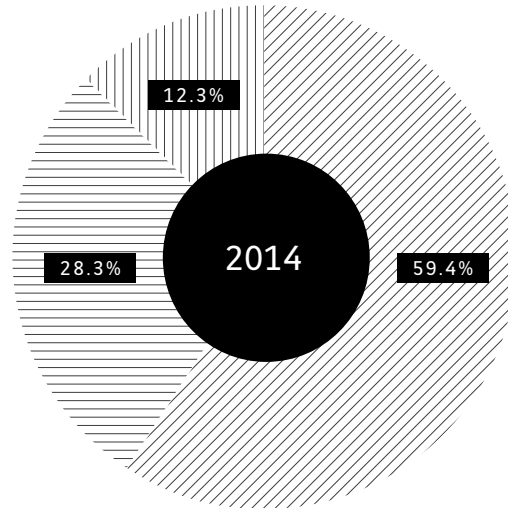
SOILS



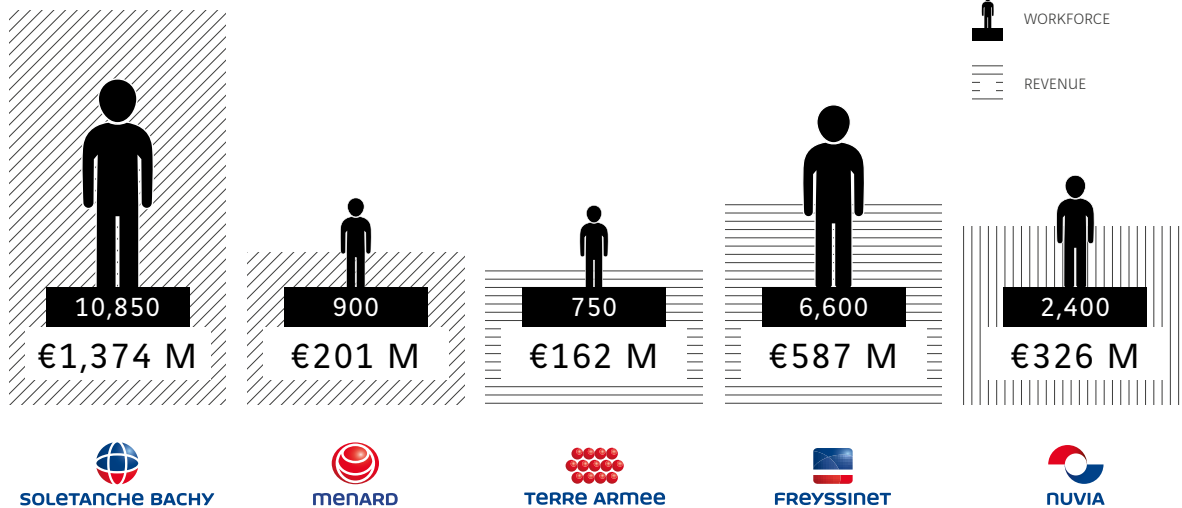
STRUCTURES



NUCLEAR

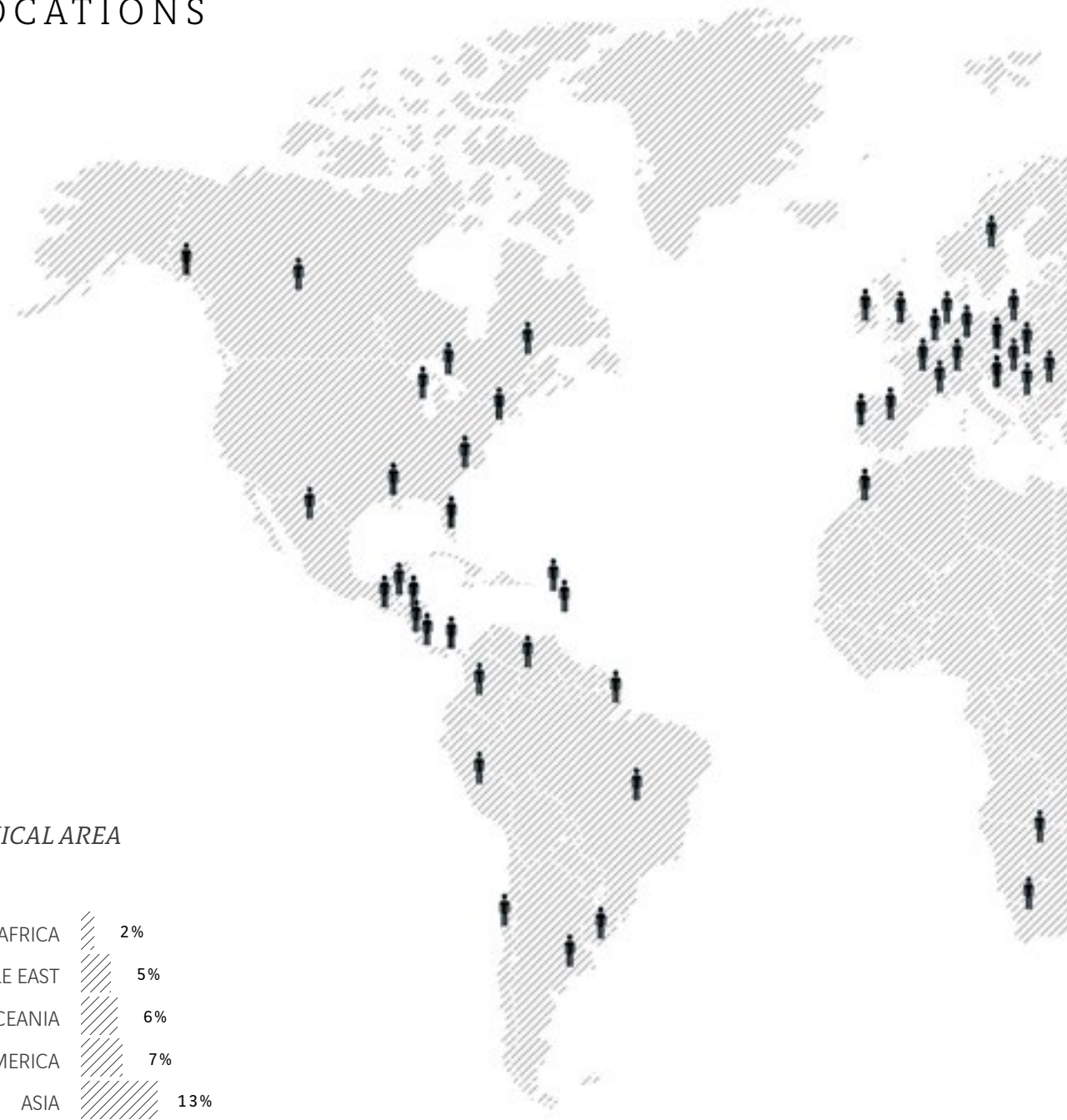


REVENUE AND WORKFORCE / ENTITY

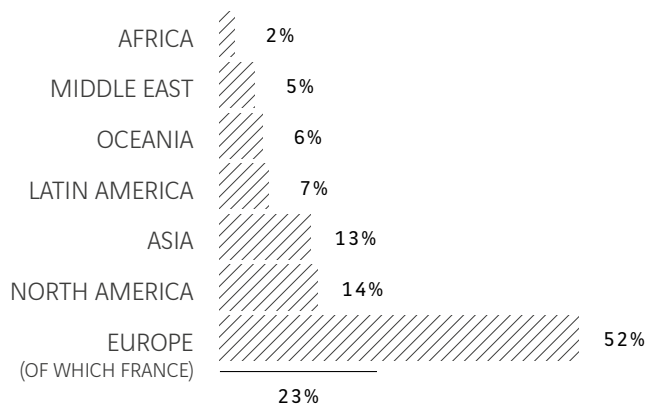


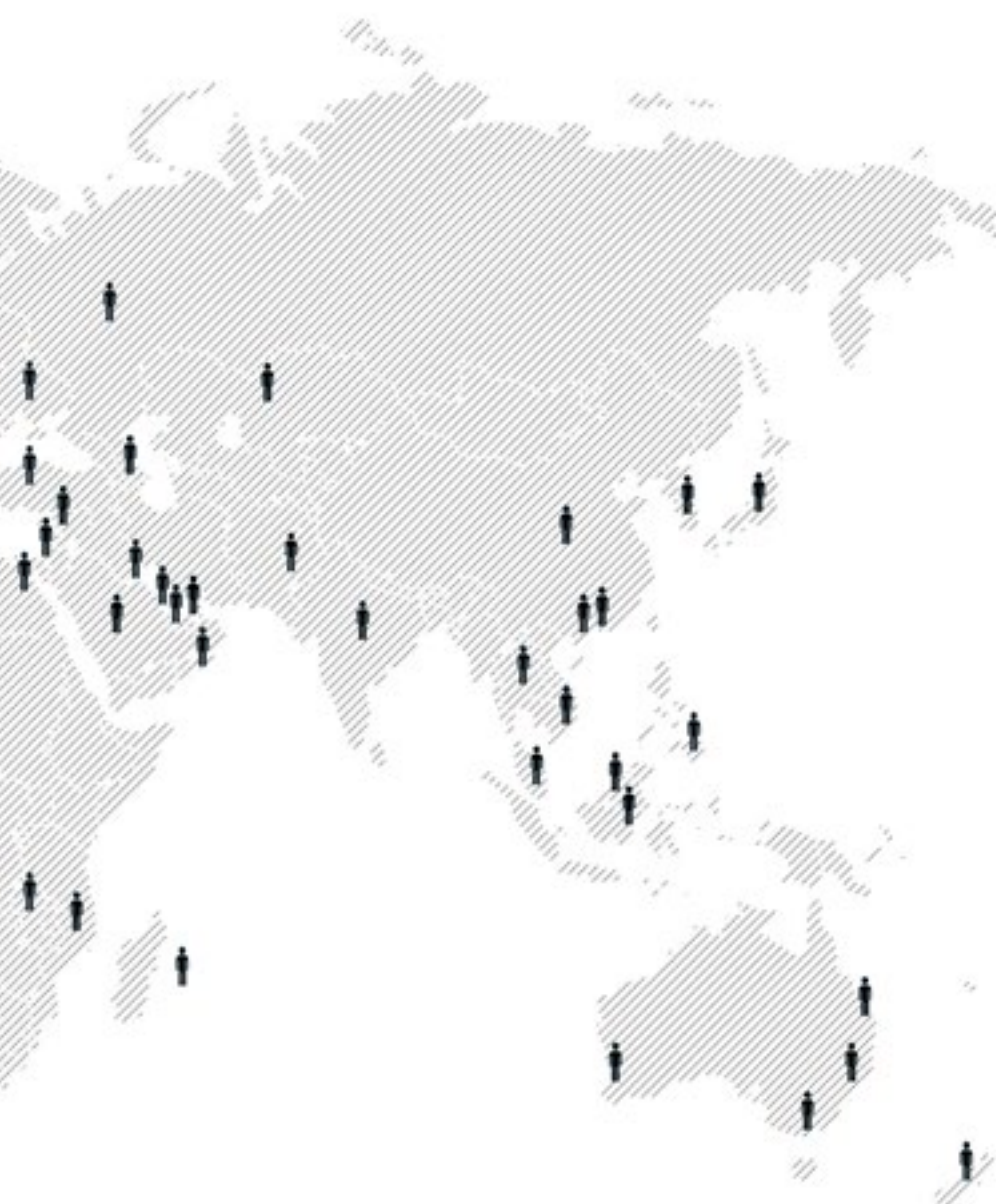


LOCATIONS



REVENUE / GEOGRAPHICAL AREA





LOCATIONS

- | | |
|----------------|----------------|
| ABU DHABI | MONACO |
| ARGENTINA | MOROCCO |
| AUSTRALIA | MOZAMBIQUE |
| AZERBAIJAN | NETHERLANDS |
| BELGIUM | NEW ZEALAND |
| BOTSWANA | NICARAGUA |
| BRAZIL | OMAN |
| CANADA | PAKISTAN |
| CHILE | PANAMA |
| CHINA | PERU |
| COLOMBIA | PHILIPPINES |
| COSTA RICA | POLAND |
| CZECH REPUBLIC | PORTUGAL |
| DUBAI | QATAR |
| EGYPT | REUNION ISLAND |
| EL SALVADOR | ROMANIA |
| FRANCE | RUSSIA |
| FRENCH GUIANA | SAUDI ARABIA |
| GERMANY | SERBIA |
| GUADELOUPE | SINGAPORE |
| GUATEMALA | SLOVAKIA |
| HONDURAS | SLOVENIA |
| HONG KONG | SOUTH AFRICA |
| HUNGARY | SOUTH KOREA |
| INDIA | SPAIN |
| INDONESIA | SWEDEN |
| IRELAND | SWITZERLAND |
| ITALY | THAILAND |
| JAPAN | TURKEY |
| JORDAN | UKRAINE |
| KAZAKHSTAN | UNITED KINGDOM |
| KUWAIT | UNITED STATES |
| LEBANON | URUGUAY |
| MACAO | VENEZUELA |
| MALAYSIA | VIETNAM |
| MARTINIQUE | ZAMBIA |
| MEXICO | |



Pont d'Arc Cavern
France
FREYSSINET



II. STRATEGY AND COMMITMENTS

HUMAN RESOURCES

Page 18

SAFETY

Page 20

CLIENT RELATIONS

Page 22

EXPANSION

Page 24

ENVIRONMENT

Page 26

INNOVATION AND R&D

Page 28

HUMAN RESOURCES

DEVELOPMENT AND QUALITY OF LIFE AT WORK

SOLETANCHE FREYSSINET FOCUSES ITS HUMAN RESOURCES APPROACH ON DEVELOPING ITS PERSONNEL. THE GROUP SUPPORTS ITS EMPLOYEES BY ENABLING THEM TO TAKE AN ACTIVE PART IN DEVELOPING THEIR SKILLS AND BY ENHANCING THEIR QUALITY OF LIFE AT WORK.



83
NATIONALITIES
REPRESENTED



77%
UNLIMITED-TERM
CONTRACTS



17%
WOMEN
MANAGERS



38
AVERAGE AGE



136,000
HOURS OF HEALTH AND
SAFETY TRAINING



103,000
HOURS OF TECHNICAL
TRAINING

A NEW HEAD OFFICE FOR SOLETANCHE FREYSSINET

A PROJECT REFLECTING THE GROUP'S VALUES

In the summer of 2014, the head offices of Soletanche Freyssinet's five entities were brought together in the same building in Rueil Malmaison, France. This strategically important move was aimed at fostering technical and commercial synergies and encouraging departments to work together.

WORKING CLOSELY WITH UNIVERSITIES ON RECRUITMENT, TEACHING AND RESEARCH

Soletanche Freyssinet has developed special relationships with 20 university campuses (five in France, five in other European countries and 10 outside Europe). It works with them in their governing bodies, on teaching and research and on recruiting their young graduates to join Soletanche Freyssinet companies.



PM+ AND ORCHESTRA INTERNATIONAL

TRAINING, THE KEY TO EMPLOYEE SUPPORT AND SKILLS DEVELOPMENT

The PM+ training course is designed for worksite engineers with three to seven years' experience. It focuses on identifying the key success factors in project management and helps build a common international Project Manager culture. Its rollout across all Group entities was continued in 2014. Meanwhile, Orchestra International, designed for junior works engineers and contract managers, provides a comprehensive survey of project organisation, preparation and closeout. The course covers the methodology used in each phase of the project. It takes account of local regulations and conditions and of company procedures. International rollout of this training course was stepped up in 2014.



IFCEN TRAINING CENTRE

NUVIA EXCELLENCE BUILDS ENHANCED DEPENDABILITY OF ORGANISATION AND HUMAN FACTORS

The new CEFRI F certified and EDF approved IFCEN centre in Pierrelatte, France offers all types of specialised training in the nuclear field – mandatory and pre-licensing training, customised attitude and behaviour training and safety training. The centre, which can accommodate up to 90 trainees per day, spreads nuclear environment expertise and therefore helps the teams achieve excellence through enhanced dependability of organisation and human factors.

SAFETY

OBJECTIVE: ZERO ACCIDENTS

IN KEEPING WITH OUR MOTTO “THE SAFE WAY IS THE ONLY WAY”, SAFETY IS THE ABSOLUTE PRIORITY AT SOLETANCHE FREYSSINET. THE GROUP STRIVES TO ENSURE THAT ALL OUR SUBSIDIARIES AND AGENCIES COME AS CLOSE AS POSSIBLE TO THE ZERO ACCIDENT SAFETY OBJECTIVE.



Caille Bridge
France
FREYSSINET



To ensure the health and safety of its employees, Soletanche Freyssinet applies a three-part safety plan.

Detailed health and safety rules apply to all Group entities. They provide practical instructions to be complied with on every worksite, in every office and in every depot and workshop.

Training via a range of programmes, including “Managing Safety”, a programme for managers designed to reinforce their involvement, encourage them to set an example and enable them to drive behavioural change.

Health and safety **objectives and resources**, such as systematic detection of dangerous situations and briefings on the tasks to be performed and the risks associated with them prior to start of work at each workstation.

Throughout the year and throughout the world, Soletanche Bachy, Menard, Terre Armée, Freyssinet and Nuvia took a large number of initiatives aimed at achieving these health and safety objectives.

COMMITTED ONE AND ALL

In 2014, Soletanche Freyssinet continued its work to raise health and safety awareness.



INTERNATIONAL SAFETY WEEK

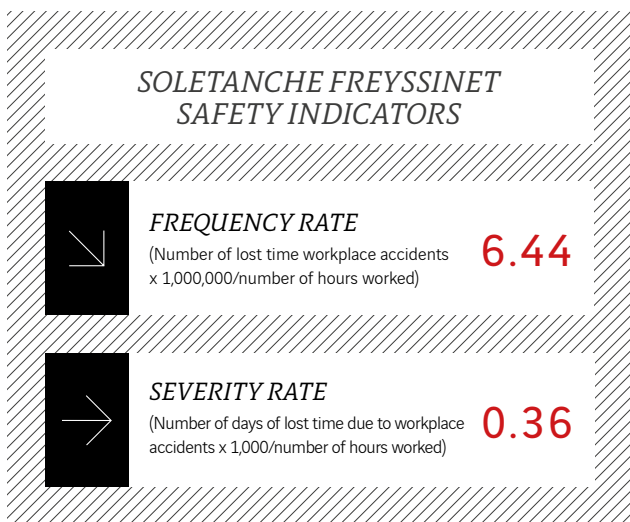
Safety events involving all the employees were held during the same week in October, all over the world, on every worksite, in every workshop and depot and at every head office. This first International Safety Week gave the employees an outstanding opportunity to review fundamentals, share experience and best practices and discuss progress and results with management.

SAFETY VIDEO

Once a year since 2009, Soletanche Bachy has made a film on a safety theme. In 2014 the decision was taken to make it as a Soletanche Freyssinet film. The theme chosen was falls from height. Accounting for 30% of worksite fatalities, they are identified as a major risk. The film was shown all over the world and was very well received by agencies and subsidiaries.

SAFETY POSTER CAMPAIGN

A highlight of 2014 was the launch of the Group's first safety poster campaign. These quarterly campaigns are circulated to all Group agencies and subsidiaries. Each campaign addresses a specific safety issue inspired by a recent safety alert, a significant statistic or a particular event on a worksite. The year's campaigns focused on hand protection, hard hats and the use of mobile telephones.



INITIATIVES

SAFER DRILLING RIGS

Soletanche Bachy is working to improve the safety of its drilling rigs. Above and beyond compliance with the European standard, studies are under way to boost the safety of these machines (portable emergency stop system).

FITNESS AT WORK

Menard USA is focusing on employee fitness. Before starting work, employees stretch and flex for five minutes.

NOTHING TO REPORT? I CAN WORK

In France, Freyssinet has introduced the *Réflexe Attitude Sécurisée* (RAS – safety reflex) system. Before starting any new task, worksite personnel are encouraged to ask themselves the following questions: what am I going to do, how am I going to do it, what are the risks involved and what steps should be taken? Nothing to Report? I can work.

SAFETY IN PROJECT MANAGEMENT

Freyssinet's Major Projects division has drawn up a series of innovative documents on some 40 project management topics. The documents are based on the Deming wheel (Plan, Do, Check, Act) and spell out the action to be taken at each step. The topics cover the full range of direct and indirect safety management topics such as risk management during the negotiation phase, the Hazid / Hazop method, work at height, crisis management and the need to stop work when a dangerous situation occurs. These documents can be freely accessed on the Group's Intranet.

SAFE TEMPORARY WORKS

Terre Armée has developed a list of stability and safety rules for temporary works and circulated it to all its locations. The list spells out, in simple terms and illustrations, the rules and methods that must be applied when building Reinforced Earth® walls in general and TechSpan® arches in particular. The documents are included with instruction sheets and are also available on the Group's Intranet. In 2015, documents covering precasting, transport and on-site handling operations will be added.



CONTROLLING NOISE EXPOSURE

To reduce the amount of time during which employees are exposed to noise, the Mechanical Protection Department at Nuvia Protection equipped all personnel with noise indicators. The device, pre-set at 85 dB, flashes green when the area presents no hearing hazard and switches to red when the environment needs people in the vicinity to wear ear defenders. This ensures that people wear them when necessary.

ACHIEVING EXCELLENCE IN CLIENT RELATIONS

THE SOLETANCHE FREYSSINET GROUP AIMS FOR EXCELLENCE IN THE RELATIONSHIPS IT BUILDS AND MAINTAINS WITH EACH OF ITS CLIENTS AND PARTNERS. THIS MEANS LISTENING TO THEIR NEEDS, ANTICIPATING THEIR EXPECTATIONS, CONSISTENTLY MEETING COMMITMENTS AND OFFERING HIGH VALUE-ADDED PRODUCTS AND SERVICES.

UNITED STATES

PRIORITY NO. 1: EXCELLENCE IN CLIENT RELATIONS

The Reinforced Earth Company (RECo), the US subsidiary of Terre Armée, set up a team in 2014 to address excellence in client relations and customer service. As part of this sales and marketing policy, the company organises educational and friendly get-togethers. This includes the popular "Lunch and Learn" events held regularly, at which RECo's techniques and applications are presented to clients and prospects. RECo takes the practice to a new level by holding one-day seminars around the country in conjunction with Menard and Freyssinet to present the three Groups' expertise and provide ongoing training for participants.

Facing panels customised
at the final client's request
TERRE ARMÉE

Attentive to its clients' expectations, Soletanche Freyssinet focuses on the issues they face. This approach builds mutual trust and respect and transforms traditional stakeholder relations. Many expressions of recognition, including awards, result-based bonuses and new contracts, bear witness to these high-quality relationships.

SINGAPORE

BACHY SOLETANCHE SINGAPORE HONOURED

At the fourth biennial Land Transport Excellence Awards ceremony, the Samsung / Soletanche Bachy JV received the prize for the best managed rail/road infrastructure project for its Downtown Line 1 C908 Telok Ayer Station & Tunnels project. The Singapore public transport authority award recognised two partner companies that excelled in the development of land transport infrastructure and delivered a quality project.

UNITED STATES

NICHOLSON CONSTRUCTION RECOGNISED AT THE ENR BEST 2014 PROJECTS

In Florida, the city of Miami undertook a broad development programme that includes the construction of the Port of Miami tunnel. Local Soletanche Bachy subsidiary Nicholson Construction took part in the gigantic project. The project received the prestigious ENR Regional Best Project of the Year award, an outstanding honour in the United States.



HUNGARY

HBM INVESTMENT CELEBRATED BY LEGO

With 30 million boxes per year, the new LEGO factory in Hungary produces 20% of the company's output. The local Soletanche Bachy HBM subsidiary built the foundations for the plant. Throughout the 16-month project, LEGO safety coordinators carried out regular on-site inspections and assessments. HBM was given an award for its engagement.

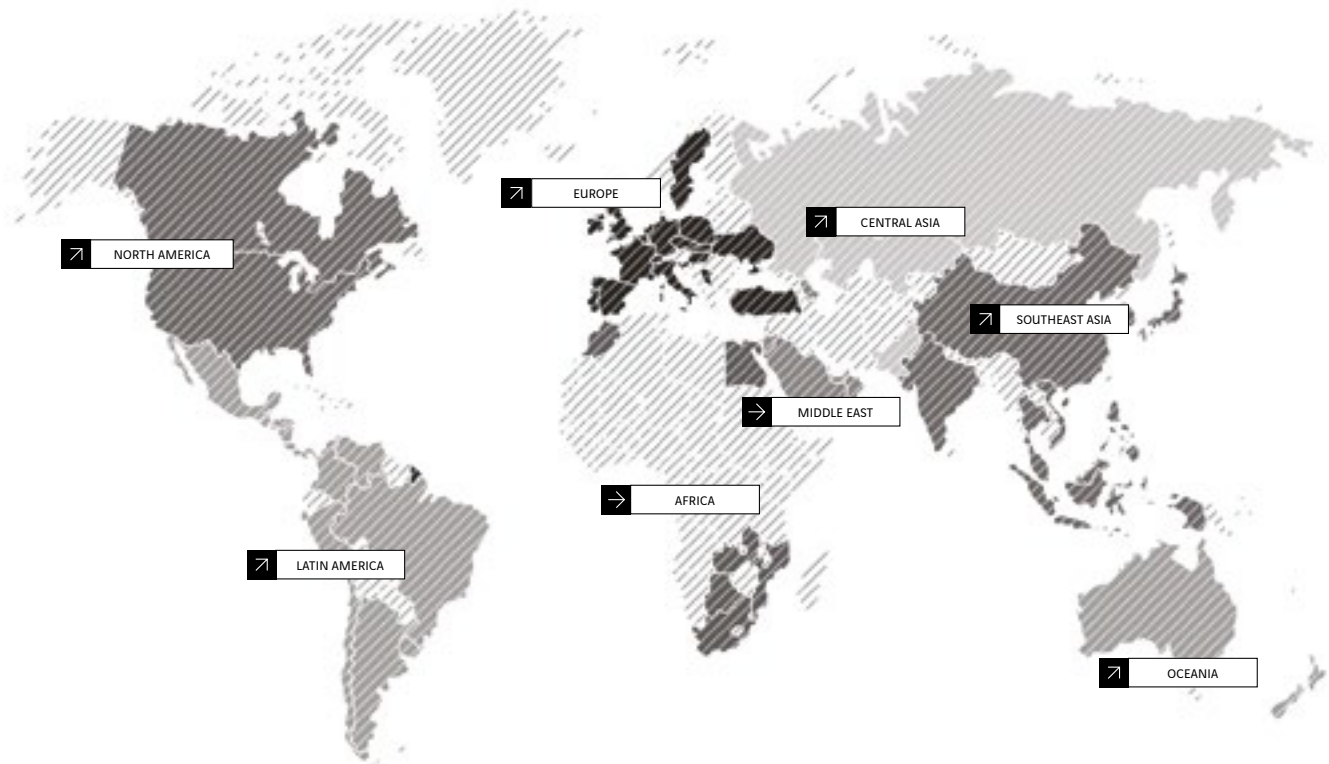
EXPANSION

DYNAMIC LOCAL AND GLOBAL EXPANSION

SOLETANCHE FREYSSINET HAS A NETWORK OF 160 COMPANIES IN NEARLY 80 COUNTRIES BACKED BY GLOBAL EXPERTISE. TO MEET CLIENTS' NEEDS, THE GROUP CONTINUES TO EXPAND THROUGH ORGANIC GROWTH, TARGETED GEOGRAPHICAL EXPANSION AND INTEGRATION OF NEW MARKETS, SUCH AS WIND TURBINES IN BRAZIL.

INCREASING REVENUE AND ORDER INTAKE

In 2014, most of the Group's expansion was driven by organic growth of its activities. Order intake grew in France, the rest of Europe, North America, Latin America, Central Asia, Southeast Asia and Oceania and held steady in Africa and the Middle East.





UNITED STATES: TERRE ARMÉE CONTINUES ITS EXPANSION

TERRE ARMÉE ACQUIRES THE NEEL COMPANY

In 2014, Terre Armée acquired The Neel Company located in Springfield, Virginia. Its flagship T-Wall® product is a precast reinforced concrete modular gravity retaining wall system, which is used as a complementary system to Reinforced Earth® on bridges, roads, motorways, waterways and railways.



GERMANY: EXPANDED NUVIATECH INSTRUMENTS RANGE

NUVIATECH ACQUIRES S.E.A. AND MED

Germany's S.E.A. company, known to radiation protection specialists for its COMO product, specialises in the design and production of portable radiation protection equipment. Also in Germany, MED develops and produces measuring instruments for the nuclear medicine and radiology sector. With these acquisitions in 2014, Nuvia expands NUVIATech Instruments, its range of nuclear measuring equipment, and strengthens its position in the developing field of nuclear medicine.

INDONESIA: SOLETANCHE FREYSSINET EXHIBITS IN JAKARTA
 Bachy Soletanche, Menard, Terre Armée and Freyssinet set up a joint booth at the Konstruksi Indonesia exhibition in Jakarta in November 2014. The major gathering provided an opportunity to promote Soletanche Freyssinet's image among Malaysia's construction stakeholders.

SOUTH AFRICA: SOILTEAM AND TERRE ARMÉE SET OUT TO CONQUER THE MINING INDUSTRY
 In February 2014, Soletanche Bachy, Menard (the SoilTeam) and Reinforced Earth South Africa, a subsidiary of Terre Armée, exhibited at Investing in African Mining Indaba. Considered the world's foremost mining conference, the event brings together mining industry decision-makers and companies working in the sector.

UNITED STATES: MENARD AND BIRMINGHAM JOIN FORCES TO SET A WORLD CMC DEPTH RECORD
 As part of an Oil & Gas project in Louisiana, Menard and Soletanche Bachy subsidiary Birmingham joined forces to improve the ground on which four oil tanks are to be built. To construct the Controlled Modulus Columns, the teams designed and fabricated two drilling masts that can reach depths of 50 metres.

CROSS-ENTITY OPERATIONS MAKE HEADWAY

MEXICO: A JOINT COMMERCIAL APPROACH AND 15,000 RIGID INCLUSIONS INTO THE BARGAIN
 In May 2014, Soletanche Bachy subsidiary Cimesa, Menard México and Menard USA joined forces to win the tender covering work at the Pemex refinery in Ciudad Madero. As part of this project, Menard's expertise was used to install 15,000 rigid inclusions via soil displacement, a first in Mexico.

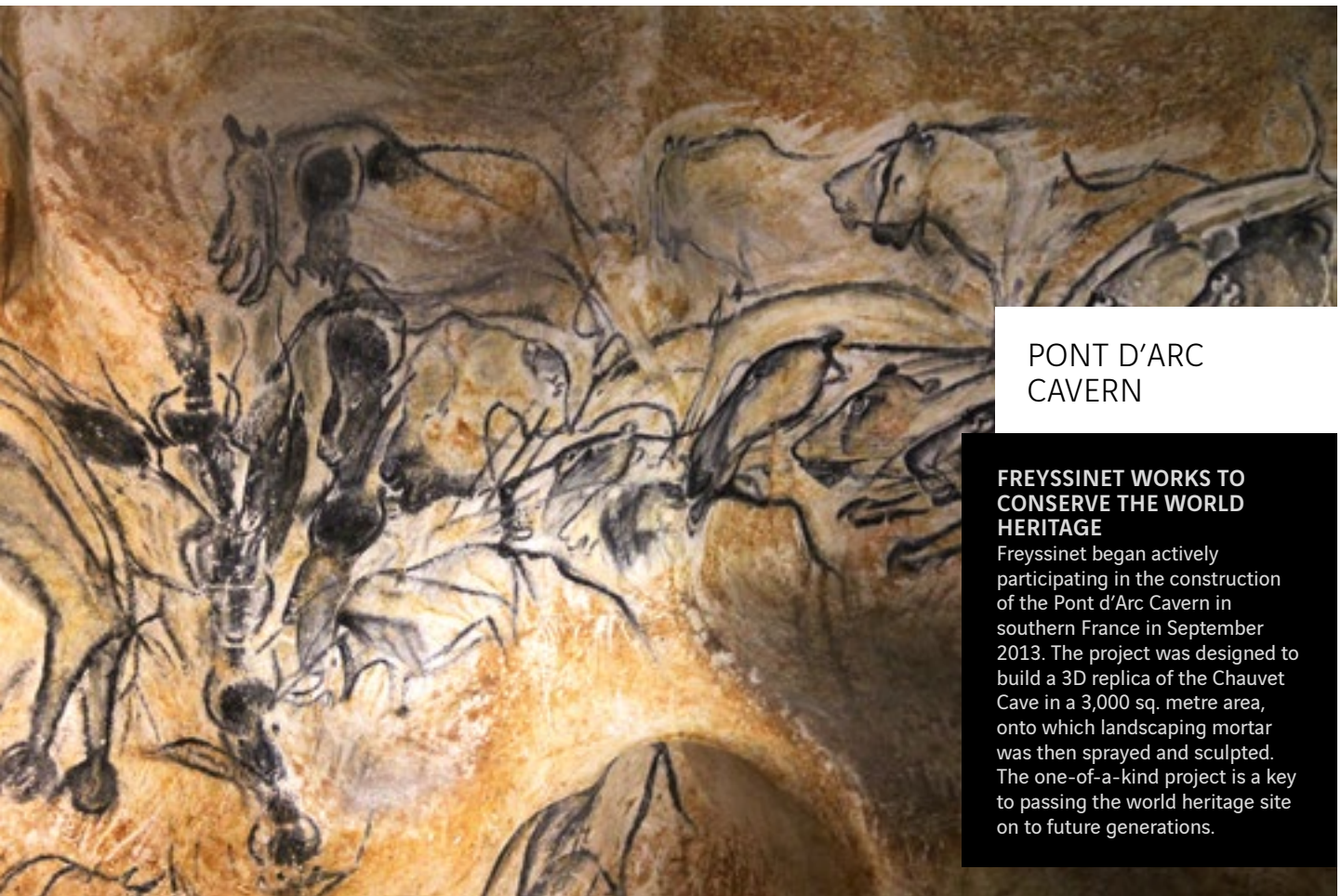
FRANCE: NUVIA AND FREYSSINET PRESTRESS A MODEL OF A REACTOR BUILDING
 The VERCORS (*VERification Réaliste du COmportement des Réacteurs* – realistic reactor behaviour verification) model is a 1/3 scale model of a PWR 1300 P'4 type reactor building. Following several months of design studies, Nuvia and Freyssinet continued with the threading and grouting method qualification phase. The prestressing work on the structure is scheduled for 2015.

ENVIRONMENTAL AND SOCIAL RESPONSIBILITY

AS PART OF ITS ONGOING COMMITMENT TO MEETING ECONOMIC, ENVIRONMENTAL AND SOCIAL CHALLENGES, SOLETANCHE FREYSSINET FOLLOWS SUSTAINABLE DEVELOPMENT PRINCIPLES IN ITS BUSINESS ACTIVITIES AND IN THE SOLUTIONS IT DESIGNS.

CONTROLLING RISKS AND REDUCING ENVIRONMENTAL IMPACT

Innovating in eco-design and eco-construction, the Group supports its clients' environmental programmes and helps them meet increasingly stringent standards.



PONT D'ARC CAVERN

FREYSSINET WORKS TO CONSERVE THE WORLD HERITAGE

Freyssinet began actively participating in the construction of the Pont d'Arc Cavern in southern France in September 2013. The project was designed to build a 3D replica of the Chauvet Cave in a 3,000 sq. metre area, onto which landscaping mortar was then sprayed and sculpted. The one-of-a-kind project is a key to passing the world heritage site on to future generations.

PRISM, THE ENVIRONMENTAL ASSESSMENT TOOL

Prism is an innovative life cycle analysis tool. It performs a quantified environmental assessment of projects and can be used to compare the environmental impact of alternative construction options. In 2014, new Soletanche Bachy, Menard, Terre Armée and Freyssinet engineers were trained in its use.

SOLETANCHE BACHY

BENTOTOP® AND CLEAN DRILLING RIGS

In France and many other countries, solar greenhouse drying is used to dehydrate sludge from wastewater treatment plants. The Bentoval project carried out jointly by Soletanche Bachy and Sol Environment and co-funded by ADEME, the French environment and energy management agency, involves the design of a new recycling process for used drilling fluid. The process uses ecologically efficient and economically beneficial greenhouse drying. The project demonstrated the industrial efficiency of the method. At the end of the drying process, the dehydrated material is chemically inert and can be recycled as a mineral filler, for example in waterproofing works. Sol Environment will market this new material under the name Bentotop®.

In 2014, Bachy Soletanche continued to focus on clean technologies. The Soletanche Bachy subsidiary in the United Kingdom acquired drilling rigs fitted with Tier 4 engines, which cut nitrogen oxide and fine diesel particle emissions by 90% compared to the previous Tier 3 generation of engines. These new engines also use very low sulphur content fuel (containing 100 times less sulphur than ordinary fuels).

MENARD

NOISE POLLUTION REDUCTION

Rapid Impact Compaction is a ground improvement technique using a hydraulic hammer. The model used by Menard's Canadian subsidiary Geopac employs a nine-tonne weight that strikes a steel impact plate installed in its base to transfer energy into the ground and thereby achieve the desired densification. Metal-on-metal impact generates a high level of noise, which is painful for workers and disruptive for residents living nearby. To tackle the problem, Geopac conducted tests in which the steel impact plate was replaced with a wooden plate. The solution effectively reduced the noise level and is certainly to be considered in future. Other materials that may be even more effective than wood are also being investigated.

FREYSSINET

RESPONSIBLE SHIPPING MANAGEMENT

Freyssinet Products Company (FPC), Freyssinet's Industry and Services business line, manufactures special products and materials for all Freyssinet entities worldwide. To reduce the greenhouse gas emissions generated by its deliveries, FPC has introduced an action plan that will cut its energy bill. After setting up new production sites in other areas of the world, notably in South Africa and Asia, FPC is now able to produce materials closer to the final clients. The company has also developed alternative transport modes to reduce the volume shipped by air. In France, 89% of goods imported by sea were taken by river barge from Fos sur Mer to Saint Eusèbe (the production site in France) in 2014. In 2015, the goal is to make maximum use of rail for export by sea (Chalon-Le Havre link).



Rapid Impact Compaction
MENARD

INVENTING THE FUTURE OF OUR TECHNIQUES

SOLETANCHE FREYSSINET SEES RESEARCH AND DEVELOPMENT AS CENTRAL TO ITS ACTIVITIES. INNOVATION IS PART OF THE GROUP'S DNA, ENABLING IT TO IMPROVE PERFORMANCE, ANTICIPATE FUTURE TECHNICAL CHALLENGES AND PROPOSE NEW SOLUTIONS TO MEET THEM. IN 2014, SOLETANCHE FREYSSINET CONTINUED TO IMPLEMENT AN AMBITIOUS INNOVATION AND R&D POLICY.



STARSOL
T-PILE®



NEW GENERATION HYDROFRAISE® MOTORS

SOLETANCHE BACHY RE-THINKS ITS EQUIPMENT

HF 7500 hydraulic motors are the most recent of the range of Hydrofraise® down-the-hole motors. More compact than their predecessors (they can be used to drill 500 mm thicknesses), their service life is also three times longer. Mounted on the new Hydrofraise® drilling machines, they boost performance by up to 30%. These motors are also used on Geomix® machines providing additional power that further extend the depths to which deep mixing can be carried out.

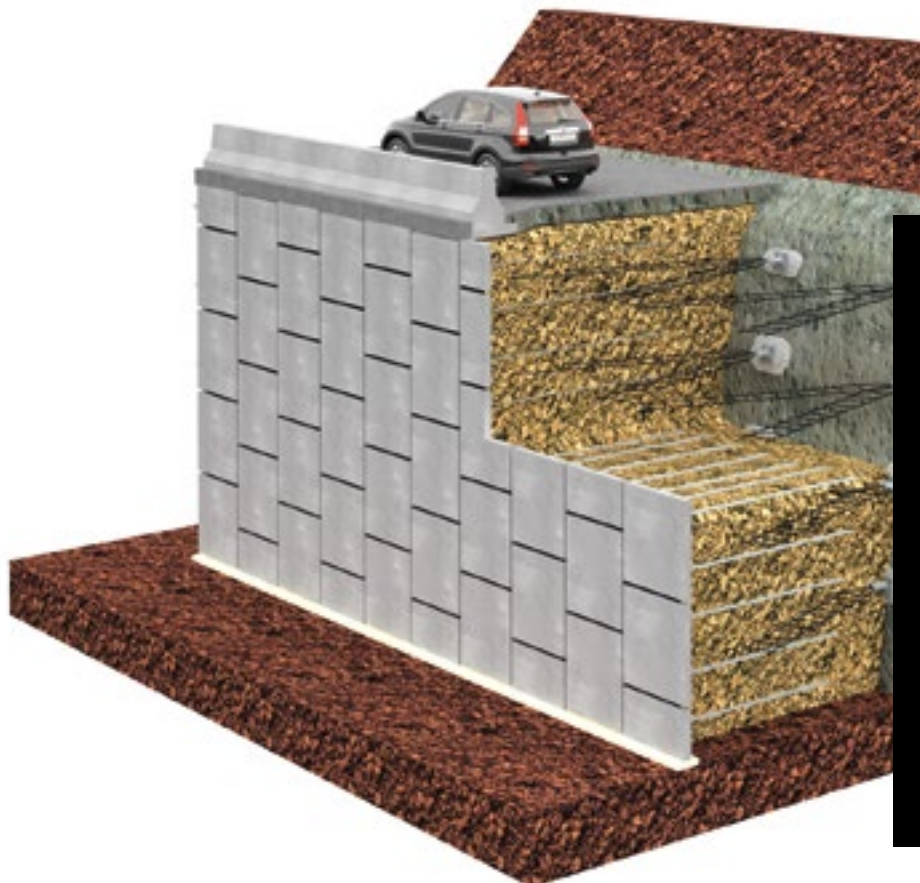
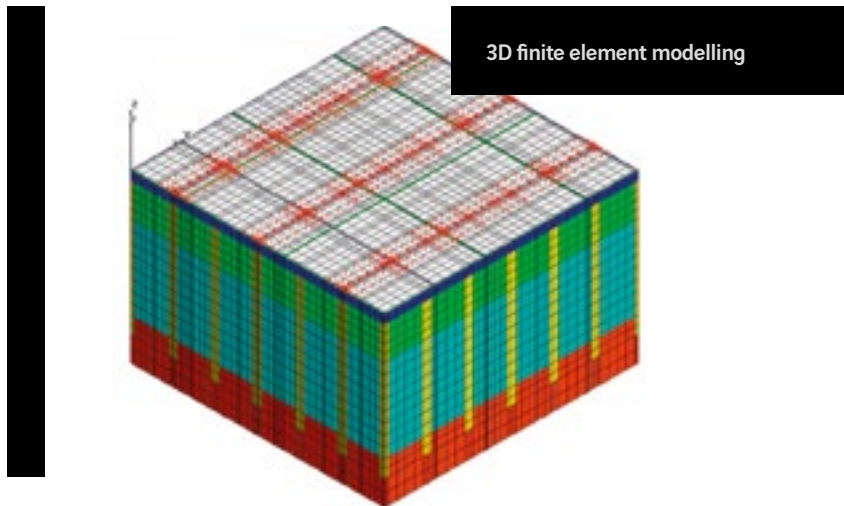
30 YEARS OF EXPERIENCE FOSTERS PROGRESS

Soletanche Bachy Pieux celebrated the 30th anniversary of the Starsol® process in 2014. To mark the anniversary, the specification was overhauled to take the new Eurocodes on board. The specification notably presents the specific features of the Starsol T-Pile®, for which structural design methods were approved following a large testing campaign in 2013. It extends a test database that is without rival in France. In the new process, the Starsol® tremie pipe activated during the concreting phase deploys a pin as the auger is raised. The result is a grooved pile, increased bearing capacity and the same concrete injection quality, which is ensured by submerging the tremie pipe one metre below the surface of the concrete already poured.

RIGID INCLUSION / INDUSTRIAL SLAB INTERACTION

MENARD OFFERS A NEW ENGINEERING METHOD

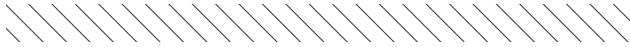
Rigid inclusions (such as Controlled Modulus Columns) are the main technique Menard uses in France. The solution offers significant benefits, including better settlement control, especially on very loose soils. Under industrial slabs, these inclusions must be designed in more detail than flexible inclusions (such as stone columns). To this end, Menard engineers have developed a novel design method for the slab and the inclusions. The innovative and compelling method is presented in the ASIRI technical recommendations as the recommended design method.



TERRALINK™ IN COMBINATION WITH REINFORCED EARTH®

A WINNING COMBINATION

The access road to the Nendaz resort in Switzerland needed to be widened to cope with increasing traffic. Working in commercial synergy with Freyssinet Suisse, Terre Armée built a Reinforced Earth® wall opposite the existing retaining wall. The solution was chosen so as to keep an access road to the resort open. In addition, a TerraLink™ solution was proposed to continue the Reinforced Earth® wall beyond its ends and to ensure a perfect connection with the existing road. By combining the two construction techniques, the company was able to ensure continuity of the facing panels and structural behaviour.



VERY HIGH WIND TOWERS

FREYSSINET INNOVATES IN WIND ENERGY

In 2014, Freyssinet and Alstom signed a partnership agreement to design and install 36 wind turbines in Trairi, State of Ceará, Brazil. As part of this project, Freyssinet is in charge of designing and building 36 precast, prestressed concrete towers with a height of 119 metres. An innovative method involving a lifting tool called Eolift® will be used in their construction. The high towers will significantly increase the energy produced by capturing higher, more powerful and more regular winds.



NUFILTER

NUVIA SUPPORT'S PERFORMANCE FOR WATER FILTRATION

As part of its 2014 Research and Development programme, Nuvia Support designed and developed a highly efficient pool water filtration system. NuFILTER UW180, which has a treatment capacity of 180 m³/h and a filter size of 1µ, offers high efficiency, as its first application under real conditions at EDF's Cruas site demonstrated. The new tool effectively met EDF's requirements at Cruas and successfully extends the range of heavy decontamination equipment developed by Nuvia Support in recent years.



CARRIER

NUVIA PROCESS INTRODUCES A NEW-GENERATION REMOTE-CONTROLLED CARRIER FOR A HIGH-TECH OPERATION

AREVA La Hague awarded a contract to Nuvia Process to dismantle a fission product solution evaporator. The solutions are highly radioactive and the evaporator is located in a closed cell. The operation therefore had to be remote controlled using indirect vision. The Nuvia Process teams designed a remote-controlled carrier able to move in three dimensions within an un-organised 300 m³ space. The tool can be fully controlled remotely and carries cutting and clamping tools that enable it to saw, section and shear the materials and then transport the pieces to appropriate containers. An operation of this type in a highly radioactive workshop is a first and the replacement of the evaporator was an important step in the project designed to ensure the future serviceability of the site's equipment in coming years. Designed and approved in only 12 months, the carrier is now in production. It is just one example of Nuvia Process's expertise in designing tools for remote-controlled decommissioning operations.





**WELLMAN
BOOTH**
WELLMAN BOOTH, 1000 SA
WELLMAN BOOTH, 1000 SA
THE WELLMAN BOOTH GROUP
A UNIT OF THE WELLMAN GROUP

Sellafield site
United Kingdom
NUVIA

III. BUSINESS ACTIVITY AND OUTLOOK

SOILS

SOLETANCHE BACHY

MENARD

STRUCTURES

FREYSSINET

TERRE ARMÉE

NUCLEAR

NUVIA

Page 34

Page 36

Page 40

Page 44

Page 46

Page 50

Page 54

Page 56



IKEA and MyTown
Malaysia
SOLETANCHE BACHY

- SOILS -



Luke QUINN
Development Manager
Boustead Ikano Sdn Bhd
MyTown Project, Malaysia

What were the challenges on this project?

“There were a number of issues to be resolved on the MyTown project. Unpredictable geology, hard limestone rock, nearby metro tunnels and the presence of a Hindu temple within the worksite are a few examples. For this challenging project we needed state-of-the-art geotechnical expertise. So we called on Bachy Soletanche Group Construction Malaysia (BSGCM).”

What were the key factors that enabled the project to succeed?

“Building on its track record and ability to adapt, BSGCM was able to complete the earthworks, special works and a part of the civil engineering works for our mega-shopping centre. The Group worked closely and resourcefully with our teams to come up with value-added alternative techniques. They were also very attentive to local authorities and residents, which helped boost acceptance. The project is now nearing completion.”



SOLETANCHE BACHY

A BENCHMARK IN FOUNDATIONS AND SOIL TECHNOLOGIES

Soletanche Bachy delivers a comprehensive range of geotechnical processes, special foundations, underground works and soil improvement and remediation techniques.



In 2014, Soletanche Bachy's revenue held steady. Volume was particularly strong in France, the United States, Central Europe, Central Asia (thanks to the momentum of the Zetas subsidiary in Turkey) and Malaysia, though it did not compensate for the downturn recorded in Asia (due notably to the completion of metro projects) and in the Gulf. Order intake held steady, with most orders placed in France, Central Europe, the United States, Latin America and Asia.

MAIN PROJECTS

- United States**, Wanapum Dam
- Argentina**, Bahía Blanca marine structures (thermal power plant)
- United Kingdom**, Crossrail and Lee Tunnel in London
- France**, Law Court in Paris, Capitaine Gèze metro station in Marseille, Hautot-sur-Seine turning circle in Normandy, Quai des Flamands quay extension in Cherbourg and East Port extension on Reunion Island
- Switzerland**, CEVA railway lines
- Hungary**, reconstruction of Line 1 of the Budapest metro
- Poland**, Second World War Museum in Gdańsk
- Cameroon**, new Wouri Bridge in Douala
- Togo**, Port of Lomé
- United Arab Emirates**, Terminal 3 in the Port of Jebel Ali in Dubai
- Hong Kong**, Express Rail Link (contract 811A)
- Macao**, SJM Cotai Macao
- Malaysia**, Ikea and MyTown shopping centres in Kuala Lumpur

ORDER INTAKE

- United States**, Port of Miami tunnel and Epic campus
- Mexico**, numerous shopping centre projects
- Colombia**, Buenaventura marine structure
- Chile**, Esccondida mine development
- France**, Paris metro Line 14 extension, Line 2 of the Nice tram and extension of the port of Sète
- Kazakhstan**, Sembol project
- Hong Kong**, M+ Museum for visual culture
- Macao**, a new casino
- Singapore**, Thomson metro line (construction of the Orchard and Gardens By The Bay stations)
- Vietnam**, Ho Chi Minh City metro
- Malaysia**, Kuala Lumpur metro

REVENUE



MANAGED REVENUE: €1.4 BILLION (revenue including the share of revenue in jointly controlled companies)

EMPLOYEES





IKEA AND MYTOWN, MALAYSIA

TWO PROJECTS CONDUCTED SIMULTANEOUSLY

A huge commercial complex rising in the centre of Kuala Lumpur will be home to an Ikea store and the MyTown shopping centre. Assisted by Bachy Soletanche Singapore and Rodio Kronsa, Bachy Soletanche Group Construction Malaysia, a subsidiary of Soletanche Bachy, built the sub-structure as prime contractor. The project called for construction of a 1,325 linear metre peripheral retaining wall, 770,000 cu. metres of earthworks (including 500,000 cu. metres to be blasted) and a 92,000 sq. metre foundation slab as well as a number of special works. The main challenge of the worksite was to conduct the two projects simultaneously. The teams' expertise and managerial talent enabled them to meet it and to control the risks.



SECOND WORLD WAR MUSEUM, POLAND

A WORLD RECORD IN SINGLE POUR UNDERWATER CONCRETE

A Second World War memorial museum is being built in Gdańsk, Poland, where the war began. The ambitious government-funded project provides for a structure that will be almost completely underground. In eight months, Soletanche Polska excavated the site. The bottom of the complex project lies 18 metres below the water table and has a residual water flow rate of 20 cu. metres per hour across the worksite's 14,600 sq. metre footprint. To limit water ingress in the absence of a waterproofing layer, Soletanche Bachy's Polish subsidiary designed and delivered a temporary anchored diaphragm wall. Subsequently, 195,000 cu. metres were dredged under water and a temporary underwater concrete plug was then poured. The plug has a volume of 25,000 cu. metres (1.5 metres thick, with 925 micropiles to permanently anchor the plug reaching a depth 23 metres). It was poured in seven days without interruption at an average rate of 150 cu. metres per hour. The operation, organised by the Soletanche Polska teams, sets a world record.



LAW COURT IN PARIS (COURT OF APPEALS), FRANCE

SUBSTANTIAL TECHNICAL AND HUMAN RESOURCES TO SERVE THE JUSTICE SYSTEM

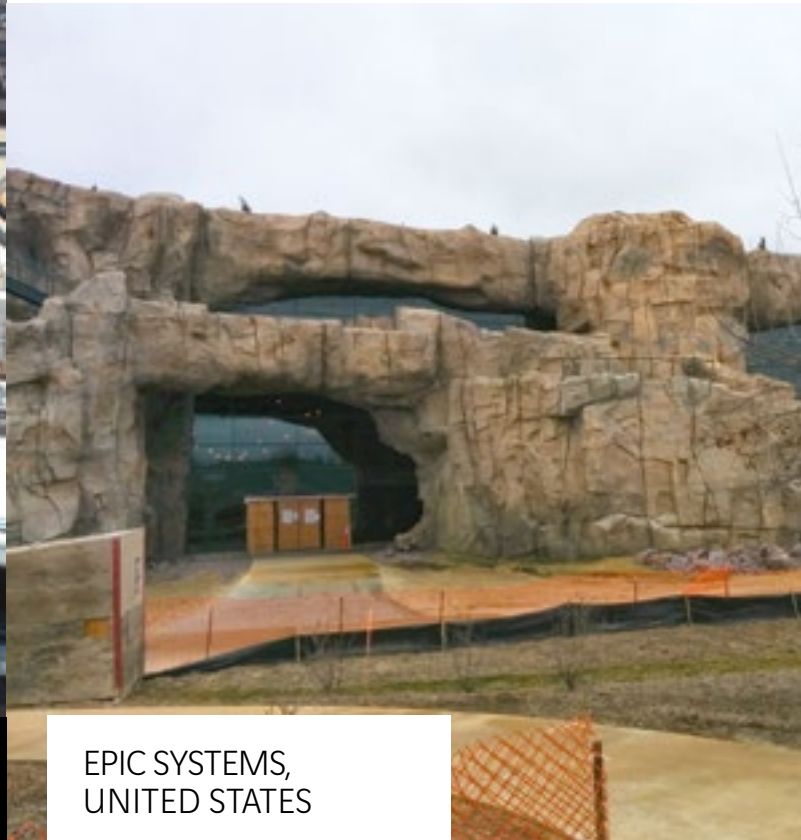
Bringing together the offices of the Paris court of appeals, the police court and the courts of the first instance, the future Law Court in Paris will be made up of a podium surmounted by a high-rise in three steps over 40 levels and an eight-storey building. The contract covering the full range of foundation works was awarded to Soletanche Bachy. The first phase consisted in carrying out injections to fill in the gypsum dissolution voids. A 721-metre perimeter diaphragm wall was then built to a depth of 23 metres. The highest part of the structure is supported by 78 barrettes set to a depth of 49 metres and the other areas rest on 350 Starsol® piles. Substantial material and human resources were made available in order to complete the project against a very tight schedule. Combined with the talents of the teams, these resources made it possible to manage work being carried out simultaneously by more than one company.



REFORMA 509
TOWER, MEXICO

UNDERGROUND LEVELS AND FOUNDATIONS WITHIN A VERY SMALL FOOTPRINT FOR A HIGH-RISE IN THE CENTRE OF MEXICO CITY

On the edge of the popular Chapultepec Park, the “Central Park” of Mexico City, Soletanche Bachy’s Mexican subsidiary Cimesa is working with the Group’s Major Projects department to build the underground levels and foundations of the new Reforma 509 high-rise building. The project’s complexity is due to the particularly small footprint of its worksite and it is being carried out in three phases. First, the two existing underground levels were demolished in a difficult operation, given that they were separated from the foundations of the neighbouring Mayor tower by only 75 cm. Following this, foundations were built at a depth of 64 metres, including 16,000 cu. metres of diaphragm walls and 3,628 sq. metres of barrettes. Civil engineering work and excavation will complete the project. The 805 tonnes of metal structures on which the high-rise will rest have been installed and the 12 underground levels are currently being excavated under cover. The teams, which gained experience on the Paseo de la Reforma towers, are again rising to the multiple challenges inherent in the project.



EPIC SYSTEMS,
UNITED STATES

SEVEN PROJECTS IN ONE YEAR AT AN EXPANDING SITE

Epic Systems, based in Verona, Wisconsin, designs medical software suitable for use by both large hospital groups and mid-range healthcare facilities. The company’s “intergalactic” corporate headquarters could easily be compared to those of Apple or Google. For the past five years, Soletanche Bachy’s subsidiary Nicholson Construction has been supporting the company’s expansion by working on office and training centre construction projects with inimitable design. Working as a subcontractor of J.P. Cullen, Nicholson Construction carried out seven independent projects in 2014 alone.



THE GROUND IMPROVEMENT SPECIALIST

From design to construction, Menard proposes and implements innovative foundation solutions based on high-performance ground improvement and reinforcement techniques.

Menard's revenue grew by 2% in 2014. Volume and order intake were strong in France, the United Kingdom, Poland, Kuwait, the United Arab Emirates, Australia, Canada and the United States, where Menard continues to open new agencies in an ongoing expansion drive. In Asia, despite less buoyant business activity, Menard carried out a large project in Vietnam. It won its first contracts in conjunction with Soletanche Bachy in Mexico and in Colombia, where Menard set up offices in 2013.

REVENUE

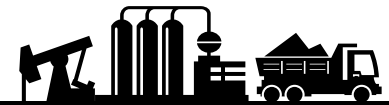


EMPLOYEES



MAIN PROJECTS

- Canada**, TFN Mills project
- United States**, US275 interchange, oil tanks in Raceland, Louisiana, Port of Long Beach
- United Kingdom**, Bexhill-Hastings Link Road
- France**, works package 15 on the SEA HSL
- Poland**, S19 motorway
- United Arab Emirates**, Bluewater Island, Pointe-Palm Jumeirah in Dubai
- Kuwait**, Al-Zour refinery
- Vietnam**, Nghi Son refinery
- Australia**, Brisbane Airport, Melbourne Docks project



ORDER INTAKE

- Canada**, Annacis wastewater treatment plant in Vancouver, Tilbury Island tanker terminal
- United States**, Fedex logistics hub in New Jersey, M&G Jumbo Plant Tank Farms in Corpus Christi, Texas
- Australia**, Perth Stadium



OIL TANKS IN RACELAND,
LOUISIANA,
UNITED STATES

CONTROLLED MODULUS COLUMNS SET A WORLD DEPTH RECORD IN LOUISIANA

In the United States, very soft clay deposits are frequently found along the Gulf coast. This raises the cost of foundations for oil storage projects in the region, which is ideally located between Texas and the oil-rich Gulf of Mexico. Menard USA was asked to propose a ground reinforcement solution able to support four 43-metre diameter tanks with a height of more than 12 metres. Preliminary ground investigations showed a clay deposit of nearly 60-metre thickness, with the clay becoming harder at a depth of 40 metres. The use of 40-metre Controlled Modulus Columns (CMC) was therefore recommended. Because none of the drilling rigs in the company's fleet could reach this depth, the US subsidiary of Menard called on Birmingham, a subsidiary of Soletanche Bachy in Canada specialising in the production of drilling and pile driving equipment. In less than eight weeks, two drilling rigs able to reach 50 metre depths were designed and built. On the strength of this engagement and the technical appeal of the solution, Menard was awarded the contract to improve the foundation soil. The technological feat paves the way for Menard to win further CMC contracts in the United States.



SEA TOURS-BORDEAUX
HSL, FRANCE

SOIL EXPERTISE SERVING HIGH-SPEED RAIL

The largest project of its type in Europe, the South Europe Atlantic high-speed line will reduce travel time between Paris and Bordeaux. Menard improved the ground under the backfill over a height of 5 to 10 metres for the northern and southern access to one of the project's iconic structures, the viaduct over the Dordogne River. A number of clay layers were to be treated to a depth of about 12 metres below the roadbed, with anchoring in the compressible soils of former swamps. Nearly 8,000 Controlled Modulus Columns with a diameter of 320 mm and a total length of about 110,000 linear metres were installed. Thanks to the strong involvement of Menard's design office, one of the major challenges of the project was addressed aligning the calculations with the technical specifications near the structure. Load tests ranging between 30 and 80 tonnes and mechanical impedance tests were carried out to ensure compliance with the most important criterion: less than one centimetre of total settlement under traffic loading over the next 25 years.



NGHI SON REFINERY,
VIETNAM

GROUND IMPROVEMENT FOR A DEMANDING PROJECT

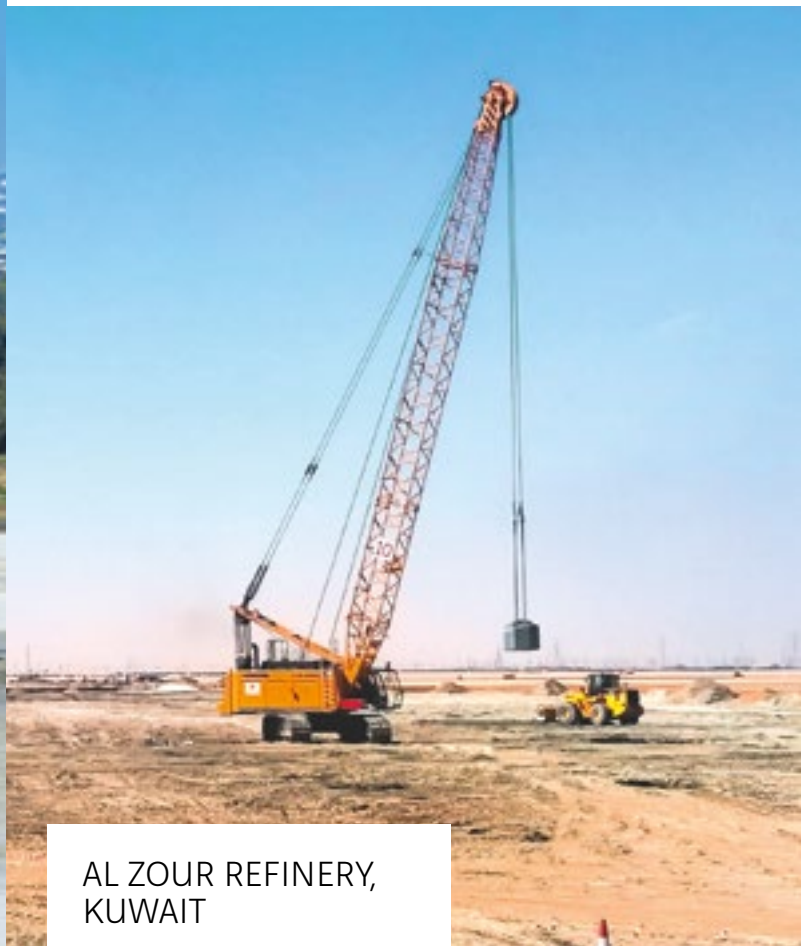
Nghi Son is Vietnam's second refinery. Menard, which worked on its first refinery, the Dung Quat complex, in 2006, also worked on the second in 2014. The Nghi Son refinery covers an area of 325 hectares and comprises a wide range of infrastructure. It will produce oil and other chemical products. As part of the project, Menard was in charge of improving an area of nearly 45,000 sq. metres that will support 32 tanks with diameters ranging from 24.1 to 68.7 metres. The Controlled Modulus Column method was used. Three drilling rigs were used to install more than 14,000 columns. Menard's stringent Quality, Health, Safety and Environment system and scheduling were an advantage on this project with high QHSE requirements.



**BRISBANE AIRPORT,
AUSTRALIA**

330,000 OF PRECAST VERTICAL DRAINS

As part of its capacity expansion project, Brisbane Airport initiated construction of an additional runway. Menard Bachy, the Menard subsidiary in Australia, worked in a joint venture to supply and install prefabricated vertical drains for the project, which required dredging and backfill. 330,000 drains with lengths ranging from 16 to 40 metres were installed in 17 areas covering a total of 65 hectares. With 8.2 million linear metres of prefabricated vertical drains, the project is the largest of this type ever carried out in Australia. The technique was chosen as the most efficient for the runway construction in order to accelerate the consolidation of saturated soils and settlement of the dredged sand platform (time reduced from five years to three). The project was completed three weeks ahead of the six-month schedule and logged more than 40,000 hours of work without a single lost-time accident.



**AL ZOUR REFINERY,
KUWAIT**

NEW PROJECT IN THE MIDDLE EAST

The contract was won through the combined efforts of Menard teams in France, the United Arab Emirates and Kuwait. It covers improvement of about 4,000,000 sq. metres of natural soil at the site of a new refinery. To improve bearing capacity and control settlement in very poor soil (silt and sabkha), the Group decided to use dynamic replacement and dynamic compaction. It brought together 20 compaction cranes and 150 people to treat the strategic industrial site. Menard put together a team made up of very experienced employees and young talent familiar with the Middle East to carry out the technically and logistically complex project. The combination made it possible to efficiently start the project and should ensure its success.



Hammersmith Flyover
United Kingdom
FREYSSINET

- STRUCTURES -



Barry WOODMAN

Costain Programme Director
Hammersmith Flyover Phase 2
United Kingdom

What were the keys to success on this project?

“Innovation and detailed construction planning throughout the Early Contractor Involvement phase has been at the centre of our solution to reduce construction and programme risk, combined with the team’s commitment and flexibility to meet the numerous technical, access and logistical challenges that have presented themselves.”

What is your impression of your work with Freyssinet in the heart of London?

“Freyssinet have brought considerable technical expertise to the project team, with tailored and innovative solutions in methodology, materials and equipment that have significantly reduced the requirement for onsite work, and the construction defect and programme risk, thereby ensuring that the successful refurbishment of the critical piece of London infrastructure for our client Transport for London is achievable.”



A BENCHMARK IN CONSTRUCTION AND REPAIR OF CIVIL ENGINEERING STRUCTURES

Freyssinet works on a wide range of projects across five continents and is the world benchmark in its specialist activities: prestressing, construction methods, cable structures, structural equipment, structural repair, reinforcement and maintenance.

In 2014, Freyssinet posted 13.8% growth. Its new construction and repair activities expanded rapidly, notably in Central and Eastern Europe, the United Kingdom and Mexico. It also recorded a high volume of activity in France, Australia, the Middle East and the United States. Freyssinet's 2014 order intake set an all-time record, with the signature of a number of major contracts.

REVENUE



MANAGED REVENUE: **€662 MILLION**
(revenue including the share of revenue in jointly controlled companies)

EMPLOYEES



MAIN PROJECTS

United States, Willamette River Transit Bridge ("Tilikum Crossing")

United Kingdom, Hammersmith Flyover

France, SEA HSL, Pont d'Arc Cavern, Puymorens tunnel upgrade

Spain, La Pepa Bridge

Russia, Kaluga Silos

Algeria, Constantine Bridge

Saudi Arabia, Dammam Bridge

China, Hainan LNG tanks

Singapore, Benoi Road NTUC

FairPrice distribution hub

Australia, MLC Centre tower repair



ORDER INTAKE

Mexico, Coyuca and Coatzacoalcos I Bridge repair

Brazil, Trairi wind farm

Turkey, BJK stadium roof and access viaducts to the 3rd Bosphorus bridge

Russia, Korabelny Bridge and Belorusskaya nuclear power plant

Hong Kong, viaduct linking Tuen Mun and Chek Lap Kok (TMCLK)

and Lian Tang 3 (LT3) Cross-Boundary Bridge

Thailand, Red Line metro line

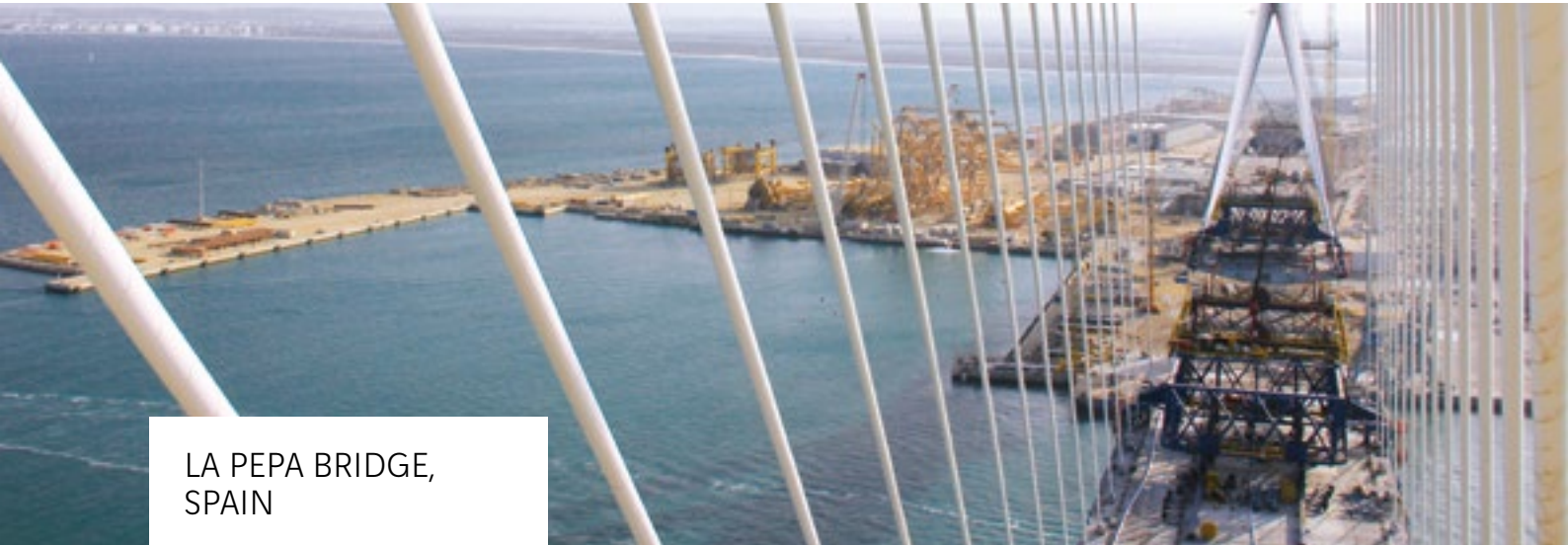
Australia, Geraldton steel silos (repair)



HAMMERSMITH FLYOVER, UNITED KINGDOM

A PROJECT CALLING FOR COMMITMENT AND TECHNICAL CAPABILITY

The Hammersmith Flyover carrying the A4 artery over the roundabout in the centre of Hammersmith in West London was one of the first crossings to be built of reinforced concrete. In December 2011, a bridge inspection found that a large number of steel cables had been damaged, notably by water ingress. Emergency work was immediately undertaken on the worst affected parts of the structure. Freyssinet succeeded in meeting the objective of bringing the bridge back into service in time for the London Olympics in 2012. In early 2014, Freyssinet was again called on, this time to carry out the second phase of the reinforcement. On this project, Freyssinet is notably in charge of external prestressing and is precasting and installing anchor blocks made of Ultra-High Performance Fibre Reinforced Concrete (UHPFRC). In an innovative approach, the material is being used for the first time in the United Kingdom as the key element in the new prestressing system. The main advantage of the material is the reduced weight and volume of the concrete anchors.



LA PEPA BRIDGE,
SPAIN

FREYSSINET STAY CABLES ON THE BAY OF CADIZ

The La Pepa Bridge will be the second crossing over the Bay of Cadiz in southern Spain. It is a 540 metre cable-stayed structure with a span rising 69 metres above sea level. Freyssinet installed the 176 stay cables (comprising a total of 2,100 tonnes of steel), took part in installing the prestressing of the piers and provided the elastomer bridge bearings. The teams began work at the site in the summer of 2013 and it is set for completion in 2015.



LARIVOT BRIDGE,
FRENCH GUIANA

REJUVENATION OF THE CROSSING OVER THE CAYENNE RIVER

The Larivot Bridge on the national highway between Cayenne and Kourou carries most of the east-west traffic in French Guiana. Heavily damaged by the salinity of the Cayenne River, the bridge has undergone major repairs and rejuvenation. The Freyssinet teams in charge of the project first focused on protecting the structure from rust by installing a cathodic protection system. They then replaced the bearing structures, upgraded a part of the deck and replaced the expansion joints. Most of these operations were carried out without interrupting automobile traffic on the bridge. The bridge was again fully operational by October 2014.



**COATZACOALCOS I
BRIDGE, MEXICO**

THE STEEL STRUCTURES AND LIFT SPAN ARE SPRUCED UP

The Coatzacoalcos I Bridge lies southeast of the city of the same name along a strategic artery in the State of Veracruz. With the region's high humidity, salinity and pollution threatening the steel used to build the structure, Freyssinet was called in to repair, reinforce and protect it. These operations took place over a period of three years. The first step consisted in repairing the central piers through reinforcement, compensating for the slope and transferring the load. The neoprene bearings were replaced, the structure was waterproofed and the most damaged areas were repaired with carbon fibre fabric (Foreva® TFC). The second step consisted in reinforcing the steel spans: the cylinders were coated, shear strength was increased using carbon fibre, external prestressing was installed on certain sections and a corrosion inhibitor was applied. In a third and final step, the lift system was refurbished and the central span replaced. The bridge was reopened to traffic in October 2014.



**BLUE AND RED
METRO LINES,
THAILAND**

EXTENSION OF THE PARTLY ELEVATED METRO IN BANGKOK

As part of the extension of the mass transit system via new partly elevated lines, the city of Bangkok called on Freyssinet's expertise. For the Red Line (north from the city centre), Freyssinet designed the tools to lay the deck and supplied and commissioned the prestressing. Prestressed concrete elements will be used in the viaduct supporting a 19.2 km section of the line that runs above the city's streets and buildings. For the Blue Line, Freyssinet also began construction of a viaduct made up of 4,054 precast segments, a total of about 3,250 tonnes of prestressing. The Red Line and the Blue Line will be brought into service in 2019 and 2017 respectively.




TERRE ARMÉE

SPECIALIST IN REINFORCED BACKFILL AND SOIL-STRUCTURE INTERACTION

Building on its unparalleled expertise and experience in its field, Terre Armée is the world leader in earth retaining structures and a specialist in precast arch segments for cut-and-cover tunnels.

Terre Armée brings its one-of-a-kind proprietary technologies and processes to infrastructure projects of all sizes around the world.

 In 2014, Terre Armée recorded 1,9% revenue growth. Growth remained on track in the United States but contracted in Australia, Canada, India and South Africa, primarily as a result of lower investment in mining projects.

REVENUE

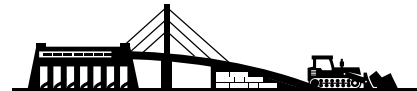


EMPLOYEES



MAIN PROJECTS

- United States**, North Tarrant Express, I-25 and Santa Fe-Denver roads
- Chile**, Las Tórtolas embankment and Antucoya mine
- United Kingdom**, A465 road (Heads of the Valleys)
- France**, SEA HSL
- Italy**, Quadrilatero project (SS77 expressway)
- Chad**, Grand Hotel river wall in N'Djamena
- Lesotho**, Koma Koma bridge
- India**, Agra Bypass and Aligarh-Ghaziabad motorway infrastructure
- Thailand**, A11 motorway widening
- South Korea**, SKM cut-and-cover
- Australia**, Gateway WA



ORDER INTAKE

- United States**, Northwest Corridor in Atlanta, I35 Corridor in Dallas, Texas, and south terminal at Denver International Airport
- Italy**, Ghella TechSpan®
- Chad**, urban roads in N'Djamena
- Australia**, HV Overpass



GRAND PARKWAY, UNITED STATES

OVER 100,000 SQ. METRES OF REINFORCED EARTH® WALLS

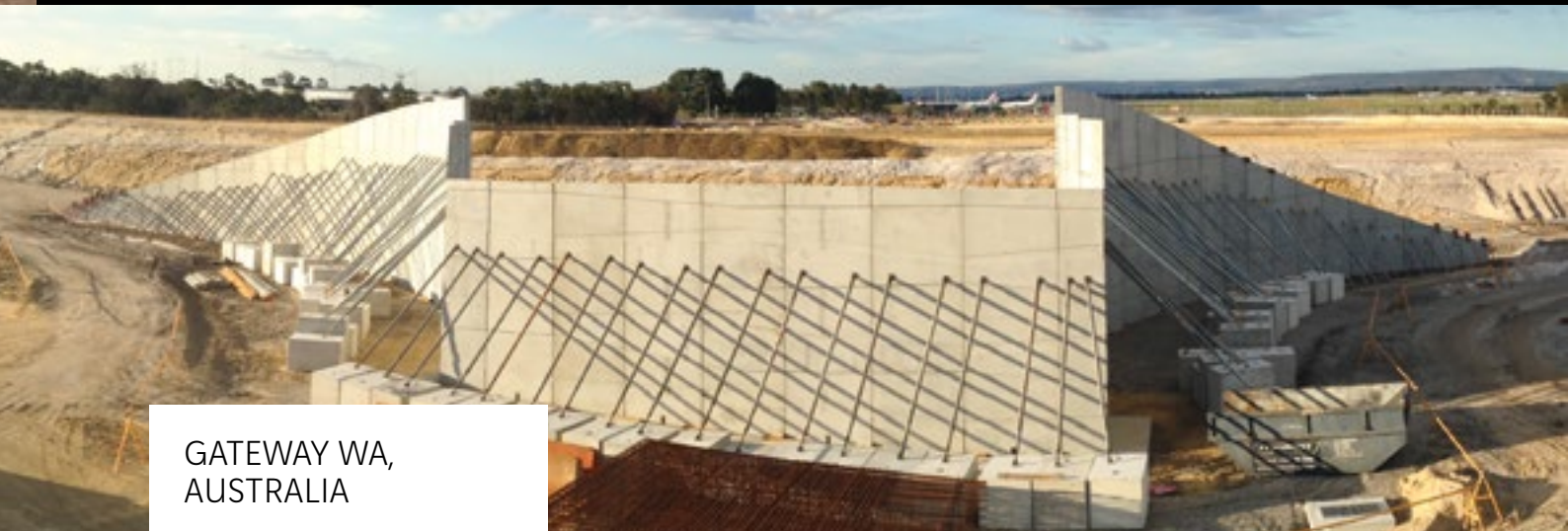
The Grand Parkway (SH 99) is a key project for the state of Texas. The road infrastructure will cover 300 km and cross seven counties. The Reinforced Earth Company (RECo) USA, the subsidiary of Terre Armée in the United States, worked as a subcontractor on the design-build construction of several segments. The contract covered over 100,000 sq. metres of Reinforced Earth® walls and 22,000 linear metres of precast cornices for more than 100 retaining structures. To highlight regional identity, three areas were selected for the installation of customised facing panels. On the north corridor panels, motorists can admire the shapes of trees that echo the surrounding pine forests.



LAS TÓRTOLAS DAM, CHILE

REINFORCED EARTH® WALLS TO INCREASE THE CAPACITY OF AN IMPOUNDMENT DAM

In 2017, production at the Los Bronces open pit mine high in the Andes in Chile will virtually double, making it the world's fifth-largest copper mine. To support the development of the facility, its infrastructure must be overhauled, including the Las Tórtolas storage dam, which will require a capacity upgrade. To achieve this, Terre Armée's Chilean subsidiary Tierra Armada Chile proposed that the dam be raised by adding Reinforced Earth® retaining walls. The idea is to build downstream and upstream protective walls in several stages as the mine expands. A total of four walls will be built in two successive heights (14 and 22 metres) along a length of 277 metres, over a total area of 4,730 sq. metres.



GATEWAY WA, AUSTRALIA

OVER 30,000 SQ. METRES OF REINFORCED EARTH® WALLS

The major Gateway motorway infrastructure project in Western Australia is designed to improve the flow of traffic on one of the region's main road arteries. Following delivery of 1,775 sq. metres of facing panels for the Abernethy interchange in early 2013, The Reinforced Earth Company (RECo) Australia was awarded the contract to design and supply 25,900 sq. metres of TerraTilt® full-height facing panels, 820 sq. metres of modular TerraPlus® facing panels and about 2,000 sq. metres of TerraTrel® metal facing panels for the access road to the Perth airport and its freight zone. The teams had to innovate to adapt to the technical constraints of the worksite (structures located under the water table, complex finishing of some facing panels, etc.), notably by creating eight millimetre thick reinforcements with special anchor points and building temporary walls to retain the backfill and keep adjacent roads open to traffic. The project got under way in 2013 and is scheduled for completion at the end of April 2015 with the handover of the last panels.



QUADRILATERO
ROAD PROJECT,
ITALY

TECHSPAN® ARCHES AND REINFORCED EARTH® WALLS FOR NEW INFRASTRUCTURE

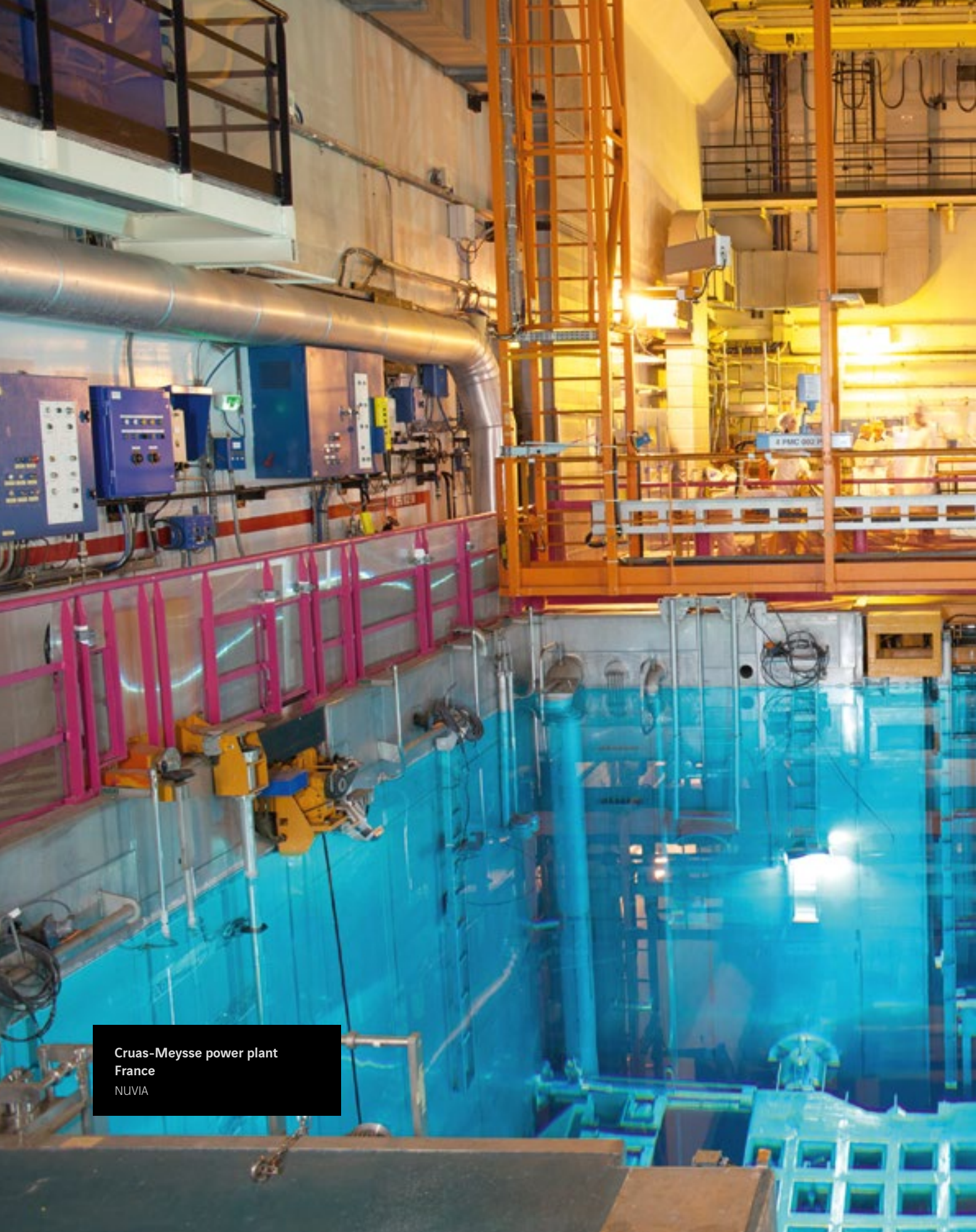
In Italy, the Quadrilatero project is designed to improve the flow of traffic in the Marche and Umbria regions by adding 160 km of new roads to the network. Terre Armée worked on the SS77 expressway, key infrastructure connecting Foligno and Tolentino. Its teams designed and supplied 1,500 linear metres of TechSpan® arches and provided technical support for their installation. They also installed 20,000 sq. metres of Reinforced Earth® retaining walls. Safety was a constant focus of attention on the worksite due to poor weather conditions, seismic risks in the region and the tight project deadline.



NNPC ROAD BRIDGE,
NIGERIA

REINFORCED EARTH® ACCESS RAMPS IN NIGERIA

Terre Armée worked in Yenagoa, the capital of Bayelsa State in southern Nigeria, to build two access ramps for the NNPC road bridge. The NNPC bridge is located at one end of the Isaac Adaka Boro expressway. A second, similar structure, also with Reinforced Earth® access ramps, will be added in 2016.



Cruas-Meyssse power plant
France
NUVIA

- NUCLEAR -



Philippe SASSEIGNE

Executive Vice President
Head of Nuclear Power Plant Operations
EDF
France

You have been calling on Nuvia's expertise for several years. What do you expect from this company?

"EDF's nuclear fleet will be facing a number of challenges in coming years, first and foremost the major "Grand Carénage" overhaul. We will only succeed in carrying out this challenging and very intensive industrial programme if our industrial partners support us in the key areas of high-quality activity preparation, expertise and flow control. Against this backdrop, Nuvia will play a crucial role in logistics. Nuvia has become a key player in that field and holds the industrial logistics contracts for three of our 19 nuclear plants."

How would you describe your relationship with Nuvia and what are the key factors that ensure the success of a project?

"Nuvia is attentive to our goal of increasing the efficiency and effectiveness of our maintenance operations. It pro-actively proposes ways to optimise our logistics processes and tries out new ways of organising them to facilitate maintenance work. As a result of the partnership relationship it forges over time, Nuvia works with the client to make improvements that enable them jointly to meet objectives going forward. Nuvia has steadily adapted to our requirements, making it possible to overcome the difficulties encountered."



THE NUCLEAR SPECIALIST

Specialising in civilian and military nuclear facilities, Nuvia works on all stages of their life cycle, from application for authorisation to construction, operation, maintenance, decommissioning and waste management.



In 2014, Nuvia recorded growth of 12,4%. Business was brisk in its three main markets – France, the United Kingdom and the Czech Republic. Nuvia also continued its expansion in China and India, notably in fire protection at nuclear power plants, and diversified into measuring equipment with the acquisition of the German S.E.A. and MED companies.

— NUVIA, FRANCE —

The company carried out a large number of projects (civil engineering, seismic protection, logistics, etc.) at EDF, CEA and AREVA nuclear sites in operation as well as sites being decommissioned (Cadarache, La Hague and Creys Malville) and sites under construction (Epure and ITER).

REVENUE



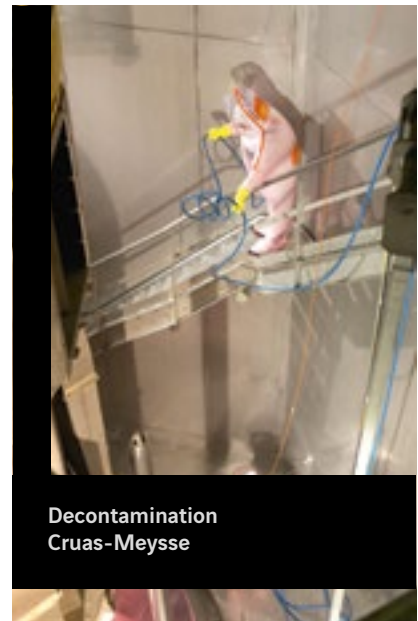
EMPLOYEES



CRUAS AND DAMPIERRE POWER PLANTS, FRANCE

EDF RENEWS ITS CONTRACTS WITH NUVIA SUPPORT

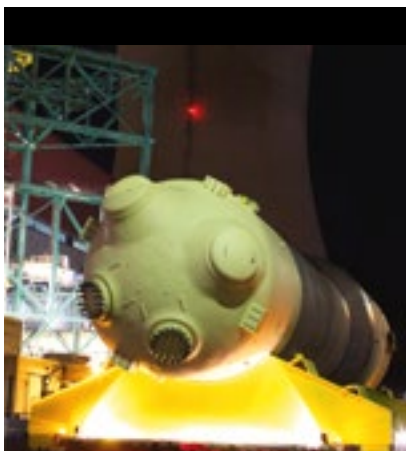
In 2014, EDF renewed its confidence in Nuvia Support, awarding it the Global Worksite Support Services contract at the Cruas and Dampierre nuclear power plants. The award of these multi-year contracts will ensure continuity, as Nuvia Support held the previous ones. In the new contracts, EDF decided to broaden the scope of work entrusted to Nuvia Support by adding further activities such as management of the warehouses at Dampierre. These contract renewals demonstrate the suitability and quality of the solutions provided by Nuvia Support to assist its clients.



CREYS-MALVILLE,
FESSENHEIM, CRUAS AND
BLAYAIS POWER PLANTS,
FRANCE

**NUVIA STRUCTURE CONTINUES
TO EXPAND ITS SPECIALIST AND
MECHANICAL WORKS ACTIVITY**

Nuvia Structure continued its longstanding activity in prestressing bars to attach equipment (Steam Generator, Primary Pump, Pressuriser, Piping, etc.) to civil engineering. The work to dismantle the tunnels at EDF's Creys-Malville plant is completed in February 2015. This is achieved after four years of work which included the successful and high-profile operation to cut up four expansion tanks weighing nearly 40 tons, each using a special machine developed by Nuvia. Following the construction of the PTR tank cover (large-capacity tank of borated water) at Fessenheim Unit 1 for EDF, Nuvia Structure equipped the second unit in 2014. The project teams used new techniques that combine 3D design and digital files to build a second composite reinforced concrete / metal frame building with a height of 25 metres.



**Steam Generator Replacement –
Cruas-Meysse**

As part of its longstanding work for AREVA, Nuvia Structure was increasingly involved in the mechanical fitting work in the Steam Generator Replacement operations. Nuvia Structure provided handling, support, docking and Steam Generation (SG) finishing for the two SG replacements planned (Cruas 4 and Blayais 3).

**LA HAGUE, ISPRA
AND GRAMAT SITES,
FRANCE AND ITALY**

**NUVIA PROCESS AT THE HEART OF
NUCLEAR TECHNOLOGIES**

Nuvia Process distinguished itself in 2014 with a high-profile operation to dismantle AREVA's R7 evaporator at the La Hague site. The work was unprecedented in two respects: it took place in a high-radiation environment and it included the design, fabrication and adjustment of a complex manipulator arm with force feedback control.

A Nuvia Process flagship project that took almost two years was completed at Ispra in Italy in 2014 with the dismantling of a reactor that had been used to carry out R&D on fusion accidents.

Nuvia continues to expand its one-of-a-kind offering in nuclear measurement, winning a large number of contracts in France and internationally.

**ANDRA, CERN, TAISHAN AND
FLAMANVILLE EPRs, FRANCE
AND CHINA**

**EXPANDED FIRE PROTECTION
WORK FOR NUVIA PROTECTION**

In 2014, Nuvia Protection won two contracts to supply fire dampers for ANDRA and CERN.

In China, Nuvia Protection is installing fire and radiation protection seals at the two Taishan EPR units, sealing the mechanical and electrical penetrations, protecting the ventilation ducts, supplying the fire dampers, protecting the cable trays and isolating the space between containments.

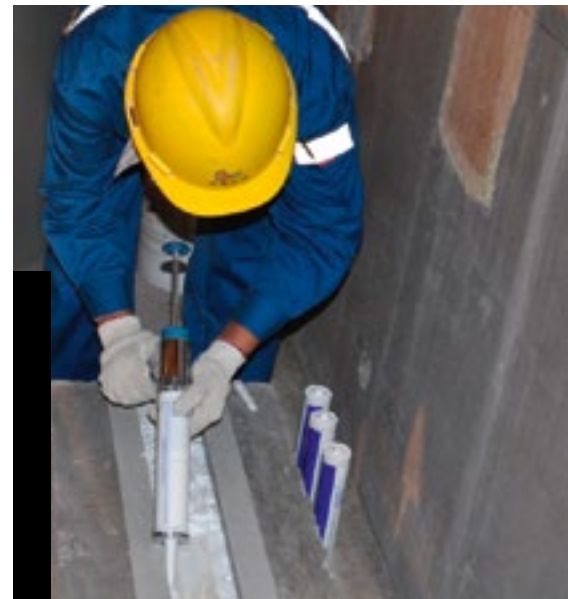
**CIGEO, EPURE, EDF, AIRBUS
PROJECTS, FRANCE**

**MILLENNIUM SHOWCASES ITS
EXPERTISE**

In 2014, Millennium began safety studies relating to the funicular railway used to transport waste packages as part of the Poma/Astrium/Millennium/Ligeron joint venture (sub-system 8 of ANDRA's CIGEO project).

Work on the Epure project continued at the Valduc centre following two and a half years of studies. Millennium coordinated all work carried out by the partners (especially CBR and C3B). Millennium also consolidated its position as the national leader in radiation protection for EDF, via framework contract renewals covering many years.

Within a joint venture led by Airbus, Millennium began the feasibility study for a mobile unit to recover waste from the pits at the Marcoule, plus a packaging unit to handle this waste.



**EPR sealing
at Taishan**

— NUVIA, UNITED KINGDOM —

In the United Kingdom, Nuvia worked primarily on decommissioning, nuclear waste management and EPC projects for Sellafield Ltd, and provided a wide range of services across the UK sites including radiation monitoring of beaches on the Dounreay coast of Scotland using the Nu GHLV 2000 mobile unit developed by its teams.

NUCLEAR POWER GENERATION

A NEW OUTPOST CLOSE TO THE CLIENT

In early 2014, Nuvia opened an office in Gloucester, near the headquarters of the country's largest current provider of nuclear electricity, EDF. Supporting construction of the Sizewell B dry storage facility generated a significant increase in EDF activity. Nuvia also signed a number of project management and technical support contracts to assist EDF in extending the life of its nuclear power stations.

OIL & GAS CONTRACT

A BUSY YEAR

Nuvia's Oil & Gas activities, including radiation protection services, generated brisk business throughout 2014. Nuvia also developed recurring activity in treating drilling equipment contaminated by naturally occurring radioactive material (NORM). These operations are performed at two Nuvia NORM facilities, based in Scotland and the south of England.

NUCLEAR CONSTRUCTION

A NEW MILESTONE IS REACHED WITH HORIZON NUCLEAR POWER

At the end of 2014, Nuvia won a contract to provide services for Horizon Nuclear Power

(HNP). The five-year contract is in support of the deployment of the future Advanced Boiling Water Reactors (ABWR) at the Wylfa and Oldbury sites. Nuvia is supporting the client by providing technical verification with a view to obtaining approval of the Decommissioning Funding Plan (DFP). Its involvement and its experience with DFPs for new reactors will reinforce its expansion and positioning in this type of activity for other construction projects in the United Kingdom and as part of its broader international consulting offer.

ENGINEERING, PROCUREMENT AND CONSTRUCTION

INCREASING CAPACITIES

In early 2014, Sellafield Ltd awarded a number of key projects to Nuvia. One involves the development of a fuel export facility for the storage pond for first-generation spent Magnox fuels pending disposal. Another covers installation of a drum filling plant for waste packages.

NUCLEAR DECOMMISSIONING TECHNICAL CHALLENGES AT HIGH ALTITUDE

At the Sellafield site in Cumbria, Nuvia is in charge of dismantling a 120 metre high stack. The dismantling of this structure,

which rises 60 metres above the United Kingdom's main nuclear fuel processing plant, is a first and involves a number of technical challenges. A platform has been fitted to the outside of the stack to enable it to be demolished vertically. The platform is designed to enable Nuvia personnel assigned to the dismantling operation to access the structure to carry out cutting operations, and to support their equipment. A diamond wire system is used to cut the reinforced concrete sections and inner metal lining into pieces. These pieces will then be brought down to the bottom of the stack for radiation monitoring before disposal.





NUVIA, INDIA

DEVELOPMENT AND INNOVATION IN PROTECTION OF INSTALLATIONS

Nuvia won the contract to provide passive fire protection solutions during construction of the prototype fast breeder reactor (PFBR) in Bhavini.

The scope of work includes design, produce, test, supply, deliver and install passive fire barriers for the mechanical and electrical penetrations. Nuvia India continues to expand in nuclear measurement with the design and production of a state-of-the-art facility for calibrating and inspecting radiation protection equipment in New Delhi. The Atomic Energy Regulatory Board, the regulatory authority, has given the facility its approval.

— ENVINET, CZECH REPUBLIC —

Based in the Czech Republic, Envinet designs and produces bespoke radiometric equipment and solutions for the radioactive waste characterisation and ionizing radiation measurement.

Envinet continued its expansion into new markets in Europe such as Croatia and Poland.

It reinforced its position in the Arab world, notably via successful cooperation with the King Abdulaziz City for Science and Technology in Riyadh.



Envinet also played a key role in a large number of R&D projects at national and international level. The development of the NuEM EGM smart gamma probes is a case in point. These are used in such applications as environmental radiation monitoring (radioactive and pollution contamination as part of an alert network), radiation protection for facility safety

(nuclear power plants, radioactive material storage, radiotherapy centres and hospitals, scientific institutions) and national security for the prevention of illicit trafficking of nuclear materials at airports, train stations and state boundaries.



SOLETANCHE FREYSSINET

280 avenue Napoléon Bonaparte - 92500 Rueil-Malmaison - France

www.soletanchefreyssinet.com

Director of publication: Jérôme Stubler - Editor in Chief: Marine d'Anterrosches - Design and production: agencenewyork - Editorial committee: Agnès Baranger, Guillaume Billaroch, Marie Brunel, Juliette Dumoulin, Nathalie Gresset, Isabelle Mennesson, Stéphane Monleau - Contributor: Patrick Russo - Translation: Alto - Cover photo: Wouri Bridge - Photo credits: Luc Benevello, Cyrille Dupont, Cédric Helsly, Jean-Marie Huron, Alain Ngann, Lisa Ricciotti, Francis Vigouroux, SIAGE Guyane, photo libraries Soletanche Bachy, Menard, Terre Armée, Freyssinet, Nuvia, All rights reserved - Printed on Print Speed PEFC certified offset premium.



