

- ROCK EXCAVATION WITH EXPLOSIVES
- REINFORCEMENT
- GALLERY DRILLING

20 METERS FROM AN OPERATING HYDROELECTRIC PLANT

SITE	SARRANS DAM , FRANCE
PROJECT OWNER	EDF UP Centre
PRIME CONTRACTOR	EDF CIH_Service Technique GC
PRINCIPAL	VINCI (GTM) / RAZEL BEC
PERIOD	March-September 2013* May-June 2014 **



GOALS & CONSTRAINTS

- EDF undertook in 2013-2014 important works to create a new drainage solution of the Sarrans dam (Aveyron), integrating a function enabling flood evacuation.
- With a 113,20 meter height on foundation and 225 meter crest length, the dam is located in a granitic zone at the entrance of the narrow and steep gorges.
- EPC-France was sought to achieve in the strict respect of the planning of the site (programmes lowering the water level), the work of:
 - ✓ Rock excavation with explosives
 - ✓ Reinforcement of the cliff
 - ✓ Digging (drilling & blasting) of 2 galleries of 106 m* and 24m**, and a 23 m well, tilted at 45°**
- All of this... 20 meters from a hydroelectric plant in use

KEYS FACTS & FIGURES



- **12 EPC specialists** (surface / underground) involved (7 000 hours)
- 20.000m³ blasted, including half in underground
- **22 surface blasts, 20m from a hydroelectric plant in use**
- Vibratory limit : **15mm/s @ 20m** controlled at 5 points
- **130m of gallery of 27m² section**
- One 23m well and 4,70 m section, tilted at 45°
- **74 underground blasts including 59 using pumpable emulsion (MORSE)**
- 3150 m² of **grid fixed** (the equivalent of **16 tennis courts**)
- 373m² of netting and 133ml of anchoring
- **1 day in advance compared to the planned date (surface part)**
- **1 week in advance for the underground works**





SAFETY OF PEOPLE

- On-site procedure enabling to prioritize the security of men in spite of a tight planning (management of co-activity up and down, surface, underground works, etc.)

EFFICIENCY AND TIMELINESS

- Procedure enabling an optimal phasing and to attain the goals in the context of operational and time constraints:
 - ✓ Creation of 2 simultaneous work zones in surface, and phasing of 3 different drilling modes,
 - ✓ Engineering of surface and underground blasts for a strict respect of vibratory limits and the control of projections,
 - ✓ 23m well achieved in 4 blasts
 - ✓ Choice of the most adapted explosives to each setting (safety/ efficiency).

A UNIQUE COMBINATION OF HIGH TECHNICALITY SOLUTIONS AND KNOW-HOW, CONDUCTED BY EXPERIMENTED PROFESSIONALS

- In surface**, acrobatic blasting of the anchoring and blast holes (manual punch), then by mechanised means (walking excavator with drilling mast, hydraulic drill 16 tons)
- Reprofiling of the cliff by the means of micro blasting, followed by pre-cut blasts, cutting down, and lifting for the falling of materials in pre-determined locations.
- Reinforcement of the slope by our specialised cordists after the transit of the material using helicopters.
- In underground**, achievement of the Superior Gallery (106m, 27m² section) using 8,5 tonnes of NITRAM TX1 produced on site and implemented via our MORSE technology, enabling us to end the digging more than one week in advance.
- Drilling of the well on all the depth (18 to 23 meters) from the Superior Gallery, enabling a strict respect of delays, in a safe manner.
- « *It is a very technical work, in regards of both vibratory constraints and respect of the delays. It encompasses all of the know-how of the company and completed in a good atmosphere within the teams, with the customer and the project manager. The digging of the well, tilted 45° (100% slope) was a true challenge that differed from traditional galleries* »
Moctar Abdallah – Tunnel Site Supervisor at EPC-France

Safety

Passion

Integrity

Respect

Innovation

Team work

EXEMPLARY MANAGEMENT OF THE CO-ACTIVITY UP AND DOWN & SURFACE/UNDERGROUND

MASTERING INNOVATIVE DRILLING TECHNIQUES, ON-SITE PRODUCTION AND LOADING

ONE WEEK IN ADVANCE COMPARED TO THE DIGGING PLANNING

A SATISFIED CUSTOMER

« *EPC-France has managed safety and delays in an exemplary way in a difficult environment* »

Renaud Courtet,
Business Manager Civil Engineering,
EDF_CIH Technical Service

Customer satisfaction rating: **9,5/10**

