



ermes

ELECTROTECHNICS AND MECHANICS OF STRUCTURES
R&D EXPERTISE AT THE SERVICE OF INDUSTRY

FIELD
EXPERTISE

TESTING AND
MEASUREMENTS

NUMERICAL
SIMULATIONS

PROTOTYPED
PRODUCT

MARKET-READY
PRODUCT

PROJECT MANAGEMENT ASSISTANCE

Validating and optimizing the design of civil engineering works

YOUR STAKES

- Sizing civil works as accurately as possible
- Detect high-risk designs

OUR OFFER

The offer consists in:

- Offer assistance in the design and sizing of complex structures

The offer can be detailed as follows:

- Expert advice : reinforcement, technological choices, controlling industrial risk
- Advanced studies based on numerical simulation (code_aster)

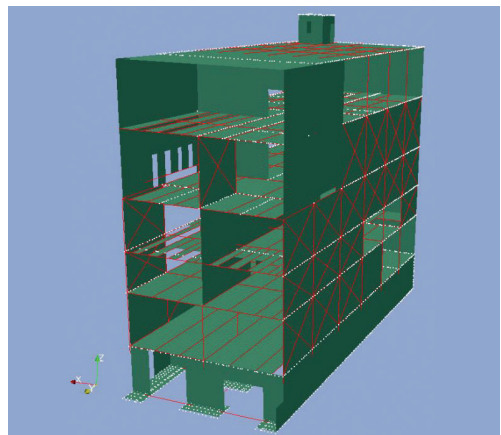
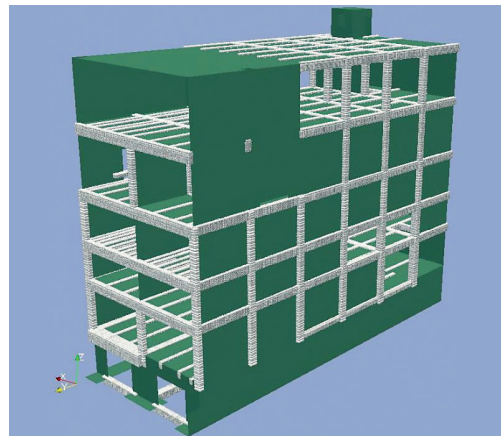
Our teams have a recognized expertise in civil engineering, and in particular in structural calculation :

- Conventional and aggression sizing (seismic, impact, explosion, etc.)
 - Taking Eurocodes into account
 - Reinforcement optimization with advanced pre- and post-treatments
 - Fine and efficient modelling of complex loads and mechanical response
- Evaluation of the effect of ageing on structures
 - Taking into account delayed deformations, concrete degradation and steel-concrete de-cohesion

Our teams rely on numerical tools under quality assurance, and developed in-house

SECTORS OF APPLICATION

- All civil engineering sectors, in particular large reinforced concrete structures



Examples of building visualization with code_aster

Validating and optimizing the design of civil engineering works

KEY FIGURES:

■ More than 700 engineers and experts within EDF's Civil Engineering competency

■ Code_Aster: 400 types of finite elements, 100 behavior laws, rich documentation, and feedback from more than 20 years.

OUR ASSETS

RECOGNIZED KNOW-HOW AND A WIDE RANGE OF CIVIL ENGINEERING SKILLS:

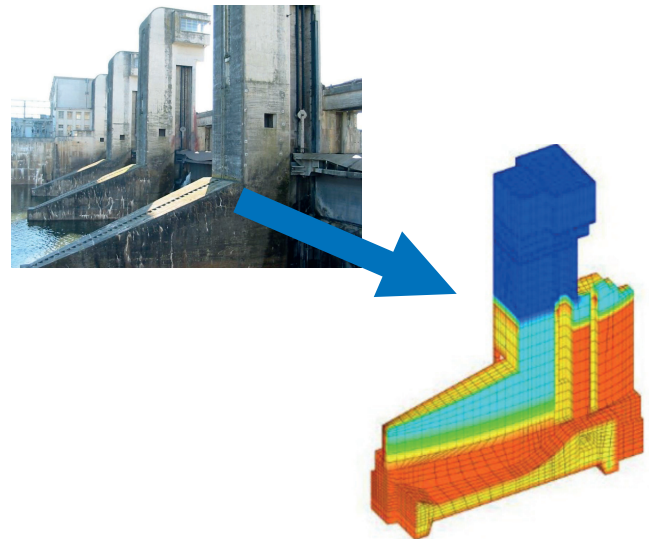
- Calculation and structures
- Design and specifications
- Structure dynamics
- Geology and geotechnical
- Laboratory and measurements
- Materials and diagnosis of pathologies
- Construction and maintenance

STRONG PARTNERSHIPS IN FRANCE AND ABROAD:

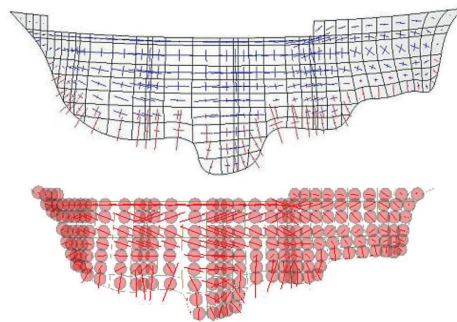
- Design offices : GDS
- Public bodies : CEA
- Associations : SFEN, AFPS, AFGC
- Research laboratories : LMT

NUMERICAL TOOLS UNDER THE AGE OF CONSTANTLY EVOLVING

EFFICIENT INTERNAL CLUSTERS THAT ALLOW COMPLEX STUDIES TO BE CARRIED OUT IN A SHORT PERIOD OF TIME



Dam modeled



Dam stresses map visualization with code_aster



SATISFIED CLIENTS

- EDF production sites : Nuclear, Hydraulic, Wind
- NECS, Egis, Tractebel, GDS, ...

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A RICH EXPERIENCE IN THE SERVICE OF INNOVATION

- R&D in civil engineering fully integrated into the constructability challenges of the EDF group, proactive in the pre-normative field and in the international scientific community
- Performance and innovation objectives: massive use of BIM, advanced construction methods (Steel-Concrete-Steel), dissemination of new methodologies