

# Plant Operation Support



## Providing high-level engineering support to operators around the world for over 40 years

We accompany operators in every aspect of their projects with an uncompromising approach to safety. Our independent experience with equipment vendors and global regulatory systems benefits our customers to optimize the safety and cost-effectiveness of their plants.

We are the unique engineering company supporting constantly the Belgian utility to operate its seven nuclear reactors.

We have achieved world-class results for the seven Belgian Pressurized Water Reactors (PWR), as can be inferred from our record low dosimetry and execution time during the steam generators' replacement. We have successfully carried out post Fukushima safety upgrades and have first-hand experience with two long term operation projects in Belgium.


### Our approach

- Establish long-term partnerships with customers
- Help them meet their objectives of competitiveness, reliability and safety
- Develop innovative technological solutions which combine economic and technical performance

### Client benefits

- Full range of nuclear and non-nuclear engineering expertise
- Project management at every stage of client's project
- Role as Architect Engineer (EPCM), Owner's Engineer or Consulting Engineer according to client's needs
- Multi-skilled project teams

### Our services

- Plant Modifications
  - Plant Life Extension
  - Ageing Management
  - Safety Assessment
  - Equipment Reliability
  - Core & Fuel Studies
  - In-Service Inspection
  - Civil Structure Monitoring & Upgrading
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# Benefit from our proven operational support at all stages of your projects



## SOME REFERENCES PLANT OPERATION SUPPORT

**Belgium - ENGIE Electrabel** - Owner's Engineer for the Steam Generator Replacement of all Belgian units, with 8 to 10% power uprate on 5 out of the 7 units - 1993-2009

**Belgium - ENGIE Electrabel** - Owner's Engineer & EPCM Services for major upgrades and Long Term Operation of Tihange 1 and Doel 1 & 2 - 2009-2019

**Belgium - ENGIE Electrabel** - Architect Engineer (EPCM) mission for design and construction of site protection measures against external flooding - 2010-2015

**Belgium - ENGIE Electrabel** - Architect Engineer (EPCM) mission for design and construction of the extension of the ultimate back-up systems of Tihange 1 - 2010-2020

**Belgium - ENGIE Electrabel** - Owner's engineering for the design and construction of a full scope simulator of Tihange 1 - 2011-2016

**Belgium - ENGIE Electrabel** - Engineering, Contract Management and Site Supervision for the replacement and renovation of the fire protection system in the three units of the Tihange NPP - 2007-2016

**Belgium - ENGIE Electrabel** - Full Engineering Support mission for the replacement of the Reactor Vessel Closure Head with new Control Rod Drive Mechanisms of Tihange 3 and Doel 4 NPP - 2015

**France - EDF** - Primary Elbows Replacement

for 900 MWe French nuclear fleet. Civil and Mechanical Design Studies, Primary Loop Calculation, Qualification - 2018-2026

**France - EDF** - Multidisciplinary design framework contract for French nuclear fleet. Mechanical, I&C and electrical, NSSS and Civil engineering, project management - 2018-ongoing

**South Africa - ESKOM - Koeberg NPP** - Comparison and reconciliation report between ASME and RCC-M codes for the manufacturing of a reactor vessel head - 2005-2007

**South Africa - ESKOM - Koeberg NPP** - Engineering Support Services for the Steam Generator Replacements - 2015-ongoing

**South Africa - ESKOM - Koeberg NPP** - Design of the Impressed Current Cathodic Protection for Units 1&2 - 2021-2025

**Slovenia - NEK - Krsko NPP** - Engineering Support for Periodic Safety Reviews - 2021-2022

**Netherlands - EPZ - Borssele NPP** - Owner's Engineer Mission for the I&C Modernization Program in the frame of the Borssele NPP extended operations project - 2012-2017

**Sweden - VATTENFALL - Ringals NPP** - Design Basis of the Component Cooling Water System and Spent Fuel Pit Cooling System - 2012-2013

**Sweden - VATTENFALL - Ringals NPP** - Post-Fukushima robustness enhancement feasibility study - 2013-2014

**France - EDF** - In the frame of Stress Corrosion Cracking (SCC) affecting the

nuclear French fleet, Tractebel carried out more than 60 3D fracture mechanics state-of-the-art calculations in less than 3 months. Moreover, Tractebel supported EDF in the development of their computational methodology - 2022-2023

**France - EDF** - In the framework of the post-Fukushima modifications, part of the new water supply piping system will be installed underground using High Density Polyethylene (HDPE) material). Tractebel expertise allowed supporting EDF in the knowledge of suitable Codes and Standards, in the development of specific calculation methodologies and dedicated computational tools - 2023

**Armenia - Metsamor NPP** - Owner's assistance for the implementation of the Stress Tests Self-Assessment - 2012-2014

**Ukraine - South Ukraine NPP** - Development of Severe Accident Management Guidelines and support for their implementation - 2005-2010

**South Korea - KEPCO E&C - Ulchin 1&2 NPP** - Technical Consulting Services for Steam Generator Replacement & Power Uprate - 2009-2013

**Argentina - Nucleoelectrica Argentina SA** - Fatigue evaluation of the surge lines in the framework of the Atucha 1 NPP LTO - 2013-2014