

**TRACTEBEL Engineering**  
GDF SUEZ



# TRACTEBEL ENGINEERING

**M. AUGLAIRE**

March 17-18, 2015

CHOOSE EXPERTS, FIND PARTNERS

# TRACTEBEL ENGINEERING within ...

GDF SUEZ

Energy Europe

Energy International

Global Gas & LNG

Infrastructures

Energy Services

Turnover of € 14.7 billion (2013 figures)  
90,000 employees (2013 figures)

Environment

90,000 employees (2013 figures)



TRACTEBEL Engineering  
GDF SUEZ

An international engineering company that provides high quality, state-of-the-art engineering consultancy services for the **energy** and **infrastructure** sectors

PROFILE

# TRACTEBEL ENGINEERING

## Markets

### ENERGY



Thermal



Hydropower



Renewable



Nuclear



Transmission  
& Distribution



Gas & LNG

### SMART & SUSTAINABLE INFRASTRUCTURE



Buildings



Transport



Water  
Infrastructure



Environment

## 2013 KEY INDICATORS

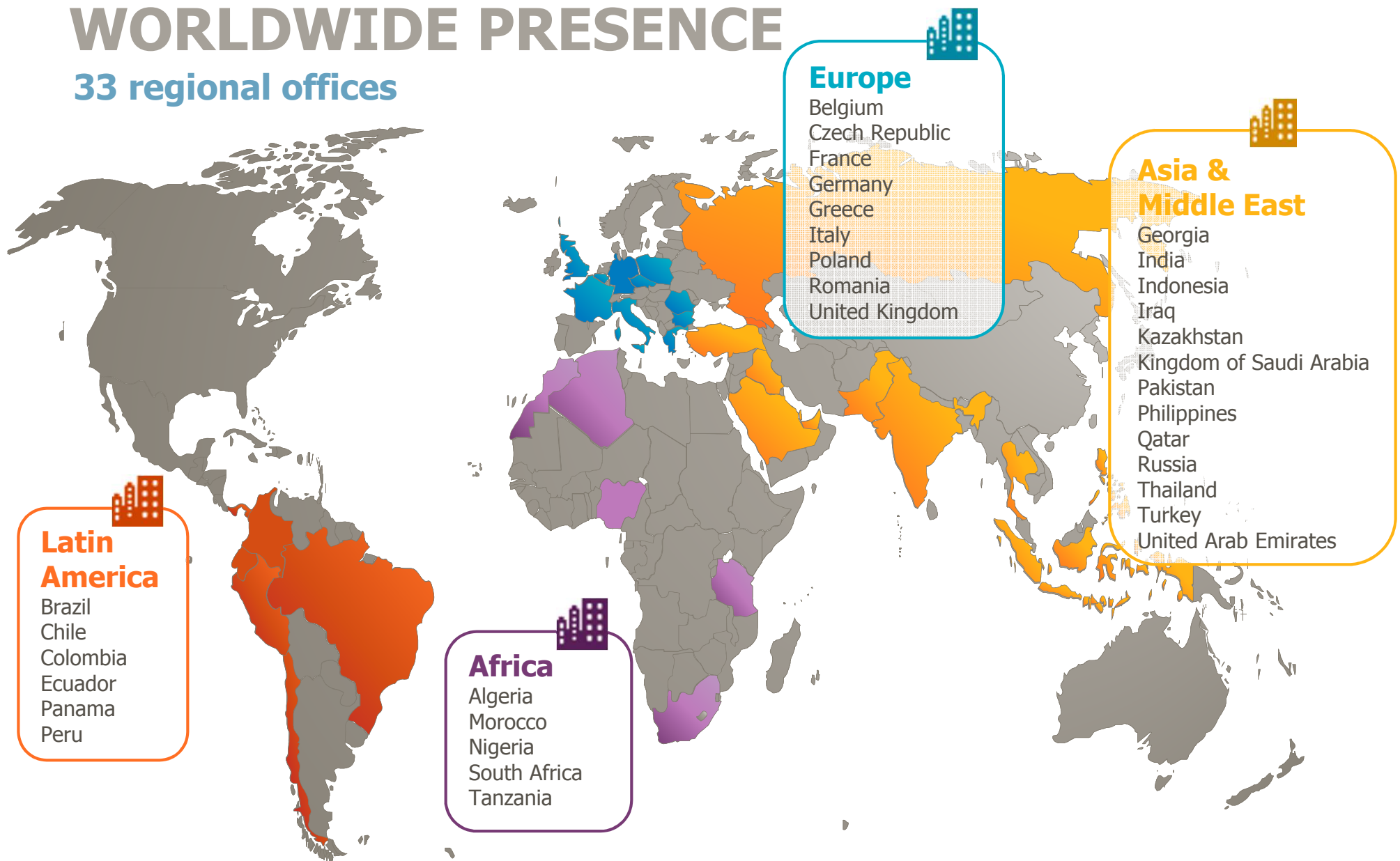


54% outside  
Belgium, France & Germany

More than  
**100 years**  
of experience!

# WORLDWIDE PRESENCE

33 regional offices





## OUR MISSION



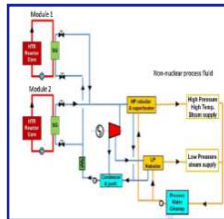
- **We serve our Clients:**
  - Innovative nuclear engineering solutions
  - From design to decommissioning
  - Focused on success
  - Strong operations expertise
  - Multiskills approach
  - Support the Group development
  - Be involved in major nuclear projects for external customers

# NUCLEAR BUSINESS AREAS

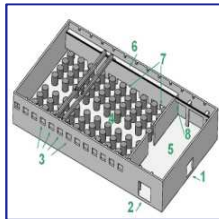
## ADVANCED TECHNOLOGIES



**Gen IV & Fusion Technologies**



**Conceptual Designs**

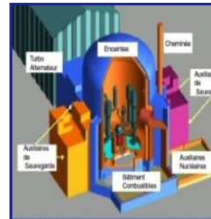


**Feasibility Studies**



**R & D & EU strategy**

## NEW PLANTS



**Gen III Technologies**



**Siting Studies**



**Licensing & Permitting**



**Bid Invitation & Evaluation**



**Engineering & Construction Oversight**

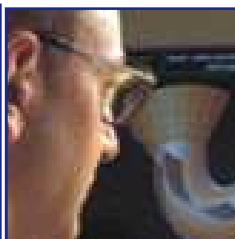
## OPERATIONAL SUPPORT



**Plant Modifications & Modernization**



**Safety Assessment**



**Equipment Reliability**



**Fuel Procurement & Core Mgt**

## RADWASTE MANAGEMENT & DECOMMISSIONING



**Spent Fuel Management**



**Radwaste Management**



**Dismantling & Decommissioning.**



# NUCLEAR PROJECT WORLDWIDE EXPERIENCE



## TYPICAL ACTIVITIES

TE performs yearly around of 700.000 hours of engineering services in the following disciplines :

- Fuel & core management (including fuel repair services)
- Core optimisation studies
- Fuel handling services
- Fuel & waste storage & disposal
- Safety reports and technical specifications update management
- Safety and licensing : studies, follow-up,...
- Training in nuclear engineering
- Nuclear regulation watch (NUREG, RG,...)
- Documentation / knowledge base / nuclear return of experience
- Expertise in nuclear construction and inspection codes



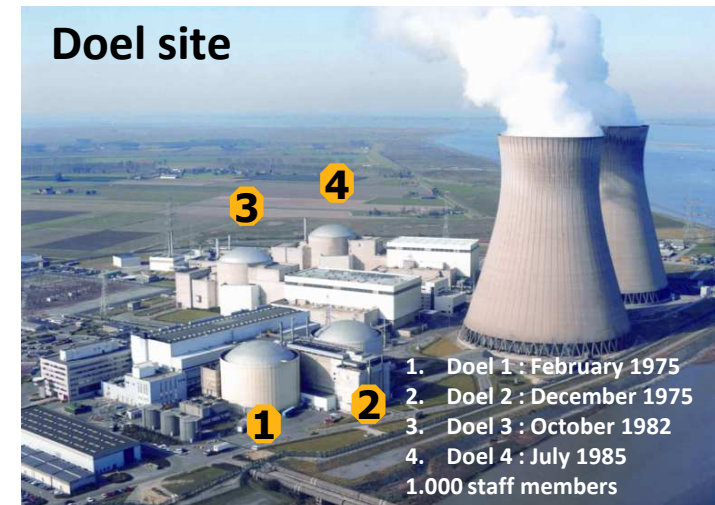
## TYPICAL ACTIVITIES (CONTINUED)

- In service inspection programming, preparation & evaluation
- Execution of in-service inspection
- Repair and replacement according to ASME XI
- Procurement : QS, QA suppliers qualification,...
- Plant life management studies
- General assistance in OM of nuclear installations
- Important modification projects



## NUCLEAR DEPARTMENT PLANT OPERATION SUPPORT OF THE BELGIAN NPPS

- Belgian Utility Electrabel
  - 7 PWR plants at 2 sites: Doel and Tihange
  - Design & Licensing based on US Rules & Standards
- Tractebel Engineering acting as Owner's Engineer of Electrabel since the commissioning of the first units in 1975
  - Full scope assistance & engineering support to the 7 nuclear units in close cooperation with the Utility
  - Optimization of Performances and of Operational & Maintenance costs



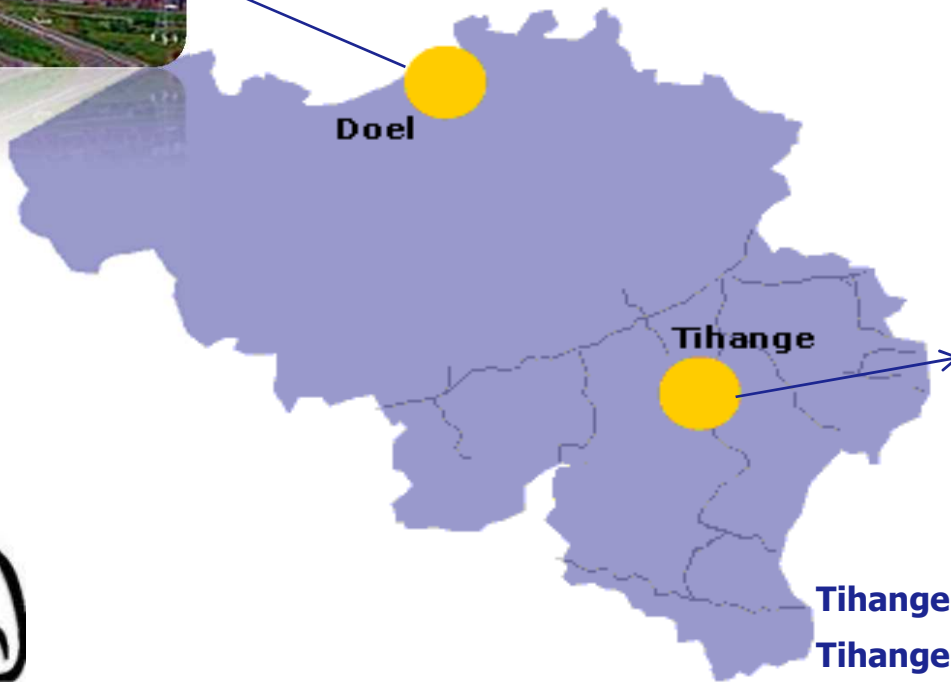


**OPERATIONAL  
SUPPORT**

# OPERATIONAL SUPPORT TO BELGIUM NPPs



**Doel 1 & 2 W 2 loops, 14 x 14 - 8ft, 866 MWe**  
**Doel 3 FRA 3 loops, 17 x 17 - 12ft, 1006 MWe**  
**Doel 4 W 3 loops, 17 x 17 - 14ft, 1039 MWe**



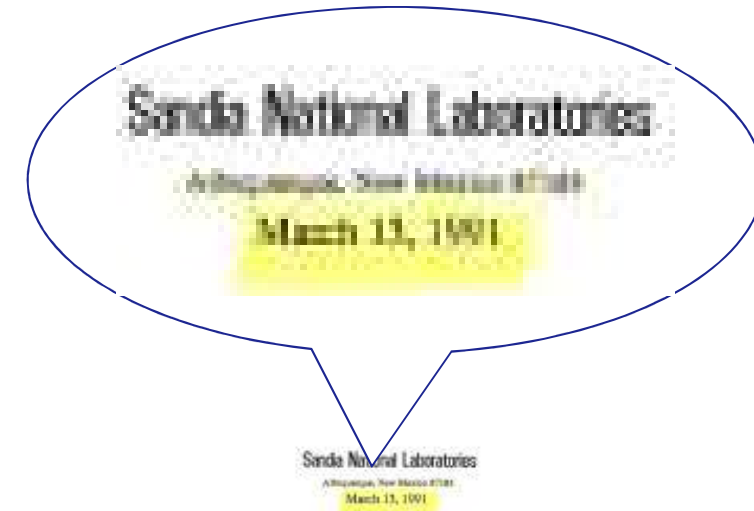
**Tihange 1 FRA 3 loops, 15 x 15 - 12ft, 962 MWe**  
**Tihange 2 FRA 3 loops, 17 x 17 - 12ft, 1008 MWe**  
**Tihange 3 W 3 loops, 17 x 17 - 14ft, 1054 MWe**





# MELCOR & TRACTEBEL ENGINEERING

- Reference code for severe accident calculations
- More than 24 years of experience as MELCOR's user
- Start in 1991 with MELCOR 1.8.0
- Thousands of sec running time for MELCOR applications inside TE



Mr. H. Stabbe, Section Manager  
TRACTABEL  
Avenue Ariane 7  
B-1200 Brussels  
BELGIUM

Dear Mr. Stabbe,

The enclosed floppy disk has seven files on it. These are sample report files for MELGEN, MELCOR and MELPZ. The output files are from computations on a VAX computer using the 1.8.0N version of MELCOR. The ST0000.DAT file is the diagnostic output from MELGEN, ST0000.DAT is the output file from MELGEN, and ST0000.DAT and ST0000.DAT are the diagnostic and output files from MELCOR.

This problem is designed to exercise all segments of the MELCOR code rather than to model any specific plant. The results show a cyclic action which should not be expected to occur in a real model, and which will not appear in future releases of the MELCOR code and its sample problems.

We hope that these files will help you with running the MELCOR code. If you need additional assistance or information, please contact me. You can FAX a message to me at 505-846-5270 if you wish.

Sincerely,

Arnold A. Blumenthal  
Thermal/Hydraulic Analysis  
Division 6418

# 7<sup>TH</sup> MEETING "EUROPEAN MELCOR USER GROUP"

Co-organized by

**Bel V**, a subsidiary of the FANC

*(Federal Agency for Nuclear Control)*

and **TRACTEBEL Engineering** (GDF Suez)

Avenue Ariane, 7, Brussels, Belgium

**March 17-18, 2015**



**FOR FURTHER CONTACT :**

**NUCLEAR-ENGINEERING@GDFSUEZ.COM**

**VISIT OUR WEBSITE**

**[www.tractebel-engineering-gdfsuez.com](http://www.tractebel-engineering-gdfsuez.com)**

