

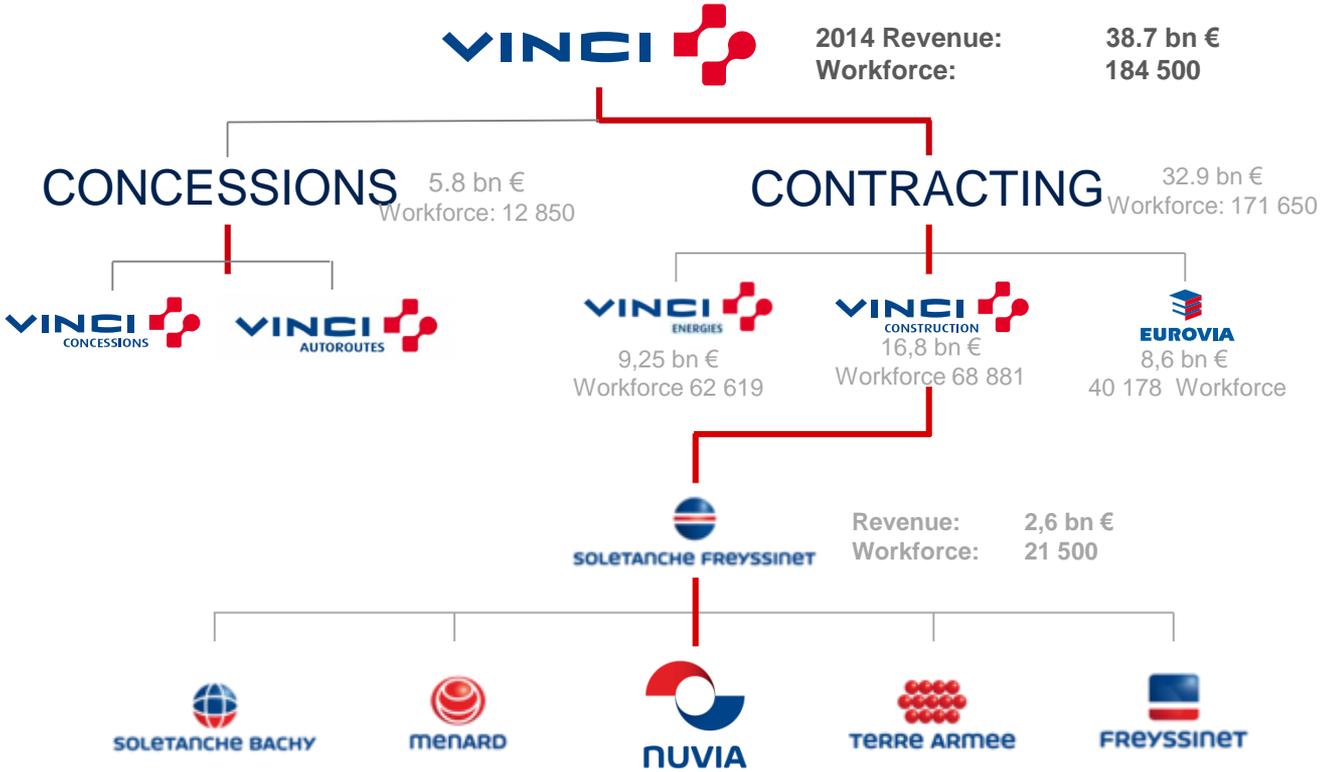


# NUVIA - decommissioning

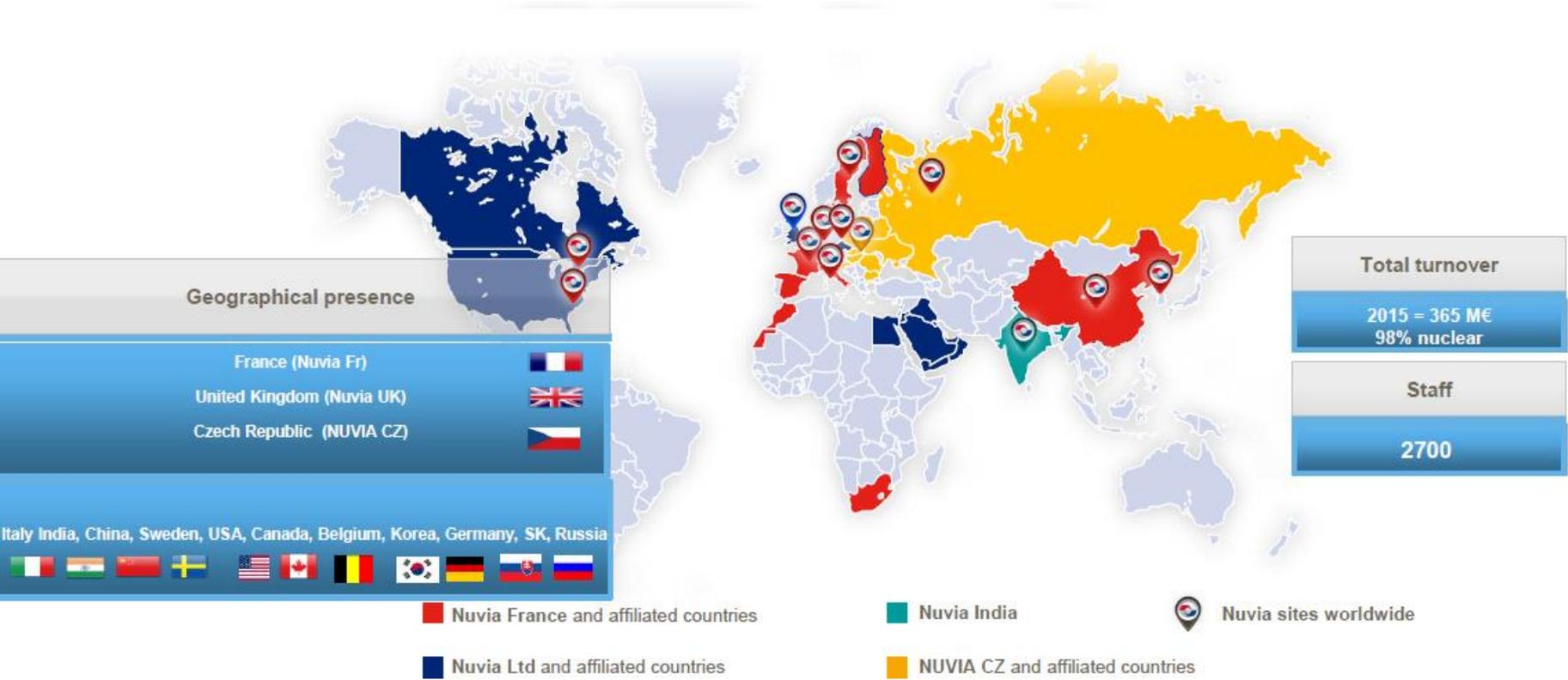
## STROJÍRENSTVÍ OSTRAVA 2016

Ing. Michal Kazda, MSc.  
26/05/2016  
NUVIA a.s.

# NUVIA Group - Overview



# Present worldwide in 2015

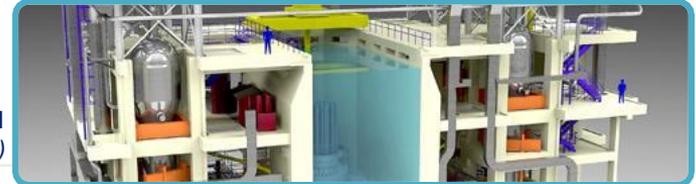


## Decommissioning capabilities

# Capabilities – summary

- **General contractor:**
  - From design up to implementation
- **All type of facility:**
  - Laboratories, reactors, plants, ..
  - Process, Structures, Sols, ...
- **A comprehensive technical scope:**
  - Engineering consulting services (scenari, feasibility, preliminary study, final design, HVAC & containment, Safety, ..)....
  - Surveys & measurement
  - Decontamination (metal, concrete, chemical rinsing, ...)
  - Cutting (mechanical, laser, ....)
  - Robotic tools & equipment
  - Handlings

**Dismantling of the reactor vessel**  
*EDF - NPP Chooz A (FR)*



**Decommissioning of a uranium building**  
*AREVA - SICN Annecy (FR)*



**Cutting of the dome of the reactor**  
*EDF - NPP Creys Malville (FR)*



**Clean-up and decommissioning of Hall 60**  
*AREVA NC – CEA Marcoule (FR)*



## Examples of Projects

# Reactor vessel decommissioning at CHOOZ A

- Project: Decommission the reactor vessel
- Country: France
- Client: EDF CIDEN
- Project owner: EDF CIDEN
- Site: Chooz A
- Scope:
  - Researching context and methods (all design phases)
  - Designing equipment and tools
  - Underwater cutting of the reactor vessel
  - Measurement and processing modules
  - Waste management

## KEY POINTS

- First PWR decommissioning project in France
- Complete service provision including all cross-business functions (radiation protection, safety, waste...)

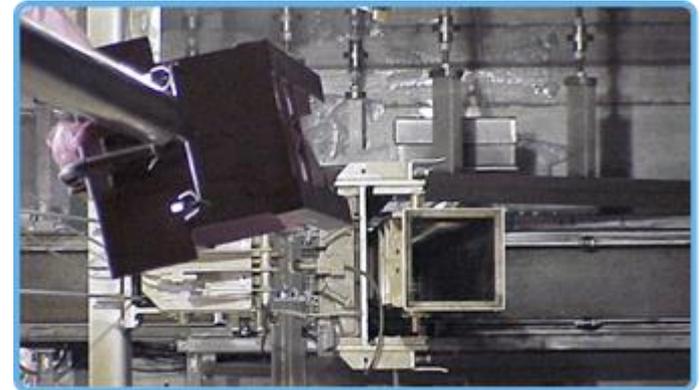


# Reactor pool decontamination

- Project: Pool decontamination
- Country: France
- Client: EDF
- Site: Cruas and Dampierre nuclear power plants
- Facility: Reactor Building / Fuel Building pools
- Scope:
  - Design, manufacture and use of special tools
  - Use of special decontamination products

## KEY POINTS

- Operator safety (radio-telephone and remote dosimeter worn)
- Radiological constraints
- Strict requirements with respect to decontamination criteria
- Managing the sequence of unit shutdown phases



# Sellafield and Dounreay Beach and Sea Bed Monitoring

- Project: Clean up contaminated beaches
- Country: UK
- Client: Sellafield Ltd and DSRL
- Site: Dounreay Sea Bed and beaches  
Sellafield Beaches
- Scope:
  - Design and manufacture a GroundHog mobile detection units
  - GPS-tracked beach monitoring
  - Find and remove radioactive particles

## KEY POINTS

- Over 1.6 billion readings collated



# Berkeley Chute Silos

- Project: Berkeley Chute Silos (phase I)
- Client: Magnox
- Site: Berkeley
- Facility: Reactor Waste Vaults
- Scope:
  - Refurbish and Test Existing Manipulators
  - Concept and Detail Design of Retrieval Equipment
  - Manufacture and Install Retrieval Equipment
  - Removal of 1 Drum of Gravel
  - Manufacture Simulant Wastes

## KEY POINTS

- Remote Retrieval of Radioactive Waste
- Potential for later Operational Support
- Full-Scale Testing and Development Rigs



# JRC/ISPRA decommissioning

- Project: Decommissioning JRC Ispra Nuclear Facilities
- Country: Italy
- Client: European Commission
- Project owner: Joint research Centre
- Site: Ispra
- Facility: Reactors and research facilities
- Scope:
  - Executive design
  - Works implementation
  - Support to safe conservation / operation



## KEY POINTS

- Long term partnership (2009- 2023)
- 57 M€ contracts as a whole

# Cutting a reactor dome

- Project: Cutting and removal of the dome (370 tonnes of steel)
- Country: France
- Client: EDF CIDEN
- Project owner: EDF Creys-Malville
- Site: Creys-Malville
- Facility: Reactor Building
- Scope:
  - Research
  - Plasma cutting
  - Heavy lifting and handling
  - Packaging for transport and removal

## KEY POINTS

- Stabilising the structure during cutting
- Severe environmental constraints
- Respecting safety requirements



# Remote dismantling

- Project : Characterisation of the fission product storage drums and of the drums containing radioactive effluents
- Country : France
- Client : AREVA NC
- Site : La Hague
- Scope :
  - Video-controlled dismantling of the drums from a barite wall
  - Validation and qualification of the tank inspection equipment and processes
  - Sample extraction
  - Evacuation of the process 21 storage drum in presence of ammonium acetate in order to confirm the feasibility of the handling sequence
  - Removal of all the drums and associated piping



## KEY POINTS

- Remote video-controlled dismantling
- Drum in hot cell

# Removal of contaminated soils

- Project: Investigating contaminated soils by excavation
- Country: France
- Client: CEA DEN
- Project owner: CEA DEN
- Site: CEA Fontenay-aux-Roses
- Facility: Around Building 17 and the "SABINE" station
- Scope:
  - Excavation of non-contaminated and contaminated soils (VLLW)
  - Packaging of VLLW soil into bulk bags
  - Measuring bulk-bag activity using gamma spectrometry

## KEY POINTS

- Excavations down to 6m
- Shielding by metal walls





The main image is an aerial photograph of the Winfrith nuclear power station, showing the large industrial buildings and surrounding landscape. An inset photograph in the bottom right corner shows three workers in yellow protective suits inside a large, dark, cylindrical containment structure, likely performing decommissioning work.

- **Decommissioning and Waste Sentencing of the SGHWR plant**
  - 3,500 tonnes of material size reduced, characterised and disposed of
  - Decommissioning of secondary containment complete
  - Primary containment decommissioning pre-works complete

**Key milestone in decommissioning SGHWR completed within**

# Kozloduy NPP decommissioning P.M.U.



• Responsible for €600M decommissioning programme and construction of new repository

- Programme management
- Tender production and assessment



# Ignalina NPP free release measurement facility

- Project: Free release measurements facility
- Country: Lithuania
- Client: Ignalina NPP
- Facility: Ignalina Nuclear Power Plant
- Scope:
  - Stationary and mobile systems for RW free release measurement which determines the possibility of waste release into the environment
  - Supply and installation of the measuring and laboratory equipment for radiological characterization
  - Development of radiochemical methods & procedures

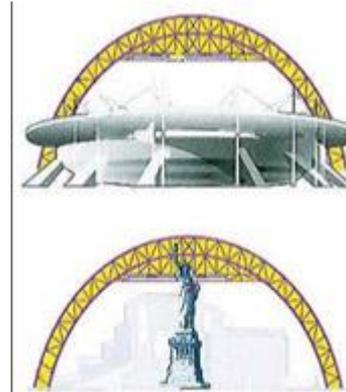
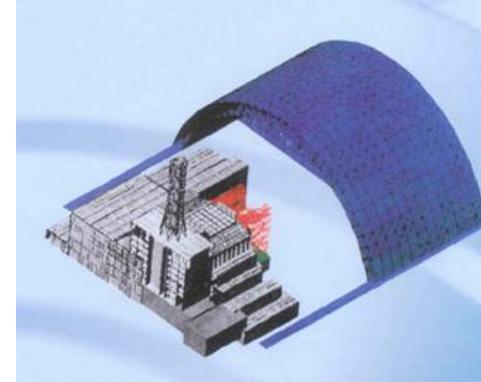


## KEY POINTS

- ENVINET's first experience at the NPP under decommissioning

# Novarka Framework Contract

- Project: Chernobyl NSC Project
- Country: Ukraine
- Client: Vinci Construction Grands Projects (Novarka)
- Project owner: CNPP / EBRD
- Site: Chernobyl
- Facility: Chernobyl Nuclear Power Plant (CNPP)
- Scope:
  - Safety Reviews
  - Design Reviews
  - Waste Management
  - Seconded Staff in Paris and Ukraine
  - Radiological Protection / Health Physics



## Market and conclusion

# Home countries market

- ◉ France
  - Gas Graphite reactor 3 sites (BU1,SLA 1&2, CH 1,2&3)
  - PWR 1 site Chooz
  - La Hague
  - Marcoule ( G1&G2, UP1, ..)
  - Pierrelatte GBI
- ◉ UK
  - Magnox – reactors and facilities
  - Ministry of Defence – Pu experience
  - Springfields & Capenhurst - Fuel
  - EDF Nuclear Generation - AGR Graphite
  - Dounreay - Sodium & fast reactor experience
  - Sellafield - Reprocessing



- ◉ Sweden / Nordic
  - Studsvik – Research facility (MTR) – 2015—2019
    - Dismantling of reactors (Areva/Nuvia)
    - Decommissioning of biological shield (Areva/Nuvia)
  - Ågesta – 1 HWR
    - Decommissioning starts approx. 2019 (same owner as Studsvik)
  - Barsebäck – 2 BWR
    - Dismantling of internals (on-going, WH)
    - Decommissioning starts approx. 2017.
  - Oskarshamn – 2 BWR
    - O1 – Shutdown 2017-2019
    - O2 – Shutdown 2020

- 📍 NUVIA is part of a major industrial international group
  - Local implantations
  - Support of strong back office (F/ UK /CZ)
  
- 📍 NUVIA nuclear capabilities are:
  - Decommissioning of all types of facilities
  - Waste management : from characterisation to disposal
  - Current projects based on over 50 years experience
  
- 📍 NUVIA develops win-win solutions through:
  - Technical excellence
  - Tailored solutions
  - Competitiveness



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