EUROPEAN FORUM OF NUCLEAR INDUSTRY SUPPLIERS ATOMEX-EUROPE

NOVEMBER 30 – DECEMBER 01 2015, BUDAPEST

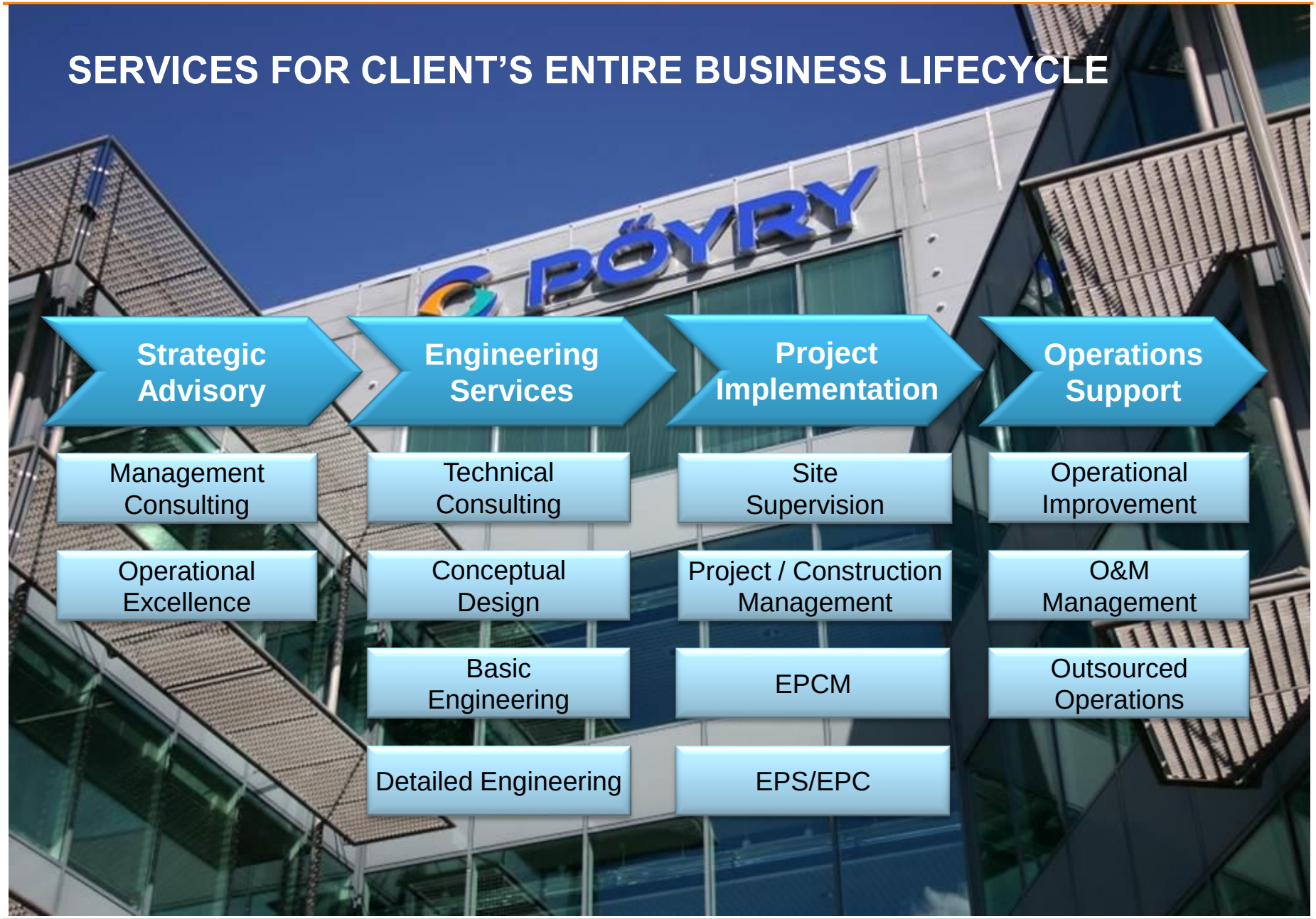
JÓZSEF DÉNES
VP GLOBAL COMPETENCE LINE NUCLEAR
MD PÖYRY ERŐTERV

CONSULTING AND ENGINEERING EXPERT

Pöyry is an international consulting and engineering company, dedicated to serving clients across the world's energy and industrial sectors

- 6,000 experts
- 10,000+ projects delivered annually
- Leading hydro and power market engineers
- EUR 571 million net sales in 2014

SERVICES FOR CLIENT'S ENTIRE BUSINESS LIFECYCLE



Strategic Advisory	Engineering Services	Project Implementation	Operations Support
Management Consulting	Technical Consulting	Site Supervision	Operational Improvement
Operational Excellence	Conceptual Design	Project / Construction Management	O&M Management
	Basic Engineering	EPCM	Outsourced Operations
	Detailed Engineering	EPS/EPC	

ENERGY BUSINESS SECTOR

- Four global competence areas:
  - ✓ Thermal power & Renewable Energy
  - ✓ Hydropower
  - ✓ Transmission & Distribution
  - ✓ Nuclear
- Providing clients with clean and effective energy solutions
- Strong track record in designing and implementing complex energy projects involving innovative technologies

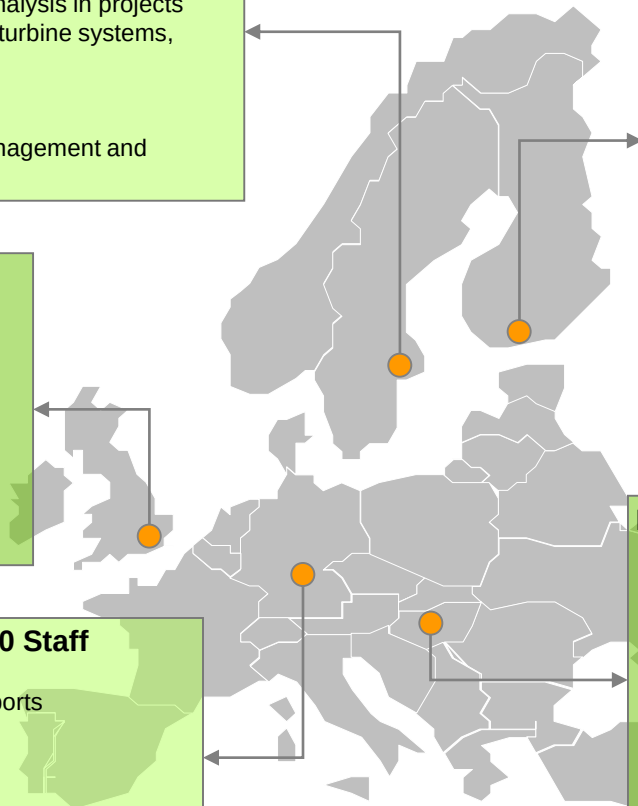
Strategic Advisory	Global Competence Lines		Regional Business Lines
World's capital and resource intensive industries	Competence driven global business in sectors with attractive opportunities		Generic offering in selected key countries
Management Consulting	Energy	Industry	Regional Operations
Strategic advice and transaction support for selected sectors	Engineering for complex processes, feasibility studies and process based technology		Broad range of services covering engineering and technical advisory

PÖYRY'S NUCLEAR ENERGY COMPETENCE CENTRES ARE PART OF THE WORLDWIDE NETWORK

Pöyry Sweden, Stockholm / 150 Staff
- Feasibility studies, technical advisory
- Electrical, I&C and automation engineering
- Thermodynamic calculations
- Safety Analysis, risk analysis in projects
- Availability analysis of turbine systems, performance testing
- Life Cycle Cost (LCC)
- Project management
- Radioactive waste management and decommissioning

Pöyry Finland: Vantaa, Pori, Kotka, Tampere, Oulu / 1600 Staff
- Feasibility studies
- Project development services
- Environmental and geological studies, EIA, siting studies
- Design and Engineering
- Safety analysis
- Licensing support
- Project management
- Construction management and civil engineering
- Engineering services for operating plants

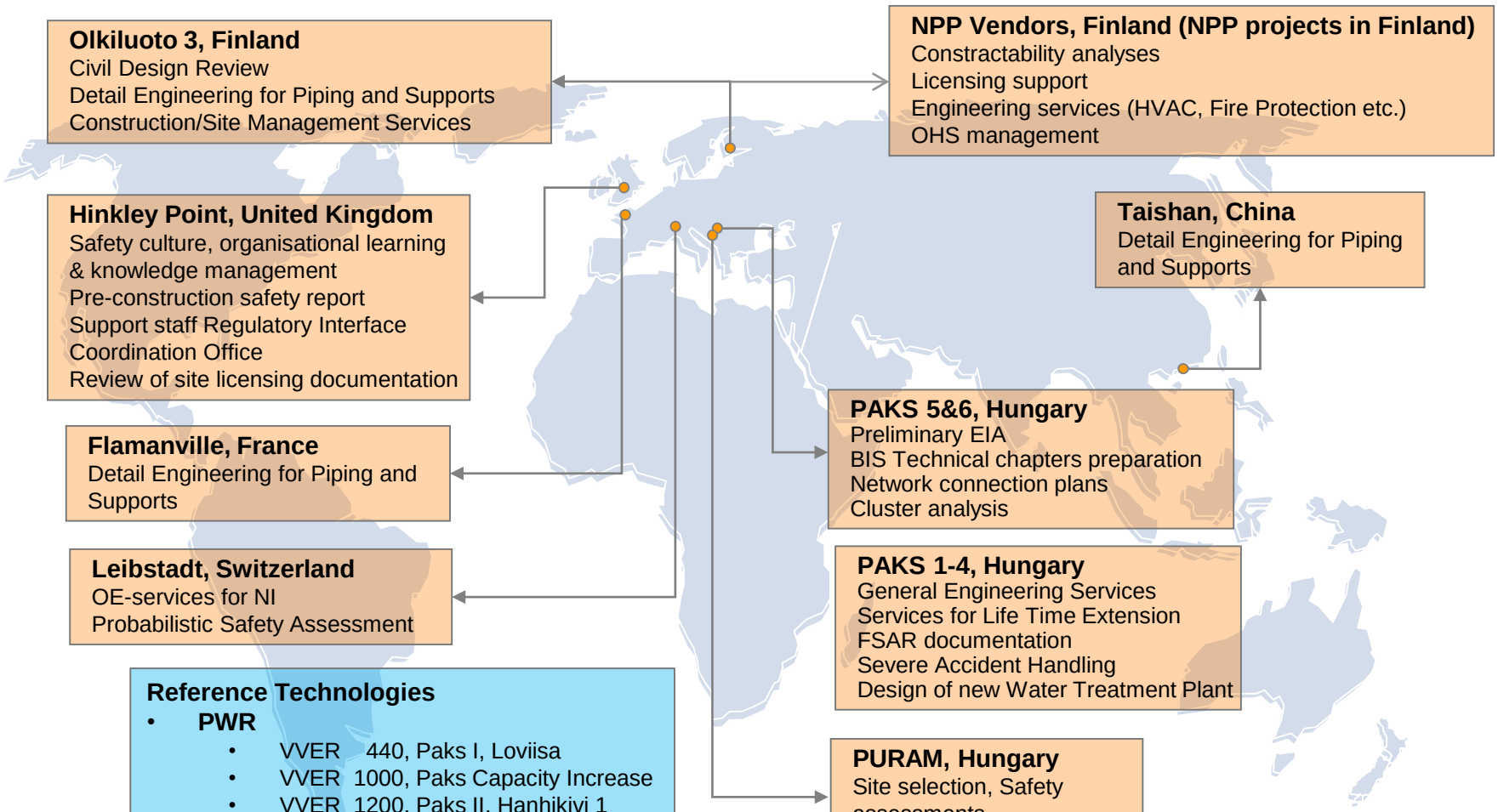
Pöyry UK: Horsham, Plymouth, Warrington, Calleva / 60 Staff
- Safety assessment reports (production & independent review)
- Probabilistic safety assessment
- Radiological protection
- Safety management & organisational development
- Spent fuel & radioactive waste management
- Licensing advice



Pöyry Hungary, Budapest /100 Staff
- Feasibility and conceptual studies
- Environmental studies, EIA
- Tender documentation
- Licensing support
- General, basic and detailed design
- Safety analysis and reports
- Project management support
- Construction and commissioning supervision
- Plant lifetime extension, capacity upgrade
- Decommissioning, dismantling studies

Pöyry Germany: Mannheim / 50 Staff
- Safety Review
- Design review & licensing expert reports
- Radiological impact analysis
- External hazards (aircraft crash)
- Site monitoring (radiological)
- Detailed design for BOP & safeguards buildings
- Site engineering, as built verification
- Waste management, decommissioning & dismantling

SELECTED KEY REFERENCES FOR NUCLEAR PROJECTS



Olkiluoto 3, Finland
Civil Design Review
Detail Engineering for Piping and Supports
Construction/Site Management Services

NPP Vendors, Finland (NPP projects in Finland)
Constractability analyses
Licensing support
Engineering services (HVAC, Fire Protection etc.)
OHS management

Hinkley Point, United Kingdom
Safety culture, organisational learning & knowledge management
Pre-construction safety report
Support staff Regulatory Interface Coordination Office
Review of site licensing documentation

Taishan, China
Detail Engineering for Piping and Supports

Flamanville, France
Detail Engineering for Piping and Supports

PAKS 5&6, Hungary
Preliminary EIA
BIS Technical chapters preparation
Network connection plans
Cluster analysis

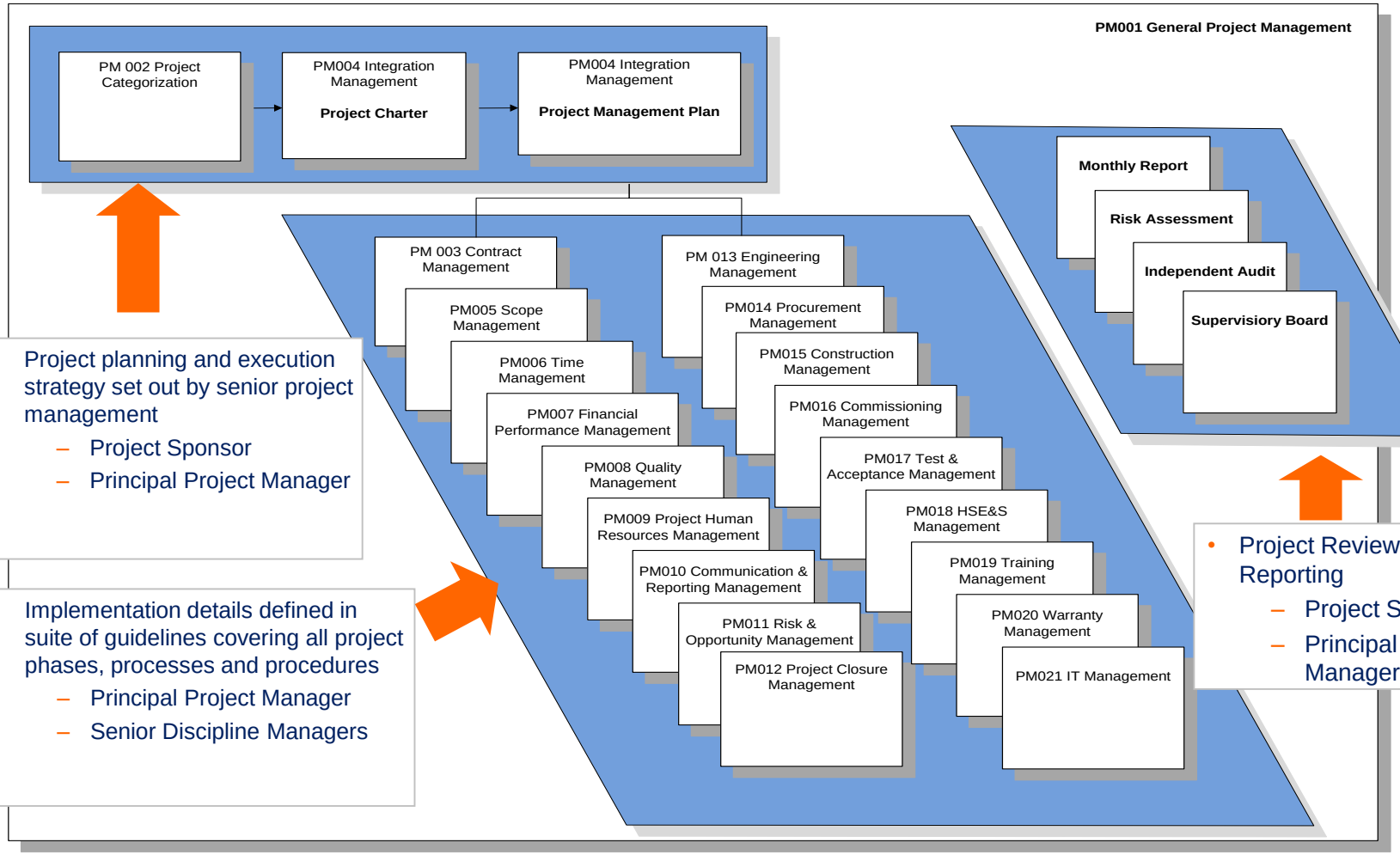
Leibstadt, Switzerland
OE-services for NI
Probabilistic Safety Assessment

PAKS 1-4, Hungary
General Engineering Services
Services for Life Time Extension
FSAR documentation
Severe Accident Handling
Design of new Water Treatment Plant

Reference Technologies
- **PWR**
  - VVER 440, Paks I, Loviisa
  - VVER 1000, Paks Capacity Increase
  - VVER 1200, Paks II, Hanhikivi 1
  - EPR 1600, OL3, Flamanville, HPC
  - AP 1000, Moorside
- **ABWR**
  - Hitachi GE, Leibstadt, Wylfa, Oldbury

PURAM, Hungary
Site selection, Safety assessments
Environmental licensing
General engineering

PÖYRY PROJECT MANAGEMENT GUIDELINES CREATE THE UMBRELLA FOR THE COMPREHENSIVE PROJECT SPECIFIC IMPLEMENTATION PROCEDURES AND MANUALS



- Project planning and execution strategy set out by senior project management
  - Project Sponsor
  - Principal Project Manager

- Implementation details defined in suite of guidelines covering all project phases, processes and procedures
  - Principal Project Manager
  - Senior Discipline Managers

- Project Review and Reporting
  - Project Sponsor
  - Principal Project Manager

PM003 – PM012 in accordance to Project Management Institute (PMI) (PMBoK edition 4.0)

PÖYRY IN HUNGARY: PÖYRY ERŐTERV

Traditions:

- Pöyry Erőterv designed 85% of the presently available installed capacity (8500 MW); Conventional PPs (Coal, HFO, Gas, CHPs) and Nuclear PP
- Erőterv designed the high voltage National Grid (all the substations and 10 000 km OHL 120–750 kV) and a number of middle voltage facilities
- Erőterv played a significant role in the system planning from the beginning to nowadays

History	
Foundation	1950
Legal restructuring	1992
Privatisation (FORTUM)	1995
MBO	2004
Member of Pöyry PLC	2010

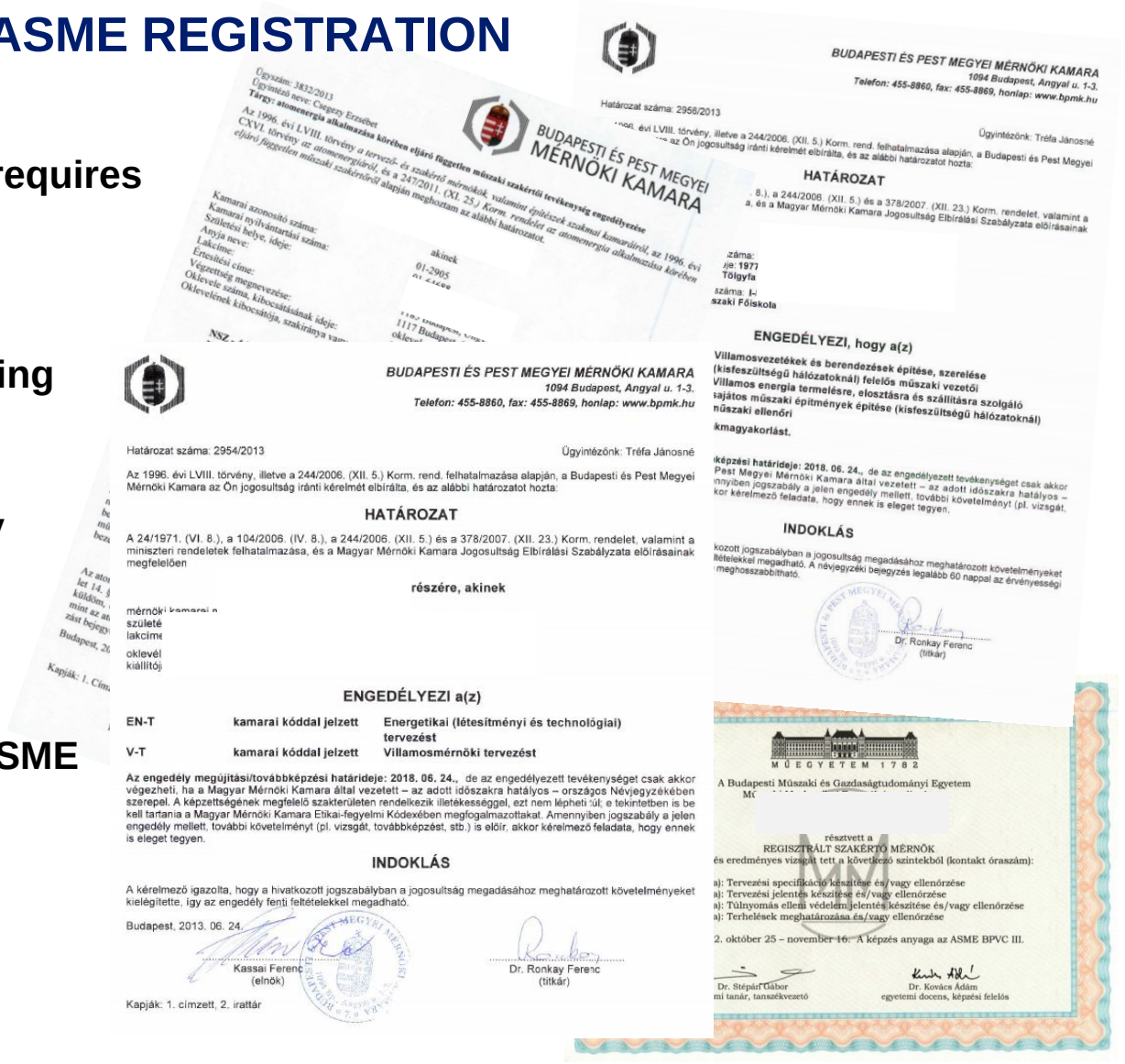
COMPANY CERTIFICATES

- MSZ EN ISO 9001:2009
- MSZ EN ISO 14001:2005
- ISO/IEC 27001:2013 Information Safety Management System
- Specific registration of Hungarian National Security Services
- KM 31/2010 ABOS (Paks NPP Certificate)
- ÉMI (civil engineering)
- Hungarian Engineering Chamber membership
- PÖYRY Group Certificate of Insurance

HUNGARIAN ENGINEERING CHAMBER MEMBERSHIP CERTIFICATES AND ASME REGISTRATION

Authorisation in Hungary requires certified designers

- **Professional fields**
  - **Mechanical engineering**
  - **I&C**
  - **Electrical technology**
  - **Civil engineering**
  - **Nuclear engineering**
- **Registered experts in ASME**



BUDAPESTI ÉS PEST MEGYEI MÉRNÖKI KAMARA
1094 Budapest, Angyal u. 1-3.
Telefon: 455-8860, fax: 455-8869, honlap: www.bpmk.hu

Határozat száma: 2954/2013 Ügyintézőnk: Tréfa Jánosné

Az 1996. évi LVIII. törvény, illetve a 244/2006. (XII. 5.) Korm. rend. felhatalmazása alapján, a Budapesti és Pest Megyei Mérnöki Kamara az Ön jogosultság iránti kérelmét elbírálta, és az alábbi határozatot hozta:

HATÁROZAT

A 24/1971. (VI. 8.), a 104/2006. (IV. 8.), a 244/2006. (XII. 5.) és a 378/2007. (XII. 23.) Korm. rendelet, valamint a miniszteri rendeletek felhatalmazása, és a Magyar Mérnöki Kamara Jogosultság Elbírálási Szabályzata előírásainak megfelelően

részére, akinek

ENGEDÉLYEZI a(z)

EN-T	kamarai kóddal jelzett	Energetikai (létesítményi és technológiai) tervezést
V-T	kamarai kóddal jelzett	Villamosmérnöki tervezést

Az engedély megújítási/továbbképzési határideje: 2018. 06. 24., de az engedélyezett tevékenységet csak akkor végezheti, ha a Magyar Mérnöki Kamara által vezetett – az adott időszakra hatályos – országos Névjegyzékében szerepel. A képzettségének megfelelő szakterületen rendelkezik illetékességgel, ezt nem lépheti túl, e tekintetben is be kell tartania a Magyar Mérnöki Kamara Etikai-fegyelmi Kódexében megfogalmazottakat. Amennyiben jogszabály a jelen engedély mellett, további követelményt (pl. vizsgát, továbbképzést, stb.) is előír, akkor kérelmező feladata, hogy ennek is eleget tegyen.

INDOKLÁS

A kérelmező igazolta, hogy a hivatkozott jogszabályban a jogosultság megadásához meghatározott követelményeket kielégítette, így az engedély fenti feltételekkel megadható.

Budapest, 2013. 06. 24.

Kassai Ferenc (elnök) Dr. Ronkay Ferenc (titkár)

Kapják: 1. címzett, 2. irattár

MŰEGYETEM 1782

A Budapesti Műszaki és Gazdaságtudományi Egyetem

részesült a

REGISZTRÁLT SZAKÉRTŐ MÉRNÖK

és eredményes vizsgát tett a következő szintekből (kontakt óraszám):

a): Tervezési specifikáció készítése és/vagy ellenőrzése
a): Tervezési jelentés készítése és/vagy ellenőrzése
a): Túlnyomás elleni védelem jelentés készítése és/vagy ellenőrzése
a): Terhelések meghatározása és/vagy ellenőrzése

2. október 25 – november 16. A képzés anyaga az ASME BPVC III.

Dr. Stépán Gábor mi tanár, tanszékvezető Dr. Kovács Ádám egyetemi docens, képzési felelős

PERFORMED ACTIVITIES IN PAKS II IMPLEMENTATION

„Teller Project" (2007–2008)

- Contribution in survey of licensing procedures
- Contribution in preparation of preliminary feasibility study
- Preliminary evaluation of environmental impacts
- Survey of grid connection possibilities

„Lévai Project" (2009–2012)

- Preparation of environmental impact assessment (preliminary phase)
- Survey of required grid connection development demands related to Paks II
- Elaboration of tender documentation (technical specification)
- Evaluation of labour force demand of commissioning and operation of Paks II

Licensing activities and preliminary investigation (2012–2014)

- Environmental licensing of the planned new units, Preliminary phase („Preliminary Consultation Documentation")
- Evaluation of external hazards at Paks II Nuclear Power Plant site within framework of the site licensing (release of hazardous fluids and chemical explosions due to accidents in public transport, and in industrial facilities situated in the vicinity of the site)
- Elaboration of PAKS II Grid Connection Study

SERVICE OFFERING IN THE EARLY STAGE OF PAKS II. PROJECT (1)

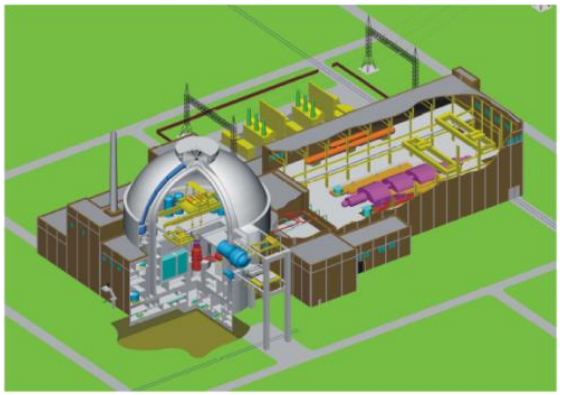
Support in licensing

- Nuclear safety licensing - Hungarian Atomic Energy Authority
  - PSAR (to meet Hungarian, IAEA and EUR requirements)
  - CLA (to meet Hungarian requirements, to develop several chapter)
  - Licensing of Construction Base
  - Procurement, Manufacturing and Installation Licenses
- Hungarian Energy and Public Utility Regulatory Authority
  - Electricity Industrial Licensing
  - Network connection
- Other Authorities in the process of EIA
  - Environmental license
  - Water usage
  - Fire protection
- Support of meetings with the authorities

SERVICE OFFERING IN THE EARLY STAGE OF PAKS II. PROJECT (2)

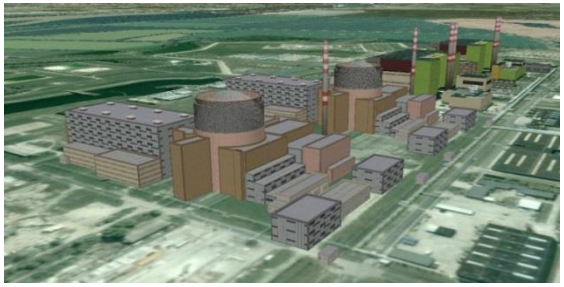
Design Services

- Basic design of specific sections or parts
  - BoP, Auxiliary systems
  - Emergency cooling water system with cooling towers
  - Radioactive waste treatment systems
- Localization, authorization of basic design
- Localization, authorization of detailed design
- Detailed Design of specific sections
  - Mechanical, Electrical, C&I and HVAC



Engineering services

- Tender documentation and evaluation for local supply packages
- Support the qualification of sub suppliers to meet nuclear quality and certification requirements
- Management of local engineering supply chain
- Project management support
- QA/QC management support



REFERENCES - NUCLEAR LICENSING

Paks NPP Unit 1-4

Client: mvm paks nuclear power plant

Legal background:

- Act CXVI of 1996 on Atomic Energy
- Nuclear Safety Code (Gov. Decree 118/2011. (VII.11.))
- IAEA Safety Requirements and Safety Guides

Different activities in licensing:

- PLEX process (2008–2010; 2013–2015)
  - Design reports of Safety class 1–3 mechanical components
- Different licensing activities (ongoing)
  - Preparation of design specifications
  - Design reports
  - Procurement license
  - Documentations for licensing of modifications

REFERENCES - NUCLEAR DESIGN

Static computation of the main building of Paks NPP VVR 440/213 Unit

Scope of work:

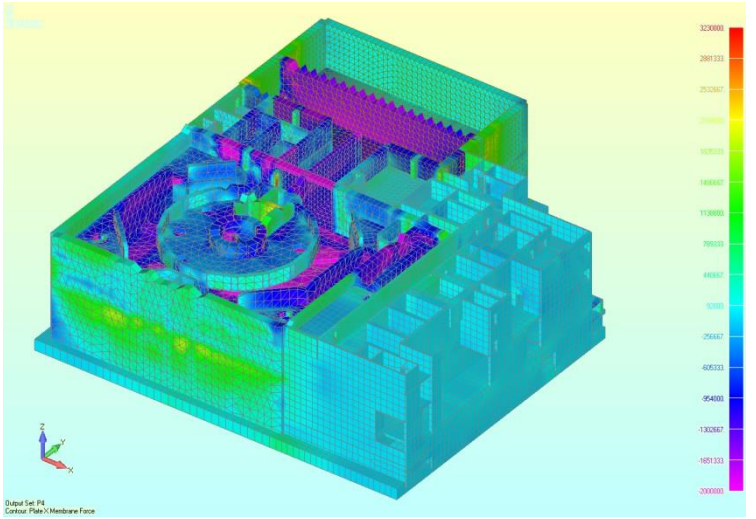
- Control static calculation of the reinforced concrete structure

Project summary (2010–2014):

- As a part of the NPP's +20 years lifetime extension program we made a control static calculation for the licencing process

Other computing projects:

- Control static calculation of safety related buildings (2007-2010)
  -25 buildings



- Analysis of possible building movements after earthquake (2013-2014)
  -25 buildings

REFERENCES - NETWORK CONNECTION of PAKS II

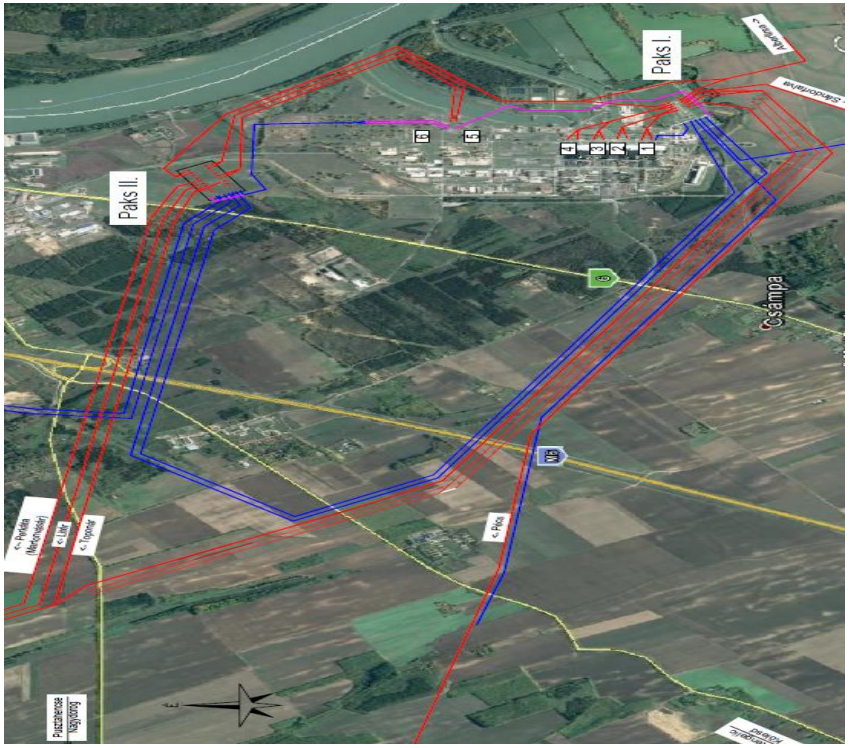
Preliminary Study

Scope of work:

- Determine the alternatives for 400 kV SS and OHL corridors
- Complex (technical, legal, feasibility, risk and economic) long term analysis of alternatives

Services (2014):

- Review and evaluation of alternatives
- Identification of risks
- Analysis of feasibility performance
- Evaluation of future development possibilities
- Network calculations
- Cooperation with PAKS II, MAVIR



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