

**SERVING
POWER INDUSTRY**



**NUCLEAR
POWER PLANTS**

OUR RANGE OF SERVICES

CONSTRUCTION

1. PREPARATION OF INVESTMENT

- Pre-feasibility study
- Feasibility study
- Environmental impact assessments
- Site investigation
- Techno-economic analyses
- Plant concept, conceptual engineering and Basic Design for Conventional Island and BoP
- Management of all site and off-site related investments
- Preparation of transportation study
- Non-commercial parts of tender documentation and contracts management

2. IMPLEMENTATION

- Project management
- Engineering
- Project administration
 - › Controlling
 - › Chain management
 - › Contracting

3. SUPPORT AFTER COMMISSIONING

- Asset management of operated power plant
 - › Maintenance
 - › Risk management
 - › Power output increase

SPECIAL WORKS

- Support for EUR certification process according to EUR documents
- Licensing and permitting including the works planning and scheduling
- Review and analyse of safety reports - Final Safety Analysis Report (FSAR) and the Probabilistic Safety Analysis (PSA), review its compliance with safety standards
- Oversight and review of Environmental Impact Assessment and relating studies (grid connection, water requirements, waste management etc.)
- Monitoring compliance with the IAEA, international standards and regulations
- Examination of compliance of design documentation with the economic and technical requirements of the Design Statement of Work
- Technical reviews and analysis of the NPP design and its suitability for compliance with requirements, such as control and protection design and suitability for seismic requirements
- Review of the equipment and material storage and record keeping procedure
- Review of the procedures for acceptance of construction, installation, start-up and commissioning works, as well as procedures for acceptance into operation
- Support the Owner in definition of the training requirements
- Review of training program
- Support negotiations with the Reactor Vendor, in agreeing specification of future services to support all major approvals and permits, and to support the Owner in reviewing specifications and deliverables
- Support the Owner in technical negotiations with the EPC contractor to achieve the necessary safety standards for the Project including the nuclear fuel supply, operations and maintenance support contracts
- Support the Owner in preparing a public relations campaign
- Participate in regular Project meetings/ briefings

WE ARE THE LARGEST CZECH EPC CONTRACTOR ABLE TO DELIVER POWER GENERATION PROJECTS FROM THE DESIGN, THROUGH PROCUREMENT, CONSTRUCTION AND INSTALLATION, UP TO COMMISSIONING AND PROVISION OF BOTH WARRANTY AND EXTENDED WARRANTY SERVICES. AS EPC CONTRACTOR OF NUCLEAR POWER PLANT PROJECTS IN THE CZECH AND SLOVAK REPUBLIC, WE HAVE MAINTAINED OUR COMPETENCY FOR SUPPLIES OF CONVENTIONAL ISLAND AND BALANCE OF PLANT.

◀ Dukovany Nuclear Power Plant (4 x 440 MW), Czech Republic

NUCLEAR POWER PLANTS

ŠKODA PRAHA has specific and unique expertise in the engineering and construction of nuclear power plants. After delivering all 12 nuclear power units in the Czech and Slovak Republic on EPC basis we executed projects of safety improvements, power uprates and supplied technological parts of the plants. ŠKODA PRAHA as EPC contractor commissioned in 2001 and 2002 nuclear power plant Temelin 2 x 1000 MW – the latest nuclear units in Europe. Our actual activities include supply of conventional island and

balance of nuclear power plant in the role of EPC contractor according to Customer's needs. We are ready to comply with all requirements from project preparing, design, through construction and assembly, up to commissioning following flexible compatibility and respecting various contractual schemes. We can upgrade the power plant systems, increase power output and implement most recent safety standards and post-Fukushima stress tests improvements.

INTEGRATED SYSTEM FOR ENGINEERING AND CONSTRUCTION

Our processes are supported by modern software tools that enable us to deliver the best value to our clients. These tools integrate support for standardized yet flexible processes, complex projects, organizational roles, team collaboration and long term experience

of engineering and construction knowledge. We offer the client our experience with these software tools to achieve the best execution of the project and to accomplish the project goals in terms of budget, schedule and quality.

SELECTED REFERENCES

1. NEW NPP DUKOVANY

PROJECT: New NPP Dukovany
CLIENT: ČEZ, a. s.
DURATION: 03-09/2016
OBJECTIVE: ČEZ, a. s. decided to execute EIA process for new units in Dukovany power plant area. ŠKODA PRAHA is preparing studies, which are part of the EIA documentation (location of the new units, incl. documentations of excavations, soil transport and backfilling as well as 3D models of referential units).

2. SUPPORT FOR EUR CERTIFICATION PROCESS ACCORDING TO EUR DOCUMENTS

PROJECT: EU-APR standard design
CLIENT: Korea Hydro & Nuclear Power Co., Ltd
DURATION: 12/2015 – 04/2017
OBJECTIVE: ŠKODA PRAHA signed service contract to support KHNP to obtain EUR certification of their EU-APR standard design according to EUR documents revision D.

3. ULTIMATE HEAT SINK COOLING TOWER - STRESS TESTS IMPROVEMENTS

PROJECT: NPP Dukovany 4 x 500 MW
CLIENT: ČEZ, a. s.
DURATION: 2013 - commissioning February 2016
OBJECTIVE: ŠKODA PRAHA was in the role of EPC contractor and designer of ultimate heat sink cooling tower system which was implemented as one of the measures of stress tests. According to the actual needs and situation at the plant the new technical solution with draft cooling towers for cooling of essential service water has been developed.

4. POWER OUTPUT INCREASE FROM 1.820 TO 1.997 MW

PROJECT: NPP Dukovany 4 x 500 MW
CLIENT: ČEZ, a. s.
DURATION: 2008 - 2012

OBJECTIVE: The purpose of the project was to provide the technological conditions for operation of individual units with a design heat output of the reactors increased to 105% in accordance with the respective regulations and standards until the end of the planned power plant life targeted to 2045. After completion of the project the total power plant output is 1.997 MWe.

The complete project consisted of the following sub-projects:

- Exchange of the turbine high pressure flow parts
- Modification of the generator stators
- Exchange of the measurement nozzles and high pressure separators on the steam piping
- Increase of the absorption capacity of the condenser bypass station
- Main condenser level control
- Modernization of the unit transformers
- Reconstruction of the generator grid connection

5. NPP TEMELÍN 2 X 1000 MW

PROJECT: NPP Temelín 2 x 1000 MW
CLIENT: ČEZ, a. s.

6. NPP DUKOVANY 4 X 440 MW

PROJECT: NPP Dukovany 4 x 440 MW
CLIENT: ČEZ, a. s.
DURATION: 1985 – 1987
OBJECTIVE: ČEZ, a. s. decided to construct NPP 4 x VVER 440 / V-213 units. ŠKODA PRAHA as EPC contractor supplied technology, including documentation, installation and commissioning. NPP is located in south Moravia 50 km south-west of town Brno, it is cooled by natural draft cooling towers; raw water is supplied from the river Jihlava.

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