Project Name	**Modernization of the ASRTP SORR, SIS, and CPL EMO12 Safety Systems**	
00	**The complete Technical Specifications and annexes will be provided to interested parties only after the signing of a Non-Disclosure Agreement (NDA)**	

OBJECTIVE AND PURPOSE OF THE CONTRACT

These Technical Specifications for the procurement (hereinafter referred to as "TS") set forth the client's requirements for the deliverables, the interface, and the safety, functional, technical, and documentation parameters of the project, which is the modernization of the SORR, SIS, and CPL safety systems for the Mochovce Nuclear Power Plant, Units 1 and 2, VVER 440/213 type.

Scope of Work: The scope of work will be carried out in the form of a multi-phase Design–Build procurement, in which the contractor is responsible for both the design of the solution and its implementation, in accordance with the requirements of these TS, the relevant legislative and regulatory requirements, and the approved project documentation.

The procurement is designed as **a two-phase process**:

Phase 1 – Design Proposal

During this phase, the selected bidders will prepare a design proposal centered on:

- safety concept (SC),
- basic design (BD),

which will include, among other things:

  - a proposed architecture for the modernized systems,
  - a definition of functions and their distribution among individual systems,
  - a proposal for the technical solution and its integration with existing equipment,
  - a proposal for implementation, including coordination with planned unit outages,
- a price quote for the project implementation.

The requirements for the content and scope of the SC and BD are set forth in Annex A, **"Requirements for the Content of the Safety Concept,"** and in Annex B, **"Requirements for the Content of the Basic Design**." ***These will be published after the signing of the***

Non-Disclosure Agreement (NDA) regarding the tender documents. The contractor is required to comply with these requirements and incorporate them into the proposed solution.

Phase 2 – Project Implementation

The successful bidder shall execute the Scope of Work based on its own proposal submitted in Phase 1 and approved by the Client, whereby:

- bears full responsibility for the design, construction documentation, and execution of the work,
- executes the Scope of Work for a fixed (lump-sum) price,
- ensures that the implementation complies with the approved safety concept (SC) and basic design (BD) as determined by the regulatory authority,
- supports the client in negotiations with the ÚJD SR.

The approved SC and BD, accepted as part of the ÚJD SR review process, constitute a binding basis for further design, licensing, and implementation of the project. The solution implemented in Phase 2 must be fully consistent with them. Subsequent changes to the SC and BD compared to the approved solution must be addressed through the change management process and are subject to approval by the client and, depending on the nature of the change, also by the relevant regulatory authority. The SC and BD must be prepared to a standard of quality that minimizes the need for changes to the approved solution during subsequent implementation. The contractor is responsible for the accuracy, completeness, and feasibility of the proposed solution. Any changes resulting from deficiencies or incompleteness in the SC and BD that are identified during implementation will be addressed at the contractor's expense and under the contractor's full responsibility.

The objective of the scope of work is to ensure the modernization of the SORR, SIS, and CPL safety systems so that:

- all nuclear safety requirements are met in accordance with the principle of defense in depth,
- The solution was licensable in accordance with applicable legislation and the requirements of the Nuclear Regulatory Authority of the Slovak Republic (ÚJD SR),

- long-term operation of the systems was ensured with guaranteed technical support, availability of replacement components, maintenance services, and product development within the framework of the equipment life-cycle management (LTSA),
- the solution was feasible under the conditions at the EMO12 nuclear power plant.

SCOPE OF WORK

NATURE OF THE PROJECT IMPLEMENTATION

The implementation of the project is subject to the operational and technical constraints of the Mochovce Nuclear Power Plant (EMO12) and must be designed and implemented in such a way that:

- take into consideration the current condition of the equipment, systems, and their interconnections,
- ensure the maintenance of safe and continuous operation of the units during implementation,
- enable the safe and controlled integration of new systems into existing I&C and process systems,
- enable seamless and secure communication between the new systems and the subsequently modernized systems (BIS, BELT, AMS, etc.).

The project is being implemented on a unit-by-unit basis, whereby:

- The scope of work is being carried out separately for Unit 1 and Unit 2 in accordance with the planned outages of the Mochovce Nuclear Power Plant units,
- activities affecting reliability and safe operation must not be carried out on both generating units simultaneously. These activities must be performed sequentially so that the required level of overall reliability, availability, and nuclear safety of the power plant is maintained throughout the entire implementation period.
- The scope of the project includes the implementation of the relevant changes on the full-scope EMO1,2 simulator. The implementation of these changes must be

coordinated in terms of both scope and timing with the implementation at the units and carried out in accordance with the requirements of applicable Slovak legislation, the decisions and requirements of the Slovak Nuclear Regulatory Authority (ÚJD SR), as well as the requirements for maintaining the relevance of the training environment for nuclear power plant operators.

The technical solution must be designed to allow for the integration of the modernized systems without negatively impacting the nuclear safety, operation, and reliability of the systems, structures, and components (SSC).

REQUIREMENTS FOR THE IMPLEMENTATION SCHEDULE

The project implementation must be planned to maximize the scope of activities that can be performed while the unit is in operation and to minimize the scope of work during outages.

The contractor is required to propose an implementation schedule such that:

- it is feasible under the operating conditions of the EMO12 NPP, including the necessary tests,
- minimizes disruptions to unit operations from the perspective of safety and reliability,
- it takes into consideration the technical and functional interdependencies between individual systems and implementation phases;
- clearly identifies and separately plans work performed during unit operation and work requiring execution during a planned unit outage, including justification for their classification,
- maximize the scope of activities that can be performed during unit operation so as to minimize the scope of work carried out during the outage, while maintaining all requirements for nuclear safety, occupational health and safety, and operational reliability,

- include a separate schedule of activities performed on the full-scope simulator, including preparation, implementation of modifications, configuration, testing, validation, and support for personnel training,
- took into consideration the timing relationships between work on the simulator and implementation on the plant's technical systems so that the necessary tests, validations, and training were completed before the changes were put into operation,
- include milestones for the completion of work during operation, readiness for a outage, completion of outages work, and the simulator's readiness for training and testing.

The basic **schedule constraints** are as follows:

- the project must be feasible within a maximum of four (4) scheduled general outages for each unit,
- preparatory work may be carried out outside of unit outages, provided that it does not affect the safety and operation of the SSC, which performs its function under the given plant conditions,
- Work that can be technically and safely performed during unit operation must not be scheduled for a unit outage without adequate technical justification,
- The execution of the work must be coordinated with other ongoing projects and activities at the construction site, and the client reserves the right to restrict or adjust the implementation schedule due to conflicts or operational and safety requirements. A list of planned projects and activities considered for the relevant period is provided in Annex G of this technical specification.

The aforementioned restrictions constitute binding requirements that the contractor must take into consideration when designing the implementation plan for Phase 2 in terms of the implementation schedule, available outage windows, and operational constraints.

The contractor is required to prepare a detailed plan for the implementation of activities during planned unit outages (GO). This plan must be prepared in sufficient detail to support the operational management of the outage, at a minimum at the level of daily

activities, including all technological, organizational, and resource dependencies necessary for the execution of work within the approved outage window.

The plan must be submitted to the client no later than 6 months before the start of the relevant general outage (GO) and approved by the client no later than 3 months before its start.

The contractor is required to define and adhere to milestones related to outage windows, in particular:

- readiness of all new equipment, affected existing equipment, and related SSCs, including documentation, software configuration, test procedures, and necessary permits for performing the work prior to the start of the outage,
- completion of the dismantling of existing equipment,
- completion of the installation of new equipment,
- readiness for testing,
- completion of testing before the end of the outage window,
- readiness of the system to support the unit's operational activities.

The contractor **is required** to optimize the project implementation process so that the scope of work performed during planned unit outages is limited to the absolute minimum. All work that does not require the technological equipment to be shut down, or whose performance outside of a shutdown period will not affect nuclear safety, operational safety, reliability, availability of the affected SSCs, or unit operation, must be performed outside of the scheduled shutdown periods. Work performed during outage must be limited exclusively to activities necessary for technical, operational, or safety reasons.

The contractor **is required** to clearly distinguish in the implementation schedule and test program between tests that can be performed while the unit is in operation, regular and necessary tests during operation, and tests requiring the unit to be shut down. Tests during operation may be designed and performed only to the extent that their compliance with applicable legislation, decisions and requirements of the ÚJD SR, LaP, approved operating documentation, the Client's internal regulations, and the Client's requirements is demonstrated. Their performance must not result in any unacceptable impact on nuclear

safety, operational safety, reliability, or availability of the affected nuclear safety systems, nor on the availability of safety functions required for the unit's current operating state.

The Contractor is required to submit a test matrix that specifies, for each test, at a minimum: the name and purpose of the test, the phase of test execution, the affected system or equipment, the link to the requirements of TS and the design documentation, the required state of the equipment or unit, the conditions for execution, the required inputs and outputs, the success criteria, the method of evaluation, the required protocols or records, the responsibilities of the participants, and the requirements for approval by the client.

The proposed solution must be acceptable for licensing under the conditions of the EMO 12 Nuclear Power Plant. The Contractor is obligated to ensure that the technical solution proposal, design and safety documentation, project implementation, and all related activities comply with the applicable legislation of the Slovak Republic, the Client's requirements, and the binding requirements of the relevant regulatory authorities, in particular the Nuclear Regulatory Authority of the Slovak Republic.

DESCRIPTION OF THE CURRENT STATUS AND CLASSIFICATION

The Mochovce Nuclear Power Plant, Units 1 and 2 (EMO12), is a nuclear power plant with VVER-440/V213 pressurized water reactors, which is part of the production portfolio of Slovenské elektrárne. The plant consists of two units (Unit 1 and Unit 2), each of which is designed as a separate generating unit.

Each unit is equipped with one VVER-440 reactor and a pair of steam turbines with attached generators. The turbines convert the thermal energy of the steam into mechanical energy and subsequently into electrical energy.

The installed electrical capacity of a single EMO12 unit is 500 MW, while the total installed capacity of the power plant (Units 1 and 2) is approximately 1,000 MW. The thermal output of a single unit is 1,471 MWt.

From a technological standpoint, this is a power plant with a closed primary circuit, where heat produced by a fission reaction is transferred through steam generators to the secondary circuit. Steam is generated in the secondary circuit, which drives the turbines and electric generators.

The power plant is equipped with control and monitoring systems (I&C), safety systems, and auxiliary process systems that ensure the safe and reliable operation of the units. Key systems include, in particular, the SORR and SIS systems, as well as other I&C systems that ensure the control, regulation, and protection of process operations.

EMO12 is part of the Slovak Republic's power grid and serves as a stable source of base load power; its operation is managed from the main control room and coordinated within the transmission system.