



## **Vendor Teaser for Maintenance Services, Operational Improvement Packages and Asset Performance Management**

**Termoelektrarna Šoštanj d. o. o. / Cesta Lole Ribarja 18 / SI – 3325 Šoštanj**

**T: +386 (0)3 899 31 00 / F: +386 (0)3 899 34 85 / E: [info@te-sostanj.si](mailto:info@te-sostanj.si) / [www.te-sostanj.si](http://www.te-sostanj.si) /**

**VAT ID: SI92189903/Registration number: 5040388000**

The Company is registered at the District Court of Celje, Reg. Entry No. 1/00511/00.

Nominal capital: EUR 578.579.850,13. Current account: NLB d.d., Ljubljana SI56 02426-0017217937 BIC: LJBASI2X; UniCredit banka Slovenija d.d., Ljubljana SI56 29000-0003080383 BIC: BACXSI22; Banka Koper d.d., Koper SI56 10100-0038312861 BIC: BAKOSI2X; Nova KBM d.d., Maribor SI56 0451-50001707126 BIC: KBMASI2X.



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## 1. Introduction

Termoelektrarna Šoštanj (the “Owner” or “TEŠ”) seeks to improve the operations, maintenance, efficiency, and availability of the Šoštanj Thermal Power Plant (the “Facility”) and specifically unit 6 (the “Unit”).

This document constitutes an invitation to enter into a technical dialogue to seek or accept advice which may be used in the preparation of the procurement documents, to discuss Vendor solutions, products and services for the scope of work listed below (“Teaser”). Vendors are defined as any party who are interested in engaging in technical dialogue in relation to provide all and any of the solutions, products, and/or services included in this Teaser. Vendors may respond to all solutions, products and/or services requested in this Teaser or any subset thereof.

The requirements of the solutions, products, and/or services identified are subject to change based on input received from Vendors during the technical dialogue. It is the intent of TEŠ to issue a public tender for solutions, products, and/or services following this technical dialogue in accordance with the Slovenian Public Procurement Act (Official Gazette of RS, No. 91/15 and 14/18; hereinafter referred to as ZJN-3).

Pursuant to Article 64 ZJN-3 the Owner as contracting authority hereby invites all interested Vendors to participate in technical dialogue and to submit their advice, information and/or solutions regarding products and services in accordance with the requirements of the Teaser as set out below.

Participation of Vendors in the technical dialogue pursuant to this Teaser is not mandatory and is not a precondition for participation in the future public procurement procedure per ZJN-3.

## 2. Background Information

The Facility is owned by the Owner and is the largest power plant in the portfolio of Holding Slovenske elektrarne (“HSE”) in the Slovenian electricity system according to annual production of electricity and installed capacity. The Facility is a mine-mouth power plant located in Šoštanj near the Premogovnik Velenje mine.

Construction of the first unit in the Facility began in 1947 with additional units coming online later to increase the installed capacity. The Unit was the most recent installation at the Facility and consists of a 600 MW lignite fired boiler utilizing an Alstom (now General Electric or “GE”) boiler and steam turbine that began operating in May 2015.

The electricity produced from the Facility provides approximately 33% generation in Slovenia. The availability and reliability of the Facility is critical to the electrical grid stability and economical supply of electricity to Slovenia.

### 3. Potential Services and Solutions

#### 3.1 Long Term Service Agreement

The Owner wishes to enter into a long term service agreement (LTSA) for the maintenance activities of the Unit for a term of up to approximately 9 years that will include a defined number of planned maintenance events. The anticipated benefits to the Owner allow cost certainty for future planned maintenance and risk sharing for the performance of the equipment during the term of LTSA through performance guarantees.

The Owner anticipates that scope of work shall cover the necessary services and parts for major planned maintenance, but also for unplanned maintenance and emergency maintenance activities, all based on the operation and maintenance manuals for the equipment, recommendations from the original equipment manufacturer and prudent industry practice. The day-to-day operation and maintenance activities will be conducted and managed by the Owner.

##### 3.1.1 *Indicative Scope Covered Equipment and Terminal Points*

###### 3.1.1.1 *Major Equipment*

The Owner indicatively plans to include the following major equipment within the future LTSA:

- **One General Electric 4 Casing Steam Turbine - Generator, WT50T23E-138**, up to and excluding the Terminal Points described immediately below:
  - ◆ HP steam inlet pipe connection to stop valve
  - ◆ Cold reheat pipe connections to the turbine casing
  - ◆ Hot reheat steam inlet pipe connections to the stop valves
  - ◆ Exhaust hood connection to the condenser expansion joint
  - ◆ Steam turbine extraction point non-return valves inlet connections
  - ◆ Steam turbine drain valves outlet connections
  - ◆ Inlet connection at LP hood spray / flange / valve
  - ◆ Generator cooling water inlet & outlet connections
  - ◆ End connection point to the generator flex leads
  - ◆ Oil inlet/outlet connections at bearings and valves
  - ◆ Base plates and foundation bolts
- **Turbine auxiliaries** included within the scope:
  - MHC control system: governor, control valve servo motor and gears, emergency trip valves, relay dump and trip valves
  - General Electric Turbine control system (including the control system cards, but excluding control system upgrades)
  - Generator protection system
  - Synchronization system

- Static excitation system and brush gear, including transformer, rectifier, voltage controller, de-excitation system and rotor earth fault protection Lube oil system
  - Generator seal oil system
  - Hydrogen cooling system skid
- **One Supercritical Pulverized Coal Boiler**, consisting of the pressure parts, the flue gas ducting and the air preheater, up to and excluding the Terminal Points described below.
  - ◆ Flue gas path from “Ash hopper section just below grate at bottom of furnace” and “ash hopper inlet at the bottom of economizer”, until “outlet flange from air preheater (excl. expansion joint)”. For clarity, this includes the regenerative air pre-heater (RAPH)
  - ◆ Water/steam path from boiler main feedwater check valve inlet flange and steam outlet (at first weld outside boiler) For clarity, this includes the economizer, evaporator, superheater, circulating pumps, and the steam coil air pre-preheater (SCAPH)
  - ◆ Reheater from “Connection to inlet of reheater inlet header” to “Connection to outlet of reheater outlet header”
  - ◆ Steam coil preheater from “steam inlet flange” to “steam outlet flange” (If any)
  - ◆ Airside of rotary air preheater from “inlet flange” to “outlet flange” (incl. Expansion joint)
  - ◆ Boiler firing system, consisting of coal mills, coal nozzles, windboxes, air nozzles, fuel supply piping, flame scanners and up to and excluding the Terminal Points described immediately below
    - Bottom ash hopper at drop off chute
    - Flue gas at outlet flange to flue gas ducting
    - Coal inlet gate on the coal chute of the coal bunkers
    - Air supply at air inlet flanges to wind boxes (including expansion joints)
- **Boiler auxiliaries** included within the scope:
  - Sootblowing system
  - Ignition system
  - Flame scanners
  - FD/PA/ID fans and motor
- **One Selective Catalytic Reduction (SCR)**, consisting of the reactor, catalyst, ammonia injection grid, dilution air fans, aqueous ammonia flow control system, and up to and including the Terminal Points immediately below:
  - ◆ Inlet to the transition to the SCR reactor
  - ◆ Outlet to the reactor from the SCR reactor
  - ◆ Base plates and anchor bolts
- **One Electrostatic Precipitator (ESP)** consisting of the casing, insulator housing, weather enclosure, hoppers, electrodes, rapping system, transformer rectifiers, control systems and up to and including the Terminal points immediately below:

- ◆ Flanged inlet connections at the transition ducts
- ◆ Flanged outlet connections at the transitions
- ◆ Outlet of the knife gate valve at the bottom of the ash hoppers
- ◆ Base plate and anchor bolts
- **Bottom ash system** consisting of a submerged scraper conveyor (SSC) system, crushers, SSC water recirculation pumps, ash conditioners, slurry/sludge pumps, up to and excluding the Terminal points immediately below
  - ◆ Bottom ash hopper drop off chute
  - ◆ Discharge at the end of the SSC
  - ◆ Base plates and anchor bolts

### 3.1.1.2 Covered Balance of Plant (BOP) Systems

The Owner indicatively plans to include balance of plant (BOP) systems in the future LTSA:

- **Main Steam Systems** (superheated steam piping, hot reheat steam piping, cold reheat steam piping).
- **Auxiliary Steam Distribution System** with pressure reducing device, header, piping and valves)
- **Air compressors** consisting of 2x250 Nm<sup>3</sup>/h oil free air compressors (air cooled), lubrication system, air receivers, air pre-filters, air outlet filters, and air dryers
- **Condensate Polishing Plant** consisting of cartridge filters, mixed bed polishing vessels, acid and caustic tanks, regeneration transfer pumps, acid dosing pumps, caustic dosing pumps, neutralization pit and its pumps, air blower, recycling pumps, hot water tank and chemical transfer pumps
- **Air preheater bypass economizer (LUBECO)** consisting of flue gas / close loop water heat exchanger, closed loop / condensate water heat exchanger, LUBECO cooling water pumps, expansion tank, temperature control valve
- **District heating system** consisting of circulation water pumps, drain pumps, expansion water tank, deaerator and jockey pumps
  - **Condensate system** including condensate extraction booster pumps (2x100%), the condensate extraction pumps (2x100%), and LP feedwater heaters (LP1 – 5), LUBECO heater
  - **Feedwater system** and heating plan consisting of feedwater storage and the deaerator, feedwater pumps (3x50% motor driven), and HP feedwater heaters (HP 7-9)
  - **HP & LP bypass stations including the reheat (RH) safety station**
- **Close cooling water (CCW) system** including CCW pumps, heat exchangers, and head tanks,
- **Make-up Water system** with demineralised water storage tank, and quick and normal make up pumps
- **Main cooling water system** including the condenser, condenser vacuum pumps, condenser level control, tube cleaning system, but excluding the main cooling tower



- **Chemical Control and Sampling System** for steam and water cycle including sampling cooler and analyzers
- **Electrical systems** for the Unit including, but not limited to, generator step-up transformers, auxiliary transformers, generator circuit breaker, protection systems,
- **Ammonia dosing system for SCR** including storage tank, dosing pumps, oxygen bottle rack, and oxygen injection system
- Other systems that the Vendor(s) may propose during the technical dialogue.

The terminal points for the BOP systems will be developed in conjunction with the Vendors to be included in the RFP.

### 3.1.1.3 *Control Systems*

The Owner indicatively plans to include the following Unit control systems in the future LTSA:

- ALSPA DCS
- ALSPA TGC steam turbine control
- Boiler protection systems

## 3.2 **Operational Performance Modules (OPMs)**

The Owner is seeking various solutions to implement in the Unit that will provide operational benefits. Due to the large number of solutions for the Unit available on the market, the Owner wishes to engage with Vendors to learn more about the offerings and how they can benefit the Unit and how they can improve on the Key Performance Indicators (KPIs) outlined in Section 3.2.1.

### 3.2.1 **Key Performance Indicators (KPIs)**

These solutions will be evaluated based on the KPIs listed below:

- Efficiency Improvement
- Availability Improvement
- Reliability Improvement
- Operations and Maintenance Improvement
- Corrosion Monitoring
- Cycling Monitoring

Measurement methodology for the improvements on the KPIs will be used to assess the performance of the Vendors. A baseline of the KPIs will be established used to benchmark the performance of the proposed solutions after implementation. The measurement methodology will be established in consultation with the Vendors and based upon the Owner's standards and procedures.

### 3.2.2 **Examples of Sought After Solutions**

The list below is a sample of the types of solutions that the Owner is interested in implementing in the Unit. Vendors are encouraged to provide any and all products/solutions that would benefit the operation of the Unit.



- Efficiency Advisor (plant performance analytics software)
- Combustion optimization
- Steam Temperature Optimizer
- Fuel Feeding Equipment Improvements
- Fuel Quality Monitoring
- Hardware Improvements (valves, sensors, etc.)

### 3.3 Asset Performance Management (APM) & Enterprise Asset Management (EAM)

As part of the Owner’s efforts to improve operational efficiencies, the Owner is investigating APM and EAM solutions. This invitation for technical dialogue to discuss Vendor solutions, products and services is to understand Vendor offerings in delivering the functionality that the Owner expects in APM and/or EAM systems. The Owner understands that a discovery period is required to scope the requirements of these systems, align with existing and planned technology stacks already in service at the Facility, categorize (and/or change) functionality to systems and ensure the Owner’s business processes to support these systems.

The intent of the technical discussions is to define what functionality will be supported by Vendor solutions. It is understood that this may be a combination of solutions to form a complete APM/EAM system for the Owner, but it is preferred that the Vendor supports the complete solution even if it is a combined technology stack. The information from the technical discussion will be used, where Owner deems it necessary and appropriate, in the support of the future public tender documentation.

All Vendors with technical/functional experience in configuration, design, testing, implementation and integration of APM and EAM solutions are asked to demonstrate their understanding of the solutions and their experience in leading the implementation of such products. A demonstration would be recommended to highlight the solutions method of delivering the functionality identified in Table 3-1 and/or showcase functionality the Vendor deems applicable that may not be identified.

Table 3-1 summaries key modules required for the solutions but is not intended to define the solutions or its functionality. The functionality can be delivered in either the APM or EAM or any combination. The intent is to deliver robust EAM functionality and APM tools to support prescriptive and predictive maintenance programs for increased maintenance efficiencies contributing to overall plant efficiency gains. It is the intent of the Owner to work with solution providers to define system requirements, solutions required to deliver the functionality and execution strategy to deliver the solutions.

**Table 3-1: Summary of Key APM and EAM Modules Expected for the Solutions**

Area	Solution	Modules
Asset Management	APM	<ul style="list-style-type: none"> <li>• Asset Registry &amp; Hierarchy</li> <li>• Asset configuration management</li> <li>• Asset Condition Assessment &amp; Health Indices</li> <li>• Asset status and location</li> <li>• Asset Inspection/Test report management</li> </ul>



Area	Solution	Modules
		<ul style="list-style-type: none"> <li>• FMEA</li> <li>• RCM</li> <li>• Failure Analysis</li> <li>• Asset criticality and risk assessment</li> <li>• Life-cycle costing</li> <li>• Predictive maintenance</li> <li>• Reliability-centred maintenance</li> <li>• Scenario analysis</li> <li>• Component tracking</li> <li>• Asset replacement and new asset on-boarding</li> <li>• Asset disposal</li> </ul>
Work Management	EAM	<ul style="list-style-type: none"> <li>• Problem/Incident Reporting &amp; Tracking</li> <li>• Planned Maintenance Program Management including work flow management</li> <li>• Work/Capital Project/Resource Planning, Scheduling, Management and forecasting</li> <li>• Work Order Tracking and KPI reporting</li> <li>• Warranty Tracking</li> <li>• Usage &amp; Maintenance history</li> <li>• External Contract Planning, Scheduling &amp; Management</li> <li>• Maintenance Costing and capital planning</li> <li>• Activity Based Costing and capital planning</li> <li>• Consumables Tracking</li> </ul>
Inventory Management	APM/EAM	<ul style="list-style-type: none"> <li>• Item Definition &amp; Location (Kitting)</li> <li>• Warehouse/Storeroom Configuration &amp; Management</li> <li>• Inventory Transactions and Material Usage Tracking (barcoding)</li> <li>• Material Replenishment</li> <li>• Cycle Counting and Physical Inventory</li> <li>• Serialized Item &amp; Lot Tracking</li> <li>• Inventory Accounting, Auditing &amp; Valuation</li> </ul>
General Technical	APM/EAM	<ul style="list-style-type: none"> <li>• Data Validation and tracking</li> <li>• Mobile Computing</li> <li>• GIS/GPS</li> <li>• Sap integration</li> <li>• Linear Asset Referencing</li> <li>• Automated Workflow</li> <li>• Bar Coding/Quick Response (QR) code/Radio Frequency Identification (RFID)</li> <li>• Graphical Viewer/User Interface</li> <li>• Visualization and analytics</li> <li>• SCADA and Remote Monitoring Interfaces</li> <li>• Document Management Integration</li> <li>• Microsoft Office 365 Integration</li> </ul>



#### 4. Schedule

The following timetable sets out the schedule of key dates and times to conduct the technical dialogue with the Owner and Vendors. All times provided are in Central European Time (CET).

Activity	Date
Teaser Release Date	November 5 <sup>th</sup> , 2019
Deadline for Vendor to Submit Response	November 15 <sup>th</sup> , 2019
The Owner notifies the Vendor of time slot for Meeting & Demo together with further instructions	November 19 <sup>th</sup> , 2019
Meeting & Demo with the Owner in Ljubljana, Slovenia (to be conducted with each individual Vendor separately)	Indicatively scheduled for December 2 <sup>nd</sup> to 4 <sup>th</sup> , 2019, with earlier or later time slots possible if absolutely necessary (in such a case technical dialogue may be conducted remotely by videoconference)

Vendors are to submit their response in writing by e-mail to the following address: [solutions6@te-sostanj.si](mailto:solutions6@te-sostanj.si). In their response they are requested to clearly designate for which part of the technical dialogue they are interested to participate in (LTSA and/or OMPs and/or APM&EAM).

In the event that the Owner does not receive sufficient proposals, advice, instructions or if the information received is not satisfactory, the Owner may release a new invitation for technical dialogue.