

2018.gada 11.jūlijā

Nr. 500300/2.5/2018/2665

Tenderers of the negotiated procedure

Subject: Negotiation procedure No AST2018/43 "The validation of the dynamic models of Latvian power plants" - answers to the tenderer questions

Dear Sir/Madam!

Hereby the Customer answers to the tenderer questions.

Question 1: From the SoW of the ToR (point 6) it's stated that 20 units must be validated. Does it mean the number of units to be tested is 20 or for some of them the models and parameters should be identified from the available documents, data and measurements?

Answer: 20 is the expected number of units to be tested. However, it is possible that 2 or 3 units in Pļaviņu HPP are similar enough to test only one of them. In that case, it could be possible to skip tests for 1 or 2 units. Considering model parameters derived from available documents and measurements, we do not expect that any unit has complete set of data to create and validate dynamic model, so it will require at least some tests.

Question 2: For the tuning of PSS, the characterization of the generators' AVRs is needed; although not explicitly mentioned, we intend that the test campaign on generating units shall not be dedicated to the tests for frequency containment only but also require specific tests to assess the parameters of the generators' AVRs. Could you please confirm?

Answer: Yes, tests shall be done both on frequency and voltage control systems. The amount of tests shall be sufficient to create and validate each generating unit's dynamic model, taking into account the information already available (namely, manufacturer's data and commissioning tests).

Question 3: Considering that, it appears not straightforward to perform both the parameters' assessment of the generators' AVR and the tuning of PSS during the same testing session. The Consultant may propose the following methodology:

- a. during a first test campaign, the parameters of the generators' AVRs and the current tuning of their PSS are tested;
- b. on the basis of data collected and the results of the test campaign, where required, the Consultant shall propose to and discuss with the customer a new set of parameters for the generators' PSS;
- c. during a second test campaign dedicated only to PSS, the Consultant shall test the new parameters for PSS.

Could you please confirm that such methodology is what the customer has in mind?

Answer: Yes, this methodology meets our expectations.

Question 4: Regarding the fine tuning of PSSs for inter-area oscillations, we understand that the Consultant has to fine tune the local modes and verify that such tuning has a positive effect also on the damping of inter-area oscillations. Otherwise, in order to achieve an actual fine tuning on inter-area modes, the following information are required:

- a. Complete model representing all the synchronized power systems;
- b. Scenarios for which the tuning should be carried out;
- c. Current tuning of the PSSs of all generators connected to the other interconnected TSOs;
- d. Overall target damping factor agreed among interconnected TSOs.

Could you please provide information about the above mentioned proposal on what type of PSS tuning should be performed?

Answer: Yes, the Consultant has to fine tune the local modes and verify that such tuning has a positive effect also on the damping of inter-area oscillations.

Question 5: We intend that the test procedures mentioned in the ToR are part of the deliverables of the project. In the technical proposal will be dedicated to list the performed tests but the details of the tests and the related procedures will only be disclosed after the project award. Could you please confirm?

Answer: Yes, we expect that technical proposal will contain list of tests for given generating unit's type (HPP and CHPP) with brief comments about purpose of these tests and possible alternatives.

The complete list of tests for each generating unit, containing all the prerequisites and procedures will be part of deliverables.

Question 6: In our experience, the best test method for the characterization of both frequency and voltage control systems of a generator is based on the step test performed through a fictitious signal to be simulated within the control systems (governors, AVR & PSS) of the generators. The way and equipment to insert such fictitious signal highly depends on the generating unit and/or the governor & AVR manufacturers. Especially, in modern units, such signal is usually inserted within the control systems through dedicated SW which are property of the OEM. Could you please confirm that all the equipment (SW & HW) and documentation necessary to insert the signals will be available on site?

Answer: We will ask the owner of generating unit to provide required equipment and staff for testing.

Question 7: The SoW indicates that the Consultant shall deliver a validated dynamic model of Latvian power system:

- a. Could you please confirm that the validation of the model shall only consist in the comparison of the model with the results of the tests on each single generating unit's?
- b. Could you please confirm that an analysis of the dynamic models of the network elements different from the generating units is out of the scope of work?
- c. Could you also please confirm that no comparison and fine tuning with actual measurements of a real system event, implicitly meaning validation of the other network model elements, are required?

Answer: We are asking to update Latvian power system dynamic model with validated generating units' models and check it for compatibility and stability issues:

- a. We confirm that the validation of the model shall only consist in the comparison of the model with the results of the tests on each single generating unit's.*
- b. Analysis of network elements other than generating units is not required*
- c. Comparison and fine tuning of Latvian power system dynamic model with measurements of a real system event is out of scope of the work.*

Question 8: *Please clarify where we should add in our offer sections not mentioned in Clause 13 such as company profile, methodology for performing the assignment.*

Answer: As to qualification requirements, we do not require any additional information not mentioned in Clause 13.

Concerning methodology for performing the assignment, we ask to provide the Technical offer. Citing:

"2. During the Procurement process the Contender provides technical offer, which covers in detail at least:

- a. The organization plan for the works
- b. Project time schedule
- c. Plant and generating unit data needed for dynamic model validation
- d. Generating unit tests to be performed
- e. List of measurements and measuring equipment to be used during the tests
- f. PSS settings calculation, retuning and testing methodology"

We consider that already includes methodology for performing the assignment. The Contender can include other details not mentioned above if needed to clarify the intentions of the Contender.

Yours faithfully

Member of the Management Board

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