

Annex No. 4 to the Contract for Work - Guaranteed Values

[note by contracting entity: the wording of this annex corresponds to part of Annex A 6 of the tender documentation; in the text of this annex, the numbering of paragraphs and references of annex A 6 of the tender documentation is preserved]

A 15 Availability

Within the guaranteed value A 15 Availability, all the equipment of the OB2 UNIT - the relevant boiler within the connection points of the OB2 WORK is subject to evaluation.

A15.1 The guaranteed availability of the K20 boiler D_{K20} is **participant fills in %** as an average over 730 days of operation.

A15.2 The guaranteed availability of the K80 boiler D_{K80} is **participant fills in %** as an average over 730 days of operation.

A15.3 The guaranteed availability of the K90 boiler D_{K90} is **participant fills in %** as an average over 730 days of operation.

Availability calculation

Availability $D_{K20/80/90}$ = Availability of the specified boiler (%) of each boiler over the evaluated period is given by the relation:

$$D_K = 100 * TOTC$$

[%]

where:

TO – The operation time of the UNIT of the K20 or K80 or K90 part, meaning the time during which the boiler is in operation:

- from the end of the boiler start-up with steam supply of nominal pressure and minimum steam temperature according to the guaranteed value corresponding to points B3.1 to B3.3 for both fuels or any mixture of them within the defined framework,
- and at the same time fulfilling the guaranteed values A 1 to A 8 and A 12 or the minimum steam quality conditions according to ČSN 07 7403 paragraph 13 and table 2, A13, A14; of this Appendix No. A6 and the evaluated period for the guarantee.

TC – the evaluated period

TC = (730 days x 24 hours - Todst) (in hours)

Where:

A15.4 The guaranteed maximum time of planned shutdowns Todst boiler K20

TodstK20 - the period of planned shutdowns over 730 days is at the most **participant fills in** hours.

A15.5 The guaranteed maximum time of planned shutdowns Todst boiler K80 and K90

Todst K80/90 - the period of planned shutdowns over 730 days is at the most **participant fills in** hours.

Evaluation of availability

Availability will be evaluated by the CLIENT with the OB2 CONTRACTOR's participation on the basis of the operational records of the equipment during the guarantee operation.

5. GUARANTEED VALUES OF GROUP II

The parameters listed below in this chapter are guaranteed for the reference conditions given in this document:

- Chapter 2.1 *The reference conditions for the GUARANTEE MEASUREMENT A,*
- For the reference values given for individual media and fuels, or a mixture of fuels from the Chapter 2.2. *General conditions.*

1. The Boiler Efficiencies

The indirect method according to ČSN EN 12 952 will be used to determine the guaranteed efficiency.

	Parameter	Units	The value of the guaranteed parameter	LIMIT VALUE OF THE GUARANTEED PARAMETER
	boiler K20 fuel 1			
B 1.1	The average boiler efficiency at nominal boiler output for fuel 1: wood chips	%	<i>To be filled in by the participant</i>	lower by more than two tenths of a percentage point than the value of the guaranteed parameter
B 1.2	The boiler efficiency at minimum boiler output for fuel 1: wood chips	%	<i>To be filled in by the participant</i>	lower by more than one percentage point than the guaranteed parameter value
	boilers K80 and K90 fuel 1			
B 1.3	The average boiler efficiency at the boiler nominal output for fuel 1: wood chips – for the duration of 24 hours	%	<i>To be filled in by the participant</i>	lower by more than two tenths of a percentage point than the value of the guaranteed parameter
B 1.4	The boiler efficiency at minimum boiler output for the fuel 1: wood chips		<i>To be filled in by the participant</i>	lower by more than one percentage point than the guaranteed parameter value
	boilers K80 and K90 for any mixture of fuel 1: wood chips – 70% and fuel 2: plant pellets – 30%			
B 1.3	The average boiler efficiency at the boiler nominal output for fuel mixture		<i>To be filled in by the participant</i>	lower by more than two tenths of a percentage point than the value of the guaranteed parameter
B 1.4	The boiler efficiency at the boiler minimum output for fuel mixture	%	<i>To be filled in by the participant</i>	lower by more than one percentage point than the guaranteed parameter value

2. The Boiler Minimum Output

Applied to reference fuels, reference feed water temperature and reference conditions.

	Parameter	Units	The value of the guaranteed parameter	LIMIT VALUE OF THE GUARANTEED PARAMETER
	boiler K20 fuel 1			
B 2.1	The boiler minimum output – fuel 1: wood chips – the average for the duration of 4 hours	% of the boiler nominal output	<i>To be filled in by the participant</i>	higher by more than 10% of the guaranteed value
	boilers K80 and K90 fuel 1			
B 2.2	The boiler minimum output – fuel 1: wood chips – the average for the duration of 4 hours	% of the boiler nominal output	<i>To be filled in by the participant</i>	higher by more than 10% of the value of the guaranteed parameter
	boilers K80 and K90 for any mixtures of fuel 1 – 70% and fuel 2 – 30%			
B 2.3	The boiler minimum output – a mixture of fuels - the average for the duration of 4 hours	% of the boiler nominal output	<i>To be filled in by the participant</i>	higher by more than 10% of the value of the guaranteed parameter

3. The temperature of superheated steam at the minimum output

	Parameter	Units	The value of the guaranteed parameter	LIMIT VALUE OF THE GUARANTEED PARAMETER
	boiler K20 fuel 1			
B 3.1	The temperature of superheated steam at the connection point at the boiler minimum output – fuel 1 for the entire fuel range and for the conditions	°C	As a minimum: <i>To be filled in by the participant</i>	Lower than 515°C
	boilers K80 and K90 fuel 1			
B 3.2	The temperature of superheated steam at the connection point at the boiler minimum output – fuel 1 for the entire fuel range and for the reference conditions	°C	As a minimum: <i>To be filled in by the participant</i>	Lower than 515°C
	boilers K80 and K90 for any mixtures of fuel 1 – 70% and fuel 2 – 30%			
B 3.3	The temperature of superheated steam at the connection point at the boiler minimum output – mixture of fuels for the entire fuel range and for the reference conditions	°C	As a minimum: <i>To be filled in by the participant</i>	Lower than 515°C

4. Rate of change of the boiler output

	Parameter	Units	The value of the guaranteed parameter	LIMIT VALUE OF THE GUARANTEED PARAMETER
	boiler K20 fuel 1			
B 4.1	The average rate of change of the boiler output in the range of minimum to maximum output – Fuel 1 – wood chips	(t/h)/min	<i>To be filled in by the participant</i>	lower by more than 20% of the guaranteed value
	boilers K80 and K90 fuel 1			
B 4.2	The average rate of change of the boiler output in the range of minimum to maximum output – Fuel 1 – wood chips	(t/h)/min	<i>To be filled in by the participant</i>	lower by more than 20% of the guaranteed value
	boilers K80 and K90 for any mixture of fuel 1: wood chips – 70% and fuel 2: plant pellets – 30%			
B 4.3	The average rate of change of the boiler output in the range of minimum to maximum output – the mixture of fuels	(t/h)/min	<i>To be filled in by the participant</i>	lower by more than 20% of the guaranteed value

5. The boiler start-up from its cold state to the boiler minimum output

The cold state means a shutdown longer than 48 hours.

The minimum output means achieving steam parameters and the boiler stable operation, without start-up fuel and achieving the steam quality according to ČSN 07 7403, paragraph 13 and table 2.

	Parameter	Units	The value of the guaranteed parameter	LIMIT VALUE OF THE GUARANTEED PARAMETER
	boiler K20			
B 5.1	The start-up time from the cold state to the minimum output – fuel 1: wood chips	min	<i>To be filled in by the participant</i>	higher by more than 30% of the guaranteed value
	boilers K80 and K90			
B 5.2	The start-up time from the cold state to the minimum output – fuel 1: wood chips	min	<i>To be filled in by the participant</i>	higher by more than 30% of the guaranteed value

6. The Boiler Maximum Continuous Blowdown

The value of maximum blowdown to maintain steam quality according to the point A12.

	Parameter	Units	The value of the guaranteed parameter	LIMIT VALUE OF THE GUARANTEED PARAMETER
B 6	The value of the boiler's maximum blowdown to maintain the steam quality as a 24-hour average	% of the boiler nominal output	<i>To be filled in by the participant</i>	Higher by more than 30% of the guaranteed value

7. The maximum specific consumption of DeNOx reagent

	Parameter	Units	The value of the guaranteed parameter	LIMIT VALUE OF THE GUARANTEED PARAMETER
	boiler K20 the fuel 1: wood chips			
B 7.1	The maximum specific consumption of DeNOx reagent (name - to be filled in by the participant) per 1 t / of produced steam as an average over 4 hours at the boiler nominal output Qualitative characteristics of the reagent: to be filled in by the participant	kg/t	To be filled in by the participant	higher by more than 30% of the guaranteed value
	boilers K80 and K90 Fuel 1: wood chips			
B 7.2	The maximum specific consumption of DeNOx reagent (name - to be filled in by the participant) per 1 t / of produced steam as an average over 4 hours at the boiler nominal output Qualitative characteristics of the reagent: to be filled in by the participant	kg/t	To be filled in by the participant	Higher by more than 30% of the guaranteed value
	boilers K80 and K90 for any mixture of fuel 1: wood chips 70% and fuel 2: plant pellets 30%			
B 7.3	The maximum specific consumption of DeNOx reagent (name - to be filled in by the participant) per 1 t / of produced steam as an average over 4 hours at the boiler nominal output Qualitative characteristics of the reagent: to be filled in by the participant	kg/t	To be filled in by the participant	higher by more than 30% of the guaranteed value

8. The specific consumption of another reagent No. 2

The specific consumption of another reagent in the relevant boiler, or the boiler system to ensure guaranteed emission limits.

	Parameter	Units	The value of the guaranteed parameter	LIMIT VALUE OF THE GUARANTEED PARAMETER
	boiler K20 fuel 1			
B 8.1.1	specific consumption of reagent (name - to be filled in by the participant) per 1 t / of produced steam as an average at the nominal output. Qualitative characteristics of the reagent: to be filled in by the participant	kg/t	To be filled in by the participant	Higher by more than 30% of the guaranteed value
	boilers K80 and K90 fuel 1			
B 8.1.2	specific consumption of reagent (name - to be filled in by the participant) per 1 t / of produced steam as an average at the nominal output. Qualitative characteristics of the reagent: to be filled in by the participant	kg/t	To be filled in by the participant	higher by more than 30% of the guaranteed value
	boilers K80 and K90 for any mixtures of fuel 1 - 70% and the fuel 2 - 30%			
B 8.1.3	Specific consumption of reagent (name - to be filled in by the participant) per 1 t / of produced steam as an average at the nominal output. Qualitative characteristics of the reagent: to be filled in by the participant	kg/t	To be filled in by the participant	Higher by more than 30% of the guaranteed value

In the case of using more reagents, the participant specifies so it in a similar table.

9. The boiler's own consumption of electric energy

This is the consumption of defined part of the UNIT OB 2 the K20 boiler part, from the fuel input to the operating silo to the output from the boiler smoke exhaust fan and the ash output on the filter hoppers.

The PARTICIPANT will list the appliances in their offer.

	Parameter	Units	The value of the guaranteed parameter	LIMIT VALUE OF THE GUARANTEED PARAMETER
B 9.1	The consumption of electricity at the nominal output of the K20 boiler as an hourly average over 4 hours of operation. fuel: fuel 1: wood chips	kWh/h	To be filled in by the participant	higher by more than 30% of the guaranteed value

The own consumption includes all appliances located within the K20 boiler room, including air conditioning, heating, lighting, including the flue gas and air system of the K20 boiler, flue gas cleaning, ash removal, small cooling circuit.

The air compressor station, a supply of belt conveyors within the OB 1 and the fuel management ventilation systems within the OB 1 are excluded from this evaluated group.