

**List of technical condition parameters of TM-84 «Б» boiler No.4  
at Arkhangelsk CHP-plant after midlife repair in 2006**

Parameter	According to normative and technical documentation	After repair	Before repair	After last major repair
1. Fuel type	Mazut	<b>Mazut</b>	Mazut	Mazut
2. As-fired fuel (low) heat value, kcal/kg	9340	<b>9400</b>	9020	
3. Moisture content of as-fired fuel, %	3.6	<b>1.5</b>	7.7	
4. Sulphur content of as-fired fuel, %	-	<b>2.6</b>	1.7	
5. Number of operating burners	6	<b>6</b>	6	6
6. Excess air behind superheater	1.06	<b>1.03</b>	1.07	
7. Steam capacity reduced to nominal parameters, t/h	417	<b>417</b>	410	
8. Temperature of superheated steam, °C	550	<b>549</b>	549	
9. Feed water temperature, °C	230	<b>212</b>	200	
10. Air inleakage into furnace, %	5	-	-	-
11. Air inleakage into boiler pass, %	25	<b>38</b>	44	
12. Vacuum at the top of furnace, A/B. kg/m <sup>2</sup>	2-4	<b>3.5</b>	3.5	
13. Vacuum before guide vane of smoke exhaust, (A/B), kg/m <sup>2</sup>	-	<b>230/220</b>	230/235	
14. Vacuum before RAH, (A/B), kg/m <sup>2</sup>	-	<b>125/110</b>	125/125	
15. RAH resistance by gas, kg/m <sup>2</sup> (A/B)	-	<b>105/110</b>	100/110	
16. RAH resistance by air, kg/m <sup>2</sup> (A/B)	-	<b>120/125</b>	100/125	
17. Speed of fan and smoke exhaust rotation	2	<b>2</b>	2	
18. Rate of opening of guide vanes of smoke exhaust, % (A/B)	-	<b>50/50</b>	58/65	
19. Rate of opening of guide vanes of fans, % (A/B)	-	<b>59/65</b>	95/95	
20. Air temperature behind calorifer, (A/B), °C	90	<b>86/109</b>	84/92	
21. Air temperature for burning, °C	-	<b>272/264</b>	267/254	
22. Gas temperature before RAH, °C	-	<b>306/300</b>	325/332	
23. Temperature of released gases (fixed), °C	198	<b>160</b>	179	
24. Heat loss with released gases (fixed), %	8.39	<b>6.94</b>	8.27	
25. Heat loss with mechanical incompleteness of combustion, %	0	<b>0</b>	0	
26. Heat loss with chemical incompleteness of combustion, %	0	<b>0.01</b>	0	
27. Heat loss from outside cooling, %	0.59	<b>0.59</b>	0.60	
28. Boiler gross efficiency (fixed), %	91.05	<b>92.46</b>	91.13	
29. Specific power consumption for traction and blast, kWatt-hour/Gcal	7.53	<b>8.14</b>		
30. NO <sub>x</sub> content in flue gases (α=1.4), mg/nm <sup>3</sup>	250	<b>610</b>		
31. CO content in flue gases (α=1.4), mg/nm <sup>3</sup>	0	<b>25</b>		
32. NO <sub>x</sub> emission with flue gases, g/s	-	<b>65.41</b>		
33. CO emission with flue gases, g/s	0	<b>2.67</b>		

Notes: Boiler gross efficiency, temperature of released gases and specific power consumption for traction and blast have been reduced to formation conditions of boiler normative parameters.

Conclusions:

1. Boiler gross efficiency has increased by 1.33 % and got 1.41 % greater than the norm.
2. Temperature of released gases has lowered by 19 °C and got 38 °C less than the norm.
3. Air inleakage into boiler gas duct has lowered by 6 % and got 13% greater than the norm.
4. Resistance of RAH heat exchange elements is at the level of indices fixed in the technical assignment. Temperature head of RAH reduced twice (by 33 °C) that indicates high thermal efficiency of the installed CMKA<sup>®</sup> heat exchange elements.

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