

**“MOSENERGO” OJSC**  
**16 Generala Dorohova Str, 119530 Moscow, Russian Federation**  
**tel./fax: (495) 442-82-90,**

April 24, 2014

Northern Interindustry Company  
«The Alternative» Ltd  
For the attention of  
Deputy Director General for Development  
A.E. Lebedev

Dear Mr. Lebedev,

In 2011 during overhaul repair of two air heaters PБИ-98 of ТГМП-314П boiler unit No.3 and during mid-life repair of two air heaters PБИ-54М of ТГМ-84Б boiler unit No.1 at power plant-25, (branch of “Mosenergo” OJSC), the heat exchange elements of hot end were replaced by heat exchange elements supplied by Northern Interindustry Company “The Alternative” Ltd.

Operation of the boilers No.1 and No.3 after the replacement showed sufficient reduction of air heater resistance by air and by gas as well as boiler gross efficiency. The replacement of heat exchange elements of hot end by CMKA<sup>®</sup> ones increased efficiency and reliability of power plant functioning in whole.

Enclosures:

1. List of main parameters of ТГМП-314П boiler No.3
2. List of main parameters of ТГМ-84Б boiler No.1

Best regards,  
Chief Engineer  
Power plant-25

I.V.Yushkov

**List of main parameters of boiler functioning (ТМН-314Н boiler No.3)**

No.	Parameter	Dimension	Until repair	After repair with the installation of CMKA <sup>®</sup> heat exchange elements into RAH
1.	Type of RAH		PБН-98	PБН-98
2.	Steam capacity	tons/hour	810	800
3.	Type of fuel	gas/ mazut	gas	gas
	Fuel consumption	m <sup>3</sup> /h	76 000	73 500
	Calorie content of fuel	kcal/m <sup>3</sup>	8009	8056
4.	Air leakage into furnace	%	3.0	3.0
	Coefficient of excess air at furnace outlet		1.11	1.13
	Coefficient of excess air before RAH		1.25	1.28
	Coefficient of excess air after RAH		1.45	1.46
5.	Gas temperature at RAH inlet	°C	340	335
	Air temperature at RAH inlet	°C	50	50
	Air temperature (hot)	°C	314	310
6.	RAH resistance by gas	mm of water column	105	70
	RAH resistance by air	mm of water column	70	40
7.	Temperature of flue gases	°C	150	145
	Heat loss with flue gases	%	7.7	7.45
	Boiler gross efficiency	%	92.05	92.3

Deputy Chief Engineer

V.U.Petrov

**List of main parameters of boiler functioning (TГM-84B boiler No.1)**

No.	Parameter	Dimension	Until repair	After repair with the installation of CMKA <sup>®</sup> heat exchange elements into RAH
1.	Type of RAH		PBII-54M	PBII-54M
2.	Steam capacity	tons/hour	420	420
3.	Type of fuel	gas/ mazut	gas	gas
	Fuel consumption	m <sup>3</sup> /h	30 600	32 700
	Calorie content of fuel	kcal/m <sup>3</sup>	8 009	8 088
4.	Air leakage into furnace	%	5.0	5.0
	Coefficient of excess air at furnace outlet		1.07	1.07
	Coefficient of excess air before RAH		1.22	1.23
	Coefficient of excess air after RAH		1.41	1.4
5.	Gas temperature at RAH inlet	°C	310	308
	Air temperature at RAH inlet	°C	50	50
6.	RAH resistance by gas	mm of water column	125	105
	RAH resistance by air	mm of water column	115	100
7.	Temperature of flue gases	°C	158	151
	Heat loss with flue gases	%	7.93	7.5
	Boiler gross efficiency	%	91.68	92.1

Deputy Chief Engineer

V.U.Petrov