

**«QUADRA GENERATING COMPANY» OJSC
BRANCH OF «QUADRA» – «VORONEZH REGIONAL GENERATION» OJSC**

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Our ref: БФ-590/3884 dated December 12, 2011

«Northern Interindustry Company
«The Alternative» Ltd
For the attention of Chief Engineer
V.I. Mankovsky

About the results of operation

Dear Vladimir Igorevich,

In response to your request No.08-01.3/864 dated December 06, 2011, we send you Appraisal report on technical condition of БК3-160-100 ГМ boiler unit (No.11) of production subdivision CHP-1 according to the results of in-service inspection after installation of CMKA[®] heat exchange elements into regenerative air heater.

Enclosures: appraisal report on the performance results in 1 sheet in 1 copy.

Sincerely yours,

Chief Engineer

V.F. Ozhogin

M.A. Boev
Tel.: 007 (4732) 44-93-20

**Appraisal report on technical condition of БК3-160-100 ГМ boiler unit (No.11)
of production subdivision CHP-1, branch of «Quadra» –
«Voronezh regional generation» OJSC**

Main parameters of boiler performance before and after the replacement of RAH heat exchange elements according to the results of in-service inspection are stated in the list of the main technical and economical parameters.

**List of the main technical and economical parameters of the performance of БК3-160-100
ГМ boiler unit No.11**

No.	Parameter	Dimension	Until repair Aug.12, 2010	After repair with the installation of CMKA [®] heat exchange elements into RAH Jun. 29, 2011
1.	Type of RAH		PБИ-3800	PБИ-3800
2.	Steam capacity	tons/hour	110	117
3.	Type of fuel	gas/ mazut	gas	gas
	Fuel consumption	m ³ /h	8950	9400
	Calorie content of fuel	kcal/m ³	8237	8066
4.	Air inleakage into furnace		15	12
	Coefficient of excess air at furnace exit		1.20	1.16
	Coefficient of excess air before RAH		1.31	1.27
	Coefficient of excess air after RAH		1.42	1.39
5.	Gas temperature at RAH inlet	°C	234	250
	Air temperature at boiler outlet	°C	35	32
	Gas temperature at RAH outlet	°C	134	125
	Air temperature at RAH outlet	°C	179	220
6.	RAH resistance by gas	mm of water column	42	55
	RAH resistance by air	mm of water column	-	-
7.	Temperature of exhaust gases	°C	134	125
	Heat loss with exhaust gases	%	5.80	5.35
	Boiler gross efficiency	%	93.27	93.77

Head of Setup and Test Subdivision

M.A. Boev

Engineer of Setup and Test Subdivision

A.V. Polyakov