«FIRST GENERATING COMPANY OF WHOLESALE ELECTRICITY MARKET» OJSC
IRIKLINO SDPP – BRANCH
462803 Energetic township, Novoorsky district, Orenburg region,
tel.: (35363) 51-339, fax: (35363) 51-688, 51-515;
e-mail: direktor-s@igres.ogk1.ru

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

21 Karl Marx Street
164500 Severodvinsk
Arkhangelsk region

Appraisal report
on the results of replacement of heat exchange elements of hot end in regenerative air heater РВП-88 of ТГМП-314 boiler No.7

In June 2009, in ТГМП-314 boiler of power generating unit No.7, during major repair period the heat exchange elements of hot end in two regenerative air heaters РВП-88, that had been used over their service life, were replaced by the new surface of heating. The developer, manufacturer and supplier of the new heat exchange elements was «Northern Interindustry Company «The Alternative» Ltd (Severodvinsk city).

While power unit functioning at nominal parameters and natural gas being burnt, heat engineering tests were executed. Specialists of the setup and test workshop fixed the following RAH and boiler operation indices:

№	Parameter	Dimension	Norm	Before repair	After repair
1	Actual steam capacity	tons/hour	950	1000	960
2	Boiler heat load	Gcal/hour	-	623.2	595.8
3	Fresh steam pressure	kgf/cm^2	250	245	245
4	Fresh steam temperature	°C	545	548	548
5	Feed water temperature	°C	272	272	263
6	Feed water temperature behind water economizer	°C	-	300	290
7	Pressure of hot	kgf/cm^2	39	39.5	40

	reheat				
8	Temperature of hot reheat	°C	545	545	550
9	Steam pressure of cold reheat	kgf/cm^2	41.5	41	42
10	Temperature of cold reheat	°C	-	307	312
11	Cold air temperature	°C	20	20	20
12	Air temperature behind RAH	°C	-	315	324
13	Temperature of flue gases	°C	144	147	140
14	Excess air coefficient behind steam superheater	-	1.05	1.04	1.04
15	Excess air coefficient behind RAH/ smoke exhaust	-	1.30	1.31	1.29
16	Air suction into furnace	%	3	4	4
17	Air suction into convective shaft	%	5	7-6	6-5
18	Air suction into RAH-smoke exhaust	%	20	20-21	20-20
19	Gas duct general resistance	mm of water column	317	415-415	305-335
20	RAH resistance by gas	mm of water column	177	280-280	160-190
21	Air path general resistance	mm of air column	-	120	100
22	Heat loss with released gases	%	6.56	6.76	6.31
23	Heat loss into surrounding atmosphere	%	0.34	0.32	0.34
24	Boiler gross efficiency	%	92.90	92.72	93.35
25	Specific power consumption for traction	kWh/ Gcal	6.42	4.83	4.3
26	Specific power consumption for blowing	kWh/ Gcal		2.90	2.4
27	Auxiliary power consumption	kWh/ Gcal	7.60	8.45	7.9
28	Rate of opening of smoke exhaust guide vanes	%	-	72-75	68-72

29	Rate of opening of blast fan guide vanes	%	-	79-90	83-63
30	Number of functioning burners	pieces	16	16	16
31	NO_x content in flue gases (if *a =1.4*)	mg/ nm^3	350	346	298
32	Vacuum at the side of smoke exhaust suction	kg/ m^2	-	420	320
33	Fuel	gas	gas	gas	gas
34	Fuel characteristics: calorie content density	kcal/kg	-	8033	8041
		kg/ m^3	-	0.6921	0.6925

Sincerely yours,

Chief Engineer N.G. Kirillov

N.A. Gromov

007 (35363) 51-345