The second stage (465.2 million roubles) is producing baked aggloporite (expanded clay), blocks, and fillers.

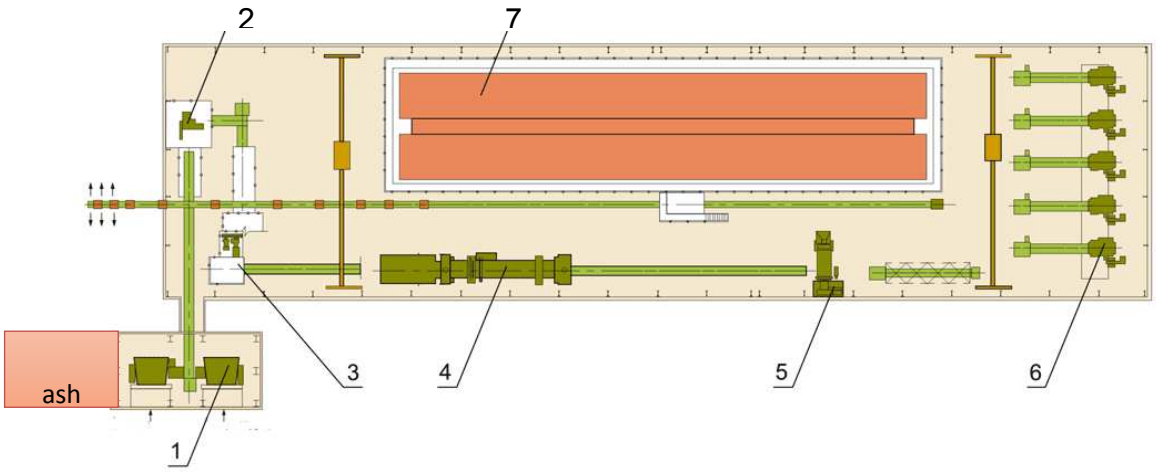
The third stage (822.0 million roubles) is producing ash-ceramic bricks, ferroalloy and alumina.

The total cost of the project is 1411.7 mln roubles.

Full volume of ash wastes processing is 560 thousand tons per year.

The proposal is formulated for Siberian Chemical Combine thermal power-station in Seversk, but can also be used for other heat electropower stations.

In the paper the stages of the investment as well as the tables and charts of the obtaining ash-ceramic bricks plant are given in Fig. 2.



1) Box-type feeder 2) Normalizer of ash 3) Granulator 4) Drying cylinder 5) Mill 6) Press 7) Kiln

Fig. 2 Block diagram of an ash-ceramic bricks production plant

Conclusion

With a huge creative and technological potential, with innovative opportunities Tomsk region can and should turn this anthropogenic raw material in kind of ash wastes, collected for many decades from heat electropower stations, into the high-performance products. By this it will provide restoration of land, filled with ash dumps, expanding urban areas and creating new jobs in manufacturing and construction areas, taking a coordinating role and using available institutional and financial arrangements in this direction.

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THE STUDY OF LOCAL FAILURE TEST RESULTS FOR PIPELINES REPAIRED USING VARIOUS TECHNOLOGIES

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The problem of safeguarding is gaining high importance in the terms of long-distance oil pipelines network development. A considerable success is achieved in design, construction and usage of the long-distance pipelines as well as their safety and reliability assurance. However, a probability of an emergency is still possible. Problems of safety assurance are aggravated by pipeline age hardening and by increasing impact of the natural and artificial breaking factors. Technical malfunction of oil pipelines leads to material, ecological damage and raises fire risks.

A selective maintenance is one of the most frequently used methods and is applied in a range of technologies. The research of the reliability of these technologies is a top-priority objective. In 2006 Korea Gas Corporation (KOGAS) performed a comparative analysis of the various technologies of pipeline maintenance using local failure test [3].

The objective of this research is to study behavior of the pipe under repair using local fracture test and the best technology for Korean pipeline maintenance.

Specimens were extracted from a pipe with the following parameters: outer diameter Do=762 mm, wall thickness t=17.5 mm. The pipe was made of the American Petroleum Institute (API) 5L X65 steel, which is commonly used in Korea [2]. Properties of the selected steel are presented in Table 1 and 2 [3].

Table 1

Chemical composition of the API 5L X65 steel

Element, wt %						
C	P	Mn	S	Si	Fe	Ceq
0.08	0.019	1.45	0.03	0.31	Balance	0.32

Table 2

Mechanical tensile properties of the API 5L X65 steel

Young modulus E, GPa	Poisson ratio ν	Yield strength σ_y, MPa	S
0.08	0.3	464.5	563,8

Damaged pipes were repaired using a welding socket [1], a composite adhesive compound (CAC), patching and Clock Spring [4, 5]. Properties of specimens are summarized in Table 3.

Table 3

Methods of maintenance and defect location

Type	Location / Method	Size of defect		
		Length l, mm	Width c, mm	Depth d, mm
Damaged pipe	Base metal (A)	200	50	14
	Welded joint (B)	200	50	14
	V-notch (C)	440	30	14
Repaired pipe	Welding socket (A)	200	50	14
	Welding socket (B)	200	50	14
	CAC (A)	200	50	14
	CAC (B)	200	50	14
	CAC (C)	440	30	14
	Clock Spring(A)	200	50	14
	Clock Spring(B)	200	50	14
	Padding 1	200	50	8.8
	Padding 2	150	50	11.5

Testing was performed by increasing inner pressure up to 28.44 MPa. Length of the pipe being tested was 2.5 m, end caps were installed on the both ends of the pipe. Pressure boosted from 0.25 MPa per minute up to 19.6 MPa and from 0.15 MPa per minute to 28.44 MPa. Pressure increment was measured every second using computer software. In order to reveal deformations of a specimen monitors were attached both to the damaged and to the repaired pipes (Table4).

Table 4

Results of KOGAS tests

Type	Location / Method	Applied pressure P_a, MPA	Hoop stress P_h, MPa	Failure
Damaged pipe	Base metal (A)	17.15	373.70	Yes
	Welded joint (B)	17.84	388.65	Yes
	V-notch (C)	8.72	190.06	Yes
Repaired pipe	Welding socket (A)	30.77	670.53	No
	Welding socket (B)	30.18	657.72	No
	CAC (A)	29.40	640.63	No
	CAC (B)	29.89	651.31	No
	CAC (C)	30.28	659.85	No
	Clock Spring(A)	25.87	563.76	Leakage
	Clock Spring(B)	28.42	619.28	No
	Padding 1	28.32	617.15	No
	Padding 2	28.32	617.15	No

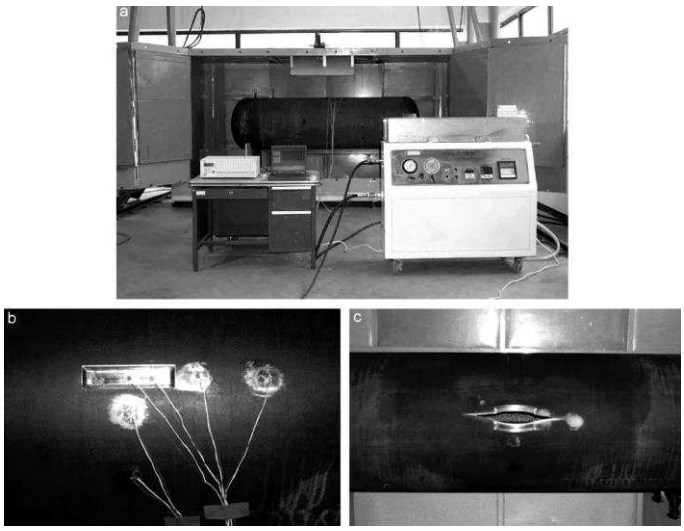

Fig. KOGAS tests: (a) Test set-up of full-scale burst test for pipes, (b) defect, and (c) failure

While analyzing advantages and disadvantages of each method safety and reliability, effectiveness and safety of maintenance technologies were verified for various defects. Welded socket, CAC and Clock Spring technologies have safety ratio which is more than 2.5 at working pressure equaled to 7.85 MPa. The methods being analyzed may be used for maintenance of the active oil pipelines with defects up to 80%. Patching may be used with defect depth up to 65% of wall thickness.

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HYDROGEOLOGICAL CONDITIONS OF EXPLOITATION OF COAL MINE "SHESTAKI"

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The relevance of this study is determined by the need of water resource management. Coal mining leads to various environmental impacts. And the most intense exposures are just water, which leads to redistribution of surface and groundwater runoff, affecting not only the conditions of water inflow formation in a career but also the river runoff watercourses of the first order. Operation career leads to disruption of natural landscapes and affects the qualitative composition of natural waters.

Investigated area is located within the boundaries of Bachatskii geological and economic district of Kuzbass in the forest-steppe landscape zone on the left slope of the river Malyi Bachat. Within the site the surface water bodies are absent. Absolute marks of the surface vary from 295 m to the north- west section of 220 m to the southeast. Daytime surface area in the southeastern part is broken by opencast mining cut "Shestaki". Hydrologically territory belongs to the basin. The Malyi Bachat flows 500m south-east of the site. The river is a left tributary of the River Bachat, which, in turn, flows into the Inya.

Within Bachatskii coalfield where the investigated area is located, there are the following aquifers.

Aquiferous rocks of Upper - modern alluvial deposit aquifer are presented at the site by pebble formations with loamy sand filling. Water is subartesian, the pressure head values range from 1 to 7-3m-12m. Piezometric levels are set at the depth of 0.6 m to 3.0 m Specific yields of wells is 0.2-0.6 l / s that characterize these deposits as quite watery but irregularly flooded. Basin aquifer complex is due to infiltration of precipitation and pressure by flowing groundwater into underlying bedrock aquifer zones. Unloading occurs in surface waters.