Limited Liability Company
«Alif - Bitumen»

Business plan

Project name:

«Production for the production of high-quality road bitumen , with the release of related products (roofing , construction bitumen , vacuum gas oil , fuel fractions) - in the Penza region , Luninsky District , working village Lunino , Russian Federation».

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Russian Federation
2016-2017 year

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Summary of the project UPB

1.

Project name:
«Production for the production of high-quality road bitumen , with the release of related products (roofing , construction bitumen , vacuum gas oil , fuel fractions) - in the Penza region , Luninsky District , working village Lunino , Russian Federation».

2.

Initiator of the project — Fedorov Dmitry Leonidovich.
Entity — LLC « Alif - Bitumen».
INN — 5821004710
CPP - 582101001
Contact data of the responsible person / company director - +79375149493,
SKYPE – llcalif, E-mail llcalif@hotmail.com, llcalif@yandex.ru
Experience initiator — more 20 years.

3.

Location of the project

The Russian Federation , Penza region, Luninsky District , an industrial community Lunino .

4.

The essence of the project.
Objective of the project.
The main objectives of the project are:

- ensuring road building organizations of the Russian Federation, the CIS and abroad , high-quality products using bitumen resource base of the Russian Federation to improve the durability of pavements .
- production of road , roofing and construction bitumen's suitable for use in all climates .
- formation of financial results c yield stable profits.
- the ability to compete at the expense of product quality and stability of its supply ,
- possibility of guaranteed orders :

  - Road bitumen accepted standards GOST 22245-90 , GOST R 52056-2003, and a single European standard EN 12591 , as well as compliance with the requirements of the Federal Road Agency's requirements for road bitumen, designed for maintenance and construction work on federal roads I and II technical categories .
  - GOST 6617-76 Building on bitumen ,
  - GOST 9548-74 on bitumen roofing brands

or any other normative and technical documentation on demand.

Sales volume (market share):

- 180-200 thousand tons of bitumen per year — no more 1% market share,

- 190-220 thousand tons of fuel fractions — no more 0,5 % market share,

Profit (return) — more 25 % years,

Project Type: - New construction,

Method of gaining end and short description of project:

- The proposal of the project describes the main technical solutions intended to carry out the development of the basic design technology and detailed design for construction of the combined installation for the production of bitumen (UPB) , designed to ensure the construction of road bitumen with a stable predetermined characteristics .

The peculiarity of the proposed technical solution is the need for the construction of a part of UPB two blocks:

- block deep vacuum distillation to obtain a bituminous material - tar optimum quality.
- oxidation unit producing bitumen .

The proposed technical solutions aimed at improving the quality of produced bitumen production, reduce energy consumption, to improve control and automation systems at all levels, improving technical and economic indices of production and its environmental safety. The absence of an industrial complex, depending on the season output of marketable products. The quality of commercial products (quality characteristics), allow for the supply of road construction in any climate zone.

Entering new markets.

The improved travelling bitumen's are highly sought into Russian Federation, countries the CIS, PEOPLES Republic of China, Mongolia, for building of federal motorways of I and II of technical categories, taxi tracks of the air fields, air strips RUNWAY.

5.

Terms and stages of the project , including work performed on the project :

- 2 years of construction,
- recoupment amount - not more than 5 years,

Realization of pre-project works:									
Collection of raw materials									
Quality Research , development workers formulations of raw materials and finished products.									
Development of initial data for design									
Development of the project - on the projects:									
Raw material park for a reception and storage of fuel oil and raw material for roofing bitumen									
Park commodity bitumen									
Automated trestle of pouring of bitumens in railway and motor-car cisterns									
Technological setting block deeply a vacuum distillation of fuel oil									
The technological setting is a block of receipt of the oxidized travelling bitumen's									
Knot of cooling and packing of bitumen's of building brands									
Special divisions of detail design									
Development of measures on OOC									
Development of measures on ИТМ ГО ЧС									
Development of detail design top level АСУТП									
Development of technological regulation									
Architectural supervision									
Number of months									
1	2	3	4	5	6	7	8	9	10

6.

Financial resources necessary for realization of project :

- the total project cost — 147.000.000 $ USA;
- the volume of work performed — A land plot has been formed, the possibility of connecting and supplying energy sources is subject to electricity, gas, a principal consent has been obtained for the abutment to the railway of RZhD KBS (the coordinates of the junction have been determined); The Department of Urban Development supports the implementation of the project and confirms the need for this material for road construction.
- existing assets and deposits — not available;
- the need for funding — 147.000.000 $ USA. (project works, railway infrastructure, placing the orders on a standard and not standard equipment, laboratory devices and equipment),

7.

Estimation of economic efficiency of the project :

- ✓ term of recoupment – PBP — 5 years,
- ✓ accepted rate of discounting — D - at the leve l5%,
- ✓ internal norm of profitableness – IRR - 27 %,
- ✓ break-even of project point – BEP;
- break-even point — BEP) It refers to a situation in which the total income(total revenue — TR) It becomes equal to the total cost(total costs — TC). To determine the BEP is necessary to consider the three main factors:
- selling price of unit of products,
- variable expenses on unit of products,
- general permanent expenses on unit of products.

Cost (unit-prise — P) a price shows, what profit a firm will get from the sale of every unit of commodities or services. Calculations I show, that basic part of money inflows on current activity is provided by the receipt of profit yield from the sale of producible products, the low enough level of complete unit cost in the volume of sales provides the high level of income from basic activity, it is possible to consider having regard to the dynamics of this article, that a production will have the stable internal financing, that promotes future financial stability substantially.

- ✓ term of return of debt funds – RP — not more than 5 years,
- ✓ coefficient of coverage of loan debt — is — more 1,2

8.

Risk assessment of the project:

- Providing of project, presence of assets, assets of owner on other enterprises - are absent.

- Coordination with the project with the local authorities. Availability of permits.

Support of project at the level of regional authorities - Government, Department of Town-planning. Support of project at the level of local, district Administration.

Possibility of tricking into, connecting and providing of productive complex energy resources in full.

- Basic obstacles able to prevent to realization of project are - are absent.

General information

Limited Liability Company «Alif - Bitumen» (further LLC « Alif - Bitumen ») it is registered in the single state register of legal entities of August, 19, 2015.

- INN - 5821004710,
- CPP - 582101001

Registered legal address of enterprise : 442730, The Russian Federation , Penza region, Luninsky District , an industrial community Lunino st. Lomonosov 26
The mailing address of the company: 442730, The Russian Federation , Penza region, Luninsky District , an industrial community Lunino, st. Park 5, a/i 1.
Organizationally legal form – Limited Liability Company.

Director general Fedorov Dmitry Leonidovich – higher education. Labour experience on the enterprises of the oil processing on different from 1993. By the range of problems of bituminous productions and quality of bitumens, reads with 1996 for present tense.
Age 50 years.

Director for Economics and Finance Zaynullin Rafik Gilmetdinovich- higher education. Labour experience of work is in chemical and petrochemical industry, bituminous productions - on different leading positions from 1980. Age 62 years.

A sphere of activity of enterprise is planning of new, modernization of existent, bituminous productions on the base of applying of front-rank technologies in industry of bitumen's with the indexes of group chemical composition, and physics - mechanical descriptions, to the answering requirements at building of motorways of federal, intergovernmental value, without limitations of climatic terms.

Objective of the project

The main objectives of the project are:

- ensuring road building organizations of the Russian Federation, the CIS and abroad , high-quality products using bitumen resource base of the Russian Federation to improve the durability of pavements .
- production of road , roofing and construction bitumens suitable for use in all climates .
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  or any other normative and technical documentation on demand

Description of goods (services)

Current production

Indexes of bitumen's, answer the highest requirements home GOST and Euro of standards.

Table № 1

Name of indexes	Values of indexes						
	GOST 22245-90		GOST R 52056-2003		EN12591	FACT (passport)	
	BND 60/90	BND 90/130	PBV 90	PBV 130	MARK 70/100	BND 60/90	BND 90/130
1. Depth of penetrating of needle, 0,1 mm : - at 25 0C no less - at 0 0C no less	 61-90 20	 91-130 28	 90 40	 130 50	 70-100 -	 77 29	 99 33
2. The temperature of the ring and ball:	49	45	51	49 43-51	51	47,5	
3. Elongation , centimeters - at 25 ^{0}C no less - at 0 ^{0}C no less	 55 3,5	 65 4,0	 30 15	 30 20	 - -	 > 100 4,6	 > 100 7,2
4. Temperature brittleness,^{0}C not higher	-18	-20	-25	-30	-10	-24	-26,8
6.Penetration index: 230 5. Temperature of flash, ^{0}C no less	от-1,0 до+1,0						
7. Table of contents of paraffin : - DIN – method, % max. - AFNOR - method, % max.					 2,2 4,5		
8. Viscosity: - 60C. Па. мин. - 135C. мм/с, мин.					 90 230		
9. Coupling with a marble or sand :	Maintains on a control standard: № 1						
10. Elasticity, % при температуре: - at 25 ^{0}C no less - at 0 ^{0}C no less			 85 75	 85 75			
11. Uniformity.	Uniformly						
After warming up at 163 ^{0}C during 5 hours							
12. Weight loss, %					0,8	0,02	0,04
13. Change of temperature of softening influence, ^{0}C no more:	5	5	6	6	8	3,1	3,3
14. Depth of penetrating of needle at 25 ^{0}C, % from a primary size 55	-	-			46	72	68
15. Extensibility, cm at 25 ^{0}C, cm	-	-			-	> 100	> 100

Material balance of production, with усредненными indexes, producing of bitumen to 200.000 tons on a year, and similarly concomitant fuel factions.

From them are 120.000 tons - bitumen's travelling.

are 80.000 tons - bitumen's building and roof.

Raw material of setting is fuel oil of M 100 with gray 3,2 < S < 3,5 %%.

Supposed power of a vacuum block on fuel oil from 420 -500 thousand m in a year or 40 - 55 m/hour.

The feedstock of the bituminous setting is the fire-box fuel oil of M- 100, supplied from the row of enterprises of the oil processing. From fuel oil of brand of M- 100 by direct oxidization to get a quality travelling bitumen is not possible. Therefore fuel oil must be preliminary subjected deeply to a vacuum distillation. Optimal depth of selection of gasoil

factions in a vacuum column with the purpose of receipt from fuel oil of the bituminous raw material characterized by normative quality indexes, in the moment of beginning of works not known and can be certain only after to the experimental working of question.

It is assumed that the exit of petroleum tar of the required quality at a deeply vacuum distillation of fuel oil of M- 100 will make probably 40-45 %. Thus the set day's productivity of UPB on a bitumen will make 500-550 tons twenty-four hours.

Table № 2.

Product name	Sign raw materials for installation			The yield from the plant		
	ton/ day	ton/ hour	% Fuel oil	ton/ day	ton/ hour	% on raw
Fuel oil	1152	48	**100**	-	-	-
Pairs of top	-	-	-	-	-	До 0,1
Fuel factions	-	-	-	538.6	22.44	46.7
Gas oil fraction	-	-	-	95.0	3.96	8.2
Petroleum tar	518.4	21.6	**45**	-	-	-
Bitumen travelling BND	-	-	-	362.9	15.1	31.5
Bitumen BNC, BN,	-	-	-	155.5	6.5	13.5

The quality of compounded bitumens higher than the quality of bitumen produced by direct oxidation . Bitumen have greater plasticity , better low-temperature performance , better adhesion to mineral materials used in road construction. The main advantage - it is less tendency of bitumen to the processes of thermal oxidative aging. The reason is that such a deeply oxidized bitumen compounded with a fairly stable components of tar and other factions. It is known that changes in the composition and properties of such products requires temperatures of 240-260 0C and higher. The temperature of the bitumen in the production of asphalt mixes half the given value , and maximum operating temperature of asphalt concrete pavement three times lower temperatures , causing significant changes in the composition and properties of compounded bitumen.

The volume of realization.

These volumes are provided approximately at the rate of release of a commodity bitumen road , roofing , construction , as well as co- fuel and gas oil fractions .

Table № 3

н/п	Product name	The volume of sales			
		per day (tons)	per month (tons)	in vkartal (tons)	in year (tons)
1	Bitumen travelling BND	362.9	11.038,2	33.114,62	132.458,5
2	Bitumen roofing BNC Construction bitumen BN	155.5	4.729,79	14.189.37	56.757,5
3	Petroleum tar	538.6	16.382,42	49.147,25	196.589
4	Gas oil fraction	95.0	2.889,5	8.668,75	34.675
5	**In total**	**1.152**	**35.040**	**105.120**	**420.480**

The issue of pricing for bitumen and related products depends largely on the price of raw materials and energy (gas, steam, water, electricity), as well as the supply and demand market. Most managers road organizations associated with the increase in prices for three reasons:

- The increased volume of road construction ,
- Higher prices for petroleum products because of higher prices for crude oil,
- Not sufficient number of high-quality products.

According to internet sources, the prices of manufactured products have developed as follows:

Table № 4

н/п	Product Name	Price mini. $./ ton	Price High $./ton	Average price $./ per ton	The price for the calculations.
1.	Bitumen BND	426,7	700	593,3	**426,7**
2.	Bitumen BNDU				
3.	Bitumen BNC				
4.	Bitumen BN	434	534	484	**434**
5.	Petroleum tar	927	953	940	**927**
6	Gas oil fraction	590	690	640	**590**
7.	Fuel oil M-100	217	560	385	Table № 7

Make price target on news agencies for the provision of prices of petroleum products, and perform calculations on them, it would not be quite right, but maintain the average calculation as a whole, let nomenclature proposals for the sale and purchase of certain types of oil products, has an undoubted place, as is done In that work.

Raw materials and reagents.

As mentioned, the regional unit for the production of bitumen (UPB) should be combined, consisting of a vacuum unit for deep vacuum distillation of fuel oil (BT), which enables the production, to monitor the production of bitumen stabilized material - tar optimum quality.

Physical and mechanical data on the quality of raw materials used for the production of bitumen with the requirements for raw materials **TU 0258-113-00151807-2002**

Physical and mechanical data on the quality of raw materials used for the production of roofing bitumen with the requirements for raw materials **TU 38.101626-76. Brand. А, Б.**

Table № 5

н/п	Indicator	The norm for SB. 20/40 (premium)	The normfor SB. 40/60 (first grade)	The norm for Brand A	The norm for Brand B	Method test
1.	Viscosity at 80 C at discharge from the opening hole diameter 5mm, sec.	20-40	41-60	5-15	15-30	GOST-41503
2.	Density 20C, г/см	0,970-0,990	0,980-1,000	0,970-0,990	0,980-1,000	GOST-3900
3.	Softening temperature not lower than C	20	25	-	-	GOST-11506
4.	Water content. % mass	FOOTPRINTS	FOOTPRINTS	FOOTPRINTS	FOOTPRINTS	GOST-2477-65
5.	The flashpoint of not less than. C	190	200	220	220	GOST-4333

Group hydrocarbon composition of raw materials for possible use in the production of bitumen.

Table № 6

Name of raw material components.	Group - the chemical composition of raw materials (% масс)		
	TU 0258-113-00151807-2002	Actual residue by oxidation.	
		Raw preparation of raw materials to the unit.	Raw after a block of raw material preparation.
Parafinonaftenovye	Before 12,0	Before 55,0	5,5 -21,5
Including: high melting waxes.	3,0 – 6,0	22.0 - 25	2,0 – 3.6
Light aromatics.	14.1	12.2	5,6–16.,5
Average aromatics	19.1	4.2	3,4 – 8,5
Heavy aromatics	18.4	13.2	48,8 – 32,6
Resin 1	13.5	4.5	9,5 -4,0
Resin 2	15.9	8,0	17,0 – 11,0
Asphaltenes	7,0	more 2,9	10,2 - 5,9

Taking into account that the proposed technological scheme will include a vacuum unit for deep vacuum distillation (BT), which allows to process petroleum products, with the presence of sulfur compounds. As a technological point of view and from the point of view of the economy, the presence of sulfur in them is very - is positive.

It is found that the sulfur in the oil in the vacuum distillation process promotes the formation of asphaltenes. Sulfur compounds in petroleum are diverse in their chemical nature and content of their peaks in the heavy oil residue. The content of sulfur compounds in crude oils varies.

For example, Bashkir, Tatar, Volga 2.0-3.5% in Chusovskoy - 5.5%. Quantification of sulfur compounds in the bitumen, depend on the type of oil and its processing method. The oxidation of heavy oil residues in the production of oxidized bitumen occurs quantitative redistribution of sulfur compounds When refining may occur and qualitative changes of sulfur compounds, for example - decay thermally unstable sulfides and disulfides and hydrogen sulfide to form merkokaptanov. The chemical nature and the structure of some of the sulfur compounds suggests that they may play a role of surface - active substances and, consequently, improve the adhesive properties of bitumen. Thus, the high sulfur content (over 3.5%), in this case, is a positive sign, the raw materials used, contributes to the quality of the products. At the same time pricing heavy oil (read raw bitumen) occurs just in the opposite direction, the higher the sulfur content in the oil, the lower its price.

Pricing policies of manufacturers, resource holders, suppliers, the technology necessary for raw materials on the market of oil products sales, as a rule, develops positively. Due to objective circumstances - a high sulfur content, not strict requirements for physical and chemical composition, not necessarily supply GOSTirovannoy products. The prices of such feedstocks are generally much lower.

Fuel oil M -100 – the next price range:

Table № 7

н/п	Product Name	Price mini $./ ton.	Max price $./ ton.	Average price $./ ton.
1.	Fuel oil M -100 ГОСТ Content: 1,0<S<2,0, 2,0<S<3,5, 3,5<S<5,			
2.	Fuel oil M -100 1,0<S<2,0	434	483	458
3.	Fuel oil M -100 2,0<S<3,5	377	487	432
4.	Fuel oil M -100 Content 3,2<S<3,5	217	217	217
5.	***Fuel oil M - 100 Content 3,2<S<3,5***	***217***	***railway tariff 50 $./ton***	267 with tariff**.**

Make price target on news agencies for the provision of prices of petroleum products, and perform calculations on them, it would not be quite right, but maintain the average calculation as a whole, let nomenclature proposals for the sale and purchase of certain types of oil products, has an undoubted place, as is done In that work. Fuel oil M-100 containing 3,5 <S <5, taking into account the train fare and other expenses, would cost approximately - $ 287 per ton.

Given the volume of shipments, manufacturers, resource holders, suppliers are to harmonize prices mean not strict requirements for product delivery.

The supply of raw material to carry out a planned refinery:

- ✓ Petroleum pererabatyvayushy Saratov plant
- ✓ Syzran Petroleum pererabatyvayushy plant
- ✓ Orsk Petroleum pererabatyvayushy plant
- ✓ Ufa Petroleum pererabatyvayushy plant
- ✓ Mari Petroleum pererabatyvayushy plant
- ✓ Shugurovskogo Petroleum pererabatyvayushy plant
- ✓ Kichuyskogo Petroleum pererabatyvayushy plant
- ✓ Ryazan Petroleum pererabatyvayushy plant

The volume of supply of raw materials

The volume averaged approximate.

Table № 8

н/п	Product name	Scope of supply			
		Per day averaged (ton)	Per month averaged (ton)	Quarter averaged (ton)	In year averaged (ton)
1.	***Fuel oil M-100 Content 3,2<S<3,5***	**1.152**	**35.040**	**105.120**	**420.480**

Besides bitumen, the material balance is shown in the output of the fuel and gas oil fractions. **This section will provide information with regards to the issue of free fuel fractions on the UPB**.

Fuel, passing attendant, factions in the production process can be produced commodity products:

- Boiler fuel,
- VGO,
- Marine Fuels,

VGO. Test Method. Demands TU.

During vacuum distillation, is the selection of light and heavy vacuum gas oil distillates, which can be used:

- a volatile agent (instead of steam)
- as a plasticizer in the manufacture of bitumen,
- a commercial product,

Table № 9

№ п/п	Product name	Test Method	TU 38.1011304-2004 c changes.1-9	TU 0258-006-49247367-2005
1.	Density C at 150 kg / m3 C at 200 kg / m3	GOST R 51069	Within 873,4 – 953,3	 870 – 950
2.	Viscosity at 500 C mm2 / s	GOST 33	Within 5,0 – 25,0	 30,0 – 60,0
3.	Sulfur content, %	GOST R51947	no more 2,0	2,0
4.	Pour , ^{0}C*	GOST 20287	not less 16*	40
5.	flash Closed Cup, 0C COC, 0C	GOST 6356	not less 61	 80
6.	Mass fraction of vanadium, %	GOST 10364	no more 0.0005	0,0010
7.	Coking behavior, %	GOST 19932	no more 0.4	0,6

Marine Fuels. Boiler fuel.

Classification of marine fuels. Technical conditions.

Classification of marine fuels produce the following main features:

- originally:
  - natural,
  - artificial,
- by a method for producing:
  - straight,
  - cracking (distillate and residual),
- the level of viscosity at t – 50^0 C:
  - low-friction (MBT),
  - medium viscosity (CBT),
  - high viscosity (BBT),

The main limiting physical and chemical characteristics of these groups fuels regulated OST 15.360-86 « Fuel for domestic and foreign vessels fishing fleet. Nomenclature. The procedure for appointment and application», shown in Table № 10.

Table № 10

н/п	View fuel	Viscosity,cCт, at 50^0 C,	Density at 20^0 C, кг/м^3, no more,	Sulfur %, no more,	coking behavior , %, no more	Ash %, no more
1.	Low -friction	before 12	890	1,5	0,5	0,05
2	Medium viscosity	12 - 150	970	2,5	9,0	0,20
3.	High viscosity	Above 150	1015	4,3	-	0,20

- sulfur content:
  - sweet,
  - medium,
  - Both high,

- for different applications:
  - motor,
  - Gas turbine,
  - Diesel,

As the main destination for ships fuel classification Shell Marine Fuel Specifications, are divided into the following groups:

- marine gas oil, MGO (Marine Gas Oil),
- marine diesel MDO (Marine Diesel Oil),
- viscous fuel IFO, TFO (Intermediate Fuel Oil, Thin Fuel Oil),
- high-viscosity fuel HFO RFO (Heavy Fuel Oil Residual Fuel Oil),
- bunker fuel oil BFO (Bunker Fuel Oil),

Indicators of the quality of fuel governed by international and national (state) standards, technical conditions, as well as departmental specifications. International and national (state) standards establish general requirements for only the most important characteristics of fuels. Specifications and departmental specifications regulate the specific requirements of all the necessary physical and chemical properties.

Specifications developed by the International Organization for Standardization (ISO) – «ISO/DIS 8217/ petroleum products. Fuels (class F)» it was revised in 1996. In accordance with these specifications, fuel divided into four classes,:

- DMX, DMA, DMB, DMC,

Medium viscosity fuel represented classes:

- RMA 10, RMB 10, RMC 10, (digit of the matches in the kinematic viscosity cCт at 100^0 C).

High viscosity grades of fuel includes:

- RMD 15, RME 25, RMF 25, RMG 25, RMH 35, RMK 35, RMH 45, RMK 45, RMH 55, (digit of the matches in the kinematic viscosity cCт at 100^0 C).

Another widely used specifications for heavy fuels are the demands of the International Council for ДВС SIMAC, embedded in 1990.

They differ from the technical specifications ISO / DIS 8217 tightening of a number of indicators and the introduction of additional features. In accordance with these specifications, distillate fuels are presented classes:

DX, DA, DB, DC,

Medium viscosity residual – classes A 10, B 10, C 10, D 15,
High viscosity residual fuels – classes E 25, F 25, G 35, H 35, K 35, H 45, K 45, H 55,
(designation similar to ISO/DIS 8217).

Despite keeping in place technical conditions of ISO / DIS 8217, in international practice more common, previously established designation of medium and high viscosity fuels:

- IFO 30, IFO 40, IFO 180, IFO 380, (digit of the matches in the kinematic viscosity cCт at 100^0 C).

The most widely used in international practice are classes of fuel IFO 180 - IFO 380. lighter fuel IFO 180, produced with the use of relatively expensive distillate fuels and solvents. Currently distillate fractions direct distillation for its production are used. Distillates obtained during advanced processing, may be of low quality, which does not improve the final fuel mixture.

The higher price of fuel IFO 180 due to the presence of additional operations for mixing.

Note that one brand of fuel from different manufacturers can vary significantly its performance.
The limits of price ranges, diverse and essentially depends on the country and the bunkering port. Price is not always characterizes the quality of the fuel, as it depends on the manufacturer it is, the cost of transportation, delivery and storage. In the same port on the difference in fuel prices may vary significantly. The price and the quality might not always be paramount and fundamental.
Abroad, the stability of prices of fuel in the large difference in the classroom and as a fuel, encourages shipowners to use most of the cheapest fuels increased viscosity. Therefore, foreign shipbuilding observed steady progress in the implementation of a wide practice of marine fuels with high viscosity with the implementation of structural measures for use on ships. This takes into account that the initial and operating costs for fuel preparation with viscous fuels will be less, and the price difference between low-viscosity and high-viscosity fuel, would be significant.

The range of fuels.

Table № 11

Home brand		Duplicating mark.
1.	Diesel fuel L-62, H-35, GOST 305-82,	Diesel weighted fractional composition (UFS) TU 38.001355-86, The ship low-viscosity fuel (SMT) TU 38.101567-87.
2.	Motor fuel DT, DTVK, DMVK, GOST 1667-68,	Gas turbine fuel TG TGVK GOST 10433-75,
3.	Naval oil F-5, F-12 GOST 10585-75,	Motor fuel DT, DTVK, GOST 1667-68,
4.	Fuel oil M-40 GOST 10585-75,	Motor fuel DMVK, GOST 1667-68,
5.	Fuel oil M-100 GOST 10585-75,	Fuel oil M-40 GOST 10585-75

Compliance with domestic and foreign marine fuels also found OST 15.360-86
Table № 12.

Table № 12.

Domestic fuel.		Foreign fuel.		
GOST or TU.	Fuel.	International Classification.	BSMA: 100	ISO/DIS 8217
Low -viscosity				
GOST 305-82,	Diesel fuel Л-62,З-35,	MDO, MGO	M1, M2, M3,	DMB, DMC, DMX, DMA
TU 38.001355-86,	Diesel weighted fractional composition (UFS)	MDO, MGO	M1, M2, M3,	DMB, DMC, DMX, DMA
TU 38.101567-87.	The ship low-viscosity fuel (SMT)	MDO, MGO	M1, M2, M3,	DMB, DMC, DMX, DMA

Domestic fuel.		Foreign fuel.		
GOST or TU	Fuel.	International Classification.	BSMA: 100	ISO/DIS 8217
Medium viscosity.				
GOST 1667-68, GOST 10433-75, GOST 10433-75, GOST 1667-68, GOST 10585-75, GOST 10585-75, GOST 1667-68,	ДТВК ТГВК ТГ ДТ Bunker oil F5 Bunker oil F12 ДМВК	 IFO 20 - - IFO 40 IFO 40 IFO 80 IFO 120	 - - - M4 M4 -	 - - - RMB 10 RMB 10 RMB 15
High viscosity.				
GOST 10585-75, GOST 10585-75, There are no analogs.	Fuel oil M-40 Fuel oil M-100	IFO 230 IFO 600 IFO 700	- M6 M11 M12	RME 15 RMK 45 RMH 55

Key indicators of marine fuels TU, ISO-8217, DMA.

Comparative characteristics. Test methods. Table № 13, Table № 14.

Table № 13

№ п/п	Namev index	OST 15.360-86	Sample options № 1	Sample options № 2	Test method
01.	Kinematic viscosity, mm2/s at 20 0C, not more at 40 0C. no more at 50 0C. no more at 80 0C. no more	Above 150	12	14	GOST 33 ASTM D 445
02.	Flash point, closed Cup, 0C, not below	-	-	-	GOST 6356 ASTM D 93
03.	Pour point, fluidity, 0C not above		21	19	GOST 20287 ASTM D 97 (метод Б)
04.	Mass fraction of sulfur, % no more I look II view	4,3	1,86	2,4	GOST R 50442 ASTM D 4294 или IP336
05.	Mass fraction of water, % no more		0,05	0,05	GOST 2477 ASTM D 95
06.	Ash content %, no more	0,20	0,12	0,042	not standardized, the definition of necessarily
07.	Mass fraction of mechanical impurities, % not more		0,01	0,01	
08.	Cocking behavior, %, no more	-			not standardized, the definition of necessarily
09.	The content of water - soluble acids and alkalis				no
10.	Density at 150C, kg/m3, not more at 200C, kg/m3, not more	1015	1010	996	GOST R 51069 ASTM D 1298
11.	Flash point in open Cup, 0C, not less				not standardized, the definition of necessarily
12.	Total sediment, % mass., no more				GOST R 50837.6 IP 390

Table № 14

№ п/п	Namev index	**DMX**	**DMA**	**DMV**	**DMS**
01.	Kinematic viscosity, $мм^2/с$ at 20^0C, no more at 40^0C. no more	 9.2 5.5	 10,2 6,0	 21,5 11,0	 29,0 14,0
02.	Flash point, closed Cup, 0C, not below	43	60	60	60
03.	Pour point, 0C not above	зимой - летом -	0 -6	+6 0	+6 0
04.	Mass fraction of sulfur, % no more,	1,0	1.5	2,0	2,0
05.	Mass fraction of water, % no more	-	-	0,30	0,30
06.	Vanadium content in mg/kg, not more	-	-	-	100
07.	Mass fraction of mechanical-related impurities,%, not more	-	-	0,07	-
08.	Coking ability of 10% residue in %, not more	0,2	-	-	-
09.	Coking of Ramsbottom in %, not more	-	0,02	0,25	2,5
10.	Ash content in %, not more	0,01	0,01	0,01	0,05
11.	Density at 150C, kg/m3, not more	-	0,890	0.900	0,929
12.	Cloud point , 0C, not higher	-16	-	-	-
13.	Cetane number, not less	45	40	35	-

Fuel oil is a complex mixture of organic compounds, mainly. – paraffin, naphthene, and aromatic hydrocarbons. Residual fuels are also organic high molecular weight asphaltene compounds, which are divided into resins, asphaltenes, carbenes and karboidy. The first two groups are the main representatives of resinous substances. When viscous fuels are used, the heavy fraction of the secondary distillation, which is characterized by a high proportion of polyaromatic hydrocarbons, resins and asphaltenes. In diesel and gas turbine fuels asphaltene substances a bit, and the engine fuel diesel, mazut f-5, f-12, their share reaches 50 %. The quality of the final product – marine fuel, largely determined by the quality of the original oil deposits, the oil content in the components of nitrogen, sulphur, minerals, oxygen, and the method of its processing.

Methods of obtaining marine fuels, there are more than a few dozen. Basically, each of the methods is described by the mixing (compounding) the components of the secondary processing of hydrocarbons. At different percentage will get a product with characteristics fully meet the requirements of existing standards, both international and domestic. Components, in the production of marine fuels, are:

- Fuel oil,
- tar,
- light gas oil,
- The heavy gas oil,
- The residue visbreaking of heavy oil fractions,
- Extract selective treatment,
- In some suggest use of the resin, for example - polialkilbenzolnaya (polialkilbenzolnaya resin - a by-product of petrochemical production of phenol and acetone),

Requirements of Maritime and River Register in respect of the basic indicators of the quality of SMT, which change upward can cause disruption of the ship power plant are:

- **density,**
- **viscosity,**
- **Content of mechanical impurities,**
- **water content**.

The most stringent requirements in terms of navigation apply to index – **flash point in closed crucible, which should not be less than 62^0 C.**

According to the JSC "VNII NP" Moscow, in the period from 1999 to 2003 yy, Russian refineries, oil companies release fuel CMT was made in the amount of 100,000 tons, to over 2,000,000 tons per year.

Volumes of production of marine fuel, talk about the needs of the product in the oil market.
Ports of St. Petersburg, Novorossiysk, Primorsk, not reloaded each month of the total consumption of about 40,000 tons of CMT, because is not enough production. As a result of the increase in freight traffic in the navigation period in the CIS countries and countries with which the Russian Federation has water posts, and growing demand for marine fuel all brands.
Positive economic growth of the Russian Federation. The increase in cargo traffic is by sea, by river transport. Transportation of refined products in the small and large distances, creating a shortage of marine fuel. Large companies, private owners, responsible for organizing transport by water, lack SMT volumes of product, and for operational services and its quality. Given the rigidity of international organizations to the quality of SMT, which reduces the requirements for use in the operation of marine fuels with a high quality, stable performance, guarantee the supply is relevant and timely.

The Russian Federation, the state and the country, which are: - access to the seas, ports, transshipment base, as well as an extensive network of rivers, all of this is the consumer market, and the market for products for marine fuel, of all existing classes and existing марок.

The main consumers.

The program includes the construction and repair of roads of the Russian Federation, to be held during 2015-2020, the leading position is still occupied pavements using bitumen. The strength and durability of the road pavement is largely dependent on the quality of bitumen, designed to bind different mineral grain size and formation with them after the seal wear-resistant durable and weather resistant pavement.
Justified criticism of the state of national roads forced the change view of the problem in the whole country, and in the regions. Leaders of the Russian Federation headed for a major renovation of the road sector. Today technology has changed tenders for carrying out contract work, has improved the quality of the facilities.

Changing priorities:

- • allocate funds for new road construction,
- increased funding for the maintenance and repair of existing pavements.
- It will solve the problem for the establishment of long-term contractual relations in particular, the supply of bitumen, gravel;
- improve the quality of projects approach;
- achieving compliance with real guarantees of the executed works,

Construction companies should be clear prices of materials and transportation. A data bank on quality control of materials used in the guarantee facilities. Designers and contractors - each carries its responsibility for the warranty period of the pavement.

Moscow Government tasked to increase the strength of pavements. In Moscow, it can be improved to make polymeric bitumen. The city government adopted the proposed architecture Construction, Development and Reconstruction of the complex urban and apply the improved polymer bitumen in the construction and reconstruction of roads, major repairs of individual objects of the road network.

Tasked the State Inspectorate of Architecture - Building Supervision (IGANS) and the combined administrative - technical inspections to conduct constant monitoring of the use of these materials.

And changed the dynamics of funding the road sector. The amount of funding for the construction and reconstruction of federal highways, subsidies of the Russian Federation on construction and reconstruction of roads, maintenance and repair of federal roads. In general, the allocation of funds from the federal budget and funding will be up to 1 trillion rubles. And taking into account the focus of state and government to perform tasks, taking into account the adopted programs, such dynamics of financing remain until 2020, in the amount of 8.3 trillion rubles.

Supply of bitumen improved in Moscow and Moscow region - is already under way with the installation of bitumen UPB JSC "Salavatnefteorgsintez".

Consumers of products are traffic organization: Russia, Kazakhstan, the CIS, the CIS countries, Latvia, Lithuania and Estonia. The huge interest in quality, bitumen production comes from such countries as China and the State, Hungary, Bulgaria, Poland, Turkey, as well as private organizations involved in civil, road construction. Preliminary negotiations with potential consumers of the Republic of Kazakhstan and the Kyrgyz Republic, the Baltic states have shown interest in similar products in the region.

The components of the fuel fractions and a gas oil fraction are valuable raw materials for oil refineries, which can be taken to further processing in the refinery. This fact will contribute to a more rapid return on funds invested in the construction of an integrated plant. Of course the cost of the construction of a vacuum unit will be higher than for the construction of a bitumen unit only, but in this case it is possible to give certain guarantees for the stability of the quality of produced commodity output.

Production plan

Production capacity.

The construction site.

The construction site is a plot of land of about 12 hectares in the industrial zone (zone of production facilities). Agreed, it examined and made an expert opinion on a plot of 12 hectares. There is an opportunity to build their own, autonomous railway line without any transit through the territory of other enterprises and organizations. This includes guaranteed delivery of raw materials for the smooth operation of the installation, and timely shipment of commercial products. For the efficient operation of production required 2 (two) rail tunnels under the sink - pouring oil.

Estimated property is located on the border of the security zone bypass road passing RP Lunino, exit to the track Penza - Saransk. Easy access - the Congress, to the alleged plot UPB is a positive step in the shipment of goods by road.

Ensuring the entrance from different angles, making it possible to check, in the case of an extreme situation, the forces: the Emergencies Ministry, the Interior Ministry, the Federal Security Service, ambulance.

The construction site UPB, geographically located favorably for working with clients on export bitumen, avtobitumavozami. It's safe to assume the supply of the following areas: Penza, Penza region, the republic - Mordovia, Chuvashia, Mari-El, Ulyanovsk and Tambov regions, as well as other neighboring regions. Avtobitumavozami supply radius is 300 km, and given the current technical solutions transport by road, the radius of the supply can be increased.

With regard to the supply of marketable products by rail, then we can speak with confidence about the transport rail infrastructure, which guarantees exit in the direction of both republics: Kazakhstan, Kyrgyzstan, China, the Baltic countries, Hungary, Bulgaria.

On the alleged plot, you must:

- ✓ - Engineering - geodetic survey.
- ✓ - Engineering - Environmental Surveys
- ✓ - Engineering - geological survey
- ✓ - Work to determine background concentrations of harmful substances - obtain approval for placement in road and roofing bitumen on the allocation of land.
- ✓ - obtain a building permit.
- ✓ - to register the object.

State Unitary Enterprise "Institute of petrochemical processing of the Republic of Bashkortostan", Ufa, as the developer of the project, provide the Customer with the following guarantees:

- ➢ Performance - power - plant for raw materials,
- ➢ assortment and volume of production of certain types of bituminous products,
- ➢ Quality trademark of bitumen taken to the production of stamps,
- ➢ the duration of continuous trouble-free operation of the plant.
- ➢ Environmental safety of the new production.

Project.

Development of project documentation for the construction of production plants construction, roofing, improved road bitumen, developed on the basis of schedule, State Unitary Enterprise "Institute of petrochemical processing of the Republic of Bashkortostan", Ufa.

PLAN-SCHEDULE.

Table № 15

Realization of pre-project works:									
Collection of raw materials									
Quality Research , development workers formulations of raw materials and finished products.									
Development of initial data for design									
Development of the project - on the projects:									
Raw material park for a reception and storage of fuel oil and raw material for roofing bitumen									
Park commodity bitumen									
Automated trestle of pouring of bitumens in railway and motor-car cisterns									
Technological setting block deeply a vacuum distillation of fuel oil									
The technological setting is a block of receipt of the oxidized travelling bitumen’s									
Knot of cooling and packing of bitumen’s of building brands									
Special divisions of detail design									
Development of measures on OOC									
Development of measures on ИТМ ГО ЧС									
Development of detail design top level АСУТП									
Development of technological regulation									
Architectural supervision									
Number of months									
1	2	3	4	5	6	7	8	9	10

The development of the project documentation has contracted. To approve the terms of reference and identify the list of objects of design, technical solutions, to appoint a representative of the customer under this agreement.

Development of design documentation must comply with applicable regulations, requirements and regulations of the Russian Federation. The documentation prepared for submission to the state authorities expertise on the subject of a positive assessment.

Execution of field supervision of the project is carried out under the contract "under the author's supervision of works on the construction." Price and payment carried at historical cost, with the provision of relevant documents to the Customer under the contract "under the author's supervision services for the construction of". *

Equipment.

The proposed technological scheme of bitumen involves a turn:

1) Overall manufacturing equipment

Tanks for raw materials:
- 5.000 tons - 3 pieces. M -100

finished products:
- 5.000 tons - 3 pieces. BND, BNC,

fuel fractions:
- 5.000 tons - 2 pieces.

pouring bitumen:
- 500 tons - 3 pieces. BND, BNC, fuel fractions.

Intermediate capacity:
- 200 tons - 3 pieces.

2) Unit raw material preparation

- process furnace for preheating fuel oil before being fed into the vacuum column;
- vacuum column with a vacuum creating system;

3) Block oxidation

- oxidation feed to the column;
- separation of the oxidation gas in order to maximize extraction of liquid hydrocarbon moiety;

4) Block producing roofing (building) bitumen

- oxidation feed to the column;
- separation of the oxidation gas in order to maximize extraction of liquid hydrocarbon moiety;
- unit packing and packing of bitumen, building brands;

5) The system of external and internal ramps

- oil heating system of industrial pipelines and devices,
- system of steam heating devices and technological pipelines,
- block thermal decontamination gas oxidation using heat of combustion gases for heating the oil coolant;
- heat transfer oil circulation system,

6) Pump equipment

- Define the project.

7) The compressor equipment

- Define the project.

8) Automation and control (Control). Automation of technological processes. General information

Appointment of an automated control system (ACS) bitumen plant:

1. continuous automatic control of technological objects of the installation;
2. continuous automated operational dispatch management installation;
3. automated production and the tasks of a technical nature;

The objectives of the creation of ACS installation are:

– ensuring reliable and efficient operation of the primary and secondary processing facilities bitumen plant by controlling the mode of operation in accordance with the technological regulations, timely detection and elimination of deviations from technical regulations and prevent emergencies;

– security bitumen production facilities and emergency fire protection facilities installation, information security;

– fulfillment of the established production targets for the volume and quality of marketable bitumen, reduced downtime logistical and energy resources, reduce operating costs;

– increase the speed, accuracy and reliability of accounting data processing and technical and economic parameters setup.

The overall structure of ACS bitumen plant

The overall structure of ACS bitumen plant has a hierarchical structure and is designed to control the main and auxiliary technological processes in real time;

ACS installation performs the following functions and tasks:

Automatic emergency protection bitumen plant (PAZ), including:

- Automatic control of the process of production of bitumen in accordance with the set regulations, including:

1. Operational dispatch management of technological process.
2. Automatic control and emergency protection loading racks.
3. Automated condition monitoring of process equipment.
4. Automated accounting , (technical) consumed energy: electricity, fuel, steam, water, process air and instrument air, inert gas.
5. Surveillance of technological equipment;
6. Preparation and printing of shift reports.
7. Operational archiving of process data.
8. Testing and diagnosis of hardware and software systems.
9. System administration.

In the ACS bitumen unit consists of the following main components:

- active and passive equipment shop network;
- means of automation, programmable controllers system PAZ;
- means of automation, programmable controllers ASUTP;
- meters subsystem metering;
- cameras and controllers CCTV;
- ARM s of operators-technologists;
- ARM shift supervisor;
- the server ASU;
- system software;
- application software.

Basic hardware-software complex for automated control system of building a system of process control SIMATIC PCS 7 company Siemens AG.

9) Laboratory

- Laboratory liquid chromatograph,
- Apparatus for determining the water saturation of the Soxhlet -07KSH 64/45,
- Apparatus for determining the softening point of bitumen KISH-88,
- Apparatus for determining the temperature brittleness of bitumen ATX-20,
- Apparatus for determining the extensibility of petroleum bitumen DB-2,
- Apparatus for determining the relative sharpness of petroleum bitumen VUB-1м,
- Apparatus for determining the flash point in open crucible TVO,
- Apparatus for determination flash temperature in closed crucible ATV-20
- Penetrometer PN-1M,
- Apparatus for distillation of petroleum products ARNP -1,
- Millivoltmeter pH-150M,

10) Sprinkler system

See. № 8 ASU, emergency protection bitumen plant (PAZ).

11) System ELEKTRA heating of process pipelines and apparatus

- the system of oil heating of process pipelines and apparatus, the steam heating of process pipelines and apparatus,
- the unit of thermal neutralization of gases oxidation using the heat of combustion gases for heating the oil of the coolant;
- circulation system oil coolant,

12) Railway junction (with drainage system of loading of petroleum products) at least 2 two branches

- The system includes: pump station, two (2) rail loading - unloading rack, gallery type 8 W/d, each of the tanks, the loading rack to vehicle 4 motor vehicle and operator loading.

14) Treatment facilities

- To define the project.

15) Industrial building (control room, transformer substation, compressor.)

- To define the project.

16) Administrative building

– To define the project.

The technological scheme.

Brief description of the installation.

There are two technological lines:

- line for production of road and construction bitumen grades,
- line for production of bitumen roofing brands.

The raw material for the plant is – tar, with the installation of (W), and the tinted product, which is used as a plasticizer in the production of bitumen roofing brands.

About the technology.

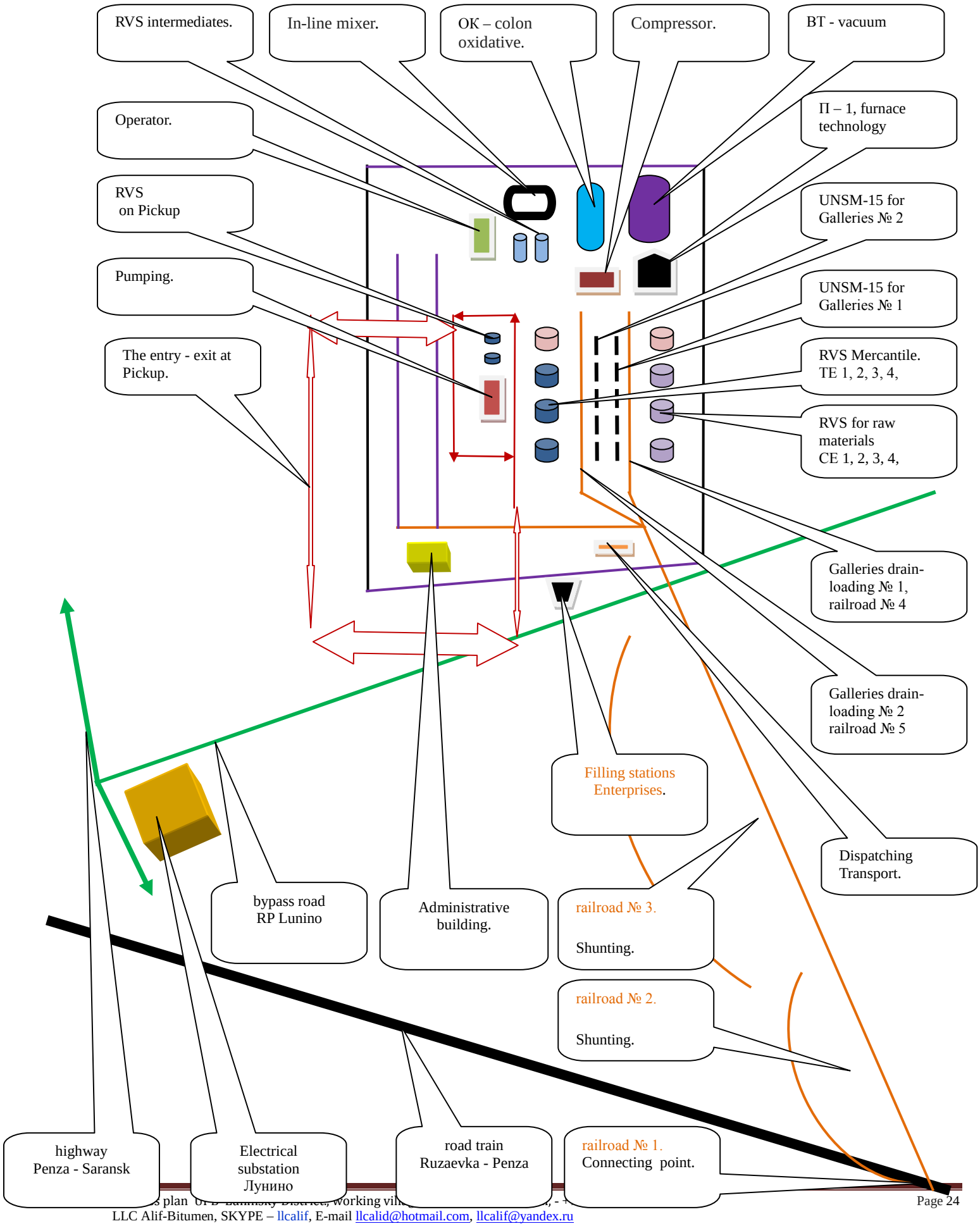
Technology of production of road bitumen grades according to the scheme: pereokislenie → dilution. The essence of the technology is that the feedstock is initially oxidized to the values of the indicator "softening temperature" of 70-100 0C and then this deeply oxidized bitumen, which is a concentrate of resins and asphaltenes diluted feedstock.

This technology has the following advantages over traditional technology of direct oxidation of raw material to road bitumen:

1. Regardless of the brand of the produced bitumen oxidation unit constantly operates in a stable mode, is configured to receive qualitative raw material with a predetermined softening temperature. Bitumen road grade of only a specified range to get the block in-line mixers obtained by compounding basis from the original raw material and plasticizing components.
2. When working on this option technology eliminates the need for oxidation of the total volume of processed raw material. Oxidation is subjected to only 50-60 % of the raw materials, the rest balance quantity of raw material fed to the dilution of the oxidized component. This leads to a reduction of air consumption, and to reduce the volume of oxidation gas, requiring thermal decontamination and, consequently, to reduce energy costs and increase environmental safety of production.
3. The quality of compounded bitumen is higher than the quality of the bitumen obtained by direct oxidation. Bitumens are characterized by greater plasticity, better low-temperature properties, better adhesion to mineral materials used in road construction. The main advantage is a less tendency of such bitumen to the processes of thermal oxidative aging. The reason is that such a deeply oxidized bitumen compendiums with tar, darkened a fraction and others, not oxidized and therefore fairly stable components. It is known that changing the composition and properties of such products are required temperature 240-260 0C and above. The temperature of the bitumen when producing asphalt mixtures is half the values given, and maximum operating temperature of asphalt pavement three times lower temperatures, causing significant changes in the composition and properties of the compounded bitumen.

The second stage of the process – compounding – process waste-free, easily and smoothly adjustable, does not require significant energy costs. The process of mixing the components is performed continuously, in-line mixers of special design, with automatic dosing of oxidized and not oxidized components of the bitumen in the continuous control of the viscosity of the starting components and final product in the stream.

The scheme of location of infrastructure UPB.



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Organizational plan

Energy.

As major energy project envisages the use of spare capacity industrial site, any available:

- Gas - the gas volume in the pipeline, in full can provide BPA with the expected consumption of gas. The pipeline passes close (on the border), the intended site for the construction of UPB. Connection does not cause too much difficulty.

- Par - autonomous powers to obtain property.

- Water - drilling wells up to 150 meters (two possible 2), on the alleged plot and autonomous water supply UPB.

- Electricity - nearest substation located in RP Lunino. Power substations in full can provide at UPB expected consumption. At the substation are immune cells must be two (2), which ensures the connection of the main and backup power supply during an uninterrupted mode of production.
  Connection does not cause too much difficulty.

- Sewage –
  1. Treatment of industrial and oily waste,
  2. Biological treatment plant household sewage,
  3. The system of water treatment,

The decision prompted the company - JSC PFC "Rybinskkompleks" Russian city of Rybinsk, Yaroslavl region - Developer Technology Energy and Environmental Technology.

Energy costs per ton of bitumen are exclusive of adjustments to the existing project.

Consumption of energy

Table № 16

н/п	Name of the energy carrier	Units	The application rates	Volume of expenses			
				Per day	Per month	In quarter	In year
1	Gas	M3 / ton	23,4	13.572	407.160	1.221.480	4.885.920
2	Electricity	KW / ton	5,4	3.132	93.960	281.880	1.127.520
3	Par	Gcal / ton	0,0217	12,5	375	1.125	4.500
4	Water	M3 / ton	0,26	150,8	4.477,2	13.431,6	53.726,4

Production staff.

Staffing provides the following list of positions and qualifications.

Table № 17

н/п	**The post**	The number of people.	Qualification.
	Management personnel		
1.	CEO	1 person	Higher education
2.	The Director for economy	1 person	Higher education
3.	Director of production chief engineer.	1 person	Higher education
4.	Chief accountant	1 person	Higher education
5.	The inspector	1 person	Higher education
6.	Chief power engineer	1 person	Higher education
7.	Engineer on labour protection	1 person	Higher education
8.	The economist	1 person	Higher education
9.	Lawyer	1 person	Higher education
10.	Accountant	1 person	Higher education
11.	Secretary	2 person	Higher education
12.	Driver	1 person.	Higher education
	Total**:**	**13** people	
	The main production staff.		
1.	The head of the installation	1 person	Higher education
2.	Head of laboratory	1 person	Higher education
3.	Head of transport Department	1 person	Higher education
4.	Mechanic at bitumen plant	1 person	Higher education
5.	Head of procurement	1 person	Higher education
6.	Head for reception and distribution products	1 person	Higher education
7.	The storekeeper	1 person	
8.	The operator of technological installation (shift supervisor))	4 people	6 category
9.	The operator of technological installation	4 people	5 category
10.	A replacement operator of technological installation	1 person	5 category
11.	Machinist process pumps and compressors	4 people	5 category
12.	Swing driver	1 person	4 category
13.	The fueler	8 people	3 category
14.	Swing bunker barge	1 person	3 category
15.	Senior assistant	4 people	6 category
16.	Assistant	4 people	5 category
17.	Laboratory assistant-analyst	1 person	6 category
	Total:	**39 people**	
	Support staff.		
1.	Locksmith of instrumentation and automation	2 person	6 category
2.	The mechanic on repair of electrical equipment	1 person	6 category
3.	The mechanic on repair of electronic devices	2 person	6 category
4.	Electrician for repair and maintenance	4 people	5 category
5.	The mechanic on repair of technological equipment	5 people	6 category
6.	Gas - electric welder	2 person	6 category
7.	the maid	2 person	
	Total:	**18 people**	
	Total: the number of total production staff	**70 people**	

FINANCIAL PLAN

Salary.

For time periods, the number of personnel engaged in production, distributed as follows:

- during the construction period of 8 months since the start of construction **13** worker.
- for the construction period starting from 9 month to 11 month **70** worker.
- for the start-up and operation of 12 months **70** worker.

Fluctuations in payroll are linked to the construction period, based on the following data:

- - Main production staff
  (the average salary 1.000 $/ month):
  - the number **39** worker.
  - Salary 39.000 $./ month.
- - Auxiliary production staff
  (the average salary 834 $/ month)
- the number **18** worker.
- Salary 15.012 $./ month.
- - Management personnel
  (the average salary 1.667 $/ month)
- the number **13** worker.
- Salary 21.671 $./ month.

Total: Fund medium monthly wage will amount: **75.667 $./** month.

Thus, the Fund's average monthly total wage of the production staff will be:

- during the construction period with 1 month. at 8 months. 173.334 $./month.
- during the construction period to 9 months. for 11 months 227.000 $./ month.

TOTAL: for the construction period from 1 month to 11 month: **400.334 $./** month.

- the first month of use (investment) 75.667 $.
- the first year of operation from 1 to 11 months, 832.334 $.
- since 12 months of operation 908.000 $.
- for the second year and all subsequent **908.000 $.**

Total: Fund average annual salary will be: **908.000 $.**

Investment.

The project envisages the attraction of investments (loans) on a long term basis. The early-maturity investments (loans) since start of production and release of commercial products – bitumen.

Assessment of the conditions of issuing and repayment of borrowed funds, suggests:

- The possibility of permanent access to the source of funding.
- The amount of the borrowed funds and related interest payments and other debt expenses.
- Determination of conditions restricting the amount of borrowings.

The scheme provides for the repayment of loans:

1. The beginning of payments of interest on long-term and current loans to determine the time of the start of production in constant operation, and, accordingly, the beginning of production.
2. Repayment of principal on long-term loans and current also define the time of start of production in constant operation and thus the beginning of the output.
3. Resources on such terms implies a gradual outflow of available funds, to the full repayment of loans and interest thereon.

A solution to the issue of collateral obligations to the creditor are encouraged to solve as follows:

- ✓ Providing the enterprise – borrower of the loan the "Negative pledge" means a provision of credit under assets under construction of production without the right to use them as collateral for any other obligations of the enterprise.
- ✓ From the date of issue until full repayment of the loan and interest ownership of all long-term assets and current liabilities under above accounts are owned by the lender.
- ✓ After repayment of principal and interest on loans provided transfer of all long-term assets and current liabilities in the property of the borrower loan
- ✓ Terms of joint activities of the lender and the borrower, upon fulfilment of all its obligations under the enterprise, shall be determined by separate agreement between them.

Payments on the loans provided with 22 months from commencement of construction, the interest rates taken into account with the interest rate of refinancing of Bank of Russia – 11 %, (for September 2015, is 11 %), and practice 11% + 5% = 16%, i.e. adopted in the calculation of the crediting rate equal to 16% per annum. With the end of interest payments and principal debt 45th month in the production of up to 189.000 tons from the start of construction.

Analysis of investment activity shows a significant proportion of long-term investments – 61.7% of the total investment that is attributable to the acquisition of the active part of fixed assets.

Repayment of credits and loans is 100% negative cash flow in financial activity of the enterprise. In General, the production activity of the enterprise assumes the excess of the gross cash inflow over outflow.

Positive net cash flow, as a result of industrial activity characterizes the degree of self-financing is a prerequisite for the guarantee of stability of its existence in the long term, and suggests the possibility of covering investments without drawing on external financing sources..

The amount of money

The amount of money allocated to long-term and current loans with the production of bitumen.

Table № 18

№ п/п	Name cost	Need a loan					
		Ed. measurements	**Investments required. $.**	Consumption Volume for 3 months.	**Investments required. $.**	For assets to build.	**On liabilities on current activities.**
1	Project work	thousands. $	2.066.667, 00	-	-	70.000.000,00	-
2	Purchase of equipment	thousands. $	33,333.333, 00	-	-		
3	construction costs	thousands. $.	22.600.000, 00	-	-		
4	The cost of Construction and installation works	thousands. $	10.000.000, 00	- -			
5	Cost of commissioning works	thousands. $	2.000.000, 00	-	-		
6	Acquisition of raw materials 3 months.	thousands. $	-	35.000X3= 105.000 (тн.)	43.050.000,00	908.000, 00	43.861.675, 00
7	gas	-	-	2.457.000,00 (M3)	409.500, 00		
	power supply	-	-	567.000,00 (кВт/ч)	94.500, 00		
	water vapor	-	-	3.150,00 (Гкал)	7875, 00		
	Water	-	-	27.300,00 (M3)	72.800,00		
8	Salary	thousands. $	908.000,00	-	227.000, 00		
9	Inflationary costs 2014 – 2015 г.г. (10% - a year)	thousands. $	7.090.800,00	-	4.386.167, 50	19.854.240, 00	12.281269,00
10	the value added tax (18%)	thousands. $	12.763.440, 00	-	7.895.101,50		
11	TOTAL:	thousands. $	-	-	-	**90.762240, 00**	**56.142.944, 00**
12	TOTAL: Required investments:	thousands. $	-	-	-	**146.905.184, 00**	

The schedule of payments.

Financial tranche from 1 to 11 months.										Financial tranche 11 to 20 a month										Financial tranche from 20 to 24 month				
63.855.184 $										40.000.000 $										43.050.000 $				
The number of months.																								
1	2	3	4	5	6	7	8	9	10															
									11	12	13	14	15	16	17	18	19	20						
																		21	22	23	24			

- payment of each tranche to occur in the first month of each period, - 1, 11, 21,

A brief economic analysis of the project.

Revenue/cost.

The impact of revenue, as an indicator of sales value, profit, is through the change in prices and actual sales.

Taking into consideration the prices, sales volumes and revenues, at the level of 23.645.055-20 $./month, and given that the main source of income is the main activity, it can be argued that the share of gross operating profits is 37.75 %, this is definitely a positive moment in the activity of production based on their capacity.

The cost is estimated by the share of production costs in sales, but its structure gives a clear picture of the major cash payments. Given that the cost of production at the factory is 10.745.600 $./month, the share of the cost of sales will be is 62.24 % and the share of raw materials in the amount of costs, if costs of raw materials – 10.044.800 $./month, will be – 95.23 %, that means, on the one hand, high efficiency technology, as the manufacturing costs, excluding raw materials, is not more than 5 %, or 700.800 $./month, on the other hand a large component of raw materials at a fraction of the cost raises the question of attachment of this indicator, fluctuations of raw material market.

Summarizing these figures, it can be argued, is a positive development that the bulk of cash inflows from operating activities is provided by the receipt of proceeds from the sale of manufactured products, relatively low total production costs of sales, ensuring a high level of operating earnings, balance sheet profit – 12.899.455-20 $./month, which is 54.5 % of sales.

And considering the dynamics of this article can be considered that the production will have a stable domestic financing, which significantly increases the future financial stability.

Net working capital.

External financing is expensive and has certain restrictive covenants. Private sources of capital increase are limited, primarily, the ability to obtain the necessary profits. Thus, managing current assets, the enterprise has an opportunity to be less dependent on external sources of funds and increase their liquidity.

Effective management of working assets is considered this project as a way of meeting capital needs.

Why such a normalized current assets, as inventories of raw materials, finished goods inventory, should be optimal (minimal) stock, due to the following reasons:

- the possibility of choosing the optimal (maximum and minimum) capacity of production, which guaranteed to the production of finished products up to 15 consecutive days, even in the event of any interruption in the supply of raw materials.

- continuity of the production of the raw material and the supply of products is continuous, which leads to accelerated turnover of current assets, including and not completed products, with a turnover measured in hours (asset also equal to zero).

Having considerable free cash flow, with positive dynamics of their growth and the possibility of their use, the balance of such current assets as the share of loans in the revenue share advances in direct material costs (advances to suppliers), article reserve funds it is advisable to equate to zero. These measures will allow:

1. Accumulate the released funds to address production problems.
2. To increase the turnover rate of the released capital.
3. To avoid "deadening" a significant proportion of capital.

The structure of short-term working liabilities means the following:

- the share of loans in direct material costs were reduced to zero.
- the share of advances to customers in the revenue estimated to be equal to – 50%
- the average term of the advances equal - 10 days.
- staff accounting - 2 times a month.
- calculations with the budget under the tax legislation - The Russian Federation.

That will allow you to organize the scheduled interest payments of the main debt, when repayment of loans without significant damage to the economy of production, and at the same time to obtain additional funds through advances from customers.

The combination of all the above measures allows routine calculations, as with production staff and budget.

For the current analysis of solvency is a very important index characterizing the difference between current assets and short term liabilities.

In the analysis process, first of all, should assess the reasons for changes in the dynamics, keeping in mind that the systematic increase may indicate excessive value of owned working capital, and the reduction may reflect the lack of working capital.

Profit.

Value, the dynamics of revenue and spending, one way or another, are the result of managerial decisions.

Sales revenue reflects the effectiveness of the marketing and production activities. The lack of income from financial investments shows a lack of forethought financial policy, and a significant decrease in net profit due to the costs of the irrational structure of sources of financing economic activity.

The practical value of the analysis of the rate of profit is in correct estimation of tendencies of formation of profit as performance indicator source of funding the needs of expanded reproduction, which allows you to link the level of financial results with the quality of enterprise management.

Capital provider (the investor), as a rule, interested in **the net profit** - its value is estimated as the source, sufficient to cover financial costs.

A positive value of balance profit, net profit and the stability of its reception, as well as a positive level of linear change of the accumulated net profit indicate the correctness of the policy, on current and investment activities, and significant increase in profits - about a rational structure of management of circulating assets as a major source of funding for economic activity.

Analytical scheme of changes in profits are shown in Table № 19

Table № 19

The name of parameters	Unit of measure	7 quarter	8 quarter	9 quarter	10 quarter	11 quarter	12 quarter	13 quarter	28 quarter
Profit from main activity	thousand dollars	13 243	42 977	42 970	43 000	43 031	43 061	43 090	43 464
Book profit	thousand dollars	13 243	42 977	42 970	43 000	43 031	43 061	43 090	43 464
Net profit	thousand dollars	4 215	33 342	32 657	32 681	32 704	32 726	32 749	33 032
Not distributed profits	thousand dollars	4 215	33 342	32 657	32 681	32 704	32 726	32 749	33 032
The same cumulative total	thousa	4 215	37 557	70 214	102 895	135 599	168 325	201 074	694 680

	nd dollars								

Cash flows.

The statement of cash flows - the primary source of information for cash flow analysis. The analysis of the statement of cash flows allows to analyze and correct conclusions regarding the liquidity of bitumen production, its future financial potential.
The main goal, the main cash flows is to present information about changes in the cash flows to characterize the ability of production to generate cash.

All considered cash flows are classified in the context of current and investment activities. Separate consideration of cash flows gives an idea about the investment policy, including the amount of those investments, which will be achieved future cash proceeds and payments.

Education positive net cash flow, as a result of industrial activity, characterized by a high degree of self-financing enterprises. Total net cash flow, guaranteeing freedom of action when making financial decisions, investment in working capital and current assets, will make a significant positive value, allows to fully cover the financial costs.

Analytical cash flow chart Table № 20

Table № 20

The name of parameters	Unit of measure.	1 quarter	7 quarter	12 quarter	15 quarter	16 quarter	17 quarter	23 quarter	28 quarter
the attraction of the loan	thous and dollar	- 146 855							
Cash flow	thous and dollar	-	23 653	70 963	70 963	70 963	70 963	70 963	70 963
Cash outflow	thous and dollar	-	- 19 153	- 41 672	- 41 676	- 41 678	- 41 678	- 41 686	- 41 690
Cash balance	thous and dollar	-	- 225 405	- 92 216	- 43 553	24 933	54 217	229 899	376 270

Liquidity - (the solvency ratio).

On the current solvency of the organization is directly affected by the liquidity of its current assets (the ability to convert an asset into cash to reduce liabilities), characterizing the state of current assets and their correlation with short-term commitments.

In assessing liquidity, the main criterion was the possibility of realization of produced goods and the ability of debt repayment organization.

The second condition was a condition of sale of finished products and payment during the specified operating cycle (between time of production and the moment of payment for goods sold).

Thus, the liquidity ratio allows one to determine to what extent current assets cover current liabilities. The larger the value of the ratio of current assets to current liabilities, the greater the confidence that existing obligations will be repaid out of existing assets.

Of particular interest is the indicator of profitability own the capital, characterising the percentage of equity capital that formed the company for a certain period.

The solvency ratio is a quantity that determines the ability of the organization to provide payments for a specific time period money cash balance. It is obvious that to ensure the solvency of the enterprise it is necessary that this ratio was equal to **or greater than 2.**

The value of the coefficient suggests that the company will have sufficient funds to support repayment of their obligations. The change in the share of long-term loans will only mean that the investment, in this case, are not risky.

Assessing the feasibility of an investment project with an expected investment of 146.905.184,00 $ and for this to be brought to the loan to bring the cash flows to one time period, bearing in mind that this project has high risk.

Considering the estimated cash flow over the loan period it can be assumed that the project may provide coverage for all of its implementation costs and generate additional cash flow for investment costs, which allow to consider this investment decision as appropriate.

the payback period of the project:

– the production of bitumen 200.000 tons. – 42 months (3.6 years) since the start of the installation.

The thrust and efficiency of the project

Conclusions.

1. The report is based on a user's interests.

Studied and shown to work:

1. Technical analysis of manufactured products for its quality and competitiveness.
2. The definition of raw material market and sales market.
3. The definition of the necessary production capacities.
4. The advisability of investing in the project in full.
5. The issue of economic analysis of the project to determine production capabilities to provide payments on primary activity and on investment.

At the same time:

The leading area of application of bitumen is: the construction and maintenance of carriageways, pedestrian parts of the streets, squares, residential areas, roads and airfields.

Criticism of the state of local roads made to change the view on the traffic problem in the whole country, and in the regions. The government has embarked on a major reconstruction of the road sector. This will be constructed in an extremely rigid system of control, what quality of materials, in this case bitumen, used contractors.

The proposed technology ensures year-round production of bitumen products. This improved road bitumen, bitumen construction, roofing, for a wide range of applications in civil engineering.

The quality of produced bitumen meets the requirements of Russian GOST and Euro standards.

There are technological opportunities for increasing the quality of bitumen and expanding the range of manufactured products.

Taking into account the specified in the present document, the supply of raw materials and sales of finished products, it can be argued that the background on which it is proposed the project to date, is clearly favorable. These products are obtained by using the proposed technology, is as today and in the future very much in demand.

The period in 87 months, gives the opportunity to analyse the results of calculations concerning the revenue, cost and impact working capital. Formation of profit and loss. Cash-flow: investment, external, internal. The use of the sources and destinations of funds. Is formed and determined by the rate the liquidity of the company.

In General, the appropriateness of investments, allows us to estimate, on the one hand, the organization's ability to create cash with another need to effectively use the financial opportunities of industrial enterprise.

The positive is that most of the new money inflows is provided by the receipt of proceeds from the sale of manufactured products.

The use of cash flow, production enterprise uses, primarily as a source of active self-funded, fully paying the tax deductions and VAT, with the involvement at the initial stage of loan funds for construction of production facilities, procurement of raw materials for production, and launch of commercial products.

Conclusion:

1. Considered the production of roofing, construction and road bitumen improved able to gain financial profit in their businesses.
2. Issue, the entire range of commercial products, provided the proposed installation, provide the possibility to meet their financial obligations, pay dividends and stay creditworthy.
3. On 17 August 2012., meeting with First Deputy Prime Minister – Minister of investment development of the Penza region on realization of the project of the construction of a UPB in the Penza region Lunin district, has identified interest in the project UPB.
4. First Deputy Chairman of Penza region government, the Minister of investment development of the Penza region, expressed the following proposals, which formed and received confirmation the following:

- OJSC "development Corporation of the Penza region", under the government of the Penza region, ready to enter into the company (create a Customer), for the project UPB.
- OJSC "development Corporation of the Penza region" - has on the balance structures.

- removing tax burdens on new high-tech plant for the production of quality bitumen total output number, up to 7 – 8 years,

Were announced guarantees by the government of the Penza region Minister of investment development of the Penza region, the commitment to preparation of technical documentation for permit and connection to the organizations:

- ✓ – ensure gas,
- ✓ – electric power,
- ✓ – provision of water,
- ✓ – the allocation of land for construction of UPB,
- ✓ – a building permit UPB,

- The results of these studies should be assessed as positive, for the decision on the implementation of the project construction installation production: roofing, construction and road bitumen improved in the region – work village. Penza Russian Federationи.

With the Administration of Lunin district of the Penza region were issues worked on the railroad with organizations:

- The Penza centre of the organization of work of railway stations of the Penza region, Penza
- the branch of JSC "RZD" Kuibyshev railway, Samara.
- the branch of JSC RZD's Central Directorate of traffic management, Moscow,

on the land plot allocated for construction of bitumen production:

- The Federal service for supervision of consumer rights protection and human welfare. Branch of Federal budget institution of health "Center of hygiene and epidemiology in the Penza region ".
- JSC "Penzagazifikaciya".
- The branch of JSC "IDGC of VOLGA" - "PENZAENERGO".

Organizations who have confirmed their intention to participate in the project UPB, as well as having experience in providing oil and gas companies own products confirmed by certificates and reviews.

1. The developer of the technology and equipment lower discharge UNSM-15 – CJSC "EXPO" of the Russian Federation Khabarovsk,
2. Developer of technologies for energy and environmental equipment CJSC PFC "RYBINSK COMPLEX" of the Russian Federation Rybinsk, the Yaroslavl region,
3. Design, manufacture, supply, construction and installation, commissioning works, tank farm and vessels. CJSC "KhImstalkom - Engineering" Russian Federation, Saratov.
4. Laboratory equipment series LOIP CJSC "LOOP" Russia, St. Petersburg, Industrial regulators EMERSON, FISHER, mission of the Russian Federation, Germany,
5. Industrial boilers and steam boilers. ZAO "vapor" mission of the Russian Federation St.-Petersburg, - VAPOR Finland,
6. The design and construction of railway track and railway infrastructure, LTD. STROYKOMPLEKT 2, the Russian Federation, Moscow
7. Drilling industrial water wells. Drilling rig construction company of the Russian Federation Moscow, Balashikha, Moscow region.
8. Vehicle model LOK – 20.300, for supplying cleaning railway rolling stock, LLC Terrikon mission of the Russian Federation St.-Petersburg, the company's ZEPHIR Italy,
9. Complex equipping of chemical analytical laboratories. State standard samples for the analysis of petroleum products (REV, PL., CH.) series EK. (production - St. Petersburg),
10. Delivery of laboratory furniture, laboratory equipment, instruments and utensils. The company "Eco project", Moscow.
11. The Rosemount ultrasonic developer and manufacturer of instrumentation, equipment and systems for industrial automation (instrumentation and control). Company ZAO "Albatros ", Moscow,
12. The production of cross-linked polyethylene pipe PEX-A material. ZAO "TVEL-PEX" St. Petersburg,
13. The production of station equipment, oil depots, loading posts. JSC "PROMPRIBOR" Livny. Orel region.
14. Developer installation module unloading of oil products from rail tank cars. LLC "ARG - Set - Technology neftenaliva". St. Petersburg.

All businesses have the appropriate licenses, certificates confirming the activity of the enterprise, quality of products and provided works.

Conclusions.

Proposed and anticipated technology solutions, for inclusion in the production process of the manufacture of binders, with the associated possibility of obtaining fuel fractions, the fractionation of the primary raw materials entering the production process of processing of fuel oil M-100 with a sulphur content of 1.0<S<3.5% of the mass, opens great prospects in the following the possibilities of using the industrial complex:

- expanding "horizon" of supplies of raw materials, which implies a departure from monopolization, dependence from one or two manufacturers, shippers,
- expanding the distribution of volumes of deliveries of raw materials between shippers with the calculation of transport logistics, which makes it possible to provide the industrial complex of the basic raw materials based on production needs.
- the inclusion of industrial-technological scheme of vacuum columns, vacuum unit, (in the method of fractionation of heavy fuel oil aimed at improving the performance of the column selection of target products, as well as improving the quality of distillate fractions), aimed at the production of the complex during the entire calendar year (provided technological regulations for installation), regardless of seasonality and demand one or two kinds of commercial products,
- expanding "horizon" of production, the range of marketable products with the requirements of existing standards, such as the Russian Federation, and the International,
- the inclusion of industrial-technological scheme of vacuum columns (method of fractionation of oil), also aimed at improving the performance of the column, selection of target products, improve the quality of distillate fractions, and the known methods of obtaining marketable products by mixing (compounding), to produce marketable products according to the requirements of existing standards, such as the Russian Federation, and International, either as a residual,
- the inclusion of industrial-technological scheme of liquid chromatography allows to determine the quantitative components of group of components of heavy petroleum fractions:

- fuel oil,
- tars,
- the cracking residues,
- bitumen,

The obtained results allow to select the mode of operation of processing units to predict the performance properties of bitumen, fuel oils and other heavy residues. Automatic processing of the chromatogram allows us to calculate the composition in percent by weight.

All of the proposed technical solution, implemented the project, will contribute to the continued effectiveness, efficiency, progressiveness, high coefficient of steps on each technology area of work: instruments, mechanisms, devices, the industrial complex, but in General, the single production complex, which may become a prototype for similar projects in other Russian regions, and abroad.

App

A brief overview and analysis of the market for improved road bitumen. Prospects, trends in road construction.

Historical background.

Mass consumers of bitumen in our country and abroad is road, industrial and civil construction. Bitumen in road construction are the main binder in the creation and rigid pavements. A large percentage of improved roads have asphalt pavement. Growing road freight transport , as well as a significant increase in the vehicle fleet , require extension of the construction of paved roads. For transport and operating advantages of asphalt pavement is their evenness, the ability to achieve and maintain the desired surface roughness, short terms of carrying out repair and rehabilitation works (practically without interruption of the movement), high operational reliability, low noise. The noise level on asphalt pavements – the lowest among other types of improved coatings. The average 3 dB smaller than in cement. One of the serious drawbacks of concrete coatings that are comparable in techno-economic indices with asphalt coatings, are the difficulty and duration of their repair and reinforcement, restoration of surface roughness, the inability of staged construction. Road construction requires a large consumption of organic binders. So, for the construction of roads with asphalt is required to spend 50 – 200 tons of bitumen for 1 km (depending on the category of road). Given the tendency to increase axle load of the vehicle and accordingly to increase the solidity of road structures, as well as increasing use of local materials, processed binder during devices road basis , the specific consumption of organic binders during the construction of road pavements will increase to 150 – 500 tons for 1 km.

Carry out repair and maintenance works on the existing road network also requires significant inputs of organic binders. For major repairs of asphalt pavement bitumen must be at least 70 t/km, for medium repair – 15 – 20 t/km. a Significant amount of organic binders required for transfer to a higher category roads local network. For devices lightweight coatings on these roads, the consumption of organic binders is at least 50 – 70 t/km.

Therefore, for road construction requires millions of tons of organic binders. In particular, the level of production of petroleum bitumens of the USSR ranked second in the world after the U.S., but the volume of their production was almost 3 times lower than in the USA. Suffice it to say that in per capita in the USSR, bitumen produced less than in Japan and France in 1,3 – 1,5 times, in Belgium, Switzerland, Norway, Holland – 1,6 – 1,7 times, in Austria, Germany 2, in Canada – 5,5, US – 3.9 times.

The use of organic binders for road construction gives a significant effect. At high operational performance of such roads reduces the cost of transportation by 20 to 25 % compared to pavement transition, and the consumption of fuel when driving cars.

For example, the increase in fuel consumption when driving car of gravel is 15 to 20 % compared to fuel consumption on asphalt pavements. Thus, the cost of petroleum bitumen to a device of improved road surfaces will be compensated by savings of fuel oil (gasoline, diesel) consumed in the movement of vehicles.

Calculations show that the cost of 50 ton bitumen for translation 1km of road with gravel surface to a higher category by device lightweight provide coverage for the service life of this coating savings of 150

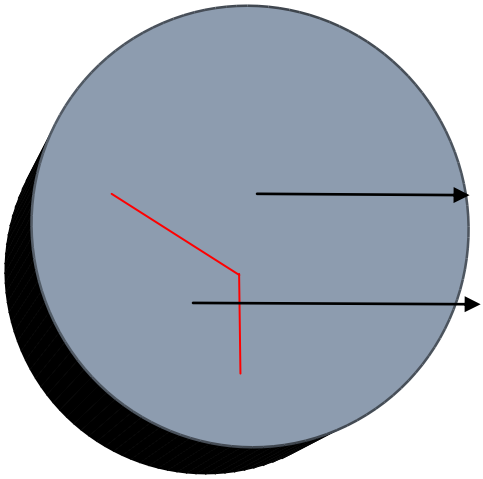
– 200 tonnes of oil products when the average intensity of movement by improving the working conditions of vehicles.

Thus, 1 ton of crude oil consumed for the production of road bitumen, in the end will save about 3 tons of the crude oil consumed as fuel. It is necessary to take into account that organic binding materials belong to the category of renewable resources (i.e., can be reused), whereas gasoline, diesel and other fuels are burned, is consumed is not renewable. Annually, due to inadequate development of network improvements road loss (burn fuel), up to several million tons. Calculations of energy intensity of the construction of asphalt pavement, including the cost of energy for the preparation of starting materials, their mixing, transport, laying and compaction, showed that the overall energy intensity of 1 km asphalt pavement (with a width of 15 m) are about 9 . 108 kcal, 1.5 – 2 times less than the intensity of concrete pavement (on average 16 . 108 kcal). Almost equal to the cost of construction of asphalt and cement-concrete pavements the maintenance and repair of cement-concrete pavements do twice as much.

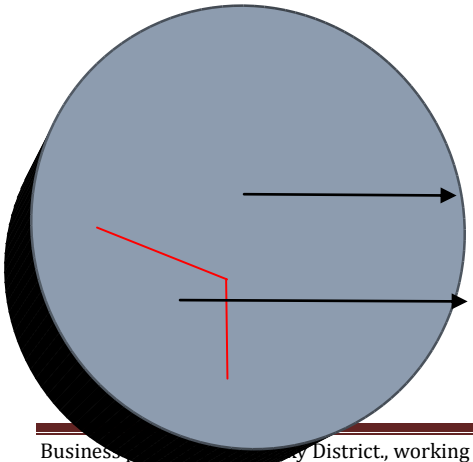
It is undeniable that the quality of cement production and the technology of production of cement-concrete pavements move forward and find their application in road construction. Analysis of raw materials, suitable for the production of organic binders, shows that existing supplies of organic raw materials sufficient to ensure long-term needs in road construction.

Russia, Europe, USA, some comparative figures

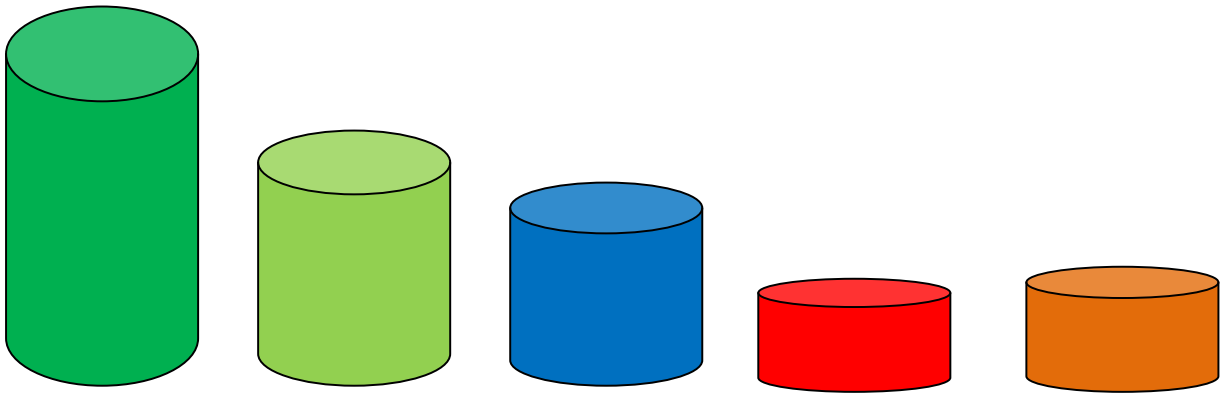
The share of the Russian motor roads of Federal importance, relevant regulatory requirements.



The share of the Russian motor roads of regional importance, relevant regulatory requirements.

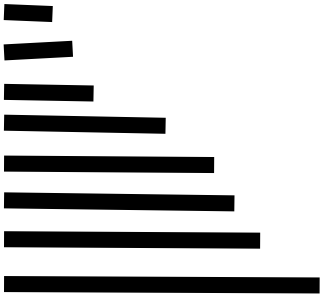


The average cost of 1 km of road of category 1A in different European countries, million Euro.
(data of the Federal road Agency.)



Switzerland	Sweden	Norway	Germany	Russia (the alternate M 10)
45	26,67	23,57	19,15	19,6

Funding for the construction of roads per inhabitant per year, euros *



- China – 10,
- Kazakhstan – 22,
- Russia – 35,
- Germany – 195,
- Финляндия – 250,
- Canada – 270,
- France – 292,
- USA – 340,

* World Bank data.

The quality of roads *

1. Singapore
2. France
3. Hong Kong
4. Switzerland
5. Germany

127. Serbia
128. Russia
129. Montenegro
130. Mongolia

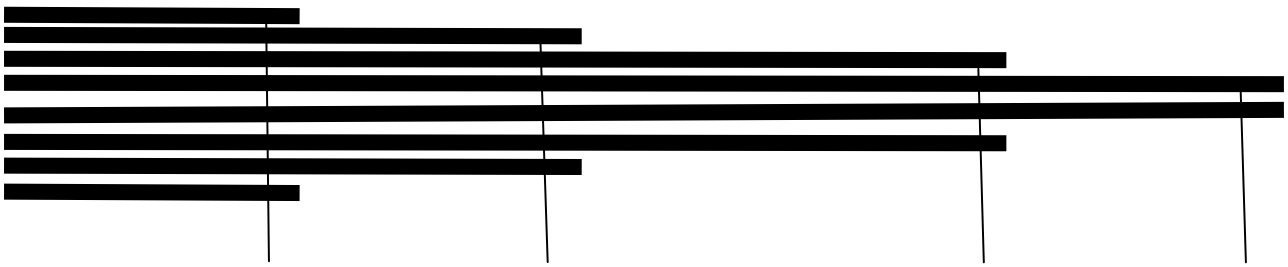
* World Bank data.

Which country is easier and faster to obtain a construction permit *

15. Hong Kong
16. Singapore
17. Saint Vincent and the Grenadines
18. Belize
19. New Zealand
20. Marshall Islands
21. Georgia
22. Сент-Китс
23. The Maldives
24. Denmark

174. Malawi
175. Burundi
176. Serbia
177. India
178. Tajikistan
179. Ukraine
180. Tanzania
181. China
182. Russia (average 504 days)
183. Eritrea

* World Bank data.



0,15% (74,8 км) 8 lanes | 0,30% (157,1 км) 6 lanes | 10,00 % (4997,2 км) 4 lanes | 89,55 % (44897,9 км) 2 lanes

According to recent reports, the situation in road construction in Russia – following. Thousand km.

The volume of construction of Federal roads.

The period from 2000 – 2013 г,

46 тыс./км

51 тыс./км

The volume of construction of regional roads.

from 2013 года

486 тыс./км

452 тыс./км

Conclusions.

The peculiarity of the climate of Russia leads to the use of roads in very difficult conditions. The range of temperature difference on the surface of the road surface sometimes reaches 100 degrees, and domestically produced petroleum bitumen, on such conditions are not calculated. As a result in winter cracks and summer – track. As a result there is an urgent need to maximize the interval ductility of bitumen, to use binders of the bitumen in all climatic zones.

Advanced technology for the production of improved bitumen and receipt of asphalt mixtures based on them, have not yet found wide application in Russia.

If there are no tasks that need to put the road sector, the development of bitumen production, aimed at a fundamental improvement of quality, increase efficiency of road bitumen in the modern conditions of road surfaces, does not occur.

It is advisable to create in different regions of our country specialized companies, equipped with modern equipment, strengthened quality control system and highly skilled engineering and technical personnel who would be involved as the development of formulations of various types of binders for a specific customer and targeted the shipment of commercial products, custom. This would relieve contractors, Asphalt concrete plant is not an inherent feature of the production of modified bitumen artisanal, unstable quality, to increase the pace of introduction of new materials in road industry of our country, and to increase the efficiency of their use through improved quality.

The above information with statistical data suggests that the prospects for road construction with the use of organic materials – bitumen, will be in demand. Requirements to the quality of road bitumen, will only become tougher.

A principled approach to the changing requirements in quality and says the Resolution of the Roundtable "Innovative development of the road sector" Transport week 2012 December 7, 2012 Moscow, as well as new technical requirements for bitumen oil road viscous.

A HUNDRED state-owned company AVTODOR, develop and adopt technical specifications for the bitumen road improved from 29 December 2011, No. 219 of 01.12.2011 g.

There are all prerequisites for what would be argued that with time the situation will change for the better, it will be assumed that the bitumen is a valuable product, and bitumen business in Russia can and should be successful.

The tightening of regulatory requirements for the quality of the construction of road surfaces will force traffic to use higher-quality materials, without a special state program - can not do.