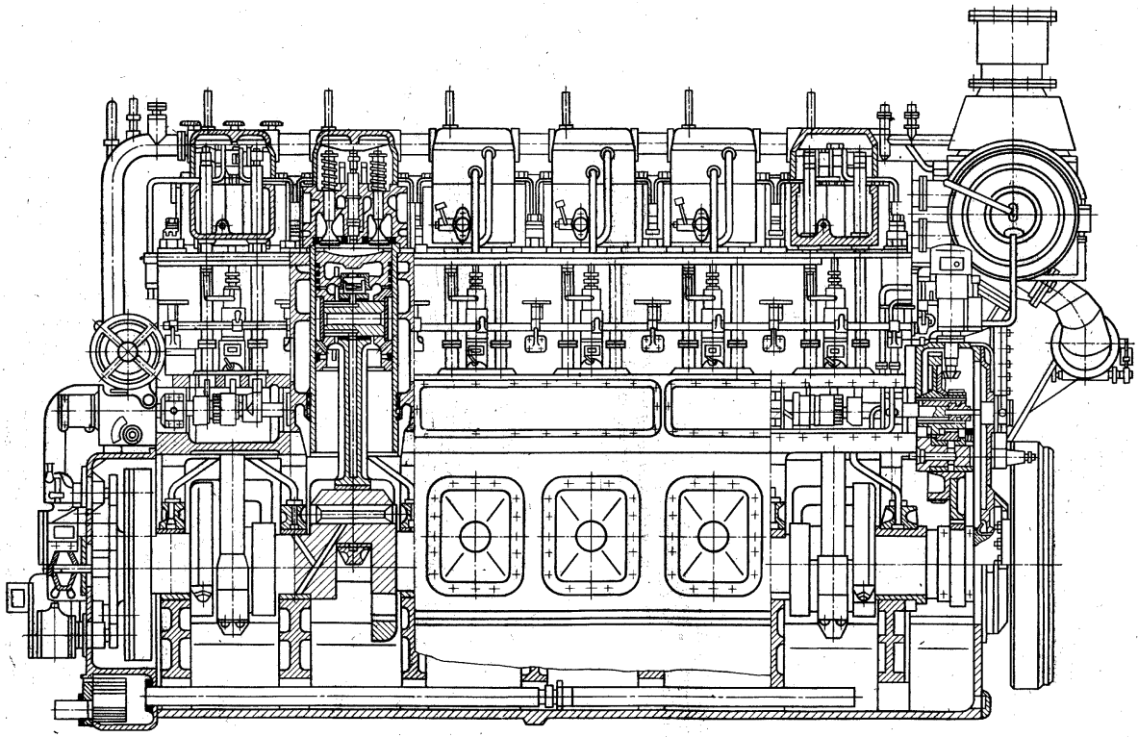
In September 2013, the specialists **“ Ohotskenergo "** (the activity of the enterprise - the production and transport of electricity in the Okhotsk area, Khabarovsk Territory, Russia **)** installed on the modular power plant (3 diesel generator G72M) module for processing diesel fuel **TRGA-3G-06**. The module works in the feed tank recirculation line.

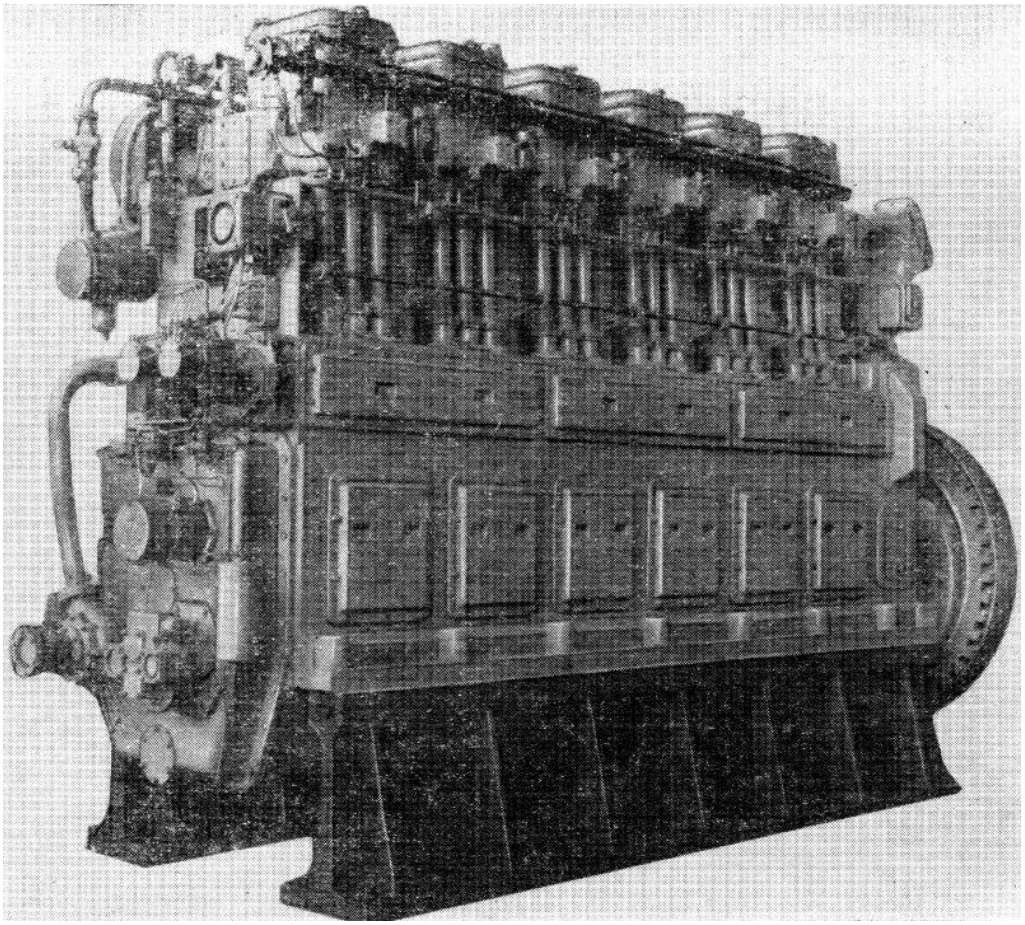
Main results of the first season of work (November 2013 March 2014).

N	**Before install module TRGA-3G-06.**	**After install module TRGA-3G-06.**
1.	actual maximum working capacity the diesel generator - 600-650 kW	actual maximum working capacity the diesel generator – 700 kW and a bit more
2.	specific fuel consumption in nominal power 255 g / kWh	specific fuel consumption in nominal power 220 g / kWh
3.	during working at maximum power - a small amount of smoke	during working at maximum power – no smoke
4.	during working at maximum power - overheating of the cooling system, the need to reduce engine rpm	during working at maximum capacity - normal engine operation without overheating for a long time
5.	when opening the engine for service work - the remnants of unburned coke on the valves and exhaust manifold	when opening the engine for service work - no remains unburned coke in the valves and the exhaust, fuel injection pump without damages

Daily consumption of one station (3 generators) - **30 tons of diesel fuel.**

Diesel engines 6CHN36 / 45 (G72M and G99 made in USSR) are used as stationary diesel-electric units and diesel engines 6CHRN36 / 45 (G70-5 and T-74) - as the main engines of marine and river vessels. Longitudinal and cross sections of a diesel engine shown below





DG72M Diesel-Generating Set

DG72M diesel-generating sets manufactured by "Dvigatel Revolutsii" (“ engine of the Revolution “) (at this time called JSC "RUMO"). Diesel- generating sets serve as the major source of electric energy for areas which are far away from central electrical power systems, standby power supply for enterprises with a continuous process facing the problem of regular power failure. Years of manufacture 1990-1997.

TECHNICAL DATA

Diesel engine model	G72M (6CHN 36/45)
Rated power of diesel engine, kW. (h.p.)	882 (1200)
Maximum power of diesel engine kW (h.p.)	972.5 (1320)
Power of diesel-generating set, kW	800
Generator voltage, V	400
Diesel engine is coupled with diesel-generating set with rigid flanges. The set is installed on a common foundation.	.
Crankshaft speed, rpm	375
Number of cylinders	6
Cylinder bore, mm	360
Piston stroke, mm	450
Fuel	Motor fuel
Specific fuel consumption for power	.
rating g/kWh	223,2
Engine oil	M10B2C, M14 B2
Specific oil consumption for power rating, g/kWh, for carbon monoxide fumes	1.22
Oil poured into oil receiver, kg	1000
Internal circuit cooling liquid	Fresh water hardness not more than 4 mg equ/h.p. with 1% VNII NP-117D additive or extrol emulsion
Cooling liquid poured into internal circuitt, kg	800
External circuit cooling	Flowing water
Degree of automation as specified by GOST 14228-80	1st
Octane levels of sound pressure and volume level, measured at 1m distance from diesel engine external circuit not higher, dBA	85
Average specific emission:	.
- nitrogen, g/kWh (g/h.p.h)	15 (11,04)
-carbon, g/kWh (g/h.p.h)	4 (2.944)
Weight of the heaviest part –cylinder block, kg	8,750
Dry weight of diesel engine without fly wheel, kg	25,500
Weight of diesel-generating set, kg	6,100
Specified service life (engine operating hours)	.
- continuous operation	1,500
- before first overhaul (piston lift)	15,000
- before major overhaul	60,000
- before complete overhaul	60000

http://www.apparatdiesel.ru/english/ttx_dg72.htm

The necessity of rigid fuel economy caused by such reasons -

1. High cost of repairs of engines and spare parts delivery from Vladivostok.
2. Seasonal fuel delivery. In winter, when the sea freezes over - delivery of fuel by ship is impossible

Immediately after the end of the first season of operation module for processing TRGA-3G-06, “ Ohotskenergo " Ltd, has bought 5 sets homogenizers TRGA-3G-06.

On it basis our representatives have made fuel modules for the treatment of diesel fuel and shipped to customers to Okhotsk.

Previously

- were made several tests to determine the diesel fuel savings on large diesel engines (diesel test stands, locomotive engines, ship engines) - in all cases, the lower limit of the fuel economy was at 4%.

More info here - **http://www.energy-saving-technology.com/paket/test-tallin.pdf**

Some examples

1. Technical University of Tallinn. **Chief of the Test** - PhD Rhine Muonio. **Equipment** - special stand made in Italy (Richard HYDRA), diesel engine, 4 cylinder, 5 kW, hydraulic brake, electronic equipment for monitoring and control. Result - increase in engine power up to 10%,

2. **TRGA modules for processing fuel in ships without additives - Pilot project. PSSF technology presentation. TYPE APPROVAL Certificate IACS.** Result - fuel economy 4%.

3. Tests on the locomotive. Ukraine.
Visual change in the amount of smoke in maximum mode of the engine

work on a standard diesel fuel

work on diesel fuel that has been processed by module TRGA

http://www.afuelsystems.com/ru/gok1/goks.html

Work on a standard diesel fuel.

The engine has used **1,000 liters of diesel fuel and produced 189.9 mWt of electricity.**

ОАО «Северный горно-обогатительный комбинат»

АКТ

г. Кривой Рог
«11» декабря 2008г.

Мы, нижеподписавшиеся, комиссия в составе:
1. Начальник транспортного отдела Климин О.В.;
2. Главный метролог ОАО «СевГОК» Козлов Ю.И.;
3. Начальник цеха по ремонту подвижного состава Бандоля А.А.;
4. Представитель управления безопасности;
5. Ведущий инженер ОСПД Гуляев И.Н.;
6. Мастер локомотивного депо Абрамцов В.В.;
7. Частный предприниматель Рубан А.В.

составили настоящий акт в том, что «11» декабря 2008г. на тепловозе 2ТЭ10М № 109 №26 проведены испытания топливного активатора на мастивированном дизельном топливе.

Испытания проводились на реостатной установке локомотивного депо УЖДТ на 10-й позиции контроллера машиниста. Заправка топливного бака тепловоза производилась из мерной емкости МО-1000 объемом 1000л. Мощность дизель-генераторной установки фиксировалась по электронному самописцу LOGOSCREEN 500, время работы дизеля тепловоза до полной остановки – по электронному хронометру.

Температура воды системы охлаждения дизеля на момент начала испытаний составляла 70,5 °С.

Атмосферное давление воздуха 767,62 мм рт.ст. (0,10234 MPa).

Температура окружающего воздуха : +0,5°С.

Результаты эксперимента приведены в таблице.

Контролируемый параметр	Ед. измерения	Величина параметра
Время работы дизеля до полной остановки	минут	3 часа 29 мин. (209 мин)
Расход дизельного топлива на прогрев воды дизеля (показания мерной линейки)	литров	213 л.
Расход дизельного топлива на эксперимент (по мерной емкости МО-1000)	литров	1000
Расход дизельного топлива на эксперимент (показания мерной линейки)	литроз	1000
Суммарная выработанная мощность д/г установкой за время эксперимента	кВт	189924,2 (189,9 мВт)

примечания / доп. информация
1. Температура охл.воды дизеля 70°С, масла 55°С.
2. Неприкасаемый остаток в баке тепловоза 137 литров.
3. Перед запуском т-за в баке 1137 литров

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6. Абрамцов В.В.;
7. Рубан А.В.

http://www.afuelsystems.com/ru/gok1/sevgok.html

Work on diesel fuel that has been processed by module TRGA.

The engine has used **1,000 liters of diesel fuel and produced 242.8 mWt of electricity.**

ОАО «Северный горно-обогатительный комбинат»

АКТ

г. Кривой Рог
«12» декабря 2008г.

Мы, нижеподписавшиеся, комиссия в составе:
1. Начальник транспортного отдела Климин О.В.;
2. Главный метролог ОАО «СевГОК» Козлов Ю.И.;
3. Начальник цеха по ремонту подвижного состава Бандоля А.А.;
4. Представитель управления безопасности;
5. Ведущий инженер ОСПД Гуляев И.Н.;
6. Мастер локомотивного депо Абрамцов В.В.;
7. Частный предприниматель Рубан А.В.

составили настоящий акт в том, что «12» декабря 2008г. на тепловозе 2ТЭ10М №0321126 проведены испытания топливного активатора на активированном дизельном топливе.

Испытания проводились на реостатной установке локомотивного депо УЖДТ на 9-й позиции контроллера машиниста. Заправка топливного бака тепловоза производилась из мерной емкости МО-1000 объемом 1000л. Мощность дизель-генераторной установки фиксировалась по электронному самописцу LOGOSCREEN 500, время работы дизеля тепловоза до полной остановки – по электронному хронометру.

Температура воды системы охлаждения дизеля на момент начала испытаний составляла 65 °С.

Атмосферное давление воздуха 768,44 мм рт.ст. (0,102453 MPa).

Температура окружающего воздуха: -2,5 °С.

Результаты эксперимента приведены в таблице.

Контролируемый параметр	Ед. измерения	Величина параметра
Время работы дизеля до полной остановки	минут	2часа 54мин (174 мин)
Расход дизельного топлива на прогрев воды дизеля (показания мерной линейки)	литров	140 л.
Расход дизельного топлива на эксперимент (по мерной емкости МО-1000)	литров	1000 л.
Расход дизельного топлива на эксперимент (показания мерной линейки)	литров	1000л.
Суммарная выработанная мощность д/г установкой за время эксперимента	кВт	242824,7 (242,8 mWm)

примечания / доп. информация

1. Для удержания одинаковой нагрузки по ходу испытаний, в 13[00] (через 8 мин. после начала эксперимента) ленивы на 9 позицию К.М. (наблюдается рост тока и напряжения)
2. Неиспользованный остаток в баке т-за 130 л.

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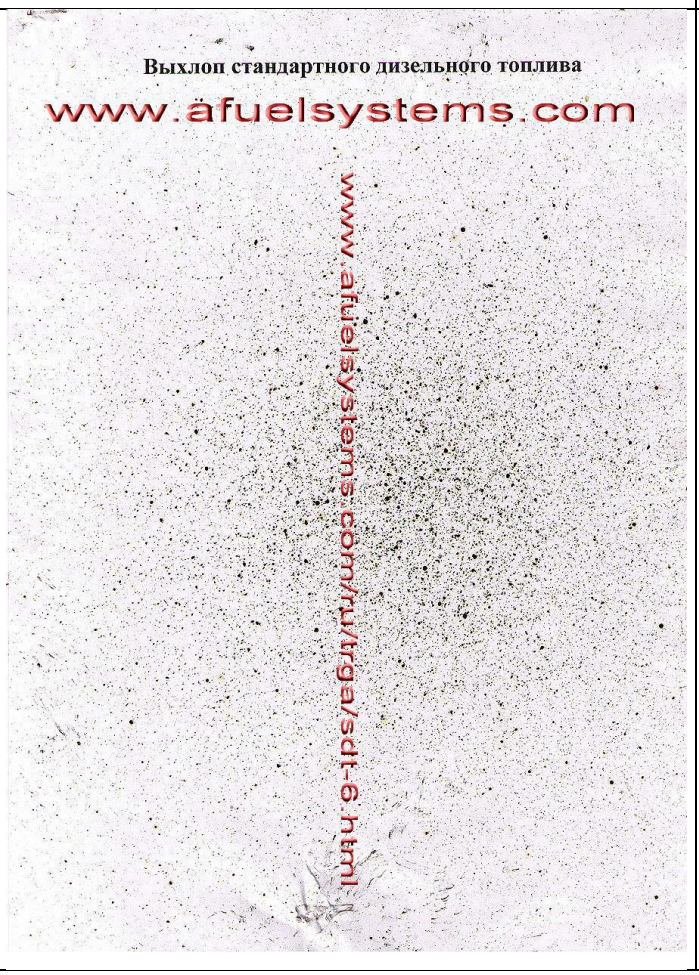
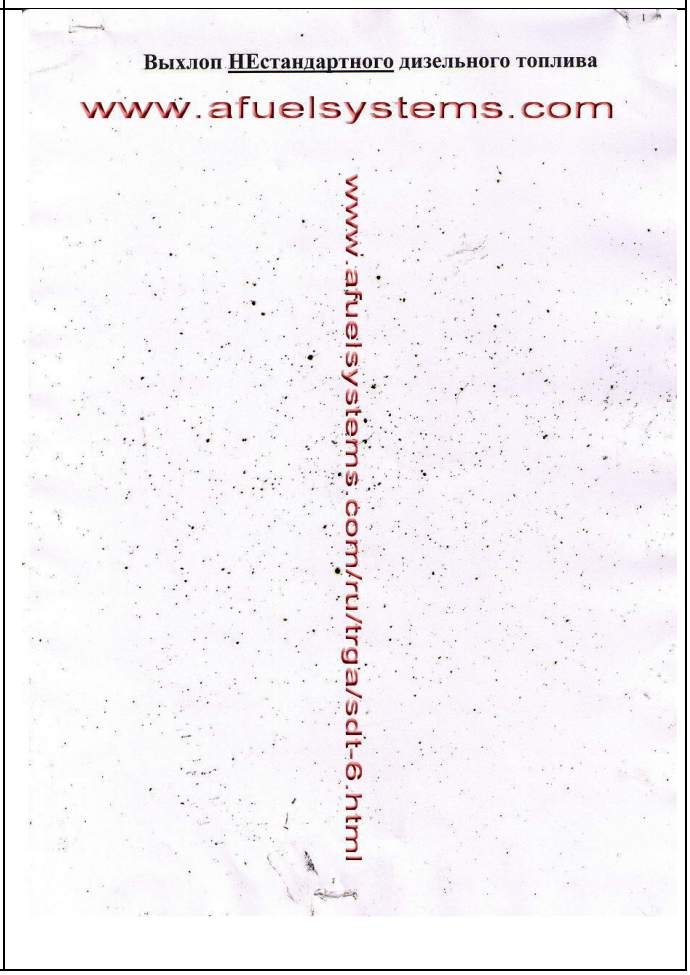
http://www.afuelsystems.com/ru/gok1/sevgok.html

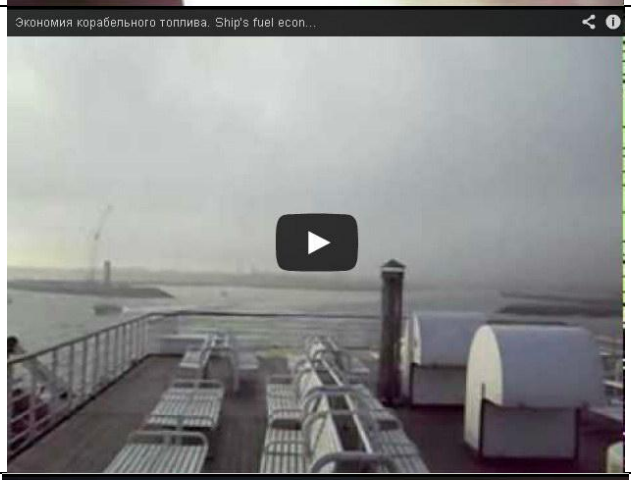
Important Notices

1. In all tests, the wear of the diesel engine was between 30% and 70%.
2**.** Specific fuel consumption for the production of 1 kWh of electricity was never less than the certified value (norm in the engine technical documentation)) of each diesel engine.
3. In this way, we can say that "there is no miracle". Work worn diesel engine on fuel, which is processed by TRGA module, in the parameter specific consumption - nearly to the values of the new engine without wear.
4. A bit about the ecology of the exhaust gas :

cars exhaust gas **working on a standard diesel fuel**	cars exhaust gas **working on diesel fuel that has been processed by module TRGA**
	

This is a photocopy of a sheet of plain paper, which was installed in front of the exhaust pipe of my diesel generator for 30 minutes for each type of fuel.

If these sheets seem a bit naive take a look on this

	Films from test systems for marine fuel savings PSSF Ship leaves port using a **standard ship's heavy fuel IFO-180** direct link to the film
	Films from test systems for marine fuel savings PSSF Ship leaves port using ship's **heavy fuel IFO-180 processed by the system PSSF** direct link to the film
	Films from test systems for marine fuel savings PSSF Ship leaves port using a **standard ship's light diesel fuel** direct link to the film
	Films from test systems for marine fuel savings PSSF Ship leaves port using a standard ship's **light diesel fuel which processed by complete system PSSF** - decrease smoke, fuel economy, ecology direct link to the film

Add films here - www.energy-saving-technology.com/en/trga_ship_films_2.html

Of course, in addition to reducing the amount of smoke and fuel economy, **two important points.**

1. Operation of the diesel engine on the treated diesel fuel does not destroy the diesel engine.
2. Module TRGA works reliably for a long time and requires minimal maintenance.

The overall results of the use of ship's modules TRGA testing on ro-ro ship Larkspur "from 19 to 22 08. 2012

	Operation on the standard fuel	**Using module TRGA only on the buffer tank**	**Using module TRGA only on the settling tank**	**Using module TRGA on the buffer tank and on the settling tank**
The main observed effects				
Flue gas temperature St. (C)	325 326 337	356 356 357	353 347 353	**368** **370** **370**
Level CO	100%	- 3.8 – 6.4 % -5.27 – 6%	-6.47 – 10.39%	**-10 – 14.97 %** **-12.34 – 13.67**
Visual amount of smoke **length in meters of water followed**	100% at startup – a lot of smoke during the driving 30-80 meters	at startup – less for 30% during the driving 5-40 meters	**at startup – less for 40%** **during the driving 5 - 10 meters**	at startup – less for 30% during the driving 5 - 20 meters
The amount of fuel sludge from the separator	0.692 tonnes per day Of which the fuek is 415 kg	0.692 tonnes per day Of which the fuel is 415 kg	0	**0**
	1	2	3	4

Additional effects of the installation of ship modules TRGA

1. Additional heating fuel. **TRGA modul provides heating fuel in a buffer tank on the temperature of 85-90 degrees**, what reduces the viscosity of the fuel, using fuel or high binding in the case of poor fuel heaters lining the resin, which is the build-up. **TRGA module provides heating fuel in settling tank so that the fuel is heated to 5 ° C in a streaming through the module.**
2. Reducing the amount and size of solid particles in the fuel directly affects the speed and reduce the amount of fuel sludge to collection tanks for fuel mud tank and, in addition to direct fuel saving, provides cost generated by the fuel acquisition sludge by the port services.
3. Reducing the amount and size of solid particles in the fuel has a direct impact on the reduction of wear separator and saving in the cost of its repair and maintenance.

More information you can see in the presentation of the effects of the operation of our systems on the ship - http://www.energy-saving-technology.com/documentation/ship/trga-ship-light-en.pdf

4. Reducing the amount and size of solid particles in the fuel has an indirect impact on reducing pollution **settling tank** and the costs incurred in cleaning.
5. Using a modul TRGA back to the **buffer tank** provides a softer transition from a heavy fuel engine and vice versa, which, in addition to reducing the heat load allow to start the transition process in less fuel earlier, which also saves on diesel.

Reliable operation of modul TRGA

Module TRGA on the buffer tank has worked continuously from 28. 11. 2011 to 15. 8. 2012, which means for 9 months. TRGA module did not require continuous monitoring or any maintenance. TRGA module did not require any cleaning, adjustment, or replacement of any parts or regulation. TRGA module was turned off before testing in August 2012, and after the test is still working. Reviewof TRGA module during testing showed that the module is in an excellent and perfect mechanical condition and has no traces of wear.

Module TRGA in a settling tank has worked continuously from 19. 8. 2011 to 18. 10. 2012. The module did not require continuous monitoring or any maintenance. The TRGA module did not require cleaning, adjustment, replacement of any parts or regulation.

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