

Stove heating of multistorey temples in Monastery built at the place where the remains of the Tsar's family have been hidden, Yekaterinburg, Ganina Yama.

By I. V. Kuznetsov

A little history: On the night of July 17, 1918 a murder of the family of the Romanovs, the last Russian tsar, was committed in Yekaterinburg. The death of the Imperial family is a deadly sin of Russia which appeals to expiation and repentance. Only through repentance the forgiveness comes and the Russian people will come back to genuine orthodox values.

At present we have people understanding this and who according to their lights and possibilities do good at the location where the crimes took place. Without support of such people it is difficult to decide something. These people at their own expense and according to their capabilities help to change the situation in the country and bring it back to faith. At the place where the butcherly annihilation of the killed took place within one year only a monastery was built. It would be impossible without constant support of welldoers and donators. Everything in life should be paid for and all the deeds, the good ones and the bad ones will be scored up.



Erection of the monastery has become a monument to the innocent killed the Romanovs as well as to millions of the best people of Russia who were crucified, shot or killed in wars, civil strives, detention camps, and those who died during deportation irrespective of their nationality and confession. This monastery is a ransom of Russia that carries sin for the death of the Imperial family, Russia that destroyed and annihilated the temples and orthodox culture that have been created during centuries, and changed the genuine orthodox values for the ideology of the temporary ones. This monument is now being visited by people from all Russia and from other countries of the world. This is an acting center of aggregation of youth to the genuine spiritual things showing the way to obedience and resignation. Every evening sayings of service and processions take place here.

Additional information can be found in the book «Penance» printed in 2001 in Yekaterinburg by the «Philanthropist» publishing house. The idea of issuing this book as well as financing belongs to A. A. Kozitsin. He also supports the construction of the monastery.

The monastery is being built in the forest, 10 km from Yekaterinburg. Until now four temples out of seven that were planned to be built have been already built. Besides a great many cells and other constructions have been erected. All temples and compositions are made from timber 30-55 cm in diameter. Power transmission line of 10 kW have been fed to the monastery, and a transformer have been installed. There is no power backup to the transformer.

In what way the heating of the monastery buildings is to be done best?

Let's consider this question, for example, viewing heating of St. Sergi Radonezhsky Temple which is being built in the monastery.

The building of the monastery of complex and changeable height and cross section with cupolas has three storeys, one of them is semibasement. Two lower storeys feature utility rooms. There are many rooms on each storey that have to be heated. Due to complex conditions a proposal concerning water heating or air convectors making use of electric

energy was viewed upon. In order to ensure a safe energy supply it is necessary to have a backup line (V.L.).

One can turn the energy which is found in fuel into heat in different ways. One can use

different kinds of fuel having various prices. One can for example, burn expensive fuel which is brought from other places, coal or diesel fuel to produce electric energy (at a far distance from an object to be heated). The electric energy can be transmitted a long distances and then be transferred again to heat the desired object. The method of heating the buildings can be solved differently. It is possible to apply systems using inexpensive energy sources such as wood. The wood resources are renewable in the near future, whereas oil, gas and coal are rather limited. Labor inputs, cost and operating expenses of the renewable sources are much lower than electricity or other imported fuels.



At present electricity in Russia an expensive fuel, with constantly increasing price. The distribution lines are unsafe, overloaded, and unreliable.

If the above given reasons in favour of stove heating are not enough, let's consider the problem in a different way.

In comparison let's consider the operation of the suggested system of water heating using electricity as the main fuel and what can be done to increase efficiency of the system.

In Russia payment for using electricity at night is less than during the day. Therefore it is good to have a heat accumulator to have a possibility to accumulate energy during the night when the price is minimal and then use it for heating and also use the heat accumulator as a backup boiler operating on inexpensive local fuel. Everybody knows that in order to increase the temperature in a certain house it is necessary to burn much fuel, you need much energy. To keep the temperature at a certain level we have to use less energy. On these statements it is necessary to install in the water heating system a heat accumulating, massive stove with a built-in boiler. The stove is operating on wood and electricity, and is increasing the inertia of the system.

The system shall possess the following features:

It shall be burnt both by wood and by electricity and shall be suitable both for increasing the air temperature indoors, and for keeping constant air temperature. It shall be efficient (it is more efficient to heat the stove at the beginning by wood having increased the temperature and than to keep it during the night using electricity).

It should possess a big heat capacity and serve as heat accumulator.

Installation of such stove into the heating system even if it will not be burnt will lead to a certain economic effect. Traditionally electricity is used for heating the heat medium. In our case it is more rational to use electricity for heating the heat accumulator (stove) as in this case the heat inertia of the system is increasing. This is to be explained by the fact that not only the heat medium (water) is being heated but also the stove. In this case the heating temperature is being increased by several times. In this case the additional capital investments will be paid by the operating expenditures. The practice of using such stoves in the water heating system of individual houses showed that the costs for heating are reduced by several times.

In these circumstances for heating of the temple I suggested using stove heating in combination with water heating and electricity. What is the gist of the project? For heating of the temple four three storied (triple-deck) stoves having the height of 8 m, with a separate firebox on each deck are to be built. The medium heat transfer of one triple-deck stove per hour is 15 kW at two firings per 24 hours. All stoves operate for one pipe. That means that each of the stoves of each deck can operate separately or all together simultaneously for one pipe. In order to increase power (heat transfer) water boilers are installed in the stove of the first and second decks that are connected to heaters of the first, second and third storeys. Water circuit of each boiler is a separate one, it works only for its group of heaters. In order to increase the power capacity of the water heating system electric heaters (tans) are installed into the stove.

Besides, each water heating system may be equipped by a standard electrical water boiler of low capacity. The stove with a built-in boiler is built in such a way that the firebox has no cold core (i.e. there are no cold boiler pipes in the firebox), that makes it possible to significantly increase the temperature in the firebox and ensure a complete combustion of fuel and a high efficiency factor. (The stove with a built-in boiler may be of various functional designation: heating, heating and cooking stove and a Russian stove « teplushka»).

These stoves can be constructed using the principle of a » free movement of gases«. A stove of each storey is a double-deck one, hood above hood. The movement of gases in a hood stove (hood) takes place under the influence of the natural nature forces. A separation of gas flow takes place. The hottest gases being the most light ones go up to hood's ceiling and are accumulated by the stove, the coldest gases being the most heavy ones are collected in the lower part of the hood (from here they are retracted due to the pipe draft), without cooling the stove. The gases with an intermediate temperature are circulating between them. The heat transfer takes place due to convection (similar to air movement indoors), the heat energy is transferred by the gas jets themselves. Using this design it doesn't matter due to what energy the heat is made. The stove can be burn simultaneously by electricity and wood or separately. These stoves have a very small impedance to the gas flow, therefore they can be done as multistorey and work simultaneously for one pipe. Besides, under the hood ceiling a volume (a sack) of hot gases which is an ideal chamber for afterburning of the gaseous combustible mixture of wood and increasing the efficiency factor of the stove. This is the difference from other systems where the movement of gases takes place due to the pipe draft, and they do not possess the above mentioned features.



The idea of using water heating using electricity for heating heat medium, and using wooden stove for backup is not new. However, in order the system be effective, a stove (with a boiler) of new design based on the principle of « free movement of gases» should be installed into the system. I am well acquainted with the systems of water heating where a wooden stove with a boiler inside the firebox (cold core) was used for backup. In this case the temperature in the firebox goes down, and the combustion of wood is incomplete. The energy which is inside the wood is not used in full, it is lost with the smoke fumes.

Besides, in stoves with forced gas movement electricity cannot be used effectively for heating the heat accumulator. The heat medium in free-flow water systems can be heated up to 100° C, and the heat accumulator inside up to 450-600° C. While heating the heat accumulator the system becomes more inertious. After the reconstruction of traditional water heating systems using electricity as the main type of fuel according to our recommendations the expenditures for electric energy are reduced by 10-12 times. It is supposed that the system is used in a mode in which wood is used as the main fuel (the stove is burnt once or twice in 24 hours), and electricity is used for keeping the temperature indoors, preferably during the night. Such a solution gives a possibility of using (burning) any stove, any storey in any combination to ensure the necessary temperature indoors depending on the temperature outside. At the same time the question concerning the increase of efficiency factor of the whole heating system of the temple is being solved (dependence of efficiency factor upon the degree of using the heating element). The maintainability of the heating system of the temple is being increased too.

You can get additional information concerning new stove developments, ways and use of stove heating in the following articles:

<http://mha-net.org/docs/KUZNETSOV-02.PDF>,

<http://mha-net.org/docs/kuznet01.PDF>,

<http://mha-net.org/docs/v8n2/kuznetsov/comfortable%20bath.html>, on our site

www. stove.da.ru, as well as in a business server (in Russian) « Engineering support of construction», <http://www.ctc-bentone.ru/engineery/articles/>.

When God decides to punish somebody, he deprives somebody of mind. Perhaps we shall pay off for our sins for a long time. It is winter now in Russia, and millions of people do not have the necessary heat in their houses as expensive fuel which has been brought from other locations is used for heating, and there is no money to pay for it, and houses have no backup heating system. In Sochi the snow storm has destroyed high voltage lines. Primorye, Sakhalin, Kamchatka and many towns and regions of Russia in year 2000 and 2001 had problems with heating. Many organizations due to high costs for heating and electricity ran into big debts. Therefore power engineers switch off or restrict the supply of heat to living houses, regions, cities and territories while they cannot pay off for the fuel in due time. The ideas of energy saving which are laid down in my works could also be used in various technological processes. These can be boilers of small boiler rooms, various heating stoves operating on any fuel (efficient use of exhaust gases, etc). The energy received as a result of complete fuel combustion cannot evaporate. An efficient system of energy accumulation and its use operates during natural free movement of gas flow (in hood systems). I enclose remarks of the customer concerning operation of boiler that we planned to use in the temple's stoves.

Phone number: 591627

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REMARKS on the work of stove-boiler made according to the design of Igor Kuznetsov

In my cottage made of brick there is a boiler having a capacity of approximately 25 kWt , made according to the design of Igor Kuznetsov. It is located in a boiler room in the basin. The boiler itself is made of stainless steel pipes according to the enclosed drawing. The firebox is designed for the use of hard fuel and is covered inside with

refractory brick.

For the fuel I use only wood. In order to heat water up to the temperature of 50-70°C it is necessary to add wood three times. Then I close the pipe. The total volume of the boiler is 1.9 m³. Its dimensions are: 105x130x140cm.



I use the boiler at day time to maintain the necessary temperature. An electric boiler having a capacity of 10-12 kWt operates at night at night charge rate

The design of the boiler is exceptionally good. It has been operating during two seasons without any drawbacks. The heated boiler due to inertia keeps the necessary water temperature for a long time. It heats the basement which always keeps dry.

At the beginning and at the end of the heating season the boiler maintains the necessary temperature. From the estetic point of view the boiler looks quite nice and is made by highly qualified personel. I recommend it for use.

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In these conditions due to investigations of new possibilities of stove heating, lack of knowledge of new developments in this field a solution is adopted to construct stoves without boilers, and the deficiency of heat can be compensated by electric air convectors, the use of which does not make it possible to accumulate heat at night. This very variant was realized. Heating of other temples has been done in a similar way. Here below is a remark of Father Superior:



Выражаем слова благодарности и признательности за отличное тепло мастеру по Кудзнецову И.В. и советуем обращаться к нему за советом по поводу ~~совет~~ проблем с отоплением не будет.
иеромонах Сергий Романов.

« We express our gratitude for excellent stoves to master I.V. Kuznetsov and advise you to apply to him for advice and help, you will have no problems with heating».
Father Sergi Romanov

The clerk who made such a decision was not interested where the money of parishioners would go to. For bringing people closer

to God, for new Russia coming into being so as it will never be called « Empire of Evil» any more or for public utilities payment.

At present in Russia RAO ES, Russia is in charge of electric and heat energy. This company is a monopolist, it determines and fixes prices as well as determines the switching on and maintenance conditions for various objects. Probably this organization will solve the question concerning reducing of payment for electricity for churches. At present, however, this question remains unsolved. But probably in future when we will have some energy saving organizations that will compete with each other, we will be able to cope with the task.

It is a pity but most likely my point of view proved to be unconvincing.

Close to the monastery a seminary is planned to be built in which the above mentioned drawbacks will be eliminated.

I took pictures of the temples in the monastery several times. Some of the pictures I enclosed to this article. I was very surprised when I got the picture of St. Sergi Radonezhsky Temple that I made with operating stoves. I have not noticed anything unusual while taking a picture.

I took a picture at 4 p.m., it is shot number 19 out of 24 on the film. After the film was developed and printed the temple on the picture was in radiance. I cannot find an explanation for that. I enclose this picture.



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