



The Kizhi Federal Museum of Architecture and Cultural History  
Cultural Heritage Site of Special Value of the Russian Federation

## The Detailed Report

on Preservation of Kizhi Pogost Monuments  
(Kizhi Pogost, C 544) in 2012



The object included in the UNESCO  
World Cultural and Natural Heritage List

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**Dear colleagues,**

The following annual broadened report deals with measures of maintenance of the World Heritage Site — Kizhi Pogost in 2012.

Thanks to the long-term work that had been done previously, we managed to do a lot for preservation of the Kizhi Pogost ensemble and restoration of the Church of the Transfiguration.

Contacts with the World Heritage Committee, The Ministry of Culture of RF, The Government of Karelia Republic and other state authorities were of considerable importance in this process.

The most important event of the year was the continuation of restoration work on the Church of the Transfiguration. The lower part of the monument was restored during the winter and set on its original foundation, and the church started to grow skywards! Thus, the concept of restoring the monument by removing restoration tiers one by one without complete disassembly has been proved in practice. The first stage of restoration has been completed and the second one, which is the basic one, has been started. It concerns the restoration of the church proper by removing and reassembling separate elements in line with the approved technologies.

The development of the World Heritage Site Management Plan has been completed, and this is another noteworthy event. In 2013, the Museum plans to submit the document to UNESCO/ICOMOS experts for consideration. This is the first experience of this kind in the Russian Federation.

Large-scale works on the development of museum infrastructure were going on in 2012, and that will help to improve the territory around the Kizhi Museum and the surroundings of Kizhi Pogost.

All of the basic activities are financed and implemented according to 'The Plan of Measures for Protection of Kizhi Pogost and Development of Infrastructure of the Kizhi Federal Museum of Architecture and Cultural History' approved by the Decree of the government of RF 1663-p as of 07.11.2008.

The authors of this report expect your suggestions, remarks and wishes and will be thankful for your collaboration in preservation of the World Heritage Site.

*The Open-Air Museum Kizhi Director*

*E. V. Averyanova*

## **Section 1. Measures on protection of the World Heritage Site Kizhi Pogost in 2012**

The World Heritage Site “Kizhi Pogost” (Kizhi Pogost, C544), the object of federal ownership, is in day-to-day management of the Kizhi Federal Museum of Architecture and Cultural History, which is subordinated to the Ministry of Culture of RF. All kinds of activities on Kizhi Pogost are controlled by the Department of Surveillance for Compliance with the Law in Cultural heritage at the Ministry of Culture of RF.

### **1.1. Site Management**

The site is managed according to the legislation in force and the recommendations of the United Nations Educational Scientific and Cultural Organization (UNESCO) for the preservation of Cultural and Natural Heritage on the basis of strategic and current planning to be undertaken by the Kizhi Federal Museum of Architecture and Cultural History.

In 2012, the development of the management plan for the WHS Kizhi Pogost has been completed.

On the 1st of March, 2012, the Federal Department for Surveillance, Supervision and Licensing in Cultural Heritage issued the permission №12-12-09 to continue the first stage of complex restoration of the Church of the Transfiguration. This permission was valid until the 31, December, 2012.

On the 10th of January, 2012, the Federal Department for Surveillance, Supervision and Licensing in Cultural Heritage issued the permission №2-12-09 to complete the repair and emergency works on the roof and porch of the Church of the Intercession.

### **1.2. Development of a management plan for the World Heritage Site.**

In 2012, the development of a management plan for the WHS Kizhi Pogost during 2012—2022 has been completed. This work was done in cooperation between the Institute of Economy at the Karelian Science Center of the Russian Academy of Science (RAS) and the Kizhi Museum.

This document reflects a complex way of planning that coordinates interests and activities of the different parties interested in preservation and popularization of the WHS. It sets the goals, tasks and measures for the efficient protection, preservation and development of Kizhi Pogost.

The management plan has ascertained such a condition of the WHS in its natural and architectural surrounding that undoubtedly preserves its authenticity and integrity to the utmost. The criteria for choosing restoration methods for separate design elements and parts have been set as well.

Much attention is devoted to the issues of preserving historical landscape and developing cultural and historical destination of Kizhi.

Specific values of the site area and legal possibilities of its use have been stipulated in the plan.

The tourism strategy has been developed.

The management plan is aimed at the overall protection of authenticity and integrity of the WHS. In 2013, it will be submitted for consideration to the UNESCO World Heritage Centre.

The plan includes a complex of measures and steps to minimize the risks to lose the outstanding universal value of the WHS, to optimize the protection, sustained development and to establish the communications that coordinate different interested parties, state and local authorities.

### 1.3. Financing

In 2012, 62 021 047 RUB were spent on preservation of Kizhi Pogost monuments and restoration, including:

Equipment and tools for the work on the Church of the Transfiguration	264 400 RUB
Completion of the development of a management for the WHS	1073 800 RUB
Installation of the perimeter security system on the enclosure of the Church of the Transfiguration	51 900 RUB
Monitoring of the condition of logs stocked for the restoration of the Church of the Transfiguration	130 000 RUB
Research for the Church of the Transfiguration	305 400 RUB
Research and design works for the Church of the Transfiguration	5631 100 RUB
Engineering supervision for 1st stage of complex restoration of the Church of the Transfiguration	845 900 RUB
Continuation of 1st stage of complex restoration of the Church of the Transfiguration	47734 900 RUB
Restoration of the iconostasis of the Church of the Transfiguration	5778 200 RUB
Monitoring of wood biodestruction for Pogost monuments and its architectural surroundings	85 447 RUB
Monitoring of deformations of the Pogost buildings	120 000 RUB

### 1.4. Protected and buffer zones

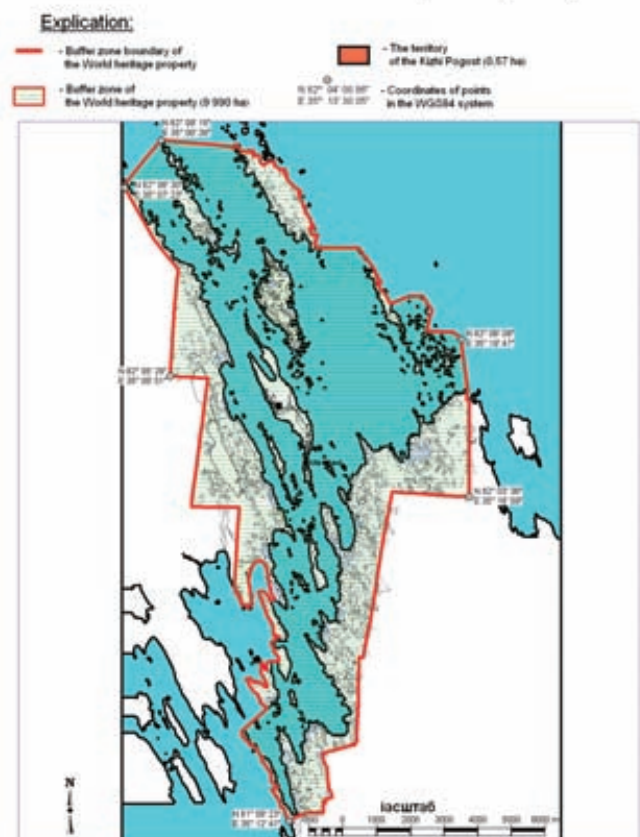
Geographical and cartographical information concerning the WHS Kizhi Pogost was prepared and submitted by the request of the Committee of the World Heritage of UNESCO. It helps to see changes of the WHS in this respect through time.

In 2012, the area of Kizhi Island (totally 9,8397 ha) was converted from 'farmland' to 'the area of historic and cultural importance under special protection' by the Decree of the government of RF. The Kizhi Museum was authorized to use this area with no fixed term.

State registration of buffer zones for the WHS Kizhi Pogost was completed. The specifications for land use and town planning within these buffer zones were developed as well.

The information on protected area boundaries and land use specifications for the WHS was submitted to the bodies of cadastral registration of Karelia Republic. This data will enter the State Cadaster of Immovable Property.

The Kizhi Pogost -the Federal Property, The UNESCO World Heritage Site (C544)



### 1.5. Protection from emergency situations

Management of the Site security system is accomplished by the personnel of the Security of the Kizhi Museum, Subdivision of the General Board of Ministry for Civil Defense, Emergency Management, and



*Checking the fire-extinguishing system  
of the Kizhi Pogost*

Natural Disasters Response of the Republic of Karelia, and Subdivision of Ministry of Internal Affairs of the Republic of Karelia.

Kizhi Pogost monuments are equipped with fire alarm, closed circuit television units located along the perimeter (including thermal imaging cameras to prevent unauthorized access), outdoor fire-fighting equipment with remote-controlled nozzles and in-door fire-fighting system in the Church of the Transfiguration.

The production project for the outdoor fire-fighting system of Kizhi Pogost was developed and approved by some of the coordinating bodies. The further stages of endorsement are facing serious difficulties due to bureaucratization of this field in Russian Federation.

Policemen on the central guarding post control the situation on Kizhi Pogost as well as technical condition of the WHS security systems round-the-clock.

Museum Security officers accomplish access control, observe compliance with regulations within the WHS and with the fire-prevention on Kizhi monuments. Museum employees and contractors

receive scheduled and unscheduled trainings. 15 museum employees received training for essential technical and fire-preventing qualifications.

Paramilitary fire station guards the WHS round-the-clock, it is equipped with two tank lorries (АЦ-40), a mobile pump house (ПНЧ-100), snowmobiles, motor boats with mobile monoblock pumps, a hovercraft (МАРС-2000), and a fire boat 'Vjun' which functions also as a pumping house in summer time.

In February, 2012, a voluntary fire brigade was comprised of museum employees to guard, train and study.

Totally 9 trainings and classes on fire-protection were conducted in 2012 and, one antiterrorist training which involved museum keepers, tour-guides, police and fire fighters.

One remote-controlled nozzle of the outdoor fire-fighting system of Kizhi Pogost was replaced; the configuration of protected zone around the Church of the Transfiguration was specifically revised for the security system with a radio-wave emitter «РАДИУ».

The wooden floors on the restoration site on the Pogost and the scaffolds for roof repairs by the Church of the Intercession were treated with fire retardant agent.

### **1.6. Protection and monitoring**

In 2012, the Kizhi Museum continued a complex monitoring of Kizhi Pogost monuments in cooperation with experts of the Forest Research Institute at the Karelian Research Centre, Russian Academy of Sciences (Petrozavodsk) and "Spetsprojectrestavratsiya" Institute (Moscow).

A part of the monitoring programme for deformations was fixing reference points on facades of the buildings. The points were fixed during a complex geodetic survey of the monuments (the Church of the Transfiguration, the Church of the Intercession, and the Bell-Tower) in June and September, 2012. The survey has not revealed any changes in the existing deformations as well as in heights and turns of the monument. The alternations in reference points have seasonal character.

In 2012, the Kizhi Museum in cooperation with the experts from the Forest Research Institute at the Karelian Research Center continued a complex monitoring of biodeteriorations of Kizhi Pogost monuments.

Regular inspections of the monuments, monitoring of temperature and humidity, of fungi growth and insects lesion focus were performed.

Special attention was focused on the condition of structural elements in wooden monuments. Measures for preventive conservation and maintenance were performed during the year. The activity of fungi and insects was estimated.

The weather conditions in 2012 were not favorable for unheated wooden monuments, e.g. high humidity and low temperature, but still fresh focus of biodeteriorations didn't generate.

The preventive measures in the barrel-roofs of the Church of the Intercession and in the Bell-Tower improved microclimate.

The programme of preventive measures was developed on the basis of monitoring results, and will make it possible to eliminate the potential focus of wood deterioration on the earliest stage and thus prolong the life-time of monuments.

### **1.7. Studies**

The Kizhi Architectural Ensemble is the main tourist sight of the Kizhi Museum and the focal point of the main outdoor tourist exposition. Thus, the main research is one way or another focused on Kizhi architectural ensemble. In 2012, this research concerned the following:

Development of projects 'The History of the Kizhi Architectural Ensemble', 'Interiors of Kizhi churches', and 'Historical and ethnographic study of villages within the protected area i.e. place names, village looks, farmlands, household, families'.

In 2012, the regular 14th collection of museum research papers «Kizhi Vestnik» was formed in the Kizhi Museum. At the present time, the collection is passing the editorial board. A collection of research papers dedicated to 300-anniversary of the Church of the Transfiguration in 2014 was prepared as well. This collection will include about 20 papers this or that way associated with preservation and studies of the Church of the Transfiguration as well as history and culture of the South Zaonezhiye.

### **1.8. Promotion program and information support**

Total amount of tourists in 2012 comprised 142 000 persons. Twenty permanent exhibitions were organized in the monuments located in the immediate neighborhood of the Kizhi Pogost Ensemble in 2012. In the Church of the Intercession the following exhibitions were made: interior exposition in the church proper, icon painting exhibition in the refectory and History of Kizhi parish in the hall. In addition to that, the Church bells were exhibited in the Bell Tower.

'Simple Ties of Life' photo exhibition by Oleg Semenenko was presented in the Kizhi Museum halls in 2012. Travelling photo exhibitions 'Karelia. Image in time', 'Kizhi.Seasons', 'Kizhi. Wonderful Feast of Summer', 'Kizhi Almost Unreal', and also 'Wooden architecture of Kizhi', 'Kizhi. Primeval Archeology', 'Tiny Island on the Earth Planet'.

Information support of work on preservation and restoration of the Kizhi Pogost is one of the main activities of Press Service of the Kizhi Museum. Printed and internet mass media as well as the materials prepared by the Museum Press Service keep public in Russia and abroad in the know about all the events happening on the UNESCO Site.

In 2012, the following materials were presented on the museum official web-site: 'The Report on the Preservation of the Kizhi Pogost Monuments in 2011', 'Engineering Drawings by Alexander Opolovnikov in Kizhi Museum Collections' (a catalogue), 'Photo Report on the Restoration in 2012', 5 news materials on restoration. Besides that, 5 video films about museum efforts on restoration of the Church of the Transfiguration were presented, and namely 'Monitoring of Logs Condition in the Restoration Complex', 'Preparing the Insertion (a piece of wood used to replace a part of damaged original log)', 'Reconstructing the Foundation of the Church of the Transfiguration', 'Test Assembly of a Stonework Fragment (a visible part of the church foundation)', 'Preparing Restoration Site for Winter and Finishing the Work on the Church Foundation'. Two extra web-cameras were fixed in the Restoration Complex to broadcast on the experts' web-page. More than 400000 unique users visited the Kizhi Museum web-site in 2012.





*The feast of the Transfiguration of the Savior*

The materials concerning the preservation of the Church of the Transfiguration are broadcasted regularly on different TV and radio channels in Russia.

Four news materials were broadcasted on local TV-channels and radio. In addition to that, 8 news materials based on museum press-releases were made on local TV and radio.

Five news materials were broadcasted on all-Russia channels and radio.

In October, local TV-company 'Karelia' filmed the results of restoration season. This material was broadcasted on local and federal TV-channels.

59 links on news materials were published on web-sites of Russian and Karelian agencies, news digests and internet portals.

One of the major TV-channels in Japan TBS (Tokyo Broadcasting System) worked on the island of Kizhi in June. The telecast will be broadcasted in spring, 2013. In July, the camera crew of 'Lennautchfilm' studio was working on a popular science film 'Sails above the Onego.' Filming for Australian TV-channel took place in the same period. The camera crew of 'ArmadaTsentr' worked in August to the order of the Ministry of Culture of RF. This filming is a part of a united internet portal «Культура.рф» to promote cultural heritage and traditions of Russia. The camera crew of 'ArmadaTsentr' made the aerial photo and filming of UNESCO Site in September. The section of Kizhi Museum appeared on this internet portal in November, thus it is possible to have a look at the Church of the Transfiguration closer and in all details. Saint-Petersburg studio of documentaries worked in September. The film 'In the Beginning was the Word...' (52 min.) will be broadcasted in the end of 2012. The fourth series of project 'Kizhi. The Chronicles of the Transfiguration' is ready. This project covers the restoration process through time.

In 2012, the museum printed about 50 kinds of promotional materials that included images of the Kizhi Pogost monuments and 7 books as well. The museum logotype appears on 40 kinds of published materials and that of UNESCO on 37. Information on the monuments was presented in 3 books and 10 promotional materials.

### **1.9. Preservation of landscapes, natural and architectural environment**

The work on preservation of the landscapes and natural environment of the Kizhi Pogost monuments was kept on in line with the basic principles developed in the Kizhi Museum and UNESCO recommendations.

The management plan for Kizhi landscape was completed in 2012. This is a long-term guideline for preserving the landscape in a desired condition, based on the up-to-date scientific approaches. The plan is an integral part of a management plan for the WHS.

The management plan for Kizhi landscape contains the conception and information about the object itself and about possible management approaches as well. The conception of landscape is created by the means of geo information systems (GIS) intended for performing the inventory and cartography of the present condition of landscapes; for modeling target condition of landscapes, planning and supporting the steps on maintenance and development; for evaluating the impacts on general appearance.

The decisions of the annual Commission for Preservation of the Historical Landscape were carried out by maintaining open areas and visual links between monuments on Kizhi Island. These activities included sanitary felling and clearing out the meadows from the growth of bushes.

Environmental monitoring programme was implemented, and special attention was focused on inventorying flora and fauna in the coastal part of Zaonezhiye peninsular and in the sector of road building between Velikaya Guba — Oyativtschena. The obtained data will help to keep local environment in tact, with the consideration of developing museum infrastructure.

In 2012, the facts of clear felling on the eastern shore of Zaonezhiye peninsular were reported. These fellings have a negative impact on the landscape surrounding of the WHS Kizhi Pogost. The reports to the corresponding institutions were made in time, which, alongside with the cooperation with non-governmental organization 'SPOK', reduced the acuteness of the problem and then stopped the fellings.

A complex of annual activities was held to secure environmental safety of museum terrain, such as monitoring air and water space, drinking water supplies, and also acaridae treatment, disinfestation and bottom cleaning.

We keep working on the problem of waste management.

#### **1.10. Development of the museum infrastructure**

The Kizhi Museum power customers were connected to the network of 'МРСК Северо-Запада' Company by the decree of the Government of the Russian Federation №1633; building of the overhead high-voltage line (U=35kV, length 46 km) from Velikaya Guba to Zharnikovo was completed; conductor lines from Zharnikovo to Kizhi were set; transformer substation (2x6,3 mW) was build in Zharnikovo; distribution unit (10kV) was build on the Klimenetsky Island. All of these objects are in operation now and securely supply power to the Kizhi Island and Zharnikovo village by using a new circuit. New power supply system equals to 4000 kW, and the previous one was below 500 kW.

The project documentation for 'Outdoor Network and Power Supply Objects on the Kizhi Island' was developed and submitted for environmental impact assessment.

The project for 'Office and Public Center of the Kizhi Museum on the Kizhi Island' had been developed earlier, and it was concluded with a negative resolution. It was recommended to revise space-and-planning and stylistic concept. The project (architectural section) was revised in the museum in 2012. The possibility of using different facing materials was worked through so that the building could harmonically fit into the surrounding environment. The combination of natural stone, wood and glass is under consideration. Styling of interiors was developed in a separate project. The Commission for Town-Planning at the Ministry of Building and the Council of Experts at the Ministry of Culture of Karelia Republic approved the revised project documentation, and further project development was permitted.

The building of road from Velikaya Guba to Oyativtschena Village is going on (in line with the Decree of the government RF №1633). The work will be completed in 2014. This road makes it possible to transport loads and passengers straight to Kizhi Island all year round.

## SECTION 2. Restoration of the World Heritage Site Kizhi Pogost in 2012

### 2.1. General information

In 2012, the 1st stage of the complex restoration of the Church of the Transfiguration was completed, and the 2nd stage was started. It will last approximately four years. It seems necessary to remind briefly the main point of the previous stages and reveal the essence of the coming 2nd stage.

Rather important and prolonged **period of preparation** had passed prior to the restoration proper, and namely the following activities had been completed: production infrastructure had been prepared, timbers of special condition stocked, carpenters trained, the restoration project developed, and steady financing secured. The essence of the **1st stage** of the restoration was that methods, technologies and restoration approaches were developed and tested, namely experimental restoration of smaller objects was performed, lifting equipment was mounted in full, the lowest 7th restoration tier was disassembled, the church foundation was reconstructed, the 7th tier was restored and brought back to the original place. The most part of the **2nd stage** of restoration is about restoring the whole building element-by-element, repairing damaged logs, eliminating wall deformations and reinforcing weak points and load-bearing elements. The work of this stage will be completed right after the central cross of church has been fixed in its proper place. The **3rd finishing stage** includes disassembly of supporting metalworks inside, restoration of church interiors and gilded iconostasis, building of necessary networks in the under floor space and reinforcement of log walls, land improvement around the site.

In 2012, complex restoration of the church was accomplished without breaks. 7th restoration tier was restored and test-assembled in the Restoration Complex during winter period; work on the site Kizhi Pogost was started in spring and included disassembly of the 6th restoration tier, reassembly of the 7th tier on its original place. In autumn, team of restorers moved back to the Restoration Complex to start the restoration of the 6th tier. The site was closed down for winter period until spring, 2013.

Different organizations operating on the site have developed a good cooperation during the whole period of restoration. Steady financing is secured by the Ministry of Culture of RF; the Kizhi Museum is a General customer. Three contractors are working on the site, namely 'Alekon' Co ltd, 'Zaonezhiye' Co ltd, and a museum team of 'Carpenter's Center.' General designer "Spetsprojectrestavratsiya" research institute (Saint-Petersburg) develops construction documents for contractors. Quality supervision is performed by different institutions starting from the Customer up to international experts.

This is the most effective organizational management for the most complicated and long-term project. Different organizations were allied to achieve the common goal, and that resulted in increasing productivity and quality, decreasing costs of production and achieving the so-called synergetic effect.

This section of the report describes in detail and in chronological sequence the workflow and results of work in 2012. The restoration was performed on two sites: Pogost (the main restoration site) and the Restoration Complex (the complementary site), and also in the workshops for iconostasis restoration located on Pudozh exhibition sector. The report explanations are backed up with photos.

### 2.2. The work performed in the Restoration Complex. The restoration of logs and church walls. Winter, 2012.



*Reconstruction of the lost lower logs  
of the Transfiguration Church*

The restoration and test-assembly of the 7th tier were started in 2011 in the Restoration Complex. Due to specific dimensions of the assembly department, the restoration tier was divided into two parts; the first one was restored and assembled in 2011, and the work on the second one was started in winter, 2012.

The technology of restoration (the whole production cycle) was tested in 2011; UNESCO/ICOMOS mission as well as Russian experts examined and approved the results of work in December, 2011. The Kizhi Museum kept on with the restora-

tion of the second part of the 7th tier in line with the approved and well-tested technology.

The upper part of the 7th restoration tier was set on the two upper log-sets of the lower part which had been already disassembled and stocked. This method preserves the original geometry of the whole 7th restoration tier and minimizes matching of logs on the site during the final assembly. It will be used for the restoration of all remaining tiers, i.e. two upper log-sets of the restored lower tier will always be the basis for the whole upper one. These two upper log-sets need to be carefully measured at their corners and at the additional reference points by tacheometer, before they get removed from the restored tier and reassembled for the base of the upper one.

It is very important that both first and second part of the 7th restoration tier was restored by one and the same contractor 'Zaonezhiye' Co ltd. The point is that tendering can prevent from keeping logical and sound succession of work on one whole restoration tier. 'Zaonezhiye' Co ltd won the next tender by reducing the cost of contract which has not affected the quality of work.

Special quality timber of the required trunk diameter was prepared and stocked in addition to the available stock, because only 25% of the original material was planned for complete replacement preliminarily but, in fact, as much as 40% need to be replaced.

Second important problem was the necessity to correct some of the lifting supports after the lowest part of the church was set on the original historic place and, consequently, gained its original plan. Reference lines of the church on Pogost were copied on the floor in the assembly department and thus predicted the overlaying of lifting supports on the church beam system. The project documentation for correcting lifting supports on the site was developed during the winter, and the question was settled. It is essential that unnecessary metalware will start getting removed from the church in 2013, so consequently the lifting system disassembly will start in a reverse order.

The imitation of loads from the upper part of church on the assembled 7th restoration tier was performed likewise in 2011. Test-pressing of the assembled part was successful, no defects of restored logs found. This procedure will be applied for all upper tiers. In addition to that, the project documentation is prepared for test-pressing of the 7th restoration tier reassembled on the Pogost. It is necessary for eliminating micro deformations because the 7th tier at the moment is not loaded by the upper part of the building like usually.

All restoration works on the 7th tier (i.e. logs repair and test-assembly in the Restoration Complex) were completed by May, 2012, and the tier was prepared for the final reassembly in a reverse order on the original place.

The process of restoration as well as technology and methods are described in the Report for 2011 in detail.

### 2.3. The work performed on the Kizhi Pogost. Disassembling log walls. Spring, 2012.

Height marks of the building baseline (foundation + 7th tier) were changed according to project objectives during the reconstruction of the foundation and restoration of the 7th tier. For instance, two lowest log-sets, previously lost, were reconstructed after careful examination of the upper logs and graphical analysis. Consequently, the building grew appr. 600 mm higher. Central part of the 7th tier was deformed downwards to 400 mm due to heavy loads, and it was set horizontally during the restoration. The reconstructed foundation



*Simulation of loadings on the restored walls*



*The prepared space for the assembly of the restored tier on the foundation*



*Dismantling of the walls in spring 2012*

The process of disassembly was perfected in the earlier period. The disassembly of the dome and so-called ‘barrel’ roof above the altar was something experienced for the first time as well as the work on reassembling and disassembling performed simultaneously on the building.

This work was accomplished by ‘Alekon’ Co ltd. Position of some of the lifting supports was corrected after the partial disassembly of the 6th restoration tier. The correction is in line with the project documentation. All church beams were set on their position because metalware was not the obstacle any more.

#### **2.4. The work performed on the Kizhi Pogost. Assembly of the basement part. Spring-summer.**

In spring, at the end of May 2012 the assembly of the restored basement part of the monument (7th tier) started at its historic site. Long-term, and sometimes invisible, work of restorers started to take visible forms, the renewed Church of the Transfiguration started to grow upwards! The “empty” space started to fill with restored material that eventually formed a rather complicated in plan view (in plan, the church has 25 walls) and in elevation points (cascade construction of the walls adjusted for relief deviation) basement of the monument.

The first log-set (i.e. several logs notched with each other in their ends forming the perimeter of a building) started with the 5th row of logs. Consequently, the four lower rows of logs were not complete log-sets (did not embrace the whole perimeter) and were built in a cascade way according to relief. In the process of the lower logs assembly it was decided to lay them exactly in the center of the strip foundations. Then, during placing the first complete log-set it was necessary to verify its geometry by checking it with the control points and, if necessary, correct it.



*Installation of the first log on the foundation*



*The restored tier exactly fit the foundation of the church*

preserves height marks on the south church wall, but those on the remaining ones were moved upwards while straightening the whole building.

Thus, the restored portion does not fit into its historic place, the more so because of the service clearance (about 1000 mm) needed for the work of lifting system.

It was not any surprising situation for restorers, and it was foreseen in the production technology. This is why the first work task in spring was partial disassembly of the upper restoration tier to get enough space for the final reassembly of the 7th tier on the foundation.

A very good result was received in the end of this stage of the work. The plan of the foundation of the church coincided with the plan of log walls within the allowable tolerances! It was not a random luck as it was carefully thought out and measured in advance on two construction sites (“Pogost” and “Restoration Complex”), where the same system of coordinates was used. The accuracy of the walls and the foundation was confirmed for the second time during the installation of the supporting beam system. All beams were nestled precisely, practically, without any gaps and discrepancies.

All the statements of some Russian restorers that the lower layers of logs have to be left untouched during the restoration can be considered now not relevant.

The complicated geometry of log walls of the Transfiguration Church (that has 25 walls) was moved to the Restoration Complex and back to “Pogost” by the Kizhi Museum employees and the engineer of the manufacturing organization ‘Zaonezhie’ Co ltd to the nearest centimeter. More than that, the ground plan of the basement was amended in the Restoration Complex and, as a consequence, the position of the upper part of the foundation was corrected as well. Using modern measuring equipment in the restoration practice and identical coordinate systems on different restoration sites one can safely carry out the works departing from the so-called traditional methods and “canons”.

During the three centuries of the monument existence at least two lower rows of logs were lost and the technical condition of the existing lower layer of logs was poor. In accordance with the restoration project the two lost layers of logs were reconstructed of new material and the lower rotten logs were completely replaced. So, the three lower rows of logs of the church are entirely made of new material. The interior link logs between the walls were also reconstructed. They were lost together with the lower layers of logs. “New” connection elements have considerably strengthened rigidity and stability of the basement walls. Reconstruction of the lost elements has dramatically increased one of the restoration indicators — the percentage of new material.

Besides the above mentioned new elements, the projecting beams of the southern porch were also made of new material.

Totally 380 wooden elements were used during the reconstruction and restoration of the basement walls — logs, beams and link structures. Among them there are 182 reconstructed elements (exact copies of the completely rotten material) and 198 restored or completely saved elements. New material in percentage terms is 40% and the original material is 60%.

One of the objectives of the restoration is the correction of threatening deformations of the walls. Of course, the issue is not about the complete correction of deformations as restorers understand that the position of the framework is an objective factor because it has been formed through the centuries and, to some extent, after the process of reassembly, logs can take the “usual” position.

But during the process of working and, in particular, in the process of assembly all works are carried out with the use of plumb level.

Besides the precise assembly of the walls there was another task to ensure the horizontal position of the floor groove located in the upper rows of logs of the assembled 7th tier.

All test assemblies in the Restoration Complex hypothetically provided the opportunity to perform this task, but finally it was solved directly on the territory of the Pogost.

In accordance with the working plan, jacks with special tool trays were installed around the perimeter of the foundation. Logs were placed on these movable bearings. During the walls assembly jacks were constantly lifted and lowered depending on the need until logs with the floor groove took strictly horizontal position. It is worth recalling that the difference between elevation points at the level of the floor groove was about 400 mm before the dismantling, and it made no sense to reconstruct such “uneven” floors.

After the walls of the basement part (7th tier) were completely assembled, the two upper log-sets were measured and taken to the Restoration Complex to base the next, upper tier during the restoration.



*Assembly of the restored 7th tier on the foundation*



*The fully assembled 7th tier (without two upper layers of logs)*

## **2.5. The work performed on the Kizhi Pogost. Adjustment of the metal framework. Summer.**



*Adjustment of the position of horizontal metal beams of the metal frame*

This experience was very useful as this situation (when wooden beams “overlap” with metal ones) can be repeated and it is quite possible that similar works will have to be done at other elevation points.

In the process of the walls assembly there arose a situation when the position and level of wooden beams of the basement coincided with the position and level of metal beams of the metal framework. To continue the work it was necessary to remove the metal horizontal beams without sacrificing the strength and stability of the framework.

According to the project documentation there were installed compensating beams above and below the supporting beam system. After that the interfering elements were removed and wooden beams with logs of the walls were assembled.

## **2.6. The work performed on the Kizhi Pogost. Reconstruction of the foundation. Summer-autumn.**

In 2011 about 90% of all foundation works were completed. The works were carried out manually under the suspended walls of the church and only in the warm summer-autumn period. In 2012 the final phase of the reconstruction started, i.e. construction of the above-ground lime mortar stone foundation.

The basic problem of the construction of the lime mortar stone foundation was the “lack” of precise indications of elevation of the upper surface of the foundation. All the draft indications of elevation had an approximate value and the actual indications of elevation could be defined only after the complete assembly of the basement part.

As it was mentioned above, the walls of the basement were aligned along the floor groove, that is, along the upper logs. Accordingly, the indications of elevation of the lower logs (that are at the same time the indications of elevation of the upper part of the lime mortar stone foundation) became available at the end of August. The remaining warm period was not enough to complete the construction of the above-ground part of the foundation qualitatively, but the major works were accomplished exactly in 2012.



*Boulders under the corners of the walls and stone filling between the boulders*

Initially the lower logs of the basement were installed on jacks, during the summer all the movable supports were gradually replaced with stone boulders that were perfectly fitted to be placed between the foundation and the lower logs of the walls. 30 boulders were put under all corners of the walls and at the places of cascade construction of the longest walls.

Installation of large stone boulders under the corners of the walls of wooden buildings is a traditional method of foundation construction in the Russian North. The space between the boulders is filled with stones of smaller size. The original

foundation of the Transfiguration Church was made in this way.

A great work was done by stone-masons of ‘Alekon’ Co ltd on adjusting the stones in size and shape. The work was carried out in a specially equipped area not far from the Restoration Complex.

Besides the 30 perfectly fitted stone boulders under the corners of the walls it was necessary to treat and adjust in size the stones used as a stone filling of the foundation. It is a thorough and painstaking work, which cannot be done fast. We can say that every stone in this foundation is a piece-work of stone-masons.

Unfortunately, due to the complexity of processes (search, delivery and treatment of hard stones) we did not manage to complete the upper part of the foundation in 2012. In 2013 the works will be continued and completed.

### **2.7. The work performed on the Kizhi Pogost. Dismantling of the 6th tier and conservation of the church for the winter period. Autumn.**

In autumn, the dismantling of the 6th restoration tier continued. According to the proven technology 283 logs, an altar dome with elements of a 'barrel' roof, window and door frames were dismantled.

The volume of the 6th tier is comparable to the volume of the already restored 7th tier. All elements are marked, cleaned and delivered to the rack storage of the Restoration Complex. The works were performed by 'Alekon' Co ltd.

A distinctive feature of the work carried out in 2012 was increasing height of work area and simultaneous processes of dismantling the upper and assembling the lower tier. Practice has shown that parallel work on disassembly and assembly of the log walls are quite possible.

More than that, the number of transportation runs from the Restoration Complex to the Pogost and back decreased. In other words we can say that the joint actions of two teams led to an increase in productivity (a synergistic effect).

The disassembled walls will be repaired during the winter 2012—2013 and in spring they will be prepared for reassembly on the original place.

The Church of the Transfiguration is traditionally conserved for the winter period. In addition to protecting the walls with reinforced polyethylene film in 2012, the restored part of the refectory was covered with a temporary roof.

The temporary roof is made of reinforced iron sheets and reliably protects the refectory from the weather. In addition to its intended application, the temporary roof will also serve as a working deck for dismantling the church walls and domes of the annexes.

Besides the basic conservation works some measures were carried out to shelter the lower layers of logs and the foundation, to do preventive maintenance of the wooden flooring around the church, to test the system of lifting and fire and security perimeter alarm systems.

### **2.8. The work performed in the Restoration Complex. Restoration of the 6th tier. Autumn-winter.**

Restoration of the 6th tier started with a preliminary assembly of the unrestored walls in the workshop and the comprehensive assessment of its condition. As it was mentioned above the assembly of the restored tier is carried out on the basis of two layers of logs of the underlying tier that has already been restored.

Specific restoration decisions are made exactly at the stage of the preliminary assembly, when all deformations and defects of the logs can be seen at eye level. It should be said that the 6th tier of the monument is placed quite high and its detailed study from the outside of the wall was approximate.

After the detailed investigation and decision-making the walls were dismantled and stored. They will be assembled again after restoration.

### **2.9. Off-season works. Restoration of logs in the Restoration Complex.**

The Restoration Complex was put into operation in 2007. It has greatly changed the approach to restoration works. Modern and comfortable conditions allow carrying out the restoration works at a good level all year round regardless of weather conditions, which is impossible while working in the standard "field conditions".



*Conservation of the Church of the Transfiguration for the winter period 2012—2013*



*The test assembly of the 6th tier in the Restoration Complex*





*Restoration of logs*

In accordance with the agreements concluded, contractor organizations rent the assembly workshop to perform the work (assembly of restored walls). The ‘Carpenter Center’ of the museum under the direction of A. Kovalchuk is engaged in restoring the original historical material all year round.

Careful and thorough work on treatment of the historical material allows preserving maximally all logs and other elements that could be used in future. Every log of the wall has its own restoration project, and this is a kind of innovation in the restoration process.

This approach on conservation of the historical material is very costly in terms of human and time resources. But the point of restoration is to do everything possible to preserve the element, to fight to the end. The last extreme measure is to make an exact copy of the worn out by time element.

It should be clearly understood that the building material of the church is wood that cannot live as long as, for example, stone. That is why one of the tasks of the restorers is not only to repair a log but to preserve the hand of masters and carpentry traditions.

In addition to logs repair the workers of the ‘Carpenter Center’ and other divisions of the museum perform other important functions: monitor the state of the new and historical material, conduct maintenance of facilities, provide yearly maintenance of the Restoration Complex, roads, security and communication systems and Internet.

## **2.10. Off-season works. Restoration of the iconostasis.**

In 2012, the Kizhi Museum continued the restoration of the iconostasis frame of the Church of the Transfiguration concentrating the efforts on the Deisis tier. It was planned to perform the conservation of the gilded surface and restoration of wood carving and the frame. The contractor is the Moscow Art Research and Restoration Directorate. Cost of works is 15 653 170 RUB.



*Restoration of the iconostasis*

The works started in the second half of 2011. Removable parts of the Deisis tier were sent to the workshops of the contractor in Moscow to perform the works all year round. In the summer of 2012 the restored elements were returned. The basic tier structures could not be transported to the workshops of the Art Research and Restoration Directorate because of their considerable size and the emergency state of the gilt covering and had to be restored on Kizhi Island. The only premises that could accommodate large fragments of the Deisis

were household parts of farmer houses (monuments). The houses are temporarily adapted for carrying out the works that do not require regulated temperature and moisture characteristics.

The conservation technology of the damaged gilt covering requires a temperature not lower than 18 °C.

Due to unfavorable weather conditions, by the end of the summer the temperature in restoration premises on Kizhi Island was not higher than 12—16 °C. It significantly slowed both the process of the gilt covering conservation and the restoration of the tier.

In October of 2012 conservation of the gilt covering was completed.

Monitoring of the conservation state of the iconostasis frame was continued in 2012. A detailed examination of the remaining structures of the iconostasis was carried out in June — July of 2012. The examination was conducted to clarify the conservation state of the wood, wooden carving and the basis of the iconostasis. It included the process of photo fixation and detailed description of damages. The Contractor is ‘Gotland’ Co ltd (St. Petersburg). As a result, the museum received preliminary estimates of costs of restoration of wood and the opportunity to clarify the requirement specifications for the following stages of the restoration.

Permanent control was established over the ongoing works. It allowed solving the problems arising in the course of the restoration and also the problems concerning the organization of work in difficult conditions of the island.

However, other problems that appeared with the beginning of the restoration in 2009 worsened in 2012. They could not find their solution. Thus, the restoration rate in 2009—2012 was dictated by the financing rate that had been defined before the beginning of the works. But the restoration practice has shown that the conservation state of the dismantled iconostasis frame requires a more complicated and hard work than it was expected.

In this regard, the restoration process appears to be much longer and goes beyond the year 2014 that had been defined from the point of financing as the time of work completion.

Despite the seriousness of the problem, preparation for the next stages of the restoration was continued. By now, preparations for competitive bidding for the right to restore the Royal Doors and the altar canopy have been held.

### **2.11. Restoration of the Church of the Intercession on Kizhi Pogost**

Three-year period of work on the Church of the Intercession was finished in 2012.

At present, the Church of the Intercession is the main site of the Kizhi Museum exhibition and, at the same time, this is an active church where services are held. Anthropogenic load nowadays is much higher than during the time of construction. About 150 000 tourists visit the church every season, and this is the reason why some of the structural elements wear off quicker than usually.

The church porch was completely reassembled and restored in 2011; the roof and domes on the central octagonal part were restored during 2009—2012. Besides, the museum carpenters restored decor elements of windows which preserves window openings and improves the appearance.

Generally speaking, the work on the Church of the Intercession was started in 1998 and that was re-roofing of the refectory part, and all remaining roofs were little by little restored by 2012. In addition to that, other measures on church preservation were performed, e.g. reinforcing the central part of roof bearing structure.

Thanks to all of the above mentioned measures taken in 1998—2012 the classification of operating regime can be revised, i.e. 'Regular maintenance and preventive inspection' instead of 'Needs restoration continually'. The Kizhi Museum strives for decreasing large-scale repair and restoration work by increasing regular preventive measures. This is the true essence of preservation of the Cultural Heritage!



*The Church of the Intercession of the Kizhi Pogost*

## Concluding Part

The year 2012 was very significant for the restoration of the Church of the Transfiguration. A part of the monument was removed, restored and brought back to the original place for the first time in its history. Today's restorers had to accept the fact that ancestors didn't have the academic knowledge of building, they could make some mistakes, and, the restored part was set on a firm foundation. That was the completion of 1st and the beginning of the 2 stage of the restoration.

The restoration continues in line with the project and its main concept of the site visibility for tourists except for the part being restored in the Restoration Complex. The project is not only general ideas and decisions, it implies the preservation of each element just as well.

This decision was approved by UNESCO/ICOMOS experts and Russian restorers not once. It is necessary to mention that work of museum restorers and contractors in 2012 was not so intensively controlled and scrutinized, which proves that previously developed methods and technologies are being applied correctly. The next mission of UNESCO/ICOMOS experts will take place in 2013.

A large scope of restoration work was completed within the reporting period. This is the first time when work started in January and was going on the whole year without breaks. Such a rate of work as well as organization of all the aspects, starting from financing and up to the formal acceptance, is obviously the achievement of year 2012. There are no reasons to think that restoration will slow down or get worse in the future. The most urgent questions are settled, namely the working technology has been perfected, the methods of logs restoration and repair are known, and the financing is steady.

The Ministry of Culture of RF and UNESCO give a great help to the restoration of the Church of the Transfiguration by steady financing, settling organizational and technical issues, moral support etc.

In the end of 2012, it is safe to say that the organizational system has been worked through and functions effectively, thus more attention can be focused on technical issues of restoration that arise in workflow. The rate of work has reached its maximum, and more hands are needed to increase it. This is a difficult task to achieve in the conditions of Kizhi Island. At present, we may suppose that restoration will be completed in 5 years in case the rate of work stays the same.

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*Kizhi Island, December, 2012*



*Disassembly of the 6th restoration tier*



*Assembly of the restored 7th tier*



*Assembly of the restored 7th tier*



*Conservation of the Church of the Transfiguration for the winter period*