*Light & Engineering*
*Vol. 27, No. 4, pp. 11–16, 2019* *https://doi.org/10.33383/2018-146*

# ASPECTS OF EXHIBITION LIGHTING IN THE STATE HERMITAGE

Boris G. Kuzyakin

*State Hermitage Museum, St. Petersburg*
*E-mail: kusyakin@hermitage.ru*

**ABSTRACT**

The article provides a brief overview of the aspects of exhibition lighting in the State Hermitage. The purpose of this publication is to give guidance to potential participants in the lighting projects of the Hermitage exhibitions on the challenges or limitations they have to face and on the exhibition lighting requirements they will be imposed by the museum.

**Keywords:** State Hermitage Museum, exhibition lighting, lighting of expositions

The purpose of this publication is to emphasize those special conditions that may complicate or hinder the work of both the designer and the exhibition lighting engineers in the State Hermitage. The issue of exhibition lighting, which is essential for any museum, is particularly relevant for the Hermitage. Traditionally, the Hermitage is ahead of all in terms of being equipped with the modern systems, and is often lagging because of its vastness. In ongoing exhibition, we have both showcases with lighting systems of the early 60s of the last century and LED systems of recent generations. The same can be said about the concepts laid in the creation of all these systems: From the naive "you need to screw in a bigger bulb" to planning the controlled distribution of light in the exhibition space.

From the conference "Light in the Museum" held from 18 to 20 April 2018 on the territory of our museum, we expected not only the opportunity to discuss the current state of affairs related to the issues claimed but also the opportunity to benefit from its work in our practical activity. There are many exhibitions in the Hermitage with the lighting not to be considered satisfactory. However, in many cases, the situation can be improved by the use of modern lighting systems, as progress in this industry has been noticeably accelerated in recent decades, and the scientific developments moved from the stage of experiments to the stage of mass production and entering the market of lighting equipment including LED devices of various purposes and quality. Moreover, the evolution of light sources is moving in the favourable direction for museum practice: Lighting fixtures become smaller, more economical, more efficient and safer, less visible.

The conditions in question, with a few exceptions, are not unique. For the most part, these are the usual problems of lighting the exhibitions in old palace buildings. Their combination in one museum complex is unique, multiplied by the scale of one of the largest museums in the world, where the period between the reconstructions of several exhibition sections can be measured by decades.

The first and obvious aspect that should be kept in mind during all further discussions on the topic "What to do with lighting in the Hermitage?", is that the expositions of our museum are located in the complex of buildings differing in time and original purpose: from the palace of Prince Menshikov, the first palace in St. Petersburg under construction, to the restoration and storage centre, the multi-stage construction of which has not yet been completed. Historical buildings, which are now occupied by the museum, are protected as architectural monuments, and this dictates very strict terms of their use, limiting the possibility of their adaptation under the needs of the current exhibition, including the light-

ing. The word "adaptation" is a key one, because even the building, which was designed in the 19th century as a museum, does not correspond to modern concepts of the exhibition lighting, as well as to the modern ideas about the exhibition. The Hermitage branch at the Imperial Porcelain Factory is located on the top floor of a reinforced-concrete factory building, the eastern wing of the General Staff Building, where various ministries were located, was constructed as a building for government agencies.

We will not consider the technical limitations that complicate the creation of modern lighting systems in the interiors of historical buildings. We will touch upon another aspect of these limitations – to what extent it is permissible to introduce not just in historical interiors, but for the most part, in those created by outstanding architects, the elements of modern engineering equipment with a purely modern and sometimes quite aggressive design.

The criteria in this area have evolved over time. For example, at the turn of the 70s – 80s, the proposal to introduce a suspended bus bar in the interiors of the French art exhibition on the second floor of the Winter Palace was completely rejected by the exhibition owners – the department of Western European art, as well as the museum management and the department of the chief architect. Over the next decades, we used suspended bus bars in historic halls with preserved interior decoration only at temporary exhibitions. This restriction actually lost its force quite recently, when in the Romanov gallery after the exhibition of works by Jan Fabre the bus bar was not dismantled, but remained as if forever, and it no longer caused protests – both museum staff and visitors have long been accustomed to such a kind of lighting equipment like the bus-bar and the luminaries hanging on it. The eye of the modern museum visitor is already accustomed to "bracket out" of perceived architectural environment such items together with other modern technical stuff.

Due to the wide variety and complexity of such situations in the Hermitage, we do not have a single recipe for such a case. Each situation is discussed individually, and the decision is made as a result of a certain balance between the daily needs of the going museum and the desire to preserve everything and not to change anything. At the same time, there are no pre-defined restrictions of conceptual nature. Not only technical innovations can be discussed, but also those related to the aesthetics. The main thing is that they should not be self-sufficient, "an invention for the sake of invention", for the sake of demonstrating the technical capabilities of the manufacturing company, for example, or dramatic transformation of the architectural environment, or self-expression of the lighting designer. We need to understand why, for what purpose, this or that concept is proposed going beyond the limits, how it helps to solve the core task – to ensure adequate perception of outstanding works of art presented at the exhibition.

The experience has shown that the most productive working practice is the mandatory phase of field modelling of new lighting systems, in which a commission consisting of representatives of the scientific department, supervising the exhibition, the department of history and restoration of architectural monuments, the department of the chief power engineer and the exposition and design department considers the established in the current exhibition the lighting fixtures, as well as the structures necessary for their fastening, which in this case can be represented as fragments. The same procedure is mandatory for all new, i.e. unfamiliar, lighting fixtures. This is due to the fact that according to only technical data, drawings and pictures in the catalogue, the art historian can hardly imagine what the luminary will look like in the interior, especially to imagine based on graphs and diagrams, how it will illuminate the exhibited item. The technical specifications, even the most detailed ones, will not give the other specialists a complete picture of the real light spot from a particular device, its uniformity, the degree of contours delineation, the presence of light rings, extraneous light, the presence of glowing cracks or holes on the casing during operation, etc.

In addition to the special status of the protected architectural environment, the palace buildings have other peculiarities.

For example, the proportions of the halls are such that the lighting fixtures installed on the cornices are focused on the exhibited items at an angle not sharp enough for the glare to be reflected in the floor or at least below the visitor's eyes. Many rooms are decorated with artificial marble walls or other shiny materials, which reflect the light sources installed above the cornice (as well as the windows facing the sunny side of the building). It should also be mentioned that the cornice may not be in the room – depending on the architectural treatment,

a flat horizontal mould can be used instead, for example, on which the bus bar cannot be installed. And there can be simply a complex arch covering without any horizontal wall articulation. In such a situation it is sometimes possible to use a suspension bus bar, which, in addition, would provide illumination of walls at the proper angle. But the ceiling without moulding or painting for palace premises is very rare and, in most cases, does not allow a suspension bus bar using.

The bus bar installed on walls or hanging is not the only method of arrangement of exhibition lighting systems. At temporary exhibitions we widely use lighting devices on separate brackets, which are installed on exhibition stands. As necessary, this method is also used at the permanent exhibition. An example of the exhibition illuminated in this way is the tent-roofed hall, where for the first time in the Hermitage second-generation LED luminaries were used to illuminate paintings.

There are usually two other light sources on the exhibition, which, in most cases, do not help the correct lighting installation. These are windows, most of which, in the case of the front living quarters, look to the south-east or south-west and at least part of the day are exposed to direct sunlight. At the same time, illuminance changes in the exhibition surfaces could have reached several hundred lx during the day. Now this difference is smaller, due to the use of light-protective films and curtains, but still exists. Daylight, of course, is the least controlled component of the overall light scene.

For the Hermitage, the issue of open windows, that is the windows not closed with light protection means, is rather sensitive and, from time to time, is tensely discussed. There are views of rare beauty on Palace Square, Neva, the Spit of Vasilievsky Island and Peter and Paul Fortress from the windows of the palace complex. In a sense, it is also a part of the historical palace space. At the same time, the open windows in some cases do not just interfere, but do not even give the opportunity to properly arrange the exhibition lighting. The palace was built as a palace, not as an art gallery. Sometimes it is necessary to set priorities: What is more important for the visitor to view – an outstanding work of painting or architectural beauty outside the window. The museum management determined the answer to this question once for all: "Everything is more important and at once." In each case we look for a compromise (or palliative).

Another disturbing source of light in the exhibition is historical lighting fixtures (chandeliers and floor lamps). In some rooms of the grand enfilade they are the only light sources. Their specific feature is a lot of glare reflected in all the paintings in the hall. These lighting fixtures are often designed or purchased for specific interiors and are an integral part of the halls design. Chandeliers can also be used in the general light scene, especially if this source is controlled (switching in parts, lighting regulation). Floor lamps seem to be the most harmful form of historical lighting fixtures as regards the glare, because they have light sources below all others. They are sometimes quite monumental constructions made of bronze and coloured stone and can simply decorate the hall with their presence, but they can only be turned on if there are no items on the walls to be viewed (paintings, for example). The most "injured" from the attempt to use this form of lighting fixtures to illuminate the exhibition is the Van Dyck Hall.

In some cases, a number of lighting issues can be solved by installing additional lighting devices on the chandelier hooks under the ceiling, i.e. above the chandelier itself and so as not to interfere with its perception as works of applied art. Until recently, we also considered such a technique prohibited, but now it is already included in some projects. This was made possible, in particular, as a result of the "LED revolution" and the continued miniaturization of lighting devices, the reduction of their weight and energy consumption.

Among the possible technical solutions of the exhibition lighting, which are used in the museum, one can mention such a form as a suspended busbar with ceiling lighting. This combination of lighting fixtures is usually used to create a certain level of overall illumination or for architectural lighting purposes, while the luminaries installed on the same busbar from the bottom are responsible for the local illumination of the exhibited items. This is quite common at our new exhibitions.

The list of the basic light sources forming the museum illumination should be concluded by lighting in showcases. In some halls containing "showcase" displays, this source can be considered as the basic source. Illumination of showcases in the Hermitage is represented by all kinds and techniques. From lighting fixtures with fluorescent lamps of the late 50s to lighting systems of large showcases with organic materials in the Pazyryk Hall, where

light sources are installed in the adjacent room, and the light is supplied in the showcases by fibre light conduits with a length of more than 11 m. This way eliminates the possibility of heating the exhibited items and increasing the temperature in the hall. In the Romanov gallery and in the Hall of Egypt, the ever-memorable Soviet lamps under the incandescent NBB-341 lamp produced in Tallinn live out their days. Once they, due to the porcelain cartridge, all-metal casing and swivel mounting, were practically the only Soviet lamp that did not cause complaints from the fire department and were installed throughout the museum in a large number, luckily were they inexpensive. Fibre-optic lighting dominates at the permanent exhibitions of the last two decades. The light sources in these showcases are halogen or LED ones. It should be noted that this scheme of the lighting installation makes it easy to reconstruct the light block to a modern light source. The entire setting of the light scene is maintained, only the light generator (containing a halogen lamp) is changed to LED one.

It is worth noting that the Winter Palace is a particularly problematic area in this text, which does not mean that everything is much easier in the rest of our museum complex.

The General Headquarters also suffers from lighting problems, although at least during the second stage of restoration works, it was possible to avoid significant mistakes. In this complex, for the first time in our museum we used LED luminaries to illuminate painting, although the bulk of lighting fixtures here are devices with halogen light sources. The LED luminaries of the first generation were used in some exhibitions (the department of the ancient world), where the accuracy of colour rendering was not essential.

The Menshikov Palace is still one of the most complex buildings in terms of exhibition lighting.

In the exposition of this section of the Hermitage there are small and relatively low rooms, where there is no space for installation of lighting fixtures, as the walls and ceiling are tightly covered with historical finishes, painting, etc., as well as (a local unique feature) Dutch tiling.

There are also complex places on our expositions where it is very difficult to find the right solution, at least within the traditional schemes. Here is an example of such a difficult situation: three large paintings were moved to the exhibition hall of the Department of the History of Russian Culture after restoration. The only lighting source in this hall is a chandelier, as the electrical equipment was designed for a showcase exhibition, a hall with preserved finishes, i.e. nothing can be hung from the ceiling, nothing can be attached to the walls, there is no power supply on the cornice, the hall width is comparable to the size of the paintings, the angles of reflection from the devices installed on the cornice would be such that all light sources would be reflected in the painting.

In this situation, it was decided to place the light sources at the bottom so that the glare would go to the ceiling. After the relevant experiments and the display of the full-scale layout, one of the Petersburg companies made for us floor devices with LED sources, which solved the problem. This experience is very useful in view of the future need to illuminate large paintings in the major hall of the museum in the Old Stock Exchange, where it is almost the only way to avoid reflections of light sources in huge pictures hanging, moreover, on a shiny wall.

Therefore, I want to draw attention to such a type of lighting device, which could be in demand in the museums, as a railing of exhibited items combined with the lighting fixture of the lower illumination. In the past, the attempts to use such a type faced the limitations related to the relatively large size of light sources. The LED revolution and the trend of size reduction of lighting devices seem to be already giving us the opportunity to overcome such limitations.

The next peculiarity of our exhibitions, which should be taken into account when designing illumination, is the exhibition composition mostly mixed. That is, the exhibition contains all types of works of art, both visual and applied. As regards lighting arrangement, those exhibition compositions have difficulties associated with the combination of materials of different light resistance groups. A marble sculpture, a painting and, for example, a piece of upholstered furniture covered with three hundred years old cloth, or an even older tapestry, may be located side by side. We try to group the exhibited items in such a way as to solve lighting problems conveniently. However, this is not always possible, and in some cases special solutions will be required.

By the way, we can say a few more words about such solutions. In most cases, even the most powerful manufacturers try to provide us with their standard products, for obvious reasons all of them try

to avoid developing lighting systems "for a specific situation". We can bring to the attention of all those who wish to participate in the improvement of lighting in the Hermitage: someone has long filled the standard positions ("hang a bus bar, turn on lamps"), and non-standard ones are as much as you want. Be ready to think and offer competent lighting projects, not just sell equipment from the catalogue. Moreover, this wish should be followed by a warning that non-standard (that is, absent on the market, experimental, "homemade") equipment is extremely undesirable because it presents the problems to consumer with maintenance, spare parts and repairs, and in most cases is a one-time.

The exhibitions with uniform material in terms of light resistance, such as the exhibition of the Imperial Porcelain Factory, are also present in the Hermitage, but rather as an exception. Both in the complex of buildings and in the General Staff there are special exhibitions of painting. As far as I know, in the perspective plans of all scientific departments, the mixed nature of the exhibitions remains, which reflects the nature of our collection. The Hermitage positions itself as an encyclopaedia of historical and cultural character.

In general, the above is sufficient to imagine the situation.

A few more words about common and seemingly understandable subjects to indicate the criteria (I apologize if it looks corny).

So, museum light, museum lighting – what, in general, is it? Its main property is that it is the controlled light. In simple terms:

– It illuminates where it is necessary;

– It doesn't illuminate where it isn't necessary.

Both functions are equally important. Or the same, but more detailed:

– First, the lighting in the museum should ensure a comfortable perception of the exhibited items and information materials placed at the exhibition, as well as, for example, the architecture of historical interiors of the Winter Palace, etc.(here, as always, the devil is always in the details);

– Secondly, the lighting by its physical parameters should not cause damage to the items exhibited in any way (heating, destruction of sensitive pigments – fading, launching destructive photochemical reactions in oxidized metal products, destruction of organic matter by UV radiation, etc.);

– Lighting should not interfere with this perception, blind and highlight the things distracting from the perception of exhibited items, create areas with ambient light, glare and etc.

For such exhibited items, as painting, the illumination "correcting" the author's intention by means of accented illumination of individual parts of the painting or experiments with the contrasts of colour temperature, capable of causing in perception the "shift" of the illuminated item in warm or cold direction relative to the general environment are not allowed. This does not apply to recreation areas, lobbies, stairs, etc., where not only changes in colour temperature, but also other lighting schemes are possible. Only the actions, which cause the blinding of visitors with bright light or dynamic light effects after which, according to physiology, there is a need to adapt the eyes to normal lighting, are excluded.

As a result of properly installed exhibition lighting, a certain meaningful light scene should be constructed with the correct distribution of light.

The correct distribution of light is an essential indicator; it is the result of the work of the designer and the lighting engineer. It is possible to create a feeling of dull and insufficient lighting for perception of the exhibited items even with a large concentration of lighting devices and other light sources. Unfortunately, this is quite typical for many of our great halls where, for example, lighting was arranged by intensive lighting of the ceiling. The light is focused on the ceiling – it is the brightest object in the room – and on the floor. The area of exhibited items, and other visual information, i.e. walls, are in the least lighted area.

Since the peculiarity of the human perceptive organs is the ability to adapt from the strongest signal, the exhibition with this technique of illumination will seem dim and inadequately lighted, even if the absolute value of illumination on the surface of the exhibited items significantly exceeds the standard.

Finally, there is something else about the conference, post factum. With the overall positive assessment and unconditional recognition of the necessity of this event, it should be noted that the division into sections, however, did not work out optimal, depriving some participants of the opportunities to discuss issues related to different sites where the work took place at the same time.

The entry list turned out to be too multifarious – scientists, museum staff, businessmen, representatives of manufacturers or suppliers of equipment,

designers of various profiles – this whole company could not found common ground: the humanitarians were tormented trying to figure out "how many lx" would be enough, someone plainly used the event for advertising purposes, etc., but it seems that the work in the general flow would be more productive, at least in this case, at a "wide reach" conference, on all issues at once.

If we say the same in a more positive way – as, however, many different people are "hungry" for the definition of criteria in the evaluation of the newest light sources in museum lighting! We hope that we will continue.

***Boris G. Kuzyakin***
graduated from the Institute of Painting, Sculpture and Architecture named after Repin of Academy of Arts of the USSR (Leningrad), faculty of theory and history of art, specialty "art critic" in 1977. In 1979, as an artist designer, he joined the State Hermitage Museum, Exhibition and Design Department (EDD) which was headed by V.A. Pavlov. Since 2003 up to present time he is a Head of EDD