DOI: 10.25515/PMI.2017.6.674

UDC 69.009.1

ENHANCEMENT OF ORGANIZATIONAL AND TECHNICAL SOLUTIONS REGARDING ANCHORING OF COMPLETED CONSTRUCTION FACILITIES OF UNDERGROUND RAILWAY SYSTEM TO OPERATING CONTROL

Evgenii G. KOZIN
SUE «Peterburgsky metropoliten», Saint-Petersburg, Russia

Stages of practical realization of measures prescribed by requirements documents regarding anchoring of capital structures of underground railway system to operating control are considered in the article. On the basis of algorithm structure analysis, which includes obtaining a permit for putting into operation and cadastre works execution a range of solutions was proposed concerning optimization of construction project owner and operating organization activities with the purpose of terms reduction of capital structures handover to operation. The results of work of a commission responsible for completed underground railway system objects acceptance and putting into operation were analyzed. Considering example of object «Second entrance hall area of «Sportivnaya» station the statistical data of revealed snagging items is consolidated and dynamics of corrective actions is provided.

Proposed solutions laid the foundation for corrections of requirements documents and were accepted for realization in the process of works acceptance of Saint-Petersburg underground railway system objects.

Key words: put into operation; capital structures; cadastre works; asset objects list; works acceptance; temporary operation

How to cite this article: Kozin E.G. Enhancement of Organizational and Technical Solutions Regarding Anchoring of Completed Construction Facilities of Underground Railway System to Operating Control. Zapiski Gornogo instituta. 2017. Vol. 228, p. 674-680. DOI: 10.25515/PMI.2017.6.674

In 2018 another World Cup Final Draw will take place in Saint-Petersburg. Competition in one of the groups as well as play-off draws will be held on Krestovsky Island.

Large number of tourists and football fans both from Russia and abroad are expected to arrive; their accommodation is supposed to be in adjacent to main arena of draws city areas. In such conditions a significant role belongs to transportation provision of a key object – stadium on Krestovsky Island as well as to functioning of the whole infrastructure, which provides transportation availability of all objects that are involved in event carrying out. Timely put into exploitation of Nevsko-Vasileostrovskaya line section from «Primorskaya» station to «Savushkina Str.» station with the intermediate «Novokrestovskaya» station and put into operation of the second phase of the project of Frunzensky radius from «Mezhdunarodnaya» station to «Uzhnaya» station (Shushary) with electric engine house «Uzhnaya» will improve transportation availability of urban environment and mobility of city dwellers, tourists and football fans.

One of principal roles in providing of transportation availability during sports events belongs to «Novokrestovskaya» station which is now under construction and will be a part of Nevsko-Vasileostrovskaya line section of underground railway system. A projected maximum passenger flow through the station is equal to 30 thsd passengers per year, which is two times more than a passenger flow of capacity-filled stations of Petersburg underground railway system now. As a part of station complex 12 escalators, 8 travelators, 2 lifts will be functioning. For the purpose of compliance with a put into service deadline and making preliminary analysis of existing experience of putting into service of newly constructed objects it is necessary to combine efforts of process participants regarding creation of infrastructure objects of relevant committees – executive branches of the government, subordinate authorities and enterprises under jurisdiction of which these objects will be transferred for further exploitation [1]. Such an approach will allow to minimize time needed for registration of newly built object in Registry of property of Saint-Petersburg and its transfer for further exploitation to state unitary enterprise «Peterbugsky metropoliten» on legal basis.

According to Government Decree of the city of Saint-Petersburg from 27.09.2012 N 1044 [6] starting from 01.01.2013 functions of projects owner regarding construction and reconstruction of underground railway system objects were transferred to the Development committee of transport infrastructure of Saint-Petersburg.

Fig.1 shows procedure of real estate objects anchoring to SUE «Peterburgsky metropoliten» created by means of public funds of Saint-Petersburg.

DOI: 10.25515/PMI.2017.6.674

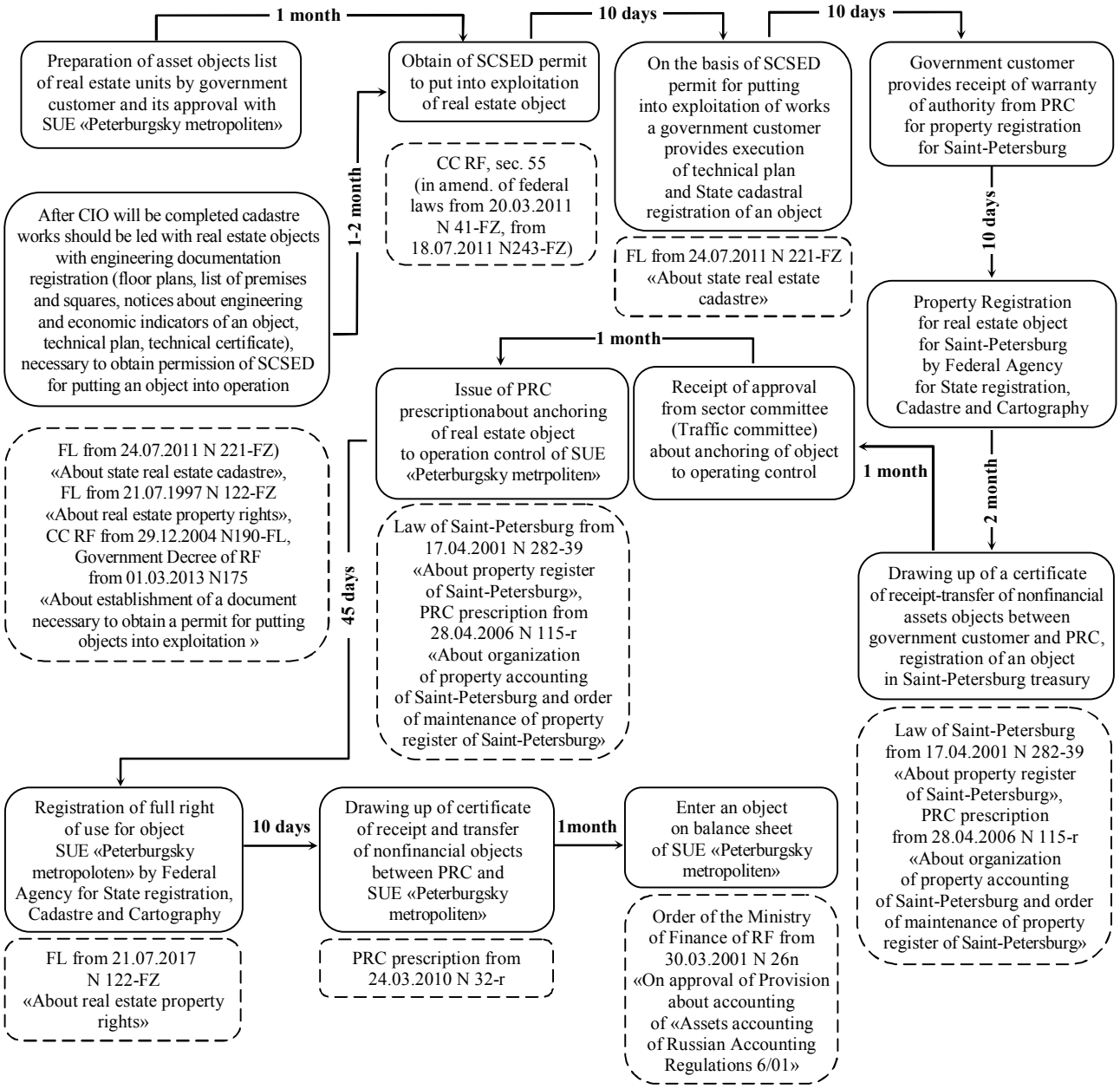


Fig. 1. Procedure of real estate objects anchoring to SUE «Peterburgsky metropoliten» created by means of public funds of Saint-Petersburg

CIO – construction and installation operations; SCSED – State Construction Supervision and Expertise department of Saint-Petersburg; FL – Federal Law; CC RF – Civil code of Russian Federation; PRC – Property Relations Committee of Saint-Petersburg; FASCC – Federal Agency for State registration, Cadastre and Cartography

For the period of time since 01.01.2013 a range of underground railway system newly constructed objects and objects after capital upgrade and reconstruction was put into exploitation. Process of putting of completed objects into exploitation to SUE «Peterburgsky metropoliten» revealed a set of questions formal solution of which leads to considerable increase in time needed to enter an object on the balance sheet of SUE «Peterburgsky metropoliten».

Enhancement of organizational and technical solutions regarding anchoring of completely constructed objects of underground railway system to operating control of SUE «Peterburgsky metropoliten» consists of several basic stages including preparation and agreement of documents and issue of necessary prescriptions [5], as follows:

1. Development and agreement with SUE «Peterburgsky metropoliten» of detailed engineering documentation and choose equipment types and classes.

2. Correction of obtained permit for capital objects construction issued by State Construction Supervision and Expertise department of Saint-Petersburg.

DOI: 10.25515/PMI.2017.6.674

3. Forming of new surface and underground facilities of underground railway system.

4. Forming of asset objects list which are projected to be transferred into operating control of SUE «Peterburgsky metropoliten».

5. Implementation of corrective actions of provisional commissions (considering experience of exploitation of the second entrance hall of «Sportivnaya» station corrective actions implementation lasts for more then 2 years).

6. Drawing up of certificate of receipt and transfer of nonfinancial assets between Transport infrastructure development committee (TIDC) and Property relations committee of Saint-Petersburg (PRC) and issue of a prescription by PRC about anchoring of real estate object to SUE «Peterburgsky metropoliten» for operating control.

7. Signing of an agreement with SUE«Peterburgsky metropoliten» concerning temporary exploitation.

Conducted analysis of transfer of completely constructed objects of underground railway system to operating control allows to propose organizational measures for reduction of terms of anchoring of movable and immovable assets to underground railway system on the right of operating control.

To accelerate the process of consideration and approval of detailed engineering documentation of newly constructed objects a Procedure of interaction between Transport infrastructure development committee and Transport committee and subordinate enterprises and establishments regarding putting into exploitation of capital construction objects was developed; terms of evaluation and approval of detailed engineering documentation between stakeholders are set in a Procedure. For instance, if we consider capital construction object «Frunzensky radius metropolitena» between «Mezhdunarodnaya» station and «Uzhnaya» projected to be put into service by 2018 there were 832 sections of detailed engineering documentation; for June 2017 80 % of sections were agreed and 20 % need to be corrected due to snagging items. If we take electric engine house «Uzhnoye» all sections of detailed engineering documentation to be agreed with underground railway system (about 400 sections) were fully considered. In the end of considering there will be a need for liquidation of snagging items regarding documentation and provision of detailed engineering documentation fully corrected in compliance with snagging items from underground railway system.

Permit of SCSED for construction must contain name titles and characteristics of objects which will be formed like real estate objects for the purpose of identification, cadastre works, further cadastre registration and state registration of property right of Saint-Petersburg [1]. Existing building permits contain incomplete list of real estate objects projected to be put into exploitation. That is the reason why after cadaster works (forming of real estate objects) and expertizes of a project it is necessary to introduce changes to SCSED permits.

Creation of a list of new surface and underground real estate objects of underground railway system and a list of asset objects projected to be transferred into operating control to SUE «Peterburgsky metropoliten» takes a lot of time. Lists should be ready before the objects will be put into exploitation and thus specialists of SUE «Peterburgsky metropoliten» provide consulting service regarding infill of the lists during a year before start of exploitation.

Technical characteristics of objects include principal technical parameters of an object, its parts, material of construction and must be agreed with specific exploitation services [3].

Difficulty and long time needed for agreement are provoked by the fact that before the moment of construction process will be completed and asset objects will be put into exploitation all post-completion documentation belongs to a customer – TIDC. Referring to latest experience, a transfer of post-completion documentation from a customer to exploitation services lasts for several months. A process of considering and agreement of a list of asset objects projected to be put into operating control in the services of SUE «Peterburgsky metropoliten» is supposed to be difficult in case of post-completion documentation absence.

At the time when project is going to be delivered a complete package of post-completion documentation should be presented to North-West Federal service for environmental, technological and nuclear supervision (Rostekhnadzor) for final review and check [5]. Participation of specialists from exploitation services in procedure of final review and check by Rostehknadzor and considering of post-completion documentation on the side of customer will allow to considerably reduce terms of agreement of technical characteristics of objects and also to introduce corrective actions pertaining to post-completion documentation of a delivered object beforehand.

DOI: 10.25515/PMI.2017.6.674

When commissioning procedure of the second inclined tunnel and entrance hall of «Sportivnaya» station took place a finding of government construction oversight authority regarding compliance of constructed, reconstructed, repaired capital construction objects with requirements of technical guidelines and project documentation of commissioned object as well as permit of State Construction Supervision and Expertise department to put into exploitation of newly constructed object were obtained within one day – 25th May 2015. On one hand, this reduced terms of preparation of necessary documents for transfer of completed construction objects of underground railway system into operating control of SUE «Peterburgsky metropoliten» and, on the other hand, indicates lack of attention to commissioning object from regulatory authorities during determination procedure. It is documented during 2 years exploitation of an object when snagging items of acceptance commissions were liquidated not to the fullest extent in terms of currently operating agreement about temporary exploitation between customer and SUE «Peterburgsky metropoliten».

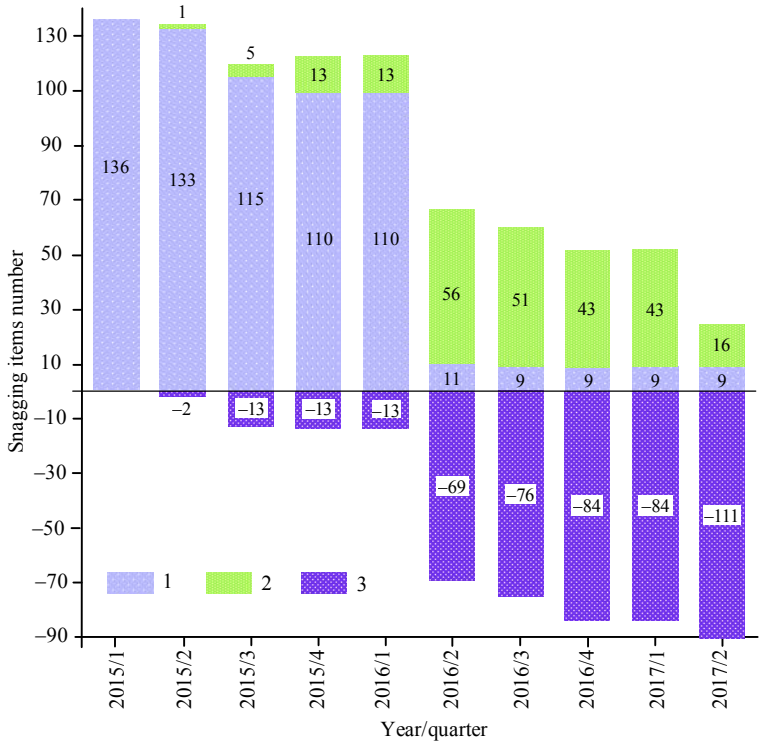


Fig.2. Dynamics of liquidation of snagging items regarding second entrance hall of «Sportivnaya» station: snagging items during start-up of entrance-hall (1), after start-up of entrance hall (2), liquidated snagging items (3)

Fig.2 demonstrates dynamics of corrective actions implementation in respect of snagging items revealed by work commissions during start of exploitation and during exploitation of the second entrance hall of «Sportivnaya» station.

By the moment of obtaining a permit for putting into exploitation not all snagging items of work commissions are corrected. Subsequently, joint orders of SUE «Peterburgsky metropoliten» and Saint-Petersburg state public establishment «Directorate of transport construction» (DTC) are issued in order to organize works in operating underground railway system for implementation of corrective actions [7].

For the purpose of reduction of terms for corrective actions realization, following organizational and technical measures are necessary to conduct:

1. Timely issuing of prescription of Transport infrastructure development committee (TIDC) about defining of commission responsible for acceptance of capital construction objects including approval of special working group participants regarding check of particular objects, facilities and installed equipment readiness.

2. Participation of specialists of exploitation services of underground railway system in procedure of final check by Rostechnadzor (on agreement).

3. Terms of liquidation of snagging items revealed by work commissions must be approved by vice-governor and controlled by Transport infrastructure development committee and Directorate of transport construction.

4. Satisfying the requirements of transport safety should be provided to a full scale before underground railway system objects will be put into exploitation.

TIDC and DTC draw up certificate of receipt and transfer of nonfinancial objects between TIDC and PRC and issue a prescription concerning anchoring of real estate object for operating control to underground railway system should start after cadastre works performing on newly

DOI: 10.25515/PMI.2017.6.674

constructed objects of underground engineering [8,9]. Taking into account forming of technically complicated integrated object of real estate a customer needs to organize cadastre works before procedure of final review and check starts and permit to putting into operation will be obtained. This procedure should effectually be conducted after main volume of construction and installation operations will be finished when check-out and start-up operations are led and all principal operations are finished and boundaries of real estate objects are set.

Customer's works in respect of drawing up certificate of receipt and transfer of nonfinancial objects between TIDC and DTC, registration of real estate object (second entrance hall of «Spotivnaya» station) in Proprietorship register of Saint-Petersburg (Saint-Petersburg treasury) took 6 months instead of projected period of 1 month which happened due to a delay in time during preparation and agreement of a prescription of TIDC, DTC and PRC.

Initially, when schedule of commissioning of completed construction object was drawn up a procedure of issuing of PRC prescription concerning real estate object anchoring for operating control to underground railway system and simultaneous drawing up of state registration of ownership of Saint-Petersburg and operating control was planned to perform. However, in reality this procedure was performed in several stages, which, consequently, became a reason for delay.

After putting an object into operation and cadastral registration a state registration of state ownership of Saint-Petersburg is needed, object is registered in treasury with its monetary indicators in compliance with approved certificate of receipt and transfer of nonfinancial assets documented between TIDC and PRC. Further after registration of an object in treasury of Saint-Petersburg a package of documents including transport committee agreement regarding anchoring of real estate object for operating control to underground railway system is addressed to PRC [5]. PRC issues an appropriate prescription. This procedure took 3 months. On the basis of PRC prescription state registration of right of operating control was performed, certificate of receipt and transfer of nonfinancial assets between PRC and SUE «Peterburgsky metropoliten» was approved.

Under the circumstances, even in case of fulfillment of presented proposals a procedure of transfer of completed constructed object to operating control to SUE «Peterburgsky metropoliten» after customer receipt of permit of putting into operation takes several months. Taking into account this circumstance and for the purpose of providing a possibility of transport service after obtaining a permit to put an object into operation it is necessary to make an agreement about temporary exploitation between customer concerning project brief and SUE «Peterburgsky metropoliten» (exploitation organization).

Fig. 3 shows a graph of measures regarding putting into exploitation of «Sportivnaya» station second entrance hall opened for passengers on 27th May 2015.

A stated above agreement is in force up to the moment of full transfer of an object into operating control of SUE «Peterburgsky metropoliten» and liquidating of all snagging items revealed by acceptance commissions on the object [10].

In accordance with an agreement SUE «Peterburgsky metropoliten» executes temporary exploitation and transport service under the terms prescribed by legislation and operating rules and regulations of underground railway systems, provides transport safety and operation of devices and equipment. TIDC – a customer regarding project brief – provides guarantee and service for devices, facilities and equipment and takes responsibility and liquidates snagging items prescribed by state supervisory authorities in respect of possible nonconformities of constructions, equipment and devices to regulatory requirements.

Currently SUE «Peterburgsky metropoliten» executes a temporary exploitation of objects on the basis of agreement made by SUE «Peterburgsky metropoliten» and TIDC for more than 2 years after putting objects into exploitation. However, the legislation does not provide exploitation of real estate object which is not placed on the balance sheet.

For liquidation of nonconformity to legislation in situation occurring during real estate object exploitation and when it is not being placed on the balance sheet of the enterprise it makes sense to introduce corresponding changes to the government decree of the city of Saint-Petersburg from 26.02.2008 N 187 «On approval of a Decree of order of interaction between executive state government body of Saint-Petersburg during construction, reconstruction, rehabilitation and capital upgrades of objects of major construction from budget resources of Russian Federation and budget of Saint-Petersburg and its transfer to special exploitation organizations» [2]. Corrections will allow to execute temporary exploitation of real estate objects on legal basis.

DOI: 10.25515/PMI.2017.6.674

Measures and work types	Year													
	2014				2015				2016				2017	
	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II
Conversion of pit shaft N 516 and liquidation of construction														
Construction and installation operations on object														
Check-out and start-up operations and integrated testing of systems														
Receipt of official notification from general contractor regarding readiness of object commissioning														
Issuing of TIDC prescription about determining of commission for real estate object acceptance including approval of special working group participants														
Work of acceptance commission and special working group														
Drawing-up of object certificate														
Signing of acceptance commission certificate														
Preparation of documents from special urban exploitation organizations justifying fulfillment of issued technical conditions for connection to utility systems														
Addressing notification to Rostekhnadzor about final acceptance procedure														
Final acceptance procedure of the object by Rostekhnadzor forces														
Receipt of finding of government construction oversight authority regarding compliance of constructed, reconstructed, repaired capital construction objects with requirements of technical guidelines and project documentation														
Receipt of SCSED permit for putting into exploitation of completed capital construc-tion object														
Making agreement about temporary object exploitation														
Cadastre works														
Cadastre registration of an object														
Drawing up certificate of receipt and transfer of nonfinancial assets between TIDC and PRC and registration of real estate object in Proprietorship register of Saint-Petersburg														
Issuing of PRC prescription in respect of anchoring of real estate object to operating control to SUE «Peterburgsky metropoliten»														
Registration of ownership right of Saint-Petersburg for real estate object														
Registration of operating control right of SUE «Peterburgsky metropoliten» for real estate object														
Drawing-up a certificate of receipt-transfer of nonfinancial assets between SUE «Peterburgsky metropoliten» and PRC														
Entering an object on the balance sheet														
Liquidation of snagging items of work commissions and exploitation services														
Temporary exploitation														

Forecast as of September 2014 Actual execution of measures as of 01.01.2017

Fig. 3. Graph (quarterly) of measures regarding put into exploitation of second entrance hall of «Sportivnaya» station

DOI: 10.25515/PMI.2017.6.674

In conclusion we may highlight main organizational and technical measures on the basis of which unrestrained readiness to putting into operating control of transport infrastructure objects may be provided:

1. Joining together efforts of special committees – state executive authorities, subordinate establishments and enterprises performing customer functions as well as state registration and organizations under jurisdiction of which objects will be transferred for exploitation purpose, aiming to minimize terms of issuing and agreement of documents for anchoring of newly constructed objects in Register of ownership of Saint-Petersburg and further exploitation on legal basis.

2. Performing of cadastre works regarding final check and receipt of permit for putting into operation when check-out and start-up operations after main volume of construction and installation operations will be finished.

3. Reduction of terms of liquidation of work commissions snagging items by general contractor forces.

4. Introduction changes to the government decree of the city of Saint-Petersburg from 26.02.2008 N 187 «On approval of a Decree of order of interaction between executive state government body of Saint-Petersburg during construction, reconstruction, rehabilitation and capital upgrades of objects of major construction from budget resources of Russian Federation and budget of Saint-Petersburg and its transfer to special exploitation organizations».

REFERENCES

1. Urban development code of the Russian Federation [Electronic resource]. Rossiiskaya gazeta N 190-FZ ot 29.12.2004 g. (s izm. i dop.). Available at: http://rd.ru/2004/12/30gradostroitelniy kodeks.html (in Russian).

2. Kozin E.G., Kononova N.S. Modern state and prospects of development of normative-technical base regarding maintenance, repair and reconstruction of Petersburg underground system facilities. Proektirovanie, stroitel'stvo i ekspluatatsiya kompleksov podzemnykh sooruzhenii: Trudy III Mezhdunarodnoi konferentsii, 19-21 maya 2010 g. Ural'skii gosudarstvennyi universitet. Ekaterinburg, 2010, p. 83-89 (in Russian).

3. Order of Ministry of Finance of RF «On approval of Provision about accounting of «Assets accounting of Russian Accounting Regulations 6/01» N 26n from 30.03.2001. (amended and revised). Spravochno-pravovaya sistema «Konsul'tant Plyus». Available at: http://www.consultant.ru/document/cons_doc_law_31472(in Russian).

4. Order of Federal Service for Ecological, Technological and Atomic Supervision «On approval and enforcement of Pretensions to structure and order of maintenance of post-completion documentation during construction, reconstruction and capital upgrades of objects of major construction and requirements raised to works acceptance acts, constructions, areas of engineering and technical provision network (RD-11-02-2006)» N 1128 from 26.12.2006. (amended and revised). Spravochno-pravovaya sistema «Garant». Available at: http://base.garant.ru/12152349/ (in Russian).

5. Government decree of the city of Saint-Petersburg «On approval of order of interaction between executive state government body of Saint-Petersburg during construction, reconstruction, rehabilitation and capital upgrades of objects of major construction from budget resources of Russian Federation and budget of Saint-Petersburg and its transfer to special exploitation organizations» N 187 from 26.02.2008 (amended and revised). Available at: http://docs.cntd.ru/document/8470518 (in Russian).

6. Government decree of the city of Saint-Petersburg «About making amendments to certain government decrees of the city of Saint-Petersburg » N 1044 from 27.09.2012 (amended and revised). Available at:http://piter-gov.ru/doc/47367 (in Russian).

7. Mizgirev S.N., Minaev G.I., Sukhov S.B., Fedorov A.G., Fursaev M.V. Rules of technical exploitation of rapid transit systems of Russian Federation. Moscow: ZAO Izdatel'skii tsentr TA Inzhiniring, 2003, p. 128 (in Russian).

8. Federal law «About real estate property rights» N 122-FZ from 21.07.1997 (amended and revised). Spravochno-pravovaya sistema «Konsul'tant Plyus». Available at: http://www.consultant.ru/document/cons_doc_law_15287/resurs (in Russian).

9. Federal law «About state real estate cadastre» №N 221-FZ from 24.07.2007 (amended and revised). Spravochno-pravovaya sistema «Konsul'tant Plyus». Available at: http://www.consultant.ru/document/cons_doc_law_7700881 (in Russian).

10. *Kozin E.* Safety Operation Assurance for Metro Artificial Facilities During Underground Space Development in St. Petersburg. 15th International scientific conference «Underground Urbanisation as a Prerequisite for Sustainable Development», St. Petersburg, Russia, 12-15 September, 2016, p. 219-228. Doi.org/10.1016/j.proeng.2016.11.717.

Author **Evgenii G. Kozin**, *Candidate of Engineering Sciences*, *Senior deputy of rapid transit system director*, *nz1@metro.spb.ru* (*SUE «Peterburgskiy metropoliten»*, *Saint-Petersburg*, *Russia*).

The paper was accepted for publication on 12 July, 2017.