

SPECIFIC FEATURES OF IDENTIFICATION AND CORRECTION OF ERRORS IN THE REGISTER MADE IN THE LAND SURVEYING

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ABSTRACT: The article looks at the pressing issue of identification of errors in the Unified State Register of Immovable Property in the territory of the Russian Federation. The objective of this paper is to find out the causes of such errors and the ways of their elimination. Main results: The authors have suggested their own classification of errors in the Unified State Register of Immovable Property based on analysis of forensic examinations conducted by the autonomous nonprofit organization “West-Siberian Expert and Legal Center” over ten years in respect of errors resulting from cadastral works and land surveying. Real-world examples of such errors are provided. Main conclusions: 1. Most of the errors in the Unified State Register of Immovable Property are caused by insufficient professional training of cadastral engineers. 2. Errors in the Unified State Register of Immovable Property can be identified with the help of remote sensing and land surveying. 3. Specialists who conduct cadastral and land surveying works should know the causes of errors in the Unified State Register of Immovable Property and the ways of their identification and correction.

Keywords: Errors in the Unified State Register of Immovable Property, Unified State Register of Immovable Property, Russian Federation, Cadastral works and land surveying

1. INTRODUCTION

Identification and correction of errors in the Unified State Register of Immovable Property (USRIP) represent a modern and developing set of measures implemented in the course of maintenance of the USRIP due to the fact that the current system of land registration in the Russian Federation was created in 2000.

Scientists and specialists in the field of geodesy, cartography and cadastral study the issues of development of cadastral systems in Germany, Austria and Poland [1, 2], the cadastral system of land registration in Turkey [3], maintenance of the cadastral register in Spain [4], land registers in Kazakhstan [5], Romania [6], Australia [7], and the new Ethiopian cadaster and land register [8]. However, maintenance of the register of immovable property in Russia is in many aspects different from other countries and is characterized by its own specific features.

It is necessary to possess reliable information about real estate items in order to manage land resources effectively and develop the land market in the Russian Federation. Modern land surveying equipment is used in the course of measurement and landmarking of land plots in the constituent entities (municipal units) of the Russian Federation, but the human factor is always involved in this kind of work, such as carelessness, lack of experience or entering approximate data. All of these cause both minor misprints and serious mistakes in land documentation.

The difficulty of error identification in the USRIP consists in the fact that they are usually found when a physical person contacts an organization dealing with cadastral works in order to perform state cadastral registration of the real estate item, obtain a building permit at the stage of development of the corresponding territory, or to resolve a dispute between owners of adjoining land plots concerning their boundaries.

Analysis of the experience of error identification and correction in the USRIP made in the course of cadastral works and land surveying is necessary for developing recommendations for cadastral engineers to be used in their practical activities. This determines the relevance of theoretical and applied research into the identification of USRIP errors in order to reveal their causes and specify land surveying methods for their identification and further elimination.

2. METHODS

The subject of this research is USRIP errors made in the course of cadastral works and land surveying in territories falling into different categories. The research is based on the following materials: data provided by the Department of the Federal Service for State Registration, Cadastral Records and Cartography for the Omsk region (hereinafter referred to as the Department of the Federal Service for the Omsk region), forensic

examinations conducted by the Autonomous nonprofit organization “West-Siberian Expert and Legal Center”, and the public cadastral plan as an online resource.

Research methods: remote sensing with the use of satellite and aerial images, orthophotomaps and terrestrial photos allow to identify USRIP errors in the fastest and the most visually compelling way and develop recommendations for their elimination. Remote sensing is used to provide information support of the maintenance of the USRIP and execution of state land supervision and municipal control and provide citizens with up-to-date reliable information about the condition of the land. Orthophotomaps are high-quality source materials characterized by clear layout and accuracy, which can be used to address all kinds of issues connected with clarification of land plot boundaries and area as well as with identification and correction of USRIP errors. Terrestrial land surveying provides more accurate results when controversial issues regarding coordinates of land plot corners are being resolved. Research is conducted with the help of visual examination, necessary terrestrial land surveying, taking photos of land plot boundaries and existing buildings, calculations based on the results of remote sensing, usage of orthophotomaps, drawing up schemes, analysis of regulatory and technical documentation and the provided materials. After that, a conclusion is made as to the presence or absence of USRIP errors and ways of their elimination.

3. RESULTS

Having conducted an analysis of ten years of operation of the Autonomous nonprofit organization “West-Siberian Expert and Legal Center”, we identified the following USRIP errors and their percentage of the total number of errors (original classification) (Fig. 1).

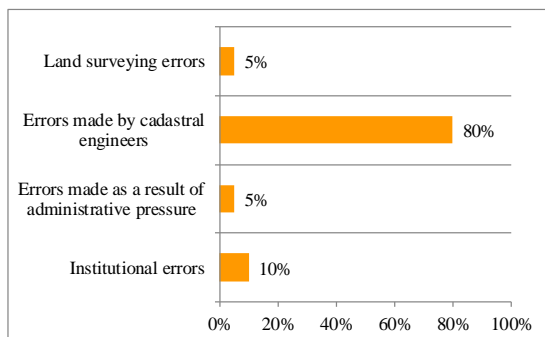


Fig. 1. The number of USRIP errors from 2008 to 2018.

The highest percentage (up to 80%) is represented by mistakes made by cadastral engineers, while the lowest — by errors made as a

result of administrative pressure and land surveying mistakes connected with determining wrong coordinates of land plot corners. Institutional errors, which constitute 10% of the total number, can be illustrated by land disputes regarding forest lands that led to the adoption of the law “On forest amnesty”.

In order to confirm the result of the conducted research, we provide specific examples of such errors, which have been identified with the help of remote sensing and land surveying methods:

1. USRIP errors (land surveying errors)

In the Novaya Stanitsa settlement located in a municipal district in the Omsk region a hanging tacheometric traverse was run from the initial point of the boundary reference network [9] 1982 and the boundary reference network 4422 in order to determine the coordinates of land plot boundaries. The hanging tacheometric traverse is uncontrolled as far as the identification of coordinates is concerned (Fig. 2).

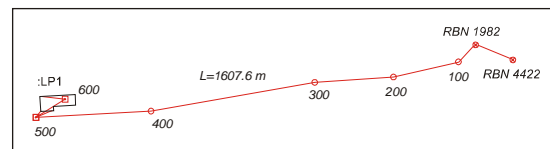


Fig. 2. Location of the initial land survey points.

A parcel of land that is overlapping with the land plot located at 31 Pomortseva St. is marked with color (Fig. 3).

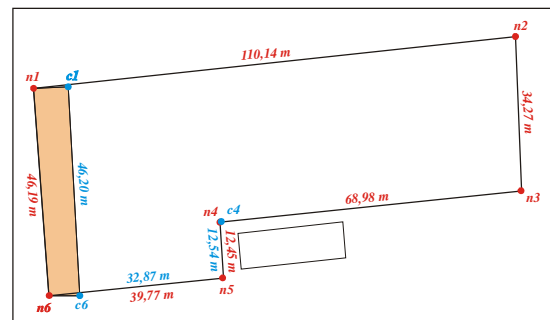


Fig. 3. Plan of the land plot based on landmarking data.

The above-mentioned circumstances led to an error of 6 m in the determination of coordinates. This error could be found on satellite images [10] and by land surveying, namely by measuring the distance from the fence to the existing building (Fig. 4).

2. Errors made by cadastral engineers:

– mistakes made as a result of the lack of qualification of a cadastral engineer.

A land plot was allocated on the bank of the Irtysh River and its coordinates were determined. Later the land plot was registered with the State Cadaster. However, in the course of the transition to the new

system of geodetic coordinates, a conversion mistake was made, so the land plot turned out to be located in the river bed (Fig. 5). The land plot was excluded from the USRIP, but the owner was not notified thereof. The initial real estate item was transferred to another owner. Forensic examination proved that the land plot was excluded from the USRIP by mistake. Terrestrial land surveying and remote sensing methods were used during the examination to prove the claim.



Fig. 4. A real-life photo.

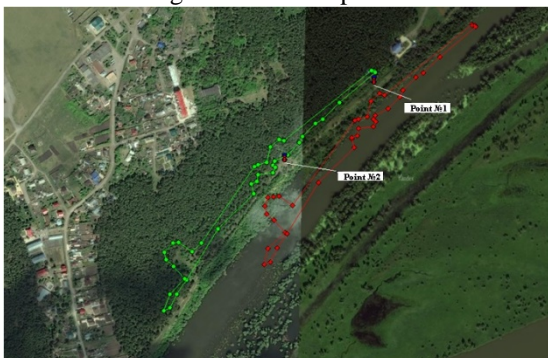


Fig. 5. Results of the comparison of coordinates of the land plot no. 55:20:240801:0089.

– intentional error.

In the village Shebarkul in the Shebarkul district of the Omsk region, two land plots were allocated for construction of residential houses with fixed areas. When construction of the houses was completed, the owner of the left land plot persuaded the cadastral engineer to draw a boundary line between the land plots just along the wall of the neighbor's house and thus, violate all existing standards. The contour of the land plot no. 55:32:100122:6 is based on the coordinates indicated in the cadastral excerpt no. 55/201/16-357274 of 24.08.2016; the underlying image used is an oriented satellite image (Fig. 6).

The possible boundary between the disputed land plots preserving the actual land-use practices is shown in Fig. 7.

3. Errors made as a result of administrative pressure.

In the village Volnoe in the Poltavka municipal district of the Omsk region, the head of the district strongly recommended that the cadastral engineer indicated the leased land plot actually used for warehouse premises as agricultural lands (Fig. 8).



Fig. 6. The contour of the land plot no. 55:32:100122:6.

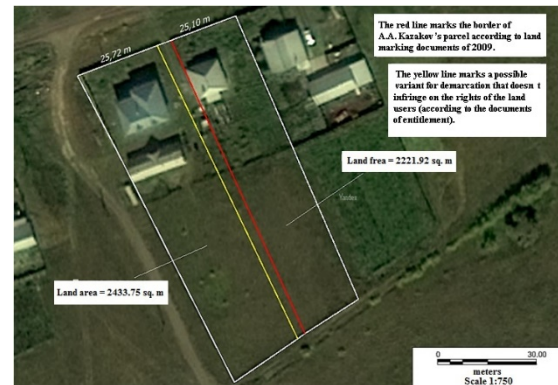


Fig. 7. The contour of the land plot no. 55:32:100122:6.



Fig. 8. The layout of the land plot and grain storages in a satellite image.

The photo shows vividly that there are warehouses on the allocated land plot.

4. Institutional errors

Tara forestry in the Tara municipal district of the Omsk region is located within the territory of the Ekaterininskoe rural settlement. In the course of an

investigation into this issue, the boundaries of land plots no. 55:27:050101:932, 55:27:050101:933 and 55:27:050101:940 (indicated in the cadastral excerpt for the land plot in electronic form) were compared with the boundaries of the forest plot indicated in a fragment of a digital forest map provided by the FSBI "Roslesinfor".

The forest plot boundaries were determined with the cartometric method accurate within 25 m. Therefore, it is inappropriate to speak of overlapping boundaries of land plots registered in the USRIP (defined in accordance with the land legislation and measured with accuracy within 0.2 m), on the one hand, and boundaries of forest plots, the boundaries of which are not determined in accordance with the land legislation and which were measured with the cartometric method to a precision of 12 to 25 m, on the other hand.

For a more detailed analysis of the situation an orthophotomap of this territory with 1:2,000 scale was used. The possible boundary between the disputed land plots preserving the actual land-use practices is shown in Fig. 9.

Superimposition of the boundaries of land plots with the above-mentioned cadastral numbers onto the boundaries of the forest plot (Figure 9) shows that the boundaries of the forest plot located in the quarter no. 179 indicated on the digital forest map do not correspond with the boundaries of natural objects within this territory. The registered boundaries are shifted against the boundaries of natural objects, and this gap is expressed by a variable value from 20 to 56 m. The boundary displacement exceeds the tolerable error range allowed for the cartometric method significantly (from 12 m).

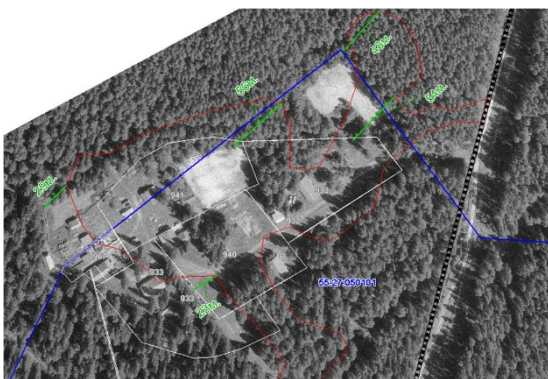


Fig. 9. Approximate assessment of the discrepancy between the boundaries of the forest plot and the boundaries of real objects in the orthophotomap and in real life.

The boundaries of land plots with the above-mentioned cadastral numbers totally coincide with the boundaries of natural objects.

Therefore, in the course of demarcation of forest plots, an institutional error is made in the USRIP

since the forest fund relies only on its own institutional instructions and ignores federal laws [11].

Generally, USRIP errors are subject to correction in the following ways: introducing amendments to the data about the real estate item, as a result of information exchange, or pursuant to a legally effective court decision.

We will illustrate the correction of USRIP errors by an example of objects located in the Kirovskii administrative district of Omsk at 88/5 and 88/4 Suvorova St. (Fig. 10) [12].



Fig. 10. The layout of the land plots.

The owner of the land plot under the cadastral number 55:36:140107:57 contacted LLC "PromKadEkspert" with a request for performing cadastral works in order to obtain a building permit and register a capital construction object with the State Cadaster. In the examined land plot there is a townhouse with brick walls.

Having processed the photos taken within the territory, in the course of drawing up the site space layout, the cadastral engineer found a USRIP error: there was a discrepancy between the coordinates of boundaries indicated in the USRIP and the actual location of the land plot under the cadastral number 55:36:140107:57 and the adjoining land plot no. 55:36:140107:74. The error was reported to the client.

This USRIP error impeded further execution of works. Additional cadastral works were necessary, namely preparation of a demarcation plan to correct the mistake regarding the location of the land plot boundaries. The owner of the adjoining land plot was willing to eliminate the identified USRIP error.

In the course of work, the following documentation was developed: land surveying layouts, location maps and drawings of the land plots, and alignment acts [9]. While the location of boundaries of these land plots was aligned, it was necessary to obtain approval of both owners was

necessary in the form of alignment acts, since in both cases on the one side of the plot there was a road registered with the State Cadaster, the boundaries of which were defined and alignment was not necessary, whereas on the other side there were lands in the state or municipal ownership without defined boundaries, which are not subject to alignment in accordance with Clause 3 Article 39 of the Federal Law no. 221-FZ of 24.07.2007. Two cadastral excerpts from the Federal State Information System of the USRIP for the land plots were obtained in electronic form via electronic public services provided by the Department of the Federal Service for the Omsk region.

An inquiry about capital construction objects registered in these land plots was sent to the Department of the Federal Service for the Omsk region. As a result, a cadastral excerpt was obtained for a capital construction object located in the land plot with the cadastral number 55:36:140107:74 as well as a notification of absence of information on any capital construction objects in the land plot registered under the cadastral number 55:36:140107:57 in the USRIP.

A copy of the land allocation file was provided regarding the land plot with the cadastral number 55:36:140107:74, which shows that initially, the area of this land plot amounted to 1,125 sq.m. In the course of cadastral works a USRIP error was made, which led to a significant reduction of the land plot to 950 sq. m. When a USRIP error is corrected, the initial state of the land plot boundaries is recovered.

Therefore, correction of the USRIP error was made by mutual agreement of the owners of the two land plots. More often than not, such controversial issues are resolved through legal proceedings due to the refusal of one of the owners to correct the error (Table 1).

4. DISCUSSION

USRIP errors can be conventionally divided into the following groups:

- land surveying errors connected with wrong determination of coordinates of land plot corners;
- errors made by cadastral engineers;
- intentional USRIP errors made as a result of administrative pressure exercised on the cadastral engineer by the management of the organization;
- institutional USRIP errors caused by the fact that institutions rely only on their own instructions and ignore federal instructions and laws.

Mistakes made by cadastral engineers comprise the largest part of all errors. They appear due to lack of experience and carelessness and fall into the first subgroup — unconscious mistakes — 40%. The second subgroup is represented by conscious

mistakes or forgery, when a cadastral engineer knows that he or she is making an error, but hopes that it will not be revealed. This situation can be illustrated by the execution of order without actually visiting the site, which leads to approximate coordinates being indicated in the demarcation plan. Data are taken from the information on the adjoining land plots that are already registered with the State Cadaster, for instance from the public cadastral plan (40%).

5. CONCLUSION

As a result of research into the causes of USRIP errors based on the analysis of ten years of work aimed at their identification, the following conclusions can be drawn:

1. An original classification of USRIP mistakes has been suggested and percentage breakdown of typical errors has been identified, which is unique and not provided by any other literary sources.

2. Causes of USRIP errors have been identified.

3. Most USRIP errors can be found by using remote sensing, satellite images and orthophotomaps as well as terrestrial land surveying.

4. Cadastral engineers and specialists who conduct cadastral and land surveying works should know the causes of USRIP errors and the ways of their identification and correction.

USRIP errors made due to any reason are quite likely to appear because works are conducted by people. However, for the client (landowner) such a mistake can cost a lot. While expenses resulting from sending an inquiry to the USRIP are not very high, costs of judicial proceedings connected with the challenging of illegal actions and damages caused by USRIP errors can be really impressive.

Table 1. The results of the research on the identification of the land surveying errors.

No	Type of land surveying errors	%
1	Geodesic	5
2	Administrative pressure	5
3	Institutional	10
4	Lack of cadastral engineer's qualifications	40
5	Intentional errors made by cadastral engineers	40
Total		100

It follows from Table 1 that 80% of the land surveying errors are the result of the lack of cadastral engineer's qualifications or their

dishonesty cadastral engineers. It is important to improve the training of cadastral engineers and introduce stricter control of their professional activities.

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