

# **Parcel Boundaries in the Czech Republic**

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**Key words:** Czech cadastre, parcel boundary, history, definition, delineation, demarcation, cadastral surveying, correction of errors, boundary disputes.

## **SUMMARY**

This paper will deal with issues of parcel boundaries in the Czech legal code and technical cadastral regulations. We will mention the history of boundary records in our country, the influence and impact on them in the planned economy period, procedure of survey of their location, methods of demarcation of border lines and their accuracy.

Brief information will be given about the representation parcel boundaries in cadastral maps according to the cadastral law, their registration in the present cadastre of real estates and their effectuality. We will discuss situations when and how it is possible to change boundaries in cadastre. Process of digitisation, techniques of delineation boundaries, procedure in the framework of the correction of errors in the cadastre and some ways of resolving boundary disputes will also be described.

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## 1. INTRODUCTION

An estate is the smallest unit of registration in modern cadastres and land registers within the Czech lands. In the Czech system of law, an estate is a subject of the civil law relations, the entities of which may be individuals, corporations and the state. An estate is understood to be a part of the Earth's surface separated from the adjacent parts with administration boundaries, boundaries of a cadastral area, proprietary boundaries, possessory boundaries, boundaries of use of the land, a boundary between the crops (nowadays – arable land, hop gardens, vineyards, gardens, orchards, grass growth, forest areas, water areas, built-up areas and courtyards, other areas) or interfaces of land by use (i.e. more detailed segmentation by the use of the land) The boundary is defined as a closed polygon connecting the breaking-points on the estate periphery. A parcel is understood to be the geometry and representation of the estate in a cadastral map. Every parcel has been and is clearly identified in any part of the register records, showing that it belongs to a higher unit of technical registration – cadastral area (formerly a cadastral municipality) and its parcel number (e.g. 157, 253/5) in a single series of numbers in ranges of parcels of land or building parcels. Rule of forming estates (identical legal relations, minimum permissible area and more) were determined in any types of registration shown below. The boundaries of administration areas and cadastral areas typically run along the possessory (leasehold estates) boundaries.

Formerly, the boundaries that were permanently visible on the ground were surveyed and registered with the breaking-points marked in a specified method with fixed boundaries signs. The boundaries of tenure were examined and surveyed. In the period of planned economy, the condition was partially modified. The boundaries of property and the use of land visible on the ground were examined and surveyed. In rural areas, in addition to the existing boundaries of use of the agricultural and forest land, also the property boundaries and land not existing on the ground (cf. par 2.3) were registered in a simplified way (in original maps). Nowadays, in addition to the preceding, also the coordinates of the planned boundaries points and the lots of agricultural land resulting from the land arrangement and boundaries thereof, not actually existing on the ground as they are parts of land of various owners managed by a single tenant, are entered in the register. Initially, the boundaries points were surveyed using graphic methods, later numeric methods and nowadays, using numerical methods and calculation, with the breaking-point coordinates being stored in a binding surveying reference system.

## 2. HISTORY OF LAND REGISTRATION AND ESTATE BOUNDARIES

### 2.1 Stable Cadastre

In Bohemia, the first modern cadastral mapping for purposes of taxation was done in 1824 - 1843. It was a part of mapping the entire former Austrian Monarchy ordered by a patent issued by Emperor Franz I in 1817. The patent introduced so-called stable cadastre.

The geodetic horizontal control of the stable cadastral surveying was the triangulation net of the I – III order with points of the IV order added determined by the graphic triangulation. The Cassini-Soldner cylindrical projection in transverse position was applied, in two strips in this country, with the beginnings of Gusterberg systems of coordinates (Bohemia) and Saint Stephan (Moravia and Silesia). The maximum distortion of length at the edge of the strip is 49 cm/km.

The boundaries of the spatial technical units – cadastral municipalities – were examined, stabilised and described prior to actual measurement. Prior to detailed measurement, the freeholders (proprietors) of land were ordered to mark out, together with neighbours, the boundaries of their estates with border marks (boundary stones, stakes) where the natural boundaries did not exist on the ground. Disputed parts of the land were precisely marked out and surveyed as separate estates. The detailed measurement was mostly done using the plane table graphic methods of accuracy in decimetres to meters. The efforts resulted in development of cadastral maps of scale 1:2880 in a sheet line uniform for the entire system of coordinates. Every cadastral municipality was displayed separately in so-called island maps. The cadastral maps derived from maps of the stable cadastre have been used for a larger part of the Czech Republic (some 70%) subject to certain limitations (insufficient accuracy, questionable conversion to the present system of coordinates) till now.

The stable cadastre map was not maintained for a long period of time, it became obsolete and therefore, in 1869, an act on new adjustment of the land tax and the register reambulance was issued. Reambulance of the stable cadastre maps was done under the pressure of time, often in an unprofessional manner and decreased quality of the maps. A new land register was established in 1871, which the maps were technical reference for. The register records and the land register were maintained in correspondence between each other thereafter.

In the late 19<sup>th</sup> century, routine maintenance of maps was introduced and the fathom system was replaced with the metric one. Mapping was done using the traverse method that was more precise and the scale of 1:2500 began to be used. The basis of modification of the estate boundaries in the cadastral maps and the registration maps became the notification sheets made out by the land tax registration offices and geometric plans made out by private civil surveyors.

## 2.2 Cadastre of Lands

New positive changes occurred in the new Czechoslovak Republic after 1927 when the Act on Land Cadastre was issued. Regulations for new cadastral mapping were developed, the Unified trigonometric cadastral net (JTŠK) was developed throughout the territory of the country and Křovák double conforming conical projection in general position with a more favourable linear distortion (0 - 14 cm/km) was introduced.

The new mapping was preceded with obligatory permanent marking (boundary marks provision) of undisputable register and freehold boundaries and local examination of the boundaries by committees. Disputed boundaries were surveyed according to the last condition of peaceful holding, otherwise according to existing representation in cadastral documentation or along the periphery of the disputed area that was divided between the holders. The disputed boundary was then removed following the court decision. Rules of land subdivision were determined, those of the boundary surveying, rearing and use within one holding and other objects of surveying.

For detailed surveying, traverse method with orthogonal measurement of detail, polar method, intersection ahead and table method was also admitted. With numerical methods, a field sketch and a field notes were kept that may be used even today for calculation of the breaking-point coordinates of boundaries in S-JTŠK. The decimetre accuracy of numerical methods was then meeting contemporary requirements. Mapping was done particularly in places, in which the original fathom map was no more satisfactory (in towns) and ended in the 1950s. The result was a graphic cadastral map in approximately 1/10 of the territory, typically in scales 1:2000 or 1:1000.

## 2.3 Real Estate Registry

Epochal changes of land ownership and relations of use after the Second World War (land reform, nationalisation and socialisation of rural areas) caused that the Cadastre of lands records stopped conforming to the actual and legal condition and the needs of the state. Therefore, beginning from 1964, they were replaced with one tool of registration – Real Estate Registry, in which technical and legal information (administration data) on real estates was integrated.

Of island maps 1:2880, a land map in continuous representation was developed. Decadic cadastral maps of the Cadastre of lands were taken over into the new registration. The new registry served primarily as a reference for control of the planned economy, particularly socialist agricultural large scale production and it was also a tool of suppressing private ownership of land. Therefore, primarily the boundaries of use of land in rural areas were registered while boundaries of privately owned estates were removed from the new maps. These estates were components of large blocks of agricultural and forest land used by socialist united cooperatives and state enterprises. The proprietary estates consolidated in huge complexes of land were registered in a simplified way in the property register records and the course of their boundaries could be found out from the previous cadastral maps. This condition

is being removed but it still exists on a part of the territory. Estates of this kind are called land registered in a simplified way.

In the period of real estate registry, new mapping continued in the country with the intent to replace the fathom map. In the 1960s and 1970s was created the technical and economic map, in the 1980s and 1990s the numerical Basic map of large scale, usually in 1:2000 and 1:1000. These maps cover approximately 1/5 of the territory. The mapping was preceded by local examination of the boundaries of estates in terms of ownership and use pursued by authorities of surveying in cooperation with the affected persons and other national authorities and organisations. The boundaries of land lots registered in a simplified way not shown on the ground were not examined and measured. Today, the results of the boundaries examination carried out in the planned economy investigation are often attacked and questioned by the owners, although formerly, the proceedings before acceptance of the recovered records were free of any objections. Detailed measurement was typically done using the polar method and aerial photogrammetry in the rural areas. The accuracy of detailed measurement meets the present needs.

Changes of the estates boundaries in the map records of real estate registry were done according geometric plans prepared by Survey Centres to order and against consideration. The Centres also staked out the estates boundaries and performed the property administration in districts. Geometric plans for own needs could be also done by some state-owned organisations. Private surveying companies did not exist then.

### **3. PRESENT CADASTRE OF REAL ESTATES OF THE CZECH REPUBLIC**

#### **3.1 New Cadastre of Real Estates**

With effect from 1 January 1993, the Real estate registry existing to the date was replaced with the Cadastre of real estates of the Czech Republic. Cadastral offices were established to exercise the national administration of property registration. Survey and cadastral inspectorates were charged with checking the national administration exercise. The records of the Real estate inventory existing until then were declared the Cadastre of real estates records. The register not only keeps the records of land in form of parcels but also of some buildings connected with the ground with firm foundations, apartments and non-residential spaces, whether completed or under construction.

#### **3.2 Individuals and Organisations Authorised to Survey Land Boundaries**

In the early 1990s, after the change of the communist regime changed and the set forth in the direction of democracy, significant changes occurred also in the field of surveying. Also the emerging private surveying companies and individual surveyors were enabled to do surveying for purposes of real estate inventory and later of the cadastre of real estates. Initially, the surveyor's could be pursued on a self-employment basis (freelancers similar to artists), from 1995, a trade certificate was required to pursue it and currently, it is done as a controlled trade. The trade certificate may be obtained either by secondary school graduates in the field

of surveying and cartography with a minimum of 5 years of work experience or a college/university graduates in the field of surveying and cartography with a minimum of 3 years of work experience. However, any result of surveying for the register should be certified by an officially authorised surveyor. This official licence may be obtained by the university graduates only, who completed the course having passed a state final examination and were awarded the degree surveying and cartography engineer. In the 1990s, this authorisation could be obtained after competing of a minimum of 5 years of work experience. Since 2001, prescribed examinations have to be successfully passed before the state examination committee to obtain the authorisation.

Surveying boundaries of estates of cadastre is shared by the state- and privately owned sectors. The state administration does new mapping while the private entities make out geometric plans, mark out the parcel boundaries and do surveying as a part of the comprehensive land consolidations. In practice, private surveyor's companies will typically operate in a part of the cadastral unit to do their jobs for the purpose of land re-allotment (rural areas and agricultural land) while surveying teams of the cadastral offices carry out new mapping within the remaining area of the cadastral unit.

### **3.3 Cadastral Map and Digitisation**

The cadastral map covers the entire area of the country. It displays all the registered parcels and boundaries thereof, thus it is not a purely indicative or orientation map. The collection of maps is varied. The cadastral map still valid for 70% of the Czech Republic area is a map in scale 1:2880 (the map scale has been derived from the length of Austrian fathom), the surveying foundation reach back to 1824-1843, the period of the above mentioned stable cadastre. The maps were surveyed using so-called table method. The originals of the maps were made out in the field. The fathom cadastral maps of today are a derivation or not the first copy of the originals. The re-ambulation done in an unskilled manner, the maintenance of the current state of the maps together with repeated re-drawing has decreased the quality and accuracy of the maps considerably. The maps primarily cover the territories of rural parts of the municipalities, the forests and fields and the areas of smaller villages. The cadastral maps were surveyed by orthogonal or polar methods in the rest of the Czech Republic area from the 1930s. This resulted in analogue maps, typically in the decadic scale of 1:1000, 1:2000. Photogrammetry was used at the beginning of the 1970s for cadastral mapping, the result of which was development of analogue maps at the beginning and of numerical maps later, in which every deflection point of the boundary has a coordinate defined in the uniform cadastral triangulation net (S-JTSK). From the second half of the 1990s, surveying equipment of the state-of-the art (such as total stations) was used to define the coordinates of the surveyor's net, mainly GPS method.

The collection of maps, so varied, was being developed in different periods following completely different regulations. It resulted in the development of maps of different accuracy and often different quality. On the whole, it gave a rise to a great difficulty to be faced by the current digitisation of cadastral maps. Translation of the analogue maps on digital form was started in 1998. In the end of 2006, approximately 1/3 of cadastral units in the country had a

cadastral map in the digital form. However, due to diverse date, the digital maps have been developed in two different forms.

The first of them is the digital cadastral map (DKM). That is developed following the results of new mapping and the results of completed full land consolidation or of remaking analogue decadic maps by calculation of coordinates of the points of deflexion of the parcel boundaries from the data obtained from the original measurements, provided that the resulting coordinates meet the required accuracy. Every point of the map except for figures and rectangular plane coordinates bears also the code of the point quality. This numerical description provides the essential information on the way of obtaining the coordinates and on the accuracy of determining them. The precise digital maps currently cover approximately  $\frac{1}{4}$  of the area of the Czech Republic. They are made out in a binding survey reference system of coordinates S-JTSK, the means of information system of the cadastre of real estates are held and due to that the register data is accessible via internet.

Another form of the digital map is so-called cadastral digitised map (KM-D). Although the form uses the same model as DKM and the name is very similar, in result it is a work completely different in quality. Put in a simplified way, the coordinates of parcel breaking-points are obtained by simple vectorisation of the raster graphics of the analogue cadastral map sheet. The method is applied to developing digital maps, primarily from those indicated above in scale 1:2880. The maps were developed and are held in the original system of coordinates, which they were surveyed in. The facts bring about many problems – the maps are not held using the means of the information system of the cadastre of real estates directly and in result, they are not accessible in the current form via internet. The result of surveying in the procedure if updating a map should be two kinds of coordinates of the parcel boundaries - model coordinates used to update the graphic file and the coordinates measured directly in the field to be used for future surveying in the given area.

### **3.4 Restoration of Cadastral Records by New Mapping and on the Land Consolidation Base**

According to the cadastral law, the register records restoration starts if geometrical determination and position fixing of properties does no longer meets the current conduct of register in result of numerous changes, insufficient accuracy or due the scale applied, or if the register records were lost, destroyed or damaged and it is impossible or impractical to recover the records from the data documented according to the condition effective until then. Another reason to start new mapping are the comprehensive land consolidations with a part of the cadastral unit. As the result of new mapping and comprehensive land consolidations is the digitised cadastral map, every effort is made to create an integrated digitised work in the entire area of the cadastral unit, if possible.

Cadastral offices send the decision on new mapping to a respective municipality one year in advance. In the decision, the municipality is given a notice of the obligation to permanently mark out the territorial borders upon agreement with adjacent municipalities. Cadastral offices should send the decision and the instruction to individuals or corporate bodies that have large

properties within the area. Most of municipalities and proprietors face considerable difficulties when making efforts to accomplish the obligation of permanent marking the administration or proprietary boundaries. Great many boundaries are not marked on the ground in any way and surveying them and marking with border signs represent considerable expenses. Cadastral offices should notify of the work commencement date 30 days in advance to the municipality and should give the minor proprietors a notice of the obligation to mark out their undisputable boundaries in a permanent way if these have not been marked e.g. with a wall or a fence.

A committee, on the membership of which there are representatives of the cadastral office, municipality and proprietors of large properties, examine the course of the boundary before surveying proper. The actual course of the boundary is investigated and compared against the representation in the cadastral map. The boundary breaking-points should be marked out on the ground if the course complies with that on the map and the proprietors consent to it and marking out of the proprietary boundary. The committee should check on the causes of the given conditions if the proprietors agree to marking out on the ground but the course does not comply with that shown in the cadastral map. Should the drawing be not done by mistake and the change of the course of the boundary was made knowingly, the committees should advise the proprietors of the obligation to furnish the geometric plan to the registry for it to change the boundary and the contract for property and legal settlement. Sometimes, the correct assessment of the facts is very difficult, therefore, the course of the boundary should be found out by experienced officials of the cadastral office with many years of experience. If the statements of proprietors regarding the course of boundary differ, the existing of the property boundary should be marked out in drawing of the cadastral map with a respective mark for doubted boundary. Thereafter, the proprietors are instructed on a possibility to resolve the boundary dispute before a court.

After finding of the course of the boundary is completed, survey of the boundary breaking-points follows. A new graphical file of the cadastral map and a new package of descriptive information is made out to fit the surveyed and calculated coordinates of the boundary points. Before the new records are declared valid, objections proceedings are held in the respective municipalities for a minimum period of 10 days. Within the proceedings, the proprietors have an opportunity to familiarise themselves with the results of the records recovery and may raise objections filing them with the cadastral office and it will pass a decision following the administration proceedings. Should no objections be raised against the contents of the recovered records or a legal decision on them has already been passed, the recovered records are declared valid.

When restoring the records on the strength of results of comprehensive land consolidation, the course of the boundary is located only on the estates boundaries marking out the periphery of the land consolidation. Coordinates boundary breaking-points according the approved land consolidation project are considered for determination of the shape, dimensions and location of a property. Then, the restored register records become valid upon a final decision passed by the Land Office on exchange or transaction of a possessory title in property included in the circuit of comprehensive land consolidation.

Recovery of the register records through new mapping and on the basis of land consolidation is a very demanding act, both in terms of finance and time. That is why that currently, these activities are carried out on a fragment of the register land, on which the recovery of the register records needed to be recovered. New mapping is the most convenient solution, primarily for digitisation of cadastral maps in scale 1:2880.

### **3.5 Geometric Plans and Staking-out Boundaries**

Making the geometric plan (GP) and marking out the boundaries of parcels are elementary surveyor's operations for the needs of the cadastre. These operations are carried out by authorised individual surveyors. The cadastral offices make out GP for their own needs only. The geometric plan together with surveying documents represent the technical data enabling performance of changes in the cadastral map and in the package of descriptive information of the register. In the absence of the geometrical plan, it is not possible to represent an object of the cadastre contents, to which titles and other material rights recorded in the cadastre are entered. Thus the GP is an integral part of the documents, which an entry in the cadastre is to be made according to. The GP is made out primarily to facilitate division of a piece of land, change of the estate boundary, marking out a building or a change of its outer perimeter in the cadastre and to represent graphically the scope of a title that holds down a proprietor to the benefit of another one. The GP is also made out when a change of the register area occurs, the boundary in result of land consolidation is to be specified, the cadastre is to be supplemented with a piece of land registered in a simplified way. As of 1.1.2007, when the cadastral act was amended, the geometric plans began to be made out also to mark out the course of boundaries set out or specified in more details by the proprietors.

Those, who develop the GP, closely co-operate with a cadastral office. The appropriate officials allocate then new parcels number, numbers of entries to do the measurement of changes and they also provide any necessary information required for developing a geometric plan: a copy of the cadastral map, copies of results of previous surveying etc. Currently, the substantial part of the information may be obtained via internet. The completed geometric plan shall be certified by an officially authorised surveying engineer. He/She should certify the GP compatibility with legal regulations in terms of prerequisites and accuracy. The GP certified in the way should be also certified by a competent cadastral office. The stamp of the cadastral office and the signature of the authorised person confirm that the data shown in the GP consist with the data in the cadastre and that the author produced all the prescribed surveyor's documents together with the GP.

All the boundaries in the GP have been surveyed in the national system of coordinates with accuracy as required. The fact will enable finding the initial boundary marks any time in future without any problems or to set them out if damaged or destroyed. Anybody making out the GP is obliged to mark the breaking-points of boundaries of an estate to be newly separated in a permanent way using boundary signs in compliance with the cadastral regulation. The boundary signs are primarily stones with worked heads, plastic boundary signs or reinforced concrete signs. Permitted for use are also steel tubes cast-in 60 cm long as a minimum. On hard bases, such as concrete, rock or asphalt, it is possible to mark the estate boundaries with

a sunken nail or another suitable metal article or a cross cut on the worked surface. In marshlands, it is possible to use poles of hard wood. The boundaries of land should be marked in a way providing for seeing both the neighbouring signs from any boundary sign. The boundaries that have been already marked in another suitable permanent (was?) way (wall, fence and the like) need not to be marked with other boundary signs.

Setting out the estate boundary is a surveyor's operation determining the location of the estate boundary breaking-points according a previous geometric and location determination of a property within a cadastre or following the map references. The land boundaries setting out shall not change or constitute the legal relations to the affected land.

Same as the GP, setting out of proprietary boundaries is done by authorised surveyor's companies or authorised individual surveyors. The surveyors obtain the surveying data from the cadastral offices. Previous GP survey sketches and field notes to obtain required surveying elements from are typically the surveying references. In absence of the reference and on condition that the surveyor verifies that the land in the cadastral map is shown correctly in technical view, any required surveying elements may be determined from the values measured in the map. The essential principle is that the boundaries should not be surveyed less accurately than allowed by the most accurate available references. The surveyed breaking-points of the proprietary boundary should be marked out on the ground in a permanent way, same as in the GP.

The surveyor should make all the proprietors of the surveyed land familiar with the result. The proprietors shall have an opportunity to comment on the surveyed boundary in the surveying record. The surveyor shall hand the surveying sketch and the boundary surveying record over to the customer. The surveyor has to hand over a copy of the survey documents to the cadastral office for filing it to the cadastral documentation and for maintaining a file of the survey information within 30 days.

### **3.6 Corrections of erroneous determination of estates boundaries**

The mistakes correction proceeding contributes to improvement of the register records in a significant way. According to the effective wording of the Cadastral Act, cadastral offices shall correct any erroneous data in the register provided that those resulted from following:

- an obvious error in managing and renewal of the cadastre,
- inaccuracies at detailed measurement, projection of the subject of measurement in the cadastral map and at calculation of areas of parcels, should the limit deviations determined by the implementing regulation be exceeded,
- incorrect data in the deeds.

The correction is done following a written petition by the owner or without the petition. Notice of correction (or non-completion of the repair) shall be delivered to all the affected owners. Should an owner be in disagreement, the cadastral offices should start administration proceedings and issue a decision. Surveying and cadastral inspectorate shall decide on an

appeal against the decision as a final authority. The decision on correction of the error related to the title to property is a procedural decision (not making a decision on legal relations but on the method of registration) and may be revised by a court.

The procedure of correcting geometry and location determination of the estate boundary in the records of the register is determined by the cadastral regulation in detail. Cadastral office will make correction on its own accord or following a petition, which should clearly indicate who gives the petition, which data of the cadastre is erroneous and how it should be corrected. The petition concerning geometry and location determination should be supported with results of surveying activities (e.g. geometric plan). If the subject is the correction of property boundary determination, there is a record in the annex containing declarations of all owners (co-owners) of affected properties. In the declaration, the owners should state that they have not altered the boundary on the ground, do not dispute it and that it is not questionable.

In addition to the corrections, cadastral offices also makes the estates boundaries more accurate to replace the border staking-out. Limit deviations are determined, the boundary course is specified by owners, checked against the geometric plan and approved by the owners.

Cadastral offices competencies are limited by the fact that a correction in the register cannot change a legal relation to the property. That may be change by decision of a court in result of civil proceedings.

### **3.7 Disputes on Estates Boundaries**

In the legal regulations of the Czech Republic in force, there is no specific civil legal procedure of determining the course of disputed boundaries of estate. For this reason, the courts acting on neighbour's dispute, do not pass decisions on the boundary itself but typically, they pass decision on the legal relation of the parties to a litigated area on the Earth's surface following a declaratory action. The court will use various proper evidence for that (hearing the parties and witnesses, local examination, historical and building documents, photographs of the original conditions etc.). Staking out the course of a disputed boundary in landscape and according to the available data and the court's instructions is of an essential significance. That is typically done in an expert opinion by an expert in surveying appointed by the decision of the court.

The expert's activities are determined by the Act on Experts and an implementing regulation. The experts of various fields are appointed by the Minister of Justice or the presiding judge of the Regional Court on a selection basis. Condition is the Czech nationality, professional and personal prerequisites and the candidate's consent. In the Czech Republic, there are some 12,000 experts who are appointed, entered on the public list and pursue the expert witness activity for consideration, of which 50 are in the field of surveying and cartography.

The expert opinion features predetermined requisites. Regarding a written opinion for the use of the court, the court will specify the tasks of the expert, typically in form of questions, in the

award. Regarding disputes on boundaries, the expert will make use of the documents on the court file and will search out the staking data filed with the cadastral authorities. Then he/she will conduct oral proceedings, on-the-spot examination and as-built surveying in attendance of the plaintiffs, defendants and their respective attorneys. It is followed with the numerical determination of the staking elements, comparison of the boundary declared by the parties to dispute and that registered in the records, staking out and demarcation of property boundaries by permanent boundary markers and making those in attendance familiar with the course. In conclusion, the expert should prepare an expert opinion in writing, which consists of the finding (description of and reasons for using particular reference data, results of oral proceedings, on-the-spot examination, measurement), opinion including answers to the court's questions, analysis of the staking accuracy and annexes (standard staking-out sketch and a report on handing over the staked out boundary, copies of essential data and photo documents). The opinion has the expert's clause and the expert's seal affixed. In the following proceedings, the court often requires oral completion of the opinion in writing, in which the expert will answer the questions asked by the parties to the proceedings before the court. Should the legal boundary be not in compliance with that on the register's records, the court will also require a geometrical plan for surveying the disputed area periphery. Unlike the expert opinion, the geometrical plan shall be developed in full conformity with the cadastral regulations, for it to be used as a reference for staking out any alterations of the legal relations according to the judgement of the court in the register.

Making out an expert's opinion and subsequent decisions to be passed by courts on boundary disputes is often very difficult in consequence of the complex history development of the registration in the Czech Republic, inaccurate, erroneous or missing data. The legal consciousness is unfavourably affected by non-uniform decisions of courts, e.g. on validity of boundaries found out during new mapping in the period of planned economy. On the contrary, settlement of a part of neighbour's disputes is facilitated by an institute of the positive prescription, abolished in the socialist legal system.

#### 4. CONCLUSIONS

The traditions of creating cadastral maps and the boundaries measurement in this country are many-year long. Our predecessors surveyors proved that even a map, a geographic work produced by primitive – in today's view – surveyor's technique may serve the purpose well for nearly 200 years. The maps of the stable cadastre in the first half of the 19<sup>th</sup> century are evidence of that. Paradoxically, the high quality of the work, once covering the entire area of Bohemia and Moravia and at present, the copies derived from the maps covering nearly 70% of the territory of the Czech Republic, currently appears to be the greatest impediment in massive and fast digitisation of the cadastral maps. For the entire period of the 20<sup>th</sup> century, no need to replace the area representation with maps resulting from new more accurate surveying and mapping was felt. In this position, not even the period of so-called planned economy in the second half of the 20<sup>th</sup> century did any help. The concept of the boundary of use was made superior to that of the title in property. It was only during the last 10 years of the last century that the importance of a good quality, credible, precise and up-to-date cadastral map, digitised if possible, turned up.

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## BIOGRAPHICAL NOTES

### **Jiri Rydval**

Born in Prague in 1941, where he graduated from the Czech Technical University, the Faculty of Civil Engineering, branch of study surveying, as surveying engineer (M.Sc.) in 1963. After graduating he was employed in Institutes in Plzen and in Prague, where he carried out cadastral and thematic mapping and geodetic engineering. Presently director of the Cadastral Office Blansko. He is active as expert witness on Cadastre. He is member of the Council of the Czech Union of Surveyors and Cartographers and member of the National Committee for the FIG, where he is an assistant to the national delegate in Commission 7. Author of several contributions at the FIG Congresses and Working Weeks on Czech Cadastre.

### **Libor Tomandl**

Born in Ostrov in 1967, graduated from the Czech Technical University, the Faculty of Civil Engineering, branch of study surveying, as surveying engineer (M.Sc.) in 1989. After graduating he was employed in Cadastral Office in Karlovy Vary. Presently director of the Cadastral Office Karlovy Vary. Since 2001 he has been a member of the examining board for acquiring official authorisation for verification of land survey results. He is member of the Czech Union of Surveyors and Cartographers and member of the National Committee for the FIG, where he is the national delegate to FIG Commission 7.

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