II National Laboratory Study

INTRODUCTION

In accordance with the Project Task requirements, the subject of this Study is a national laboratory for testing of radio-equipment and telecommunications terminal equipment (National R&TTE Laboratory). This study will analyze the current situation and propose solutions to establish the national laboratory for testing of radio-equipment and telecommunications terminal equipment.

The document of the Strategy of Quality Infrastructure System Improvements in the Republic of Serbia for 2015-2020 („Official Gazette of RS“ No. 93/15), foresees further developments of the quality infrastructure system which supports all economy branches, since it represents the base for product safety and quality in all phases, from product's design, through fabrication and market placement, ending with product's use. For the sake of a harmonized development of this area with the needs of the industry of the Republic of Serbia and adequate provision of services to the companies, it was necessary to establish a strategic framework for the development of the National R&TTE Laboratory. The motivation for this process is the desire to contribute to the society by increasing competition of domestic R&TTE products on local and international markets and to improve the overall economic growth of the Republic of Serbia. The National R&TTE Laboratory should enable the infrastructure to meet the requirements of the economy and society in this area in a quality, professional and timely manner, so that quality and safe products are placed on the market and testing of radio equipment and telecommunications terminal equipment is preformed both for the economy and market monitoring purposes. Additionally, one of the set objectives was the creation of R&TTE placement conditions without unnecessary technical and administrative barriers, in accordance with the principle and rules of the single European market and the WTO TBT (Technical barriers to Trade) agreement. This agreement, among other, sets rules and principles in the domain of the application of other countries' technical regulations and validity of foreign documents and harmonization signs, which could be all made possible by establishment of control mechanisms and a laboratory for R&TTE testing on the market.

The aim of this study is to propose solutions for establishment of the laboratory, based on the results of an overall economic, technical and legal analysis, taking into account economic, financial, operational and technological aspects that need to be fulfilled, accompanied by an overview of all important parameters leading to an appropriate decision.

The study gives an overview of the regulatory and institutional framework for the R&TTE quality infrastructure system, as well as analysis of the obligations and current role of RATEL in the already established R&TTE quality infrastructure system in the Republic of Serbia. The analysis of the regulations in the domain of electronic communications and the R&TTE quality infrastructure system shows that there are no legal barriers to the creation of the laboratory within RATEL itself.

The study contains R&TTE market analysis of the Serbian economy in respect of R&TTE production, import and export, based on an assessed number of R&TTE manufacturers by industry and by R&TT equipment type placed on the marked. In addition,

an assessment was given regarding market needs for R&TTE testing laboratory services, including the needs of the competent authorities for R&TTE market monitoring. Also, an analysis of the existing situation in institutions and companies dealing with R&TTE measuring and testing was carried out, and a comparative overview of the laboratories in the Republic of Serbia already partially equipped for R&TTE and/ or electric and electronic equipment testing was given, taking into account authorizations for the performance of assigned tasks granted by competent ministries and accreditation certificates issued by the Accreditation Body of Serbia.

The study defines the testing object of the laboratory and deals in detail with standards and methods to be applied accordingly, along with kinds/ types of testing (measurements) included in each single standard. In this manner, the foreseen scope of operations of the mentioned laboratory and types of testing covered and supported by the planned measurement equipment and devices, as well as by other necessary components and installations (such as semi-anechoic chambers or anechoic chambers) are defined.

CONCLUSION

In accordance with the Project Task requirements, this study has discussed the present situation in the Republic of Serbia in the area of radio and telecommunications terminal equipment (R&TTE) testing and suggested a set of activities for the purpose of creation of a National Laboratory for R&TTE testing. The National R&TTE Laboratory should provide infrastructure for a quality, professional and timely response to the needs of the economy and society in this domain, to provide an environment for safe and quality product placement and performance of R&TTE testing, both for the economy and market monitoring purposes.

Based on the analysis of the manner governing the domain of the R&TTE quality infrastructure system in the EU countries, EU candidate countries and EFTA members, the current solution in the Republic of Serbia regarding RATEL's role as a designated body for the assessment of R&TTE harmonization is not present in any other EU country where the analysis has been performed. More precisely, in any of the analyzed countries, the NRA has no role of a designated body for harmonization assessment. For that reason (along with corresponding changes in the regulations), possible changes of RATEL's role within the R&TTE quality infrastructure system are suggested:

- discontinuation of the activities of the designated body for harmonization assessment,
- RATEL's inclusion in the assessment process regarding the fulfillment of requirements for designation of competent bodies for R&TTE harmonization assessment and/ or monitoring of designated bodies, in cooperation with the relevant ministry (primarily through opinion giving), and
- RATEL's inclusion in the inspection activities (R&TT market monitoring for the equipment placed on the market and/ or monitoring of the R&TTE put in use).

Bearing in mind the current role of RATEL in the R&TTE quality infrastructure system, the analysis of the R&TTE market in the Republic of Serbia has shown that the creation of a commercially affordable laboratory for R&TTE testing is not possible. Since the Republic of Serbia is not member of the EU, and is not likely to become one in the following period, commercially affordable functioning of a laboratory could not be provided via services offered to foreign users either. Due to administrative procedures and temporary import/ export related costs for the R&TTE transport to the laboratory (which is in itself costly and time-consuming), the Serbian R&TTE testing laboratory would be less competitive than those seated in the EU. Meanwhile, one should keep in mind that testing costs of a Serbian-based laboratory cannot be significantly lower than those of an EU-based lab. This is due to capital costs for creation and maintenance of a laboratory (including high amortization rate for equipment) being the same in Serbia and in the EU countries, causing the staff and regular business operations' costs to impact total costs in a relatively insignificant way.

In the Republic of Serbia, there are accredited laboratories for harmonization assessment in accordance with rules and standards pertaining to general electromagnetic compatibility and general safety, R&TTE and/ or electric and electronic equipment. There are also accredited laboratories authorized for safety testing in the domain of environmental impact, but only for radio-transmitters (i.e. radio base stations) in operations mode. However, none of the laboratories is adequately equipped for electromagnetic compatibility

testing of radio-equipment in operations mode (important requirements of Article 3.1b of the R&TTE Directive (1999/5/EC) and RED (2014/53/EU)), nor for radio-parameters of radio-equipment in operations mode (important requirements of Article 3.2 of the R&TTE Directive (1999/5/EC) and RED (2014/53/EU)). The only exception is „Idvorski Laboratorije“ which performs testing of equivalent isotropically radiated power for data transmission equipment operating in the 2,4 GHz ISM bandwidth and using broadband modulation techniques, which is all but a small portion of what is required in the domain of testing of radio-equipment in operations mode. Financially speaking, the existing laboratories operate at different levels of success, one of them („Idvorski Laboratorije“) performing with losses during 2015.

The analysis of the regulatory framework in the domain of electronic communications and R&TTE quality infrastructure system has shown that there are no legal obstacles to a laboratory figuring as a subject of this Study (i.e. the National R&TTE Laboratory) being created as an independent organizational unit within RATEL. In addition, the process of creation of such laboratory for R&TTE testing within RATEL, is completely in conformity with RATEL's authorizations and obligations as defined in the Law on Electronic Communications.

Since at the moment there is no acquisition model for any of the existing laboratories that would be acceptable to RATEL, the establishment of own laboratory is proposed in this Study.

Taking into account the defined testing scopes of the existing laboratories, testing scope guidelines set forth in the RED (2014/53/EU), ground for creation of the subjected Laboratory, scope of RATEL's activities as defined in the Law on Electronic Communications and designation of RATEL as a body for harmonization assessment pursuant to the R&TTE Rulebook, it was concluded that the subject of examination of the National Laboratory should be testing of electromagnetic compatibility of radio-equipment in operations mode (important requirements of Article 3.1b of the R&TTE Directive (1999/5/EC) and RED (2014/53/EU)) and testing of radio-parameters of radio-equipment in operations mode (important requirements of Article 3.2 of the R&TTE Directive (1999/5/EC) and RED (2014/53/EU)).

Due to high complexity of the system for R&TTE testing and the requirements defined by appropriate standards, with an aim to avoid the situation where the Investor is launching a public procurement procedure for separate system elements (expected to be purchased from different manufacturers) and subsequently integrating hardware and software components, it is technically and economically rational to implement a concept where complete measurement and testing systems for specific R&TTE classes (with all necessary ancillary equipment and software support) are purchased. Otherwise, there would most certainly be significant problems in terms of solutions compliant with standards.

The process of creation of the National Laboratory includes purchase of a semi-anechoic chamber (SAC), which requires construction of a dedicated facility. The process of creation of the National Laboratory is, therefore, planned in four phases:

- Phase I: Hiring and initial training of the laboratory staff. Provision and equipment of temporary premises for the functioning of the laboratory in the first two phases. Purchase of the portable chamber and initial measurement

system set. Elaboration of the construction design and preparation of the documentation for construction of permanent premises where a 3m-long semi-anechoic chamber (SAC) and laboratory are to be situated.

- Phase II: Construction of a dedicated room for the semi-anechoic chamber (SAC) and the rest of the permanent space for the operation of the laboratory. Training of the staff and R&TTE testing feasible with the available equipment. Promotion of the laboratory.
- Phase III: Relocation from temporary to permanent premises of the laboratory. Additional equipping and hiring. Purchase of additional measurement systems and additional training. Performance of regular testing.
- Phase IV: Purchase of the remainder of the measurement systems. Initial accreditation of the laboratory. Regular testing and further internal training and staff development.

The duration of each of the mentioned construction phases is estimated to be 12 months, with the possibility of synchronization of the dynamics with the Investor's needs or economic, regulatory and other requirements that arise during the realization of the project. At the end of each realization phase of the R&TTE laboratory construction, it is necessary to reassess the dynamics of the project, primarily regarding the beginning of each next construction phase.

At the very start of the first phase, it is necessary to have at least three employees for the operation of the laboratory. In the third construction phase, hiring of another employee is planned.

The National Laboratory Project, due to its infrastructural complexity, its demanding scope, specific niche of measurement R&TTE services and poor competition of the relevant market with the laboratories in the EU, cannot be considered as financially affordable, at least not directly (formally, the payment period is 79 years and internal rentability rate is -28.65%). Positive results could be reached by influencing possible increased demand, encouraged primarily by the local market (however not excluding the foreign market), and via project investment discharge (through partial funding from European and international subsidies). On the other hand, financial affordability of a future RATEL's laboratory could be envisaged through significant indirect benefits in the domain of RF spectrum use control and management, falling under RATEL's primary competencies. Taking into account very high prices of certain frequency bands on the market today, insufficient or inadequate control of the devices in use on the market can in certain situations drastically depreciate the real spectrum value, causing a multi-million material damage to the state. Total cost of one such laboratory, as subjected in this Study, is certainly lower than the possible damage caused by non-dedicated use of but a small portion of the frequency spectrum.