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## INVESTIGATION INTO THE ORGANIZATIONAL STRUCTURE INFLUENCE ON THE FUNCTIONING OF AN ACCREDITED TESTING LABORATORY

### 15.1 INTRODUCTION

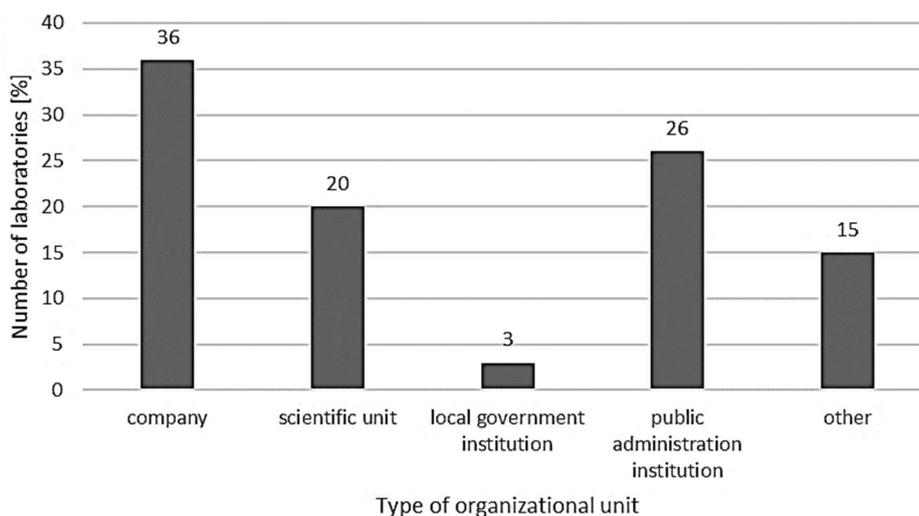
Management systems are widely described in the national and international literature. The ISO 9001 quality management systems are most often discussed. Various industrial areas [11], public administration and health service institutions were reported. The ISO/IEC 17025 standard on testing laboratories was widely described in terms of the research/testing methods [1, 2, 3, 4]. On the other hand, the management system was mainly examined in terms of the institution experience on the way to obtain the certificate as well as the experience learnt from several years of the management system maintenance and improvement [5, 6, 7, 8, 9, 10]. The literature overview allows for claiming there are many publications devoted to particular laboratories and focused on the system implementation, analytical methodologies or other technical and technological aspects. The aim of the following article is to present the analysis of the organizational structure influence on the functioning of an accredited testing laboratory. It presents and discusses selected results from the survey research addressed to accredited testing laboratories registered in Poland.

### 15.2 SURVEY RESEARCH RESULTS AND ANALYSIS

At present, the Polish Centre for Accreditation (PCA) grants accreditations in Poland. The body was established on the basis of the Act on Conformity Assessment System of 30 August 2002. It issues certificates of accreditation to institutions such as:

- testing laboratories,
- medical laboratories,
- calibration laboratories,
- organizers of proficiency testing,
- institutions certifying management systems,
- EMAS verifiers.

Within the total number of testing laboratories, 1,213 ones had accreditations (data as of 8 October 2015) [8]. The laboratories differ in terms of the tested/research areas and objects. For that reason, it was decided to conduct a survey to assess the functioning of management systems functioning in the Polish accredited testing laboratories. The survey was carried out between 5 and 30 October 2015. 328 laboratories participated in the survey, which made 27% of the total number of the institutions authorized to participate in it. It was answered by different institutions all over the country. The respondent pool consisted of both large units (over 200 employees) and small laboratories ( $\leq 5$  employees). The examined laboratories had different experience with the ISO/IEC 17025 standard. Among the respondents, the laboratories had had the accreditation certificate for: up to 1 year (5%); 1-3 years (14%); 4-6 years (16%); 7-8 years (24%); and over 10 years (41%). Notably, the discussed laboratories also differed in the organizational units they were located at. The information is given in Fig. 15.1.



**Fig. 15.1 Number of laboratories in specific organizational units in Poland in 2015**

Source: based on the data available at the PCA website, <http://www.pca.gov.pl/akredytowane-podmioty/akredytacje-aktywne/laboratoria-badawcze/> (PCA data, as of 8 October 2015)

The data clearly shows that most laboratories are located at companies, which constitutes 36% of all the units participating in the survey. Another large group is made by public administration laboratories (26%). Finally, 15% of respondents selected the reply “other”. The analysis in this area shows that the respondents pointed out the following replies:

1. controlling body;
2. budget entity;
3. hospital;
4. notified research body;
5. foundation;
6. research institute.

The survey sent to laboratories included questions on their size, number of

employees, daily problems and organizational structure. Table 15.1 presents the questions concerning the organizational structure.

**Table 15.1 Results concerning the laboratory structure**

Questions	Suggested answers	Results [%]
How does organizational structure affect the laboratory impartiality?	structure helps to manage the laboratory and provides its impartiality	75
	structure complicates the laboratory management	5
	structure does not influence it	19
	other:	1
The highest management level introduced changes in the unit organizational structure due to the standard implementation	yes	52
	no	48

Source: own research report

The laboratories confirmed the Authors' assumptions that the organizational structure of the institution was very important for the management of accredited testing laboratories. As many as 75% of the laboratories acknowledged that the structure helped to manage the laboratory and provided its impartiality. 19% of the laboratories recognized that the organizational structure did not affect the laboratory impartiality. Only 5% of the respondents declared that the institutional organizational structure complicated the laboratory management. 1% of the respondents indicated the reply "other", where it was stated that the respondent belonged to single-person laboratory group in which the organizational structure had no influence on the laboratory impartiality.

Table 15.2 shows replies concerning the type of changes implemented into the organizational structure by the highest management level.

**Table 15.2 Results concerning the laboratory structure**

Questions	Suggested answers	Results [%]
Changes in the structure concerned:	n/a	47
	establishment of additional organizational units within the organizational structure	14
	development of new procedures (regulations) concerning the entire organization	9
	management model compliant with the standard requirements	25
	other: - creation of the quality manager and technical manger positions - change in the department reporting line - consolidation of the organizational units within the organizational structure - structure standardization - separation between the systemic competences and chain of command	5
Finish the sentence: <i>The general organizational structure of the institution</i> ...	helps to manage the laboratory	55
	hinders the laboratory management	7
	has no influence on the laboratory management	36
	other	2

Source: own research report

48% of the respondents did not have to implement any changes in the organizational structure in force. On the other hand, 52% of the laboratories declared that the highest management level had implemented changes in the organizational structure due to the standard implementation.

The finding shows that the ISO/IEC 17025 standard forced institutions to implement the changes that were supposed to help to manage the organization more efficiently and to obtain the accreditation certificate. The changes that the highest management level had to implement concerned: establishment of additional organizational units within the organizational structure (14%), development of new procedures (regulations) concerning the entire organization (9%), adaptation of the management model with the standard requirements (25%) and other activities (5%) such as consolidation of the units or creation of the quality manager position.

In order to verify whether the organizational structure indeed helped to manage the laboratory, the respondents were asked to finish the sentence *The general organizational structure of the institution ...*. 55% of the laboratories declared that the organizational structure helped in the laboratory management whereas 36% of the respondents recognized that the organizational structure had no influence on the laboratory management. 7% of the surveyed institutions acknowledged that the general organizational structure hindered the laboratory management. 2% of the laboratories selected the reply "other". They stated that the structure had influence on the management system and determined the implementation of appropriate procedures but that it was also difficult to give a precise answer.

### 15.3 CONCLUSION

The aim of the article was to analyse the organizational structure influence on the functioning of an accredited testing laboratory. Selected results from the survey sent to the accredited testing laboratories in Poland (1,213) are presented and discussed. Altogether, 27% of the surveys were returned. The article indicates that the survey respondents mainly represented laboratories located in companies (36%) and public administration institutions (26%). Generally, the laboratories differed in the time they had had the accreditation certificate for. The research pool contained both institutions with long-term experience (41%) and laboratories which had had the certificate for 1-3 years (14%). The laboratories were asked about the organizational structure of the institutions. The Authors wanted to analyse whether the organizational structure had influence on the management model. 75% of the respondents declared that the organizational structure helped to manage the laboratory and provided its impartiality. The research showed that 52% of the examined institutions had to adapt their structure to the standard requirements. The changes concerned issues such as the establishment of additional organizational units in the organizational structure (14%), implementation of new procedures (regulations) in the entire organization (9%), or management model compliant with the standard requirements (25%). All in all, it may be univocally said that the

organizational structure helps in the laboratory management. The claim is confirmed by the conducted research as 55% of the laboratories indicated this reply.

## REFERENCES

- 1 I. H. Grochau, C. Schwengber ten Caten: A process approach to ISO/IEC 17025 in the implementation of a quality management system in testing laboratories *Accred Qual Assur* Volume 17, Issue 5, 2012, s. 519-527,.
- 2 A. Igllicki, M. I. Mila, J. C. Furnari, P. Arenillas, G. Cerutti, M. Carballido, V. Guille'n, X. Araya, R. Bianchini: Accreditation experience of radioisotope metrology laboratory of Argentina, *Applied Radiation and Isotopes*, 64, 2006, s. 1171-1173.
- 3 Kun Ho Chung Geun Sik Choi, Wannoo Lee, Young Hyun Cho, Chang Woo Lee, Implementation of ISO/IEC 17025 standard in a nuclear analytical laboratory: The KAERI experience *Accred Qual Assur* 10, 2006, s. 603-605.
- 4 J. Namieśnik, P. Konieczka, B. Zygmunt: *Ocena i kontrola jakości wyników pomiarów analitycznych*, WNT, Warszawa, 2007.
- 5 K. Hullihen, V. Fitzsimmons, M. R. Fisch: Establishing an ISO 17025 Compliant Laboratory at a University Proceedings of The 2008 IAJC-IJME International Conference, Paper # 059, IT 305, 1-15.
- 6 R. Michalski, Akredytacja laboratoriów badawczych, *Laboratorium – Przegląd Ogólnopolski*, 3-4, 2013, s. 26-28.
- 7 R. Michalski, J. Mytych: Przewodnik po akredytacji laboratoriów badawczych wg normy PN-EN ISO/IEC 17025, 2011.
- 8 J. Mytych, M. J. Ligarski: Badanie uwarunkowań funkcjonowania akredytowanego systemu zarządzania jakością w laboratorium badawczym – koncepcja badań. *Zeszyty Naukowe. Organizacja i Zarządzanie*, Politechnika Śląska, 2015, 80, s. 203-215.
- 9 J. Mytych, M. J. Ligarski: Ocena funkcjonowania akredytowanego systemu zarządzania jakością w laboratorium badawczym – wyniki badań ankietowych. *Systemy Wspomagania w Inżynierii Produkcji*, 2016, 2(16), s. 258-269.
- 10 U. Ricci: Establishment of an ISO 17025:2005 accredited forensic genetics laboratory in Italy, *Accreditation and Quality Assurance*, August 2014, Volume 19, Issue 4, s. 289-299.
- 11 B. Sokołowska, Zapewnianie jakości w mikrobiologii żywności – kontrola jakości badań w akredytowanym laboratorium, *Prace Instytutów i Laboratoriów Badawczych Przemysłu Spożywczego* 59, 2004, s. 359-369.

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**mgr inż. Joanna Mytych**  
Institute of Environmental Engineering,  
Polish Academy of Sciences  
ul. Skłodowskiej-Curie 34,  
41-819 Zabrze, Poland  
tel. +4832 271 64 81  
e-mail: Joanna.Mytych@ipis.zabrze.pl

**dr hab. inż. Mariusz J. Ligarski**  
Silesian University of Technology  
Faculty of Organization and Management  
Institute of Production Engineering  
ul. Roosevelta 26, 41-800 Zabrze, Poland  
tel. +4832 277 73 48  
e-mail: Mariusz.Ligarski@polsl.pl

## INVESTIGATION INTO ORGANIZATIONAL STRUCTURE INFLUENCE ON THE FUNCTIONING OF AN ACCREDITED TESTING LABORATORY

**Abstract:** *The quality management systems compliant with the PN-EN ISO/IEC 17025:2005 standard are widely described in terms of the research methods. However, the construction and functioning of the management system are discussed on a much smaller scale. The Authors of this publication tried to assess selected results from the survey conducted among 1,213 accredited testing laboratories functioning in Poland. The Authors focused on analysing the survey results describing the influence of the organizational structure of the institution in which the laboratory was located on the functioning of an accredited management system in a testing laboratory.*

**Key words:** *quality management system, ISO/IEC 17025:2005, accreditation, testing laboratory*

## BADANIE WPŁYWU STRUKTURY ORGANIZACYJNEJ NA FUNKCJONOWANIE AKREDYTOWANEGO LABORATORIUM BADAWCZEGO

**Streszczenie:** *Systemy zarządzania jakością wg normy PN-EN ISO/IEC 17025:2005 zostały szeroko opisane w kontekście metod badawczych. Natomiast budowa i funkcjonowanie systemu zarządzania zostały opisane w znacznie mniejszej skali. Autorzy publikacji podjęli próbę oceny wybranych wyników przeprowadzonego badania ankietowego na próbie 1213 akredytowanych laboratoriów badawczych funkcjonujących na terenie Polski. Autorzy skupili się na analizie wyników ankiety opisującej wpływ struktury organizacyjnej jednostki, w której jest umiejscowione laboratorium, na funkcjonowanie akredytowanego systemu zarządzania w laboratorium badawczym.*

**Słowa kluczowe:** *system zarządzania jakością, ISO/IEC 17025:2005, akredytacja, laboratorium badawcze*