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Association of Polish Electrical Engineers and the Chamber of Licensed Experts

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***Abstract*— At the beginning of the year 2024, 65 years will have passed since the establishment of the Chamber of Experts of the Association of Polish Electrical Engineers (SEP). During this period, SEP underwent significant changes. Particularly serious changes in the conditions for practicing association expertises have occurred in recent years, along with dynamic economic and political changes in Poland. Expertise is strongly based on economic conditions and the ways in which scientific, technical and industrial competences are expanded and available in the society. In the past, these highest competencies were quite strictly limited to well-organized professional communities related to scientific and technical associations such as SEP, and federal bodies such as NOT. Competencies were also generated in the best industrial centres associated with academic polytechnic centres. Today the role of expertises in electrical, electronics and ICT engineering is undergoing significant changes.**

***Keywords*—licensed expertises in electrical engineering; industrial expertices; chamber of engineering experts**

I. Introduction

THE Association of Polish Electrical Engineers - SEP [1] is a national non-governmental organization integrating Polish professional communities in Poland and abroad. SEP has a rich online representation [2,3]. Professional and industry associations perform important roles such as representing the interests of professionals, providing training, providing support on professional issues, promoting industry standards and safety. Scientific and technical associations like SEP are an indispensable element of society's development processes. If you willingly participate in the development processes of society, you have many responsibilities and take on many responsibilities. The association is not automatically a participant in important processes, but evolves into a participant through its own responsible and valuable work.

Depending on the ambitions and specialization of the environment creating the professional, scientific and technical association, some of them actively operate widely in the scientific, educational, economic, innovative, industrial, economic, social and political spheres. Large, significant national and international professional associations with diverse task agendas are often strong lobbying organizations in the sphere of economics and politics as well as social life and development.

The Association of Polish Electrical Engineers undoubtedly has the ambition to be the best organization with a professional egalitarian character that effectively contributes to the development of the country. To some extent, a good example of an association defined in this way, with the strong reservation of operating in completely different economic, social, economic and international conditions, is IEEE - The Institute of Electrical and Electronics Engineers [4].

On the occasion of the IRSEP 65th Jubilee, but also due to the need for an intellectual response to the irreversible changes in the place of SEP and of expertises in the economy, a group of people associated with SEP and the central unit of the Chamber of Experts of SEP (CORSEP) shares several subjective reflections in this article having an essay form. These reflections are formulated as questions concerning the current status of SEP, and more generally other professional associations. Polish version of this paper was published in Elektronika, a technical monthly journal by SEP [26].

II. How to Keep the Highest Level of Egalitarian Engineering Society

The over a hundred-year-old Association of Polish Electrical Engineers shared the fate of the country during this long and turbulent period of time. It experienced, together with the Polish economy and science, the ups and downs known to us. In difficult operating conditions, SEP achieved success. Through diligent professional work, it has reached the level of a very good egalitarian association with a significant social reach and a high level of professional and community acceptance. Achieving such social status does not mean impatiently waiting for rewards. On the contrary, it means taking on more responsibility. It means receiving greater rights from the society and, consequently, greater opportunities to act.

Reaching a high professional level is one thing, it is a long-term process, but maintaining it is a completely different process. Maintaining the same highest level of performance over such a long and varied period of time is impossible. People in SEP changed, views changed, there were better and even better periods. The level of the Association is being improved every day in the current period, as before, by the continuous good work of all SEP Members. We want this level to be as good as possible in the next periods. It depends on work today and on ideas on what and how to change to better use resources, better see changing needs and better respond to social demand for our activities and its changes in the near future.

This essay is in no way a laurel for SEP. However, it contains a lot of superlatives, because the over 100-year-old Association of Polish Electrical Engineers with an exceptionally large social positive balance objectively deserves it. It is also, in no way, a criticism of SEP, because it is easy to criticize, and critical arguments could be easily generalized to many external factors,

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beyond the association ones. It is a short essay on the changing and immutable roles of professional scientific and technical associations in today's society, with only implicit reference to the SEP. Against the background of such an essay part, this article honors a very important agenda of SEP, celebrating the anniversary of the Chamber of Licensed Experts (IRSEP).

An essay form may allow us to dream of an ideal engineering association, hypothetically similar to SEP, that is professionally perfect, large, active, influential, ambitious, educational and opinion-forming, constantly educating, with a wide range and activities, community and socially accepted, having effective lobbying and economic influence abilities, etc. These dreams, sometimes expressed in the metaphorical form should not mislead the reader. They are often hard but kind questions for the Association of Polish Electrical Engineers where it is today, now, at this moment, in the face of moved issues. Perhaps some form of answer to these questions will lead to refreshing old and formulating new development arguments, to wisely introducing the constant changes that are inevitable. However, we leave the questions without question marks at the end to perhaps emphasize more strongly that they are largely rhetorical.

The Association of Polish Electrical Engineers is one of the best professional organizations in the country actively working for its professional community and the society. SEP has the ambition to constantly maintain and increase this level of serving the society. Such ambitions of every good professional non-governmental organization developed within the association translate (or not) into fleeting social consent. Lack of such a consent is a disaster for the association and most often means indifference. The consent is a subtle category that receives its metrics as the association develops and it prepares a mature offer. It is equivalent to various forms of social acceptance. It seems that active acceptance is a high form of consent when the association becomes one of the players in the development processes. It is the dream and goal of some ambitious associations to obtain strong consent from the society for cooperation and direct active influence in various areas of the living and sensitive social fabric.

Extremely valuable and rare social acceptance, which is equivalent to various forms of cooperation, is very often proportional to the amount of sweat, blood and tears honestly shed by the association for the benefit of the society. It is proportional to the amount of effective, difficult, reliable organic work needed by the society without expecting reward for it. The worst thing is that no one actually defines the work necessary to be performed, because it is supposed to anticipate needs in the right direction of development. It's easy to make a mistake here, even when working in a good professional association, and a lot of work goes to waste, even in very good faith.

Caution in the operation of the association is advisable, using good professional, also managerial and political skills. Excessive caution slows down action and development. The association is then wise but practically outside the society. Many associations are like this. SEP does not want to be such an association. Active action always and inevitably carries risk. No one eliminates the significant role in the society of associations operating in narrow industries, protecting such industries, with a small number of members, elite, closed, etc. SEP has never been, is not and will not be such an association. It is a broad, egalitarian, friendly association, focused on professional, educational and broad social activities, reaching out to young people looking for a career path, active engineers, but also professional retirees.

The association needs to hear more and see further in its area of competence. It must know much more in this area than anyone else. No one will take this responsibility away from the association. And it has an absolute obligation to share valuable knowledge, unknown to the wider public, from his own studies, from such a diligent and accurate view of further areas, in an appropriate way. It will not do this, it will not be able to cope with this basic associational task, if it does not constantly and persistently improve its area of professional competences. And this difficult, constantly changing area is slipping away, deepening and expanding, and requires a lot of work. A lazy association, in any area of its activity, will never be successful and will never meet the expectations placed on it.

A very important role of the association is that it can, and in the case of the best egalitarian associations, should constitute a neutral platform for cooperation between engineers, scientists, industrial leaders and other experts involved in technological communities, economic policy, and various areas of industry in the country, for the common good of all stakeholders of the development processes. A very difficult task indeed. Only a few associations manage to build such a platform. It is built slowly, with your own effort, reliability and professional excellence, convincing the community and society to have your own, well-balanced opinions, honestly oriented towards the social good.

The diverse agencies of a suitably large and ambitious association look at the society from different angles, from different directions, developmental, economic, educational, and others. This view is richer. A wise association is one that listens carefully and takes seriously the voices of its specialized agencies. Wise is an association that takes into account the opinions of external experts, including those from outside the association or from friendly associations, in accordance with the old business principle that the label cannot be seen from the inside of the bottle. Wise is an ambitious association that serves its members reliably, but what it really does is serve the society.

A wise association is one that gives more to the society than it receives from it. And it doesn't get offended or lower the quality of his work if he gets little. It believes in its mission, constantly remembers it and honestly adapts his actions to the conditions of its implementation. In no case can this mean either idealism or opportunism, only an effort to be effective. The combination of all the above-mentioned attributes, such as significant operational efficiency, not expecting rewards from the society, creative contributions to development, etc., seems completely impossible to achieve. And yet, this is exactly what some very successful organizations and people do, on the verge of the impossible.

A good egalitarian association presents the best possible offer to the society. Without a good, attractive offer, an association is worthless. The offer is diverse, versatile and of high quality, developed by experts from specialized agencies of the association. The offer is prepared to meet current social needs and wisely slightly anticipates these needs in many well-thought-out directions. It stimulates development, forces reflection, forces thinking, activates, encourages action, learning, education, organizational and business efforts, etc. The offer is quickly verified by the society. There is a response, or no response? Between these poles there is a wide area of reaction and action.

A wise association is one that actively modulates its offer, cooperates with the society on many fronts, does not remain deaf to changing needs, is not afraid to ask questions and learn on its own, is not ashamed of mistakes, but efficiently processes conclusions and does not get too smart. The association's offer

to the public has many layers. The general layer is the most important and concerns the association's operating strategy, reveals its nature and defines only a few, maybe two or three, general but very well-defined and objectively valuable vectors of action. The strategic layer of the association's offer would not have such objective value if it were not supported by attractive, specific offers that address the current needs of the professional community and the society. Through the mouth of the association, such detailed offers are formulated by its specialized agencies.

The Association of Polish Electrical Engineers has existed for over a undred years. Sixty-five years ago, SEP established its Chamber of Licensed Experts IRSEP. This body, which was extremely necessary at that time, strengthened the organization in formal, professional and legal terms, providing expert service to the developing economy. One has to remember that the role of an association of higher public utility and its bodies is always to serve society as best as possible. Throughout its rich history, SEP has consistently and tirelessly tried to fulfill this role. The establishment of the Chamber of Licensed Experts 65 years ago was intended to strengthen this role of the Association in the area at the intersection of science, technology, innovation and economy. Very soon after its establishment, the Chamber of Licensed Experts presented its own specific offer for the domestic industry, its expert community, and society.

III. SEP Chamber of Licensed Electrical Engineering Experts in Continuous Development

These were the noble and courageous guiding thoughts of the then Main Board of SEP, which established the Chamber of Experts 65 years ago - to anchor the organization more strongly in the economy, to link the important electrical industry more closely with scientific and technical progress, innovation, and to involve appropriate people, experts, but also young people just leaving technical universities. The SEP Chamber of Experts was intended not only to create the possibility of additional use of expert knowledge, included in a good association framework, but, in connection with other related SEP bodies, also to ensure staff education and expansion of the expert base. SEP, in cooperation with industry and universities, ensured the efficient building of such a database of expert appraisers, but already in non-university, economic, industrial and real hard economy conditions. This stage of continuing education was and is essential in the professional career of an electrical, electronics, automation, IT and telecommunications engineer.

Then, 65 years ago, SEP was one of the pioneers in creating new methods of continuous education of professional staff and thus contributed to building a new economy based on the best-educated and experienced specialists. During the first decades of operation of the Chamber of Experts and related training agencies, thousands of engineers and electrical technicians took advantage of SEP's various professional offers. Today it is hard to believe how the Association perfectly met the needs of the community and society. At one time, SEP had a near monopoly in many useful professional activities. Today, the needs are completely different, but of no lesser importance, and perhaps of greater importance due to the extraordinary dynamics of the economic processes. The association is diligently, and not without a difficulty, working on its structures, algorithms of operation at the central level and its agencies, and therefore also changing its offer for the community and society.

The Association of Polish Electrical Engineers is one of the most important industry organizations in the country. This respectable, over 100-year-old organization with a traditional name and the characteristic blue SEP logo deals with issues related to the electrical and electronics industries. The issues of SEP activity include, professional, industrial, economic, scientific and technical activities, innovations, but also, to a large extent, socio-political ones. The term electrical industry meant something completely different when SEP was created a hundred years ago, and it means something different today. This also applies to the changing area of interest of the SEP Chamber of Experts and other related SEP agencies such as the Central Training and Publishing Center, the Quality Research Office, Committees, Sections, Commissions, etc. The energy industry has expanded to include nuclear power plants, photovoltaics, windmills, hydroelectric plants, and the use of many other renewable energy sources. The energy sector includes increasingly effective large and small energy storage facilities. We have energy of increasingly higher quality, provided in a system and network manner. A cable network is not enough, just like a cellular network, mobile energy is necessary. The energy sector is currently only part of SEP's traditional area of operation.

The area of activity of SEP and its Chamber of Experts had to cover areas strongly correlated with electrical sciences, such as automation and robotics, electronics, electron technologies, materials engineering, superconductivity, optoelectronics, photonics, telecommunications, applied computer science, and recently also quantum information technologies. Electronics itself has become a broad field of science and technology, but also building and enriching, apart from utility energy, in a completely extraordinary way, infrastructure of the civilization. Energy, consumer electronics, photonics, including stationary and mobile telecommunications, and the Internet of Things, are building a new foundation for the development of the civilization of knowledge. At the right time, the Association itself and its agencies, including the SEP Chamber of Experts, had to evolve to cover these areas. Such business expansion is not a linear process. Once upon a time, several dozen years ago, it was built over generations. Today we are dealing with a real acceleration, a revolution where Industry 4.0 and AI will probably soon become a generally applicable standard in developed countries to which Poland strogly aspires.

What changes the Industry 4.0 standard for SEP, its agencies and the Chamber of Experts. Everything is changing. The entire paradigm of industrial and economic activity, personnel training, finance, etc. is changing. The entire industry of electricity, energy, electronics and telecommunications, automation and robotics, as well as the IT equipment of these industries, including artificial intelligence algorithms, equipment, big data technology, knowledge creation, is changing from big data, etc. Soon nothing will be the same. The association and its professional roles in society will change much faster than recently. Are we all aware of this? What won't change? The Association's most important service roles towards the modern society will not change.

Industry 4.0 and its subsequent 4.x versions, an excellent concept of economic development, will not help much to those who do not want to understand it, learn it and apply it effectively. It can be said that it will only make economic life and development more difficult and complicated. Industry 4.0 is not a simple, linear evolution of current models of the management, scientific and technological development of the society. It is a great leap forward that consumes what society has accumulated over the last several decades in energy, electronics, information technologies, engineering and technical

sciences, organization of the manufacturing industry, economics and development policy, and the construction of new civilization infrastructure.

What can the Association and its agencies do in these conditions? To paraphrase the paragraph above, it must become the Association 4.0. It must change and develop intensively in inevitable directions of information intensification. Take care of tradition, but do not base your current activities on tradition. In the traditional areas of electricity, we did not have artificial intelligence, deep machine learning, artificial neural networks, etc. And yet the artificial intelligence AI is a combination of electricity, computer science and the anthropomorphic approach, and many other fields. The purpose of AI is to help people carry out new tasks and ideas, not to automate what people can already do. This also applies to the Association and its specialized agencies, such as the Chamber of Experts.

AI is completely different algorithms. It is necessary to contribute with your unique knowledge to the development of systems such as ChatGPT. It is necessary to build your valuable knowledge base. No one will relieve SEP of such duties. What's worse is that these are actually optional activities. We won't do it, someone else will. Whether or not we will be participants in the development in this fundamental layer. Do we all really understand the importance of this direction of development? The Polish resources of ChatGPT, as well as the old good Wikipedia, are generally modest, and in the field of electricity, extremely modest. No one has done it, and it's a lot of work. Not only simple database work and more complicated big data, but also really complicated construction of the concept of national warehouses and knowledge bases. Such national virtual resources are disturbingly modest in all disciplines of engineering and technical sciences. A modest presence in the world's professional virtual resources demands our attention.

One needs to dynamize ones actions and learn from yourself and others. Educate in hot development areas. Continuously raise public awareness of new technologies. Conduct extensive educational activities regarding the advantages of new technologies, but also their disadvantages and related risks. Counteract and combat ignorance or false knowledge regarding new technologies such as artificial intelligence, anthropomorphic robotics, next-generation mobile telecommunications systems, energy storage, renewable energy, energy mobility, nuclear or thermonuclear energy options, etc. Research, weigh, evaluate critically technology development options, always develop your own opinion based on knowledge and social needs, never otherwise. Always be ready to answer in advance if the public asks a question. It's good to anticipate such critical questions. The answer must be absolutely reliable, even if it does not concern certainty but only an estimate of probability. The Association and its agencies carry significant responsibility for their words and actions. One mistake can ruin many years of effort to build trust, prestige and brand. Also remember that in the open, often brutal network environment the Association operates in conditions where some people earn a fortune on false knowledge.

In such an area of significant responsibility of the Association and such coordinates of its activities and ambitions, the Chamber of Experts SEP - IRSEP, as an important agency of the Association, has its own specialized role to play. IRSEP is one of the Association's links with the real economy. The cases submitted to IRSEP reflect the need for competences in a very interesting way. Such demand is not constant, it is dynamic, flows in different directions, and depends on the economic structure and its changes. IRSEP expert opinions reveal a certain direction in the evolution of the economy. The Chamber of Experts should not stop in its development only at the stage of preparing complex or even more complex expert opinions. This is the traditional structure of the Chamber. Regional centers present their offers and wait for orders. Is such an offer dynamic enough or does the tradition prevail?

Can the Chamber of Experts afford to prepare commercial sectoral innovation and industrial studies regarding national conditions? Is there any point in doing such studies? Associations and international groups based on associations that develop industrial standards, also in the field of electricity, are constantly preparing such studies. The idea of expertises, one could very emphatically say, is eternal. How variable it is. The role of expertises in the economy today is completely different than several dozen years ago. However, some attributes of expertises and experts remain absolutely unchanged. An expert should always and consistently have appropriate qualifications, experience and knowledge related to a given field. Its task is to provide a reliable and independent opinion or expertise for the needs of the client, court, insurer or other institution. The Chamber of Experts must protect such an appraiser, help him, enable his development and reliable work.

IV. Licensed Expertises in Industry and Electrical Engineering

Industrial appraisal is a field of expertise that includes research and analysis on various aspects of the industry. Industrial experts are specialists who have technical knowledge and experience in specific industrial fields, which enables them to evaluate various aspects of enterprises, machines, production processes and installations. The main areas of activity of industrial expertise include assessment of the value of industrial property, technical condition examinations, forensic examinations, examination of production processes, industrial safety and standards, industrial risk assessment, assessment of products and market opportunities and many others.

In terms of property valuation, industrial experts may assess the value of various industrial assets, such as machinery, equipment, factory buildings and other company resources. In terms of technical condition examination, they carry out tests aimed at assessing the technical condition of machines, devices and industrial installations. They can identify problems, determine the causes of failures and propose solutions. In the field of forensic expertise, industrial appraisers, as court experts, may be involved in court cases involving industrial disputes, accidents, damages or breaches of contracts. Their task is to provide reliable technical expertise that can be used in court proceedings. When it comes to examining production processes, industrial experts analyze production processes in enterprises, identifying areas where improvements can be introduced, costs can be optimized or efficiency improved.

In the field of safety and industrial standards, industrial experts may assess compliance with industrial standards and safety in manufacturing plants. They ensure that companies comply with relevant standards and regulations. In the field of industrial risk assessment, appraisers conduct risk analyzes in the field of industrial activities, identify potential threats and propose remedial measures. Industrial expertise is usually a complex area that requires specialized knowledge and skills. Industrial experts may specialize in various fields, such as mechanical, electrical, chemical or environmental engineering, depending on the type of property or process that is the subject of their expertise. Sometimes full expertise requires combining

different specialties.

The names Appraiser, Licensed Expert and Chamber of Appraisers, Chamber of Licensed Experts are generic terms, informally reserved words, quite specifically defined by various formal, legal and informal professional community standards. The words Expert and Appraiser refers to a person who has specialized knowledge and skills in a specific field whose purpose is to provide an assessment, expertise or opinion about a specific thing, situation or issue. Appraisers are often used in various fields, such as real estate, automotive, insurance, construction, art, and other areas requiring specialized knowledge.

Due to the frequency of expertise cases, some specialties are more popular. Real estate appraiser - assesses the value of real estate, examines the technical condition of buildings, etc. Car appraiser - deals with estimating the value of vehicles, examines the technical condition of cars. Insurance appraiser - analyzes damage and estimates losses in the event of an insurance claim. Court appraiser - provides forensic expertise in specific areas, which can be used as evidence in court proceedings. Art appraiser - assesses the value of works of art, authenticity, or conservation status.

In the area of operation of the Federation of the Supreme Technical Organization FSNT NOT [5], almost every industry Scientific and Technical Association SNT has its own Chamber of Licensed Experts. The areas of competence of these appraisers are, for example: SIMP - mechanics, PZITB - construction, SEP - electrical, POLSPAR - measurements, automation and robotics, PTIE - environmental protection, SITO - horticulture, SITR - agricultural technology, SITP - firefighting technology, PZITS - refrigeration , heating and ventilation, gas, water and sanitary technology, SITPH - metallurgy, materials engineering, SGP - geodesy, SITPChem - chemical industry, SITG - mining, PSRWN - real estate valuation, SITSPoż - food industry, and many other areas of engineering and technical. The Licensed Experts of SEP and other SNTs associated with NOT have competences strictly defined and statutorily guaranteed by their parent SNTs.

Experts are usually formally organized in their specialist SNT Expert Chambers. Some experts are additionally associated, apart from their parent SNT, in the Polish Association of Appraisers and Court Experts PSRiBS [6]. Some universities offer education at the level of bachelor's studies in engineering, as well as postgraduate education in the field of industrial expertise and court expert witnesses. Literature sources on industrial appraisal and expertise are combined with industry literature, are of general nature and can be found in textbooks on business management, industry, production processes, etc.

Chambers of Experts play an important role in coordinating the activities of appraisers. They are centers for professional development. They provide a platform for expwerts to pursue continuing education, improve professional skills, and stay up to date with industry standards. Chambers of Experts are networking centers. They offer networking opportunities between professionals in their fields of competence. They facilitate the exchange of knowledge and experiences. They are guided by high standards and ethics in their work. They often establish and maintain ethical standards and guidelines for the expert profession. They help experts maintain the integrity and consistency of appraisal and valuation practices.

Chambers of Experts with a recognized reputation are good advocates for their communities. They defend the interests of experts by representing them in discussions with regulators or industry and government agencies. Chambers of Experts with the greatest ambitions undertake appropriate social activities. They are involved in social activities, education and continuing education. They help the public understand the importance of professional appraisals and the role of experts.

V. SEP Chamber of Licensed Experts – Activities and Future

The history of the Chamber of Experts of the Association of Polish Electricians, in the period from its establishment in 1959 to 2016, is presented in detail and colorfully by J.Grzybowski and A.Skorupski on the occasion of the launch by SEP, a few years ago, of a useful campaign of a number of historical studies on the development of the Association and its specialized agencies [7]. An updated version of this great historical work, covering the period to the present day, is presented in [8].

Appraisal and expertise in the Association of Polish Electricians is created by local Chambers of Experts associated with regional SEP Centers. The Central Administrattion of the Chamber of Experts plays a supporting and coordinating role. The CORSEP Central Expert Office is located in the organizational structure of the Association among other central bodies. CORSEP's activities are managed by a three-person Management Board. The advisory function of the CORSEP Management Board is fulfilled by the Council of the Chamber of SEP Licensed Experts, composed of nine experts from various SEP Branches. The CORSEP body conducting administrartive processes regarding SEP experts, expertises and industrial recommendations is the five-person IRSEP Qualification Committee.

CORSEP operating procedures are two-step. Applications for obtaining the title of SEP Licensed Expert and related titles, as well as applications for granting SEP industrial recommendations to companies, are submitted to SEP Branches, where they are formally processed and reviewed. Positively assessed applications from SEP Branches are sent to CORSEP. CORSEP, with the help of its Qualifications Committee, launches its own review procedure. CORSEP and the Qualifications Committee, after the members have assessed the applications, all members gather for a meeting to approve the applications. Each specialist department is supervised by a specialist in a given area of science and technology. The department head reports on the application at the meeting of the CORSEP Qualification Committee. The other members of the Commission express their opinions, and then there is usually a discussion about the quality of the proposal. The decision is made by the Qualification Committee as a result of a secret ballot.

Until recently, the area of competence of the SEP expertise subject to assessment was divided into several dozen specialist sub-areas. Most of this division has changed recently. As a result of these changes, the Council of the CORSEP Chamber of Experts reduced this division to 9 specialist sections: Energy production; Power networks; Energy storage; Electronics; Automation, robotics and metrology; Lighting technology; Installations and devices; Vocational electrical engineering; Electric machines.

Specialized sections are thematically detailed for the internal use of the CORSEP Qualification Committee. The Electronics section includes, for example, topics such as: electroacoustics, electronics, information and communication techniques, information and computer technologies, and power electronics. The Professional Electrical Engineering section includes topics such as: economics, management and work organization;

marine electrical engineering; material engineering; industrial electrothermia; electromechanics of motor vehicles; electrical engineering in agriculture; operation of systems; electrical engineering in mining; electrostatics; and quality of electricity. The remaining specialist sections are divided thematically in a similar way.

The offer of SEP's regional Licensed Expert Centers is one of the foundations of IRSEP's operation. A modest supplement to these general considerations is a very brief review of the offer of regional SEP Chambers of Experts in Poland. This is by no means an exhaustive review. It is simply a supplementary example of expertise activities. For various reasons, this activity is distributed unevenly in the country. It depends largely on the possibilities and characteristics of the innovative industry and business in the regions, as well as a tradition.

National sources on industrial appraisal in general are most often available as part of broader textbooks on business, industry and economics, as well as the labor code and industry codes [9]. ESG standards – Environment, Social, Governance concern the so-called green industrial future and include the impact of industry on the environment and climate, occupational health and safety, management and control processes [10], sustainable industrial and social transformation [11], Industry 4.0. [12], as well as building competences in these areas of expertise, because appraising is an excellent competence covering theoretical knowledge and practice [13]. Online sources of expertise in the world are the main browsers such as ChatGPT [14], Google [15] and others such as LinkedIn, X, or Internet portals of associations such as the IEEE. The sources of knowledge about expertise in SEP and other SNTs gathered in the NOT Federation are most often the websites of the regional branches of these SNTs.

The future of expertise and appraisal at SEP is safe and good. However, it must change as the market and demand change. It is also worth using good examples of such changes. Appraisal in the worldwide organization IEEE is organized differently. It is more diverse in terms of form and granulation. Granulation applies, for example, to forms of micro-expert opinions provided by licensed experts online. In such a case, the expert is on-line and provides advice in real time, most often paid and measured by the ordered time. Such micro-expertise is particularly popular in the field of work on functional codes for electronic systems.

The good future of expertise and appraisal at SEP is related to the expansion of the local, geographical, personal and thematic offer base, as well as effective cooperation between the SEP Centers. The SEP Expert ID must regain the value it once had, especially in the eyes of experienced engineers. Today, SEP and its Chamber of Experts operate in conditions of significant market competition. SEP, as an organization of social trust, faces various types of difficult competition and the only way to respond to such conditions is a high-quality, unique offer. This requires significant substantive effort from the Association. It also requires strictly guarding one's own interests, including condemning dishonesty. A significant part of the current IRSEP offer is focused quite narrowly around the electricity sector. This is the traditional field of activity of the Association. This offer should be expanded to include power electronics, automation and robotics, metrology and diagnostics, including remote diagnostics, electromobility, energy storage, information technology, software for electrical systems, and other rapidly developing areas.

VI. SEP – Regional Chamber of Experts

The Chamber of Experts at the Krakow Branch of SEP [16] carries out the full scope of: preparation of expert opinions, judgments and expertises, technical designs; consulting - technical advice; analyses, studies and scientific research; experimental, computational and analytical work, as well as laboratory and industrial tests and research; control, measurement, adjustment and commissioning works; technical inspections; supervision of construction and installation works; technical inventories; preparation of operational and operational instructions; valuation of equipment and technical devices; training in improving qualifications and vocational education; organization of training seminars; recommendation opinions.

The above-mentioned work is performed by research workers from universities (AGH and Krakow University of Technology), outstanding specialists from design offices and industry, who ensure high quality of the work performed. More important expert opinions performed at the SEP Expert Center in Krakow in 2022: Expert opinion on the correct operation of the photovoltaic installation; Assessment of the technical condition of the lightning protection installation in production hall buildings; Expertise on electrical installations after a room fire; Technical opinion regarding 15 kV medium voltage cables, Lublin clinical hospital; Technical opinion on the causes of the failure of the server room in the Merkury office building; Expert opinion on the causes of damage to the transformer bay; Opinion on the cable connection.

The Experts of the Gdańsk Branch of SEP [17] are recruited from among scientists and practitioners from universities, institutes, design offices and enterprises, ensuring high quality of the services provided. The services they provide are impartial in technical terms, taking into account applicable regulations and technological progress around the world. Specialists from the SEP Expert Center in Gdańsk provide free technical and organizational advice on electrical installations and devices every Monday and Wednesday in particular hours.

The Appraisal Center in Gdańsk provides services in the field of: Expertise, judgments and opinions for courts; Valuation of assets and property: electrical - installations, networks and electrical devices, energy - electricity, heat and gas, automation, IT and telecommunications; Preparation of operating, renovation and workplace instructions; Design of electrical networks, installations and devices; Preparation of cost estimates, bills of quantities and technical specifications; Measurements of electrical and lightning protection installations; Assessment of the technical condition of electrical installations and devices; Verification of developed projects and cost estimates; Technical inspections of electrical installations and devices; Supervision of construction, assembly, inventory and technical works; Organization of scientific and technical meetings (symposia, exhibitions, conferences); Giving opinions on applications for awarding professional specializations; Information activities and technical advice; Development and sale of training materials; Assessment of the operation of telecommunications installations in buildings, including antenna, internet and telephone installations; resolving disputes regarding the quality of their functioning; Detecting the causes of radio interference; Assessment of compliance with electromagnetic compatibility requirements. The SEP Expert Center in Gdańsk cooperates with the Gdańsk University of

Technology and the Pomeranian District Chamber of Construction Engineers, and the strategic sponsor is GDE.

Within the Warsaw Branch of the Association of Polish Electrical Engineers and the Electronics, IT and Telecommunications Branch [18], there is an economic agency, the Center for Expertises and Technical Services, which has been dealing with technical issues in the field of broadly understood electrical and electronics engineering for many years. ORiUT was separated from the Headquarters of the Chamber of Experts in 1981 and established the SEP Expert Center in Warsaw. The work is carried out by ORiUT through teams of experts each time created for the needs of a given order, consisting of, among others, Experts, Appraisers, Specialists and Verifiers with confirmed qualifications and professional achievements, and coordinated by OW SEP as part of the order.

The Expert Center at the SEP Coal Basin Branch in Katowice has been operating for 40 years [19]. With a staff of 60 experts and specialists in various fields of electrical engineering, the Center undertakes orders for: carrying out technical and economic expertise and opinions; development of technical documentation; performing diagnostic tests; conducting investor supervision; development of plans for supplying municipalities with heat, electricity and gas in the planning and design phase; performing control and measurement works in municipal and cooperative construction, in accordance with the requirements of construction law in the field of: high-voltage power networks and stations; electrical equipment, machines and electric drives; power plants and combined heat and power plants; industrial energy and mining electronics; industrial electrothermal energy; operation of energy systems; home electrical engineering. The Center offers insurance companies high professionalism in preparing expert opinions related to the liquidation of losses caused by natural disasters and failures in technological systems of the insured entities.

Similar offers of Expert Centers and their activities are available, for example, on the websites of SEP Branches in Łódź [20], Poznań [21], Gliwice [22], Słupsk [23], Częstochowa [24], Białystok [25], and Rzeszów, Lublin, Bielsko-Biała, Toruń, Koszalin, Tarnów, Wrocław, Szczecin, Olsztyn, Radom, Chełm, Bydgoszcz, Gorzów Wielkopolski, Kielce, Opole, Skierniewice, etc. The offers of Expert Centers at SEP branches are diverse and often reflect local characteristics, industrial and business.

VII. SEP Chamber of EXperts – How to Be Competitive in Technology and Be Heard

On March 12, 2024, a ceremonial scientific and technical conference related to the 65th anniversary of Expertise at SEP is planned at the House of Technology in Warsaw. The conference will be attended by representatives of regional SEP Centers and local Chambers of Experts. Plenary papers are planned on the activities of the Chamber of Experts of the Polish Association of Construction Engineers and Technicians PZITB, and a historical one on the activities of IRSEP. It is planned to organize a technical panel on energy storage and its quality. SEP Expert Centers plan to present their industrial offer. A discussion on the directions of development of SEP Expertise is planned.

The 65th Anniversary Conference of the SEP Chamber of Experts will be solemn with the participation of the Association's authorities and guests from friendly NT Associations, companies recommended by SEP, technical universities, industrial organizations, chambers of commerce and appraisers. The anniversary part summarizing IRSEP's achievements will be supplemented with an interesting substantive part about the future and development. On the occasion of the IRSEP anniversary, a special issue of the monthly scientific and technical magazine SEP Elektronika - structures, technologies, applications will be published, containing several articles regarding the activities of IRSEP [8,26].

The Association of Polish Electrical Engineers is the largest organization associated with the Supreme Technical Organization NOT, which has the status of higher utility, as one of several dozen institutions so distinguished. This high rank is associated with activity in the scientific, educational, economic, innovative, industrial, economic, social and political spheres. This activity should meet social demand and respond to its changes in order to participate in development processes and ongoing technical progress.

Associational activity is directed both to its internal problems and to the service of external institutions and organizations. The internal one is maintaining a platform of cooperation between engineers, scientists, industrial leaders and experts, where activities aimed at the development of the field of relavant technology are organized. External activity means presenting the society with the best-prepared offer to meet current social needs.

One of the SEP agencies that fulfills the association's tasks is the Chamber of Experts. It was established 65 years ago and serves to strengthen the role of the Association. It attracts the best experts in various fields of electrical engineering, with particular emphasis on new technologies, which allows it to undertake difficult opinions, expertise and studies. On the other hand, the Association wants to speak out on matters that may contribute to the progress of national industry, science and education.

An important task of the entire Association is to support these activities so that its authority increases. Then the impact on preparing society for the implementation and use of new technologies will increase. To achieve these goals, it is worth preparing commercial sectoral innovation and industrial studies that will take into account national conditions. This may apply to Industry 4-0, AI – artificial intelligence, power electronics, automation and robotics, metrology, electromobility, energy storage, digitalization and other rapidly developing areas of electricity. This voice of SEP should be heard at all levels of decision-makers.

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