Project Title: Study phase and preparation of detailed documents of the quality control reference laboratory of medium power electric motors with power from several tens of kilowatts to less than one megawatt.

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Keywords:

Medium power electric motors, reference laboratory, quality control, power from tens of kilowatts to one megawatt

Project Necessity:

The importance and necessity of establishing a reference laboratory for testing electric motors in Iran is undeniable. Since the observance of the principles of technical standards at the international level and national standards have a significant role in the quality of products produced in the country's motor industry and it is natural that by producing higher quality products, not only the volume of investment required for modernization Motor equipment is declining, but the quality of operation of the industry is further improved.

Electric motor testing laboratories play an important role in the development of industry science and technology, as well as the development of electrical equipment research and development units. Over time, it has been proven that such institutions, by using the power of technology and expertise, have led to the development and integration of technologies, as well as traditional technologies towards modernization. The need to use a reference laboratory in accordance with valid international standards that demonstrates the quality of the equipment becomes apparent. Also, by obtaining the relevant approvals and licenses and meeting the requirements of measuring and calibration laboratories at the international level, the tested and certified products from the laboratory, comparable to similar foreign products, have the same certification and are available on a global scale.

Project Goals:

- Study on the components and facilities of a reference laboratory
- To identify the relevant types of tests and standards
- Review of foreign and domestic laboratories
- Identify the necessary laboratory equipment
- Estimating the cost and time of setting up a reference laboratory
- Prevent the outflow of currency from the country

Abstract:

Technical and engineering group of Shahroud Turbo Generator Company as one of the leading companies in the field of design and construction services, reconstruction and testing of various types of electric motors, as one of the companies providing services to various industries and due to having laboratory facilities and surrounding The needs of large industries for the process of testing electric motors were commissioned by the Advanced Electric Motor Technology Development Center of Niroo Research Institute to collect all the requirements for designing and building a reference motor testing laboratory in the form of a consulting research contract. Niroo Research Institute's Motor Test Reference Laboratory will be able to independently perform all types of motor testing and inspection services (up to 1 MW) in accordance with international standards, as well as monitor the testing process of various related organizations and promote Quantitative and qualitative.

Different standards have been developed by various international institutions and the National Standards Office of Iran in the field of electric motors, which in this project will identify and study these standards. In different countries, there are advanced reference laboratories that can be used in the implementation phase. There are also several laboratories in different parts of the government and manufacturers of electric motors, and the potentials of these laboratories can be used at the time of implementation. Therefore, identifying external reference laboratories and the potential of domestic laboratories is of particular importance. The necessary equipment and devices for the laboratory should be extracted based on the need for various tests and in accordance with the relevant standards. The organizational structure and manpower of the laboratory as well as the dimensions and size of laboratory devices and equipment and the requirements of indoor and outdoor spaces, the area of the laboratory infrastructure are estimated as a basis for estimating land acquisition costs and construction and construction operations.

Steps and Methodologies:

In this project, the design of a laboratory for electromotive systems up to 1 MW has been studied. First, the domestic capabilities in the field of testing electromotive systems in the country were discussed. Then, foreign reputable laboratories were analyzed in this field and then how to establish a laboratory in the country. As reported in Chapters 3 and 4, all the equipment and drawings required to establish a laboratory have been

extracted and brought. Also, the schedule of the project for implementation along with the suggestions of spatial location and administrative and installation requirements for setting up this laboratory are given.

Also, due to the fact that many advanced techniques have been developed for condition monitoring and troubleshooting of rotating machines and equipment on a global scale, such as vibration measurement and analysis, noise measurement and analysis, current measurement and analysis using frequency spectrum, An in-house reference laboratory needs to be able to test and analyze these techniques on manufactured products to enable designers and manufacturers to comply with standards during design and construction.

The first chapter identifies the types of tests and related standards. In the second chapter, it is tried to examine the domestic laboratories in terms of potential and capabilities and foreign laboratories in terms of facilities and services provided. In the third chapter, the necessary equipment and devices in the laboratory are identified. In carrying out this process, first, due to the need to use the facilities with a correct arrangement, according to the power range and available torque sensors, a general plan for the test sets is considered, and then the tools and equipment for the implementation of this plan. Were examined and identified. The organizational structure and manpower required in different areas of management and staff have been identified and the location and space required for the laboratory for civil and construction operations have been estimated. In the fourth chapter, we have tried to identify and schedule the necessary phases for estimating the project execution time and start-up cost. The safety criteria required to achieve a safe industrial environment against hazards and to achieve proper occupational health have also been reviewed. In the fifth chapter, the whole report is summarized and concluded.

Main Results (technical outputs, patents, papers, books, reports, etc.):

- The project report "Developing Study phase and preparation of detailed documents of the quality control reference laboratory of medium power electric motors with power from several tens of kilowatts to less than one megawatt"