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**Project Title:** Providing the Technical Guidance of Condition Monitoring of Distribution Networks

<b>Department:</b>	The Department of Power Systems Planning and Operation	<b>Employer:</b>	Plan and Budget Organization
<b>Project/Program Manager:</b>	Omid Shahhoseini	<b>Executor:</b>	Niki Moslemi
<b>Project Financial Code:</b>	700001	<b>Project Quality Code:</b>	CDSP05
<b>Type of Project/Program:</b>	Contract	<b>Assistant:</b>	Research

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### Project Necessity:

Today, the establishment of comprehensive condition monitoring programs (Condition Monitoring) is an integral part of maintenance programs in various industries, including the electricity industry. In fact, monitoring the situation is one of the main components of predictive maintenance. In maintenance, condition monitoring is a set of actions that determine the condition of the equipment by monitoring the condition of the equipment and examining its changes over time based on parameters such as vibration, sound, performance, lubrication, temperature, etc. An integrated and professional approach to the issue of "status-based maintenance" or "predictive / predictive maintenance" has proven benefits and advantages that the establishment easily justifies condition monitoring programs based on partial discharge, corona vision, ultrasonic, thermography, earth test, oil moisture test, etc. in various industries. Identify and control erosion before heavy damage, estimate repair time and schedule maintenance, estimate useful life and prevent replacement of materials and parts before their end of life, find the root causes of erosion of parts and components and how they affect, compare and compare Benefits from researching parts and identifying chronic breakdowns and optimizing maintenance programs in different systems are among the benefits. In the meantime, it is necessary to have full knowledge and technical knowledge about the technical specifications of this equipment, how to maintain and also analyze the outputs of the equipment to provide the most optimal monitoring of the situation and maximize its benefits.

### Project Goals:

- 1- Familiarity with status monitoring and related methods in distribution networks
- 2- Preparing and compiling a technical guide for monitoring the status of distribution networks

### Abstract:

In this project, in the first step, to collect and review technical documents including standards, guidelines and international and domestic instructions, regarding technical specifications, maintenance and analysis of output monitoring equipment in the form of partial discharge (PD), ultrasonic, thermography, earth test. , Oil moisture test was performed. It is worth mentioning that common methods of monitoring the status of distribution networks include visual inspection, sound and vibration analysis, ultrasonic testing, partial discharge test, thermography test, oil moisture test and earth test. Then the mentioned documents were reviewed and analyzed and the technical guide in

the form of different chapters according to the mentioned methods, including the specifications of each method and The equipment used in it was prepared and compiled. Since with the advent of new technologies such as the Internet of Things, it is possible to monitor the online status and real-time equipment, at the end of the work, the introduction of new methods and equipment was on the agenda and added to the technical guide..

### **Steps and Methodologies:**

- 1- Collecting and reviewing technical documents including standards, guidelines and international and domestic instructions, regarding technical specifications, maintenance and analysis of output of partial discharge monitoring (PD) equipment.
- 2- Collecting and reviewing technical documents including standards, guides and international and domestic instructions, regarding technical specifications, maintenance and analysis of output of ultrasonic status monitoring equipment.
- 3- Collecting and reviewing technical documents including standards, guides and international and domestic instructions, regarding technical specifications, maintenance and analysis of thermographic status output outputs.
- 4- Collecting and reviewing technical documents including standards, guidelines and international and domestic instructions, regarding technical specifications, maintenance and analysis of equipment output monitoring, ground test status
- 5- Collecting and reviewing technical documents including standards, guidelines and international and domestic instructions, regarding technical specifications, maintenance and analysis of output of oil humidity monitoring equipment.
- 6- Preparing and compiling a technical guide regarding the above equipment, including the required technical specifications, how to maintain and how to analyze the outputs of each equipment

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

- 1- Technical report of the guide for monitoring the status of distribution networks