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Project Title: Utilization of Cathodic Protection for Transmission Towers Using Renewable Energy

Department:	Non-metallic Material	Employer:	Niroy Research Institute
Project/Program Manager:	Hadi Beirami	Executor:	Nastaran Riahi Noori
Project Financial Code:	236700	Project Quality Code:	PCPPN33
Type of Project/Program:	internal project	Assistant:	Research

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Project Necessity:

Foundation of electric transmission tower similar to other structures has a great impact on stability and performance of electric tower. Without having sound and safe foundation, this structure cannot perform the functions for which it has been designed. Durability and corrosion protection of power transmission foundation not only satisfies its stability and safety issues but also plays significant role in reliability of overhead power line due to its acting part in grounding system.

Project Goals:

- Assessment of corrosion in concrete foundation of electric transmission towers;
- Design cathodic protection system using photovoltaic electric sources;
- Applying designed system on a selected foundation using solar panels;
- Monitoring of the protected system and comparing with normal protection approach in the same area.

Abstract:

It is widely accepted that reinforcement rebars in concrete foundation of power transmission lines act as the ground electrodes during current faults. Corrosion assessment, life time estimation and corrosion protection of concrete structures are very important issues in corrosive areas. As an example, Iran operates more than 125,908 km overhead transmission and sub-transmission lines (> 63 kV). Approximately 19 percent of these high voltage lines are located at corrosive coast lines. Around 17 percent of these high voltage lines are more than 30 years old.

Steps and Methodologies:

In this project, after a brief assessment about corrosion and cathodic protection of steel in concrete, a novel approach has been conducted regarding corrosion assessment and cathodic protection of foundation of electric transmission towers using solar panels at Niroo Research Institute.

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

- Know-how about design and execution work to apply cathodic protection system on foundation of electric tower;
- Experience about using Photovoltaic system for applying cathodic protection systems;
- Decreasing cost of protection of electric tower foundations.