



**FINAL YEAR PROJECT  
B.ENG (HONS) IN MECHANICAL ENGINEERING**

**APPLICATION OF SOLAR ENERGY IN  
CATHODIC PROTECTION  
OF BURIED PIPELINES**

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# ABSTRACT

Corrosion is the destructive results of chemical reaction between a metallic metal and its environment. Metal atoms in nature are present in chemical compounds (i.e., minerals). The same amounts of energy needed to extract metals from their minerals are emitted during the chemical reactions that produce corrosion. Corrosion returns the metals to its combined state in chemical compounds that are similar or even identical to the minerals from which the metals were extracted. Thus, corrosion has been called extractive metallurgy in reverse [3].

*Cathodic Protection (CP)* systems have been widely used for many years to prevent corrosion in pipelines, well casing, and other metallic bodies that are buried in soil. *Impressed Current Cathodic Protection (ICCP)* is one of the cathodic protection methods. *Photovoltaic* or solar system cathodic protection of buried pipelines means that ICCP of buried pipelines by using solar energy as a power source. The solar system will represent the conventional power supply (i.e., generator and rectifier).

This project started with laboratory set-ups to find the optimum current and followed by the actual experiment on specimens pipe and anode. Five sets of CP system, where is each system consisting of one specimen pipe and one anode joint to their own power terminal (AC-DC converters) were buried in the soil kept in the glass tank (size: 1x1x1 foot) for two and half

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