SUMMARY

This is the final report of the study entitled *Feasibility Study for Establishing a Central Electrical Laboratory in Saudi Arabia*. This study was sponsored by Consortium of interested companies in the Kingdom. The study was conducted by the Center for Engineering Research of the Research Institute.

The objective of the study was to evaluate the economic viability of establishing a central electrical testing laboratory in Saudi Arabia. This objective was achieved through measuring the demand for electrical testing; collecting information on the testing equipment; scoping detailing for the laboratory; defining the laboratory in terms of its functionality and space requirements; determining the location of the testing laboratory that will maximize its functionality; performing an economic feasibility analysis of the laboratory; and investigating alternative scenarios for funding the establishment of the laboratory. The study team prepared extensive questionnaires to collect relevant information from electrical related organizations in the Kingdom and the GCC countries. The study team carried an extensive search efforts and visited many international electrical testing laboratories to survey the most relevant equipment for testing HV and HC laboratory. The study team analyzed the outcome of the collected data from local and GCC companies and the information gathered about international laboratories practices to define the preliminary scope of the targeted electrical testing laboratory. The team defined the functional program of the laboratory qualitatively by describing the mission and objectives of the project. The team also defined the spaces that will be required for the various facilities. This program will include all the spaces that will be needed for the proper functioning of the laboratory. The team prepared a schematic design layout for the laboratory based on the developed architectural program. This layout is to show the general configuration of the laboratory and is not meant to provide a design solution. The study team performed an economic analysis of the laboratory. The profitability of the project was analyzed according to the criteria of undiscounted measures of project worth, and discounted measures of project worth. The life cycle economic figures are presented to support the recommended alternative. The economic arguments included cost estimate of land which could be used to locate the subject laboratory. The study team investigated alternative scenarios for funding the establishment of the laboratory. The most appropriate funding scenario was recommended to the consortium members to consider.

The financial viability of the project was examined based on cash flow analysis, benefit to cost ratio, and payback period. An interest rate of 8% was used for discounting the cash flow and therefore considered the time value of money. The viability of the investment is measured by comparing the benefits to the costs. All benefits and costs are normalized for comparison purposes. The net present worth (NPW) was calculated for all the cost and benefit parameters. Therefore, the benefit to cost ratio was calculated and found to be 1.25. From the expected annual revenues and costs of the investment, it was possible to determine the payback period which is expected to be at the end of the ninth year from the start of the High Voltage Testing Laboratory. The Internal Rate of Return on the investment was also calculated and found to be 14%.

The economic analysis strongly supports the decision to invest in the High Voltage Testing Laboratory project.