



جامعة الملك فهد للبترول والمعادن  
King Fahd University of Petroleum & Minerals

الشركة السعودية للكهرباء  
Saudi Electricity Company







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# OPTIMUM SELECTION OF TRANSFORMER SITES IN PLOT PLANS

(Saudi Electricity Company)

By  
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# INTRODUCTION

- Rapid Increase in No. of Customers
  - New plot plans
  - 200 per year (Avg. 300 lots)
- Necessity for Planning
  - Save and reliable power supply
  - Economical design (optimum sites)
  - GIS Model to simulate the process





# BACKGROUND

- Plot Plans
  - Aramco **PP# 1/367** in Dhahran
- Saudi Electricity Co. (SEC)
  - Franchise area
  - Sites Allocation History
  - Electric network design





# PROBLEM DEFINITION

## • Sites Selection Process:

Transformers distribution over the plot plan provided the following:

- Individual demand load shall be met
- Voltage drops are within allowable limits
- Equipment ratings shall not be exceeded





# CURRENT SITUATION RESULTS

- The process will eventually reach to the following results:

Complete LT/MV Master Plan & S/S Sites





# OBJECTIVE

- Develop a Proposal
- Investigate possibilities
- GIS Capabilities to Simulate the Process





## SEC & GIS

- Primitive Actions 20 years ago
  - Mapping purposes only
  - No real benefits
- Recently, Pilot Project
  - Part of Dammam area
  - Maps linked to WMS
  - Perform all functionalities
  - Web GIS





# GIS POTENTIAL FOR SITES SELECTION

- Reading the Map
  - Create area attributes
  - Relating attributes (area & ICMD)
- Smart System
  - Calculate DL & distances (VD)
  - Logical expressions to choose sites
  - Distribute within limits





# GIS POTENTIAL FOR SITES SELECTION

- Benefits

- Design time reduction
- Better resources utilization
- A step towards integration
- Better customer service





# CONCLUSION

- Convince Management
- Convince Staff
- Better Understanding of Problem, Better GIS Solution





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