ADDS Case Studies

Introduction

Roussey Companies provides ADDS (Applications for Distribution Design Systems) for URD design at electric utility companies. ADDS has proven itself as an application that saves significant dollars for both the design and construction processes associated with URD. These savings are real and result from a variety of reasons. ADDS is provided to Utilities at no cost, and it's use is paid for by the number of meters designed in developments.

Most electrical utilities design URD installations using a template design process. The template design process became the norm as a result of either loss of design expertise or time constraints that prevented designers from calculating the results of various design scenarios. A lack of time frequently means that only one scenario is designed and a most economical and efficient solution not achieved. Template scenarios also result in utilities overbuilding URD installations since they are designed to err on the safe side and support lack of expertise and/or lack of time.

Template design methods save some time while providing "fail-safe" designs that will ensure adequate service to homes in a development. Although time savings are realized by doing template design over manually engineered methods, even more time can be saved by designing with ADDS. ADDS not only performs all the engineering calculations that ensure maximum use of equipment, but it also automatically places all the equipment graphically. ADDS also provides reports for developments that summarize each transformer's load, cost, fault current, attached cables, and the lots served. Additional reports include primary cable, and primary equipment information. ADDS also ensures that trenching is minimized. These features can reduce design time up to 70% as compared to existing methods.

Construction costs in terms of material and labor are also reduced significantly through the use of ADDS. Traditional template design methodologies make assumptions based on house size, transformer size, average lot size, and then assign a certain number of houses per transformer. As a result, the design is not optimized and therefore produces a design with more installed transformation than is necessary. This in turn increases the amount of trenching, and secondary resulting in higher job costs. ADDS is proven to reduce construction costs up to 35% over traditional template methods.

PECO Energy Case Study

Roussey Companies ADDS application has been designing the URD work for PECO Energy for the last seven years. During this time, over 52,000 units of housing have been designed for. Prior to using ADDS, PECO Energy pursued a combination of manually calculated and standard template approaches. Designers were limited in time and the manual process of engineering all of the developments could not be accommodated.

The design work for new developments has gone through two stages at PECO since the adoption of ADDS in 1993 due to reorganization and downsizing. Throughout the changes, ADDS has continued to be the tool of choice for efficient and cost effective designs. Prior to 1993 designs were created manually. Then in 1993 ADDS was brought in to PECO and mappers and designers created URD designs with it. Following the spin-off of Exelon Infrastructure Services (EIS), the design work was outsourced to Roussey Companies through the NRCG (New Residential Construction Group) of EIS. As a result, ADDS was not physically in place at PECO, but continued to be used as part of an outsourced design strategy.

In order to evaluate the effectiveness of ADDS, several developments that were designed with manual methods were redesigned using ADDS. The results of these redesign efforts were as follows:

- Providence Ridge in Bucks County, PA – ADDS design resulted in a reduction of transformers by 16% and a reduction in installed kVA by 24%. Design time for the same development was reduced by 60% as a result of the automation inherent to ADDS.
- Peddler's View in Bucks County, PA – ADDS design resulted in a reduction of transformers by 14% while using the same amount of installed kVA. Design time was again reduced by 60% because of the ease of use of ADDS.
- Pin Oaks Estates in Montgomery County, PA – ADDS design resulted in a reduction of transformers by 33% while using the same amount of installed kVA. Design time was reduced by 60%.
- Wyndham Woods in BucksMont Region – ADDS design resulted in a reduction of transformers by 25% and a reduction in kVA of 25%. Design time was significantly shorter.

Since ADDS has been used to design all of the new URD developments over the last seven years for PECO Energy, the savings resulting from it's use are substantial. Construction costs within the developments and design times for development layout have been reduced enough to have saved PECO Energy approximately $13 million over the last 7 years.

Detroit Edison Case Study

Detroit Edison selected ADDS as a tool for planners and mappers to automatically generate cost-effective, electrically optimized layouts for URD developments. ADDS provides as part of the design process all equipment parameters, load characteristics, and fault-current and voltage flicker values. Detroit Edison's goals included reducing time to design the jobs, and reducing the amount of equipment installed on each job. In this fashion Detroit Edison expected to reduce the cost of installing, maintaining, and operating URD facilities.

Detroit Edison ran several tests of the software versus their traditional design methods. One example for a 400 lot mobile home park resulted in a reduction in design time of 90% and 17 less transformers being needed to provide service. Other sample jobs consistently resulted in 30% to 35% lower installation costs than designs generated manually. Detroit Edison estimates that annual savings from ADDS use will be $2 million annually for reduced transformer installations. This estimate does not include miscellaneous avoided expenses such as taxes, equipment maintenance, transformer core losses, and stores handling.

Detroit Edison also values the fact that since design times are reduced significantly, then a designer or mapper can take time to create additional scenarios as necessary in order to generate the best design for conditions. Mappers are also able to produce quality URD designs with ADDS which frees up designer time to address other issues.

Summary

Roussey Companies ADDS software is a money saving URD design tool available to Utility Companies. Both PECO Energy and Detroit Edison have benefited greatly from the use of ADDS. The ADDS approach is one of practicality in that it allows a designer to interact with the application in order to account for the dynamics of dealing with builders of new developments. A designer can produce multiple scenarios and be assured that ADDS will never allow a design that violates engineering principles.

Additionally, since ADDS is provided at no cost to utilities, there is no up front cost to be budgeted for. Savings from the ADDS design methodology are realized with the first development. The pay per meter billing approach ensures that utilities will continually see significant savings without a large initial expense or ongoing maintenance charges.

For additional information and references, contact Bob Lyhus at Roussey Companies.