Supplemental Project Notice

# DATA-DRIVEN EVALUATION OF ANIMAL INTRUSION ISSUES IN SUBSTATIONS

House Sparrow nest constructed on top of a gang-operated switch

## PROJECT HIGHLIGHTS

- Rank substations based on animal caused outages and their impact
- Identify troublesome species and mechanisms by geographical area
- Document trends in animal caused outages on susceptible substations
- Benchmark substations where animal abatement methods have been applied to assess their effectiveness

## Background, Objectives, and New Learnings

Substations serve as the focal point for the electrical systems they serve. Although substation animal-caused outages occur infrequently, they can impact a substantial number of customers. Significant costs may also be associated with wildlife-related outages, affecting both the utility and its customers. A single substation outage, in fact, can cost millions of dollars if utility equipment is damaged. Bird electrocutions in substations can also lead to fines under the federal Migratory Bird Treaty Act.

The types of animal problems encountered in substations differ by species and include animal contacts, nesting, bird pollution, fires, health issues, and legal violations of the Migratory Bird Treaty Act and other federal and state regulations.

It is important to implement best management practices with respect to siting, design, and maintenance to minimize attraction of small birds and mammals, which in turn reduces the associated appeal (and, therefore, electrocution risk) to larger predators such as owls, raccoons, and snakes.

The objective of this study it to develop a data driven methodology to evaluate animal caused outages in substations. The methodology includes the development of impact metric(s), identification of most damaging species (avian, mammal) and mechanisms (nesting, contact with overhead components, equipment intrusion, etc.), and application of reliability growth models to assess evolution of the problem over time.

In addition, this study will explore benchmarking techniques to evaluate effectiveness of animal abatement methods by comparing substations by geographical area and/or self-benchmarking based on historical data.

## Benefits

The methodology developed as part of this project aims to leverage historical outage data to help utilities to better understand the prevalence and impact of animal caused outages, their nature, and their evolution over time. Analysis of existing datasets, that utilities are actively collecting and have available, seeks to provide perspective on the effectiveness of animal abatement investments and inform future abatement strategies.

## Project Approach and Summary

The impact metric(s) will be used to rank substations and define thresholds for concern. Using these results, EPRI will identify a list of species and mechanisms responsible for outages across substations. For substations mostly affected by animal outages, EPRI will create a list of "most wanted" species based on geographical areas.

Reliability growth models will be used on the most susceptible substations to understand the evolution of animal caused outages over time.

EPRI will request information on the animal abatement methods deployed over time, map the animal abatement measures by substation, and compare performance at substations with and without animal abatement in the same geographical area. If analysis is inconclusive, EPRI will use self-benchmarking techniques (i.e., compare performance in the substation prior and after the implementation of animal abatement method) to evaluate effectiveness of selected animal abatement techniques.

## Deliverables

The deliverables as part of this work include:

- Technology transfer webcast
- PowerPoint deliverable

The non-proprietary results of this work will be incorporated into EPRI R&D Program 51, and made available to the public, for purchase or otherwise.

## Price of Project

The price is based on the total scope of the work which depends on the total number of substations, geographical areas, and animal abatement solutions already deployed in the field.

The project offers insight based on data driven approaches applied to substation outage data. This project does not include field visits.

## Project Status and Schedule

EPRI will start work as soon as research contracts are in place.

## Who Should Join

The project is open to all EPRI members and other utilities.

Utilities currently facing animal related outages or looking for better understanding on the effectiveness of animal abatement options are encouraged to join.

## Contact Information

For more information, contact the EPRI Customer Assistance Center at 800.313.3774 (askepri@epri.com).

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