

Southern California Edison
**WSD-001 – Resolution WSD-001 to Establish Procedures for the Wildfire Safety Division's
Review of 2020 Wildfire Mitigation Plans Pursuant to PUC Sections 8386 and 8386.3**

DATA REQUEST SET WSD - SCE - V e r b a l - 0 0 1

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Response Date: 3/15/2020

Question 004:

It would be helpful to understand how the wildfire risk modeling was developed (e.g., the 122,000 outages, ~30 different factors, etc.). Please provide a write-up to explain this.

Response to Question 004:

SCE's method for calculating the probability of ignition has two components; the probability of a spark and the probability of a spark turns into a fire. These are components of our Wildfire Risk Model characterized as:

$$Risk(fire) = Prob(Spark) * Prob(Fire) * Consequence$$

The same source of fault data shown in Tables 11 and 18 is used to calculate the probability of a spark. Probability of spark has two main components: Probability of a spark caused by an equipment failure (EFF) and probability of a spark caused by a contact with a foreign object (CFO).

These models for EFF and CFO were developed using proven machine learning methods where the model is developed using a training subset of the data, and then tuned against a testing set.

What this means is that each fault is randomly divided into two groups with an 80%/20% split. The 80% of faults group is used to build and train the model and the resulting model is tested against the 20% group for accuracy. This method ensures that the model is tested against data that was not used to build the actual model.

The models are built by looking at characteristics related to the equipment that had the fault. These characteristics are called "features" and include things like the age of the equipment, the manufacture, the average temperature at the location of the asset, how much wind has hit the asset over time, etc.

Independent models have been developed for all the equipment types most likely to cause an ignition; transformers, switches, capacitors, and wire (includes connections and fuses). Generally, each asset type will include about 30 features and others are generated through a process called feature engineering.

As with our EFF models, CFO models were built using historical faults that were caused by

contacts with objects. Independent models have been developed for contact by vegetation, cars, balloons, unknown, and other. The other category includes things not covered in these categories like a tarp that flies into a line.

Because these probabilities are calculated at an asset level, we can calculate the probability at each structure (pole). For calculating the total risk at the structure, the aggregate of all existing probabilities is multiplied by the consequence which is currently the Reax value at the specific location.

The other component of probability of ignition is the probability of fire. The probability of fire represents the chance that a spark turns into an ignition which is related to things like available fuel and weather conditions at the time of the spark and is characterized by the fire potential index (FPI).