PACIFIC GAS AND ELECTRIC COMPANY
Wildfire Mitigation Plans Discovery 2023
Data Response

PG&E Data Request No.:	OEIS_004-Q001		
PG&E File Name:	WMP-Discovery2023_DR_OEIS_004-Q001		
Request Date:	May 4, 2023	Requester DR No.:	P-WMP_2023-PG&E-004
Date Sent:	May 9, 2023	Requesting Party:	Office of Energy Infrastructure Safety
DRU Index #:		Requester:	Colin Russell Lang

SUBJECT: REGARDING IGNITION PROBABILITY WEATHER MODEL

QUESTION 001

In PG&E's WMP, it states its

> "IPW framework analyzes positive and negative changes in grid performance and reliability year-over year and applies a timeweighted approach to weigh more recent years of learned performance more heavily in the final model output." (p. 769).

a. What metrics are used to analyze the year-over-year changes in grid performance and reliability?

b. Provide a description (i.e., changes in event, ignition, and outage numbers) and locations of changes PG&E has observed in grid performance based on implementing system hardening mitigations, including the amount of time it took to observe any statistical changes that would account for changes in PSPS decision-making.

c. How is year-to-year weather variation accounted for in the analysis of year-over-year changes in grid performance and reliability?

ANSWER 001

a. The IPW model learns changes in performance through the hourly relationship between outage occurrence and the weather conditions present. We use evaluation metrics like the AUROC values as published in our WMP to assess model skill for model deployment.

b. To date, system hardening is not an explicit feature, or input, of the IPW model. Any changes in the current model due to system hardening would come from the outage occurrence to weather relation changing rather than from an engineering, subject matter expertise or presumed change. We are currently exploring new features for future IPW models such as the age of the assets. For example, when a line with old poles is replaced with new poles, as occurs under the system hardening program, changes in the outage to weather relation due to age would be reflected in the model for this line.

c. The IPW model is trained with hourly weather data from each POMMS 2x2 km grid cell and whether an outage occurred or not at that time and area. Thus, the IPW model is not learning annual variation in weather, but learning hourly variation in outage occurrence given the hourly weather conditions present. The time-weighted averaging approach of the IPW model balances learning any changes in the outage to weather relation over time with preserving information of historic events. For example, the IPW model will learn positive changes where one area has had significant asset replacement and the observed outage to weather relation has improved. In another example, the IPW model will learn negative changes in an area (e.g., an area that has had significant tree mortality or ageing assets) and if the resulting observed outage to weather relation has worsened.