

Southern California Edison
2022-WMPs – 2022 Wildfire Mitigation Plan Updates

DATA REQUEST SET O E I S - S C E - 2 2 - 0 0 7

To: Energy Safety
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Response Date: 4/15/2022

Question 03:

Drone Inspections – Verification

- a. In SCE's 2022 WMP Update, SCE discusses using machine learning (ML) to process images taken during drone inspections.
- i. How is SCE verifying and validating the accuracy of the algorithms for asset defect detections? Provide any confidences levels calculated.
- ii. TO what scale is SCE planning on implementing these ML algorithms moving forward (i.e. percentage of imagery evaluated using the algorithm vs. manually for defects, percentage of imagery evaluated validated by SMEs)?

Response to Question 03:

- i. SCE is utilizing precision and recall metrics for validating the accuracy of the asset defect detection algorithms. Precision: when the model predicts a defect, this is the percent of time it is correct. Recall: the model correctly identifies this percentage of all defects for the given object. The corresponding precision and recall metrics for the current asset defect detection models are:

| Defect Detection Object Model | Precision | Recall | Threshold |
|-------------------------------|-----------|--------|-----------|
| Distribution Pole | 71% | 37% | 80% |
| Distribution Crossarm | 88% | 47% | 80% |
| Distribution Transformer | 77% | 31% | 95% |
| Distribution Insulator | 89% | 46% | 95% |

In addition, a threshold was applied to the model predictions to limit the number of false positives. These thresholds were chosen using the Precision-Recall curves of the test data for each asset type. Only predictions with a probability of defect greater than or equal to the threshold are flagged as a potential defect. Our goal is to maintain a high precision while increasing the recall as we gather more data to continue to improve the performance of the models over time.

- ii. For inspections that are conducted in the office, using aerial photos captured by drone or helicopter and sent back to the office for inspection, SCE is running the above algorithms on all these images in an advisory mode, before the inspector begins their inspection. This process highlights asset condition issues identified by the algorithm to

the inspector to be validated during their inspection.

For inspections that are conducted in the field, our inspectors capture a series of photos as part of documenting the inspection and asset condition. After the completed inspection, SCE plans to run the above algorithms on all the images captured during the inspection as part of a quality review process to identify any conditions identified by the algorithms that may have been missed by the inspector. This is targeted to be in place by the end of 2022.