

**COMMENTS OF PACIFIC GAS AND ELECTRIC COMPANY ON  
ENVISTA FORENSIC'S FINAL ROOT CAUSE ANALYSES REPORT**

Dated: August 4, 2022

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## I. INTRODUCTION

As a result of the 2017 and 2018 wildfires, the California Public Utilities Commission (Commission or CPUC) selected Envista Forensics, Inc. (Envista) to undertake a root cause analysis of 17 of the 2017 wildfires to identify gaps in PG&E's processes that contributed to these ignitions and to reduce the risk of future fires. On July 6, 2022, Envista issued the final Root Cause Analyses report. The report contains 19 enumerated findings and recommendations. We provide responses to 13 of these recommendations where we thought a response was appropriate.

We agree with the majority of the recommendations provided in the report and, in the years since the fires, proactively implemented much of this work even before these recommendations were made. Additionally, we have created a comprehensive wildfire safety strategy through the implementation of dozens of wildfire mitigation programs that have been effective in reducing wildfire risk in our territory. Below we provide detail on some of the highlights of our recent wildfire mitigation work, before turning to the recommendations in the report.

## II. FIRE MITIGATION EFFORTS SINCE THE 2017 AND 2018 FIRE SEASONS

Since the 2017 and 2018 fires, we have substantially overhauled and augmented our wildfire mitigation efforts. Our goal is to end catastrophic wildfires, and we have made significant progress in reducing our wildfire risk. However, given the continuing climate-driven changes throughout California, we are continually adapting and improving our programs by working with regulatory and local agencies and stakeholders.

Our wildfire mitigation efforts are focused into several different categories of work, including, but not limited to:

- Risk assessment and mapping;
  - This work includes the use of risk maps and sophisticated modeling techniques to target wildfire risk.
- Situational awareness and forecasting;
  - This work includes advanced weather and fire potential forecasting, continuous monitoring sensors, fault indicators, and the creation of a Hazard Awareness and Warning Center.
- Grid design and system hardening;
  - This work includes the undergrounding of electric lines, the installation of covered conductor, pole replacement and reinforcement, and the installation of automation equipment.
- Asset management and inspections;
  - This work includes multiple types of detailed inspections including ground, climbing, aerial, infrared, and LiDAR, as well as quality assurance (QA) and quality control (QC) programs related to those inspection.

- Vegetation management (VM) and inspections;
  - This work includes all our VM inspections, including our Enhanced Vegetation Management (EVM) work, and the QA/QC of those inspections.
- Grid operations and protocols
  - This work includes our protective equipment and device settings, automatic recloser options, aviation support, and personnel procedures and training related to fire risk.
- Data governance;
  - This work includes all our internal data management improvements, as well as our collaborative wildfire research.
- Emergency Planning and preparedness;
  - This work includes our workforce training related to service restoration, our community outreach and communications, and our disaster and emergency preparedness plan.
- Public Safety Power Shutoffs (PSPS).
  - This includes all the work related to our PSPS program, including our annual improvements and future plans.

Most recently, we implemented two important programs to further reduce wildfire risk. First, we have committed to undergrounding 10,000 circuit miles of distribution lines in and near areas of high wildfire risk. Locating overhead power lines underground reduces the risk of ignition by approximately 99%.<sup>1</sup> By prioritizing this undergrounding work in the areas of highest risk, we will substantially reduce the wildfire risk in our system. Second, in 2021 we implemented our Enhanced Powerline Safety Settings on approximately 11,500 miles of distribution circuits in High Fire Threat District (HFTD) areas. This program resulted in an 80% decrease in ignitions on these circuits, compared to the previous three-year average on the same circuits.<sup>2</sup> Given the effectiveness of this program, for 2022 we have expanded the program to include approximately 44,300 miles of distribution circuits in HFTD and High Fire Risk Areas (HFRAs), as well as certain non-HFTD areas in our territory.

A detailed description of our comprehensive wildfire mitigation programs can be found in our 2022 Revised Wildfire Mitigation Plan (WMP).<sup>3</sup>

### **III. RESPONSES TO THE RECOMMENDATIONS OF THE ROOT CAUSE ANALYSES REPORT**

Below we provide responses to 13 of the recommendations provided in the report. Please note that we did not provide responses to Recommendations 3, 5, 16, 17, 18 and 19 because the recommendation either required no follow up or was not directed at PG&E.

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<sup>1</sup> PG&E 2022 Revised WMP, p. 553.

<sup>2</sup> *Id.*, pp. 699, 839.

<sup>3</sup> Available at: [https://www.pge.com/en\\_US/safety/emergency-preparedness/natural-disaster/wildfires/wildfire-mitigation-plan.page?WT.mc\\_id=Vanity\\_wildfiremitigationplan](https://www.pge.com/en_US/safety/emergency-preparedness/natural-disaster/wildfires/wildfire-mitigation-plan.page?WT.mc_id=Vanity_wildfiremitigationplan).

## **A. Theme 1: Institutionalized Learning**

### **a. Recommendation # 1: Corrective Action – Compliance Management**

Implement an enterprise-wide corrective action program (CAP) that requires its use for all incidents and events, as well as trends issues across all LOBs.

### **b. Response to Recommendation # 1**

We agree with this recommendation and have implemented an enterprise-wide CAP. We are in the process of trending CAP issues by LOB, where appropriate. We deployed the CAP across all lines of businesses in 2017. In the years after the 2017 deployment, the Enterprise CAP organization has increased program requirements to ensure all line of business CAP teams are operating under the Enterprise governance processes. Each CAP team must meet the enterprise governance, which is designed to:

- Identify and track actual and potential issues, problems, concerns or ideas;
- Determine risks, causes and implement corrective or preventative actions;
- Assess the effectiveness of corrective or preventative actions; and
- Leverage opportunities for improvement.

The CAP also allows for the ability to trend issues across all lines of business (LOBs) at both the macro and micro level. The CAP tool, which is SAP based, categorizes issues in multiple fields including, but not limited to: LOB; functional leader and organization; region; district; issue type; issue sub-type; evaluation type; and injury vs non-injury. Each functional team has the ability to trend issues both within their asset base, or across the enterprise.

Each LOB has the discretion to implement a trend process that fits within their operations. In 2021, a trend process was piloted in Electric Operations CAP to look for larger potential trends. This allows the CAP issue owner to identify common issues or trends that may be potentially adverse to safety, quality or compliance. If a potential trend is found, an additional CAP notification is created to allow for further analysis and issue resolution. We will continue to evaluate the results from the Electric Operations CAP trending pilot, as we look to expand to other LOBs.

We also offer the following separate programs for coworkers to utilize as a complement to the CAP:

- Compliance and Ethics Helpline;
- Electric Map Correction Tool;
- Facilities Management requests;
- Human Resource (HR);
- Here to Help Hotline (Customer inquiries);
- IT Service / Hardware Requests (SMC);
- Material Problem Reports (MPR);
- Motor Vehicle Incident (MVI);
- Corporate Security.

**c. Recommendation # 2: After-Action Review**

Incorporate the After-Action Reports (AARs) into the enterprise-wide CAP that requires timely AARs for emergency and wildfire exercises and events across all LOBs.

**d. Response to Recommendation # 2**

We agree with this recommendation and previously implemented a new CAP process that integrated the AARs. Our AAR Process Standard specifically addresses how findings from AARs are incorporated in the CAP process, which is enterprise-wide.

**e. Recommendation # 4: Risks Identified but not Acted Upon**

Given the proven costs of not taking quick action when new major risks are identified, PG&E could institute a process to ensure that relevant plans, operational programs, and procedures are aligned with actions to address such threats.<sup>4</sup>

**f. Response to Recommendation # 4**

We agree with this recommendation and have instituted comprehensive processes to address a wide variety of threats, including wildfires.

We have made substantial progress since the 2017 and 2018 fires in updating and developing a robust Risk and Data Governance Guidance, Standard, and Procedure document framework. This includes the development of at least 15 new Risk and Data Governance Guidance, Standard, and Procedure documents, as well as the revision of many other existing associated documents. This ensures that relevant plans, operational programs, policies, standards, and procedures are aligned with actions to implement an All-Hazard approach to previously identified and newly identified threats and hazards. This effort included the development of at least 15 new Risk and Data Governance Guidance, Standard, and Procedure documents and the revisions of many other existing associated documents. In recognition of these efforts, in 2021 we received PAS 55 and ISO 55001 certifications for Electric Operations Asset Management System.

Operationally, our Emergency Preparedness & Response (EP&R) practices have also significantly improved. We have expanded our EP&R practices to an All-Hazards approach to be able to respond to any adverse risk event. To achieve this, we developed an Incident Command System and established roles and responsibilities through staffing and training. Additionally, external communication protocols were developed to respond to any potential event. Besides a general All-Hazards approach, for potentially substantial risk outcomes as identified through the risk assessment process, we developed specific Annexes for tailored response plans for significant risk events. We completed the first phase of an enterprise Threat and Hazard Identification and Risk Assessment (THIRA) that resulted in development of new Annexes and updated existing Annexes to the Corporate Emergency Response Plan. We maintain a Corporate Risk Registry that identifies threats and hazards that are listed and

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<sup>4</sup> Envista Root Cause Analyses Report, p. 99.

prioritized by likelihood of occurrence and severity. The Risk Registry is one point of information in prioritization of the development of new annexes.

Improvements in our standardizing of risk quantification and emergency preparedness and response also allow us to proactively identify, monitor, report, and respond to potential risk events. These improvements ensure visibility into how investments are focused on the areas of highest risk, while being able to respond to risk events operationally if they do occur.

We have also updated our Risk Models to improve our quantification and prioritization tools. We previously relied on the initial wildfire risk model developed in 2018 to prioritize the circuit level where the highest wildfire risk existed, leveraging a relative risk ranking. In 2020, we substantially upgraded this risk quantification toolset. All risk quantification is based on two components: risk event likelihood (i.e., probability) and risk event consequence. For the 2021 Wildfire Distribution Risk Model, which was developed in 2020, we upgraded both parts of that calculation. The risk event likelihood analysis was advanced into a more comprehensive assessment for two of the most significant utility-caused ignition drivers: vegetation contact and conductor failure. For the risk event consequence component of the model, we now use outputs from a Technosylva fire simulation model, which derives fire propagation and consequence outcomes based on available fuels, topography, and weather; as well as buildings and population locational data. We made further enhancements to the risk model and, for 2023, we will use the Wildfire Distribution Risk Model v3 to target and prioritize work in several of our largest wildfire risk mitigation programs including EVM, System Hardening, and Asset Inspections. This newest version of the Wildfire Distribution Risk Model also provides a more granular “bottom up” approach that informs decision-making at the circuit segment level.

As agreed to by the Plan of Reorganization, PG&E established an executive-level Chief Risk Officer (CRO) and Chief Safety Officer (CSO). The CRO receives direct reports from safety officers in the field, including LOB issues. The CRO has regular contact with employees and contractors working in the field and is empowered to report directly to the Safety and Nuclear Oversight (SNO) Committee and the Chief Executive Officer (CEO). Sumeet Singh is the Executive Vice President and CRO and reports directly to the CEO of PG&E Corporation. Mr. Singh is also presently serving as the Interim CSO and, as CRO and Interim CSO, oversees all risk management associated with operations and public safety. A proposed decision was recently issued by the Commission that would permit PG&E to consolidate the CSO and CRO positions and remove the interim label.<sup>5</sup>

Additionally, to ensure our alignment, governance, accountability, and support of the implementation of our updated wildfire risk model, we established in late 2020 a new governance committee, the Wildfire Risk Governance Steering Committee or (WRGSC). This committee is chaired by PG&E’s CRO and incorporates leaders from Electric Operations, Risk and Internal Audit, and other teams. The WRGSC reviews and approves the workplans for the most critical wildfire risk mitigation programs to ensure they are in alignment with the current approved risk model. Additionally, as part of implementing our Lean Operating System, regular

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<sup>5</sup> See Proposed Decision Granting the Relief Requested in Pacific Gas & Electric Company’s December 15, 2021 Petition for Modification, I.19-09-015 (July 15, 2022).

reporting of work completion, quality results, and trends are being conducted in the Daily, Weekly and/or Monthly Operating Reviews held by the CRO.

Furthermore, our updated Wildfire Distribution Risk Model v2 has produced more comprehensive, updated results in terms of which assets and locations in our system are most appropriate to target for programs like System Hardening. As a result, we have shifted our project execution, in alignment with the risk model outcomes, so that some previously identified projects may no longer be executed and newly identified projects are being aggressively pursued to reduce risk as quickly as feasible.

We have also expanded our programmatic and portfolio-level risk assessments through the calculation of a Risk Spend Efficiency (RSE) for an increased number of programs and wildfire risk mitigation activities.<sup>6</sup> In our WMP, each year we provide RSEs for more initiatives and continue to refine these portfolio-level and programmatic risk assessments through our 2020 Risk Assessment Mitigation Phase (RAMP) Report and other risk-focused regulatory proceedings. In 2022, we will establish an RSE Governance Team and enhance our use of RSEs as an important tool to evaluate risk initiatives and key inputs into the overall decision-making process.

## **B. Theme 2: Vegetation Management**

### **a. Recommendation # 6: Leadership Qualifications**

PG&E should immediately take steps to ensure that a Vice President and other senior program leaders have the necessary professional VM education, experience, training, certifications, and competence to adequately administer and manage VM functions.

### **b. Response to Recommendation # 6**

We respectfully disagree with the report's assertion that our Vice President and other senior VM program leaders lack the necessary professional qualifications and competence to successfully administer and manage our VM functions. We do not dispute that managing a VM program requires a threshold level of familiarity and understanding of the subject matter, but the skillset necessary to administer a program of the size and scope of ours requires a much broader skillset than just knowledge of VM practices. In that same vein, it makes the most organizational sense for the leadership levels that are closest to the performance of the VM work to have the most functional VM experience. Thus, it is important that each role is filled by individuals with the correct skillset and background for that role.

We believe that our Vice President and other senior VM program leaders possess the appropriate education, experience, training, certifications, and competence to fulfill the roles to which they have been assigned. Similarly, we believe our VM Execution team leaders possess the appropriate education, experience, training, certifications, and competence to fulfill the roles to which they have been assigned.

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<sup>6</sup> See PG&E 2022 Revised WMP, p. 13.

**i. PG&E’s Vice President and Senior VM Leadership Have the Expansive Qualifications Needed to Manage a Program as Complex PG&E’s VM Program**

The Vice President for Enterprise VM leads the VM Department and is supported by six senior program leaders. These individuals together manage all VM programs and provide oversight of finance, reporting, training, internal and external communications, commitments management, governance, and the maintenance of standards and procedures. They are supported by the VM Execution team, who are responsible for performing VM field activities.

In order to succeed in the role, our VP and VM senior leadership must possess a broad-based skillset that extends beyond knowledge of VM practices. Indeed, the key responsibilities of our VM senior leadership include, but are not limited to, all of the following items:

- Being responsible for the safe and reliable operation of our Vegetation Management programs and ensuring the operation is in accordance with rules established by the Commission, Federal Energy Regulatory Commission (FERC), the Company and other external stakeholders; in accordance with other applicable standards, codes and rules.
- Providing strategic vision and direction for critical operations and systems activities and events while ensuring safety, reliability, and cost effectiveness.
- Maintaining public, coworker, and contractor safety at all times by promoting a positive safety culture, exhibiting an absolute commitment to safety for self and others, and by ensuring all applicable safety rules, regulations and standards are followed.
- Continuously improving safety and operational results by building and maintaining strong relationships with labor partners, assessing and deploying new technologies, developing efficient resource strategies, driving lean operations and setting effective performance targets.
- Communicating to external agencies and other stakeholders on matters relating to systems inspections, vegetation management and applicable portions of the WMP.
- Engaging on and resolving difficult and sensitive customer issues.
- Using contracting strategies and best practices to manage complex commercial relationships for safe and efficient operations.
- Managing staff to accomplish results by recognizing and valuing diverse perspective, managing effective training programs, developing strong succession plans, and actively managing performance through rewards and recognition programs.

As can be seen from the table below, our VP and senior VM program leaders each possess the appropriate experience and qualifications for their respective positions, given the responsibilities required of senior leadership. Given the heavy administrative responsibilities of these roles, particular emphasis is given to management experience when filling these positions.

<b>POSITION</b>	<b>UTILITY EXPERIENCE</b>	<b>MANAGEMENT EXPERIENCE</b>
Senior Vice President of Vegetation Management & System Inspections	Over 30 years	Over 20 years



Vice President, Vegetation Management	20 years	15 years
Director of Portfolio Management	14 years	10 years
Director of Execution for the Central Coast and Central Valley	15 years	9 years
Director of VM Execution for the Bay Area and North Coast	25 years	Over 20 years
Director of Execution Sierra and North Valley	37 years	25 years
Director of System Programs	15 years	30 years

**ii. The Leadership Levels Closest to the Work Are Experienced and Qualified in VM Work and Provide the Necessary Functional Expertise**

As a corollary to the skills necessary for a position in VM senior leadership, we believe that it is important that the leaders closest to the work being performed have functional expertise in VM. Thus, we prioritize VM experience and professional qualifications when filling these roles. As can be seen below, each member of our Execution leadership team has a minimum of 15 years of VM experience as well as the relevant professional certifications of being either an ISA Certified Arborist or a Registered Professional Forester. The table below sets out the relevant educational credentials, certifications, and VM work experience for the Senior Managers of each of PG&E’s seven VM Execution team leaders.

<b>POSITION</b>	<b>DEGREE(S)</b>	<b>CERTIFICATION(S)</b>	<b>EXPERIENCE</b>
Senior Manager North Valley Region	BS Ornamental Horticulture	ISA Certified Arborist; ISA Utility Specialist Certification	26 years
Senior Manager Bay Region	BS Public Administration; MBA	ISA Certified Arborist; ISA Utility Specialist Certification	15 years
Senior Manager Vegetation Management Operations	BS Urban Forestry; MBA	ISA Certified Arborist; Certified Municipal Arborist	16 years
Senior Manager Central Valley Region	BS Biology; MBA	ISA Certified Arborist; ISA Utility Specialist Certification	23 years
Senior Manager Sierra Region	BS Forestry	Registered Professional Forester	19 years
Senior Manager North Coast Region	AA Forestry	ISA Certified Arborist; ISA Utility Specialist Certification	17 years
Senior Manager Central Coast Region	BS Forestry	ISA Certified Master Arborist; Registered Professional Forester; Certified Arbor Utility Specialist	21 years

Therefore, as with the VP and senior VM leadership, the VM execution leadership possesses the necessary education, experience, training, certifications, and competence to fulfill their role in our VM program.

**c. Recommendation # 7: Contractor Qualifications**

Personnel performing tree risk assessments shall have the demonstrated competence to effectively conduct required tasks including a minimum defined level of education, training, skills, and experience to identify and mitigate at-risk trees. This includes, but should not be limited to, education, training, and demonstrated competence in basic tree biology and major species identification. A basic understanding of electricity and the utility structure and operations is necessary. The Certified Utility Foresters (CUFs) should understand all applicable CPUC and Public Resources Code (PRC) regulatory requirements. In addition, personnel should recognize key electrical hardware, including identification of maximum potential operating voltage.

Understanding utility tree risk assessment processes and systems as described within the Utility Tree Risk Assessment Best Management Practices is required. A CUF shall demonstrate competency in recognition of common tree and site defects and conditions. Effective communication techniques for tree owners/managers to ensure effective mitigation, permissions, and notifications is essential. An understanding of crew types for effective and efficient mitigation, field recordkeeping, field marking of trees for satisfactory identification, and reporting practices and procedures to ensure accurate database management is paramount.

As these utility arborists gain experience, within one year they should be able to conduct a Level 2 Basic Assessment through additional training and education based on Level 1 experience. After gaining three years of experience in utility arboriculture, these arborists should be required to hold a current ISA-certified arborist, Tree Risk Assessment Qualification, and the ISA Utility Specialist credential.

All vegetation management staff and contractors should have annual training to identify, analyze, and evaluate tree risks.

CUFs need annual training on identifying and evaluating high-risk trees. Training should include information from the following sources:

- GO 95 Rule 35
- Power Line Fire Prevention Field Guide, Edition 2020
- PRC-4293
- ANSI A-300 (Part 7) Integrated Vegetation Management, Latest Version
- ISA Best Management Practices Integrated Vegetation Management
- ANSI A-300 (Part 9) Tree Risk Assessment, Latest Version
- Best Management Practices – Utility Tree Risk Assessment, By John W. Goodfellow
- FERC-003.4

It is important to develop lead trainers within PG&E's VM Staff. These lead trainers can train new CUFs and do additional training because of QC audits. Field verification shall be done annually to ensure the CUFs are identifying and listing hazard trees for pruning and removal. CUF training should be documented with signatures of the CUF and trainer.

**d. Response to Recommendation # 7**

We agree with this recommendation and, given the substantial improvements we have made in the last four years, believe our VM program now meets or exceeds the proposed training requirements.

We presently offer three separate levels of training for all VM Pre-Inspectors: (1) web-based training; (2) testing; and (3) field skill observation. All our Pre-Inspectors are enrolled in the Pre-Inspector Structured Learning Path to track their initial VM training. The initial training consists of nine separate courses (VEGM 0101 through VEGM 0109) with a final test assessment which must be passed in the final segment (VEGM 0110). Pre-Inspector training includes each of the items identified in this recommendation:

- GO 95, Rule 35;
- Power Line Fire Prevention Field Guide, Edition 2020;
- PRC-4293;
- ANSI A-300 (Part 7) Integrated Vegetation Management, Latest Version;<sup>7</sup>
- ISA Best Management Practices Integrated Vegetation Management;
- ANSI A-300 (Part 9) Tree Risk Assessment, Latest Version;
- Best Management Practices – Utility Tree Risk Assessment, By John W. Goodfellow; and
- FERC-003.4.<sup>8</sup>

We have also put in place safeguards to protect the integrity of our training process and, unless Pre-Inspectors fully complete their training, they are not allowed to have read or write access to our VM databases for that particular role. We have also adopted improved methods to track the training of our Pre-Inspectors by creating and utilizing standardized checklists for each Pre-Inspector and maintaining formalized records in our PG&E Academy. While we do not believe annual re-certification is necessary given that Pre-Inspectors work year-round, we adopted an annual refresher training in 2021 and are beginning this training this year.<sup>9</sup>

**e. Recommendation # 8: Vegetation Management Programs**

[PG&E has too many unnecessarily disjointed programs that should be combined to improve efficiencies in vegetation management.]<sup>10</sup> Combine these programs, resulting in a more efficient, streamlined program. The inspectors and tree crews can identify and clear the ROW

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<sup>7</sup> For inspection of transmission assets only at this time.

<sup>8</sup> For inspection of transmission assets only at this time.

<sup>9</sup> See PG&E 2022 Revised WMP, p. 782-783.

<sup>10</sup> Envista Root Cause Analyses Report, p. 107.

and off-ROW hazard trees, maintaining regulatory clearance requirements at lower costs without any reduction in safety or reliability, as has been demonstrated by utilities across the country.

**f. Response to Recommendation # 8**

We agree that consolidation of our VM programs would be beneficial. Consequently, in 2022, we will begin transitioning from three separate VM Program elements (Routine, Enhanced, and Tree Mortality) to our “One Veg” program where processes, tools, procedures, and personnel are shared across all the VM activities. We plan for this transition to be completed in 2023.

**g. Recommendation # 9: QA/QC Programs**

The QA/QC programs [for VM] should be performed at the same time with the priority of identifying hazard trees. The QA/QC programs should audit 100% of all circuits in high fire-risk areas. In other areas, the sample formula should be based on tree populations. Since PG&E has QA/QC programs, these departments should be responsible for identifying all hazard trees.

**h. Response to Recommendation # 9**

We agree with some items in this recommendation and respectfully disagree with others. We do not believe QA/QC must be performed at the exact same time as the pre-inspection work. However, we do believe it is helpful to have the QA/QC work performed relatively close in time to the pre-inspection work, as trees and vegetation continue to grow in the intervening time period and the QA/QC team is able to have a better understanding of how the location appeared to the pre-inspector if a relatively short amount of time has elapsed between the inspection and the QA/QC work. That being said, we also believe it is beneficial to have as many inspections as possible each year and providing time between the pre-inspection work and the QA/QC work allows us to have a second set of eyes in the field throughout the year while still maintaining an understanding of how the location appeared to the pre-inspector. Therefore, we arrange our pre-inspections and QA/QC work to be close in time but not at the exact same time.

We also respectfully disagree that our QA/QC programs must audit 100% of all circuits in high fire-risk areas for all types of VM work. We currently perform Work Verification on 100% of our EVM work as we deem this work the highest priority. Work Verification is an independent review of all EVM work to verify that: (1) the pre-inspector prescribed tree work that is needed, per compliance requirements, (2) tree work is completed as prescribed; (3) the pre-inspector has listed out all strike trees; and (4) all hazard trees are mitigated or removed. However, for our non-EVM work, we do not believe it is necessary or beneficial to audit 100% of all circuits. First, all HFTD distribution overhead conductors are visited a minimum of twice a year by pre-inspectors and a visit from QA/QC would constitute, at minimum, a third visit within a year. Second, for our non-EVM work, our QA Program reported compliance with regulatory minimum clearance requirements of more than 99.4% for the years 2018 to 2020, which includes work both inside and outside the HFTD areas. Given this high QA compliance score, and the multiple inspections already taking place in HFTD areas, we do not plan to audit 100% of all circuits in high fire-risk areas.

We agree that simply sampling line miles is not the most effective way to sample tree populations. However, we also believe that basing our sampling technique on tree populations alone is not the best way to sample our VM work given the significant rate of tree mortality in California and the constantly changing vegetation landscape. That is why we use a cluster sampling technique where adjacent source side device (SSD) pairs are randomly sampled, and then the cluster of trees within the sampled SSD segments are included in the sample. Thus, at a high-level, we are employing a single-stage cluster sampling design with SSDs as the primary sampling unit. We have validated our sampling technique with outside statistical experts who have confirmed that the use of a cluster sampling design is entirely appropriate for our objectives, especially in light of the uncertainty associated with the number of trees within adjacent SSD tracts. Samples are derived from completed vegetation work targeting an average population of approximately 90,000 trees each year. In cluster sampling, the primary sampling unit (PSU) is usually a natural unit that is easy to enumerate (such as a mile or an SSD). As a result we respectfully disagree to the extent that the recommendation suggests our sampling formula be entirely based on tree populations.

**i. Recommendation # 10: Pre-Inspection Contract Strategy**

PG&E should consider converting from lump sum contracts to time and materials contracts [for VM pre-inspection contracts].<sup>11</sup>

**j. Response to Recommendation # 10**

We respectfully disagree with the recommendation that all VM pre-inspection contracts should be converted to time and materials (T&M) contracts as we do not think T&M contracts are the superior choice for all types of pre-inspection work. We believe that different contracts provide the proper incentives and cost savings for different jobs. To this end, we use a mix of contracting methods that are appropriate for the specific program and scope of work at issue in that contract. This includes both T&M contracts and fixed price (lump sum) contracts, and we are also considering the use of unit price contracts for certain types of work. Thus, for our routine VM pre-inspection work, we believe fixed price contracts are the superior choice.

We do not agree with the argument that underlies this recommendation, which is that routine VM pre-inspection contractors were doing low quality work because the fixed price contract incentivized the contractors to spend as little time as possible to complete their work and that, under a T&M contract, they would be incentivized to spend more time performing the work and, thus, provide a higher quality work product.<sup>12</sup> We dispute the premise that a T&M contract would necessarily cause contractors who are performing low quality work under a fixed price contract to suddenly perform higher quality work. It is very likely that contractors who perform low quality work under a fixed price contract would still perform low quality work under a T&M contract while simultaneously charging a higher price for that work. Thus, the way to improve the quality of work is: (1) to hire contractors with the proper experience and qualifications; and (2) to conduct QA/QC on the contractors' work so that contractors are incentivized to perform

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<sup>11</sup> Envista Root Cause Analyses Report, p. 111.

<sup>12</sup> *Id.*, pp. 111-112.

high quality work and low-performing contractors can be identified. Given that we have already implemented these processes, we do not believe changing the contractual structure of our routine VM pre-inspection will lead to higher work quality.

**C. Theme 3: Circuitry**

**a. Recommendation # 11: 3-Wire System**

PG&E should expeditiously proceed with System Enhancement Initiative No. 20, which requires PG&E and the CPUC to engage an independent engineering firm to study the grounding methods and circuit and transformer configuration in PG&E's distribution system and transmission system.

**b. Response to Recommendation # 11**

We agree with this recommendation. This study is expected to be completed by the end of 2023.

**c. Recommendation # 12: Asset Management**

PG&E should implement a comprehensive program that includes the proper balance of the various approaches to maintenance, including preventive, predictive, and corrective, and not replace on failure.

**d. Response to Recommendation # 12**

We agree with this recommendation and believe that we have already addressed the issues it raises. We provide a comprehensive description of our current asset management program in our 2022 Revised WMP.<sup>13</sup> Similarly, we recently provided significant details about our strategy for reducing our tag backlog at the request of Energy Safety in our Revised WMP.<sup>14</sup> However, a summary of both of these programs is provided below.

**i. Background on PG&E's Asset Tag Backlog**

Our asset tag backlog is the result of a concerted effort made by the company to accelerate its inspections of all assets in HFTD areas after the fires of 2017 and 2018. This work was created as a result of these fires called the Wildfire Safety Inspection Program (WSIP). Prior to the WSIP, we generally inspected our assets on a five-year schedule in accordance with the Commission's GO requirements. However, given the significant changes in wildfire risk in our service territory evident in 2017 and 2018, the WSIP program accelerated that inspection cadence to inspect all assets in the HFTD areas in the 2018 to 2019 timeframe. Through the WSIP program, we performed enhanced inspections on approximately 695,000 distribution structures, 50,000 transmission structures, and 200 substations in HFTD areas.

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<sup>13</sup> See PG&E 2022 Revised WMP, pp. 613-719.

<sup>14</sup> *Id.*, pp. 675-696.

For the WSIP inspections, PG&E leveraged Failure Mode and Effects Analyses (FMEAs) to identify single points of failure on electric asset components that could lead to fire ignition. As a result of the WSIP inspections, PG&E identified approximately 277,000 non-conformances, resulting in the creation of Electric Corrective (EC) or Line Corrective (LC) tags. This volume amounted to approximately four times the average annual inspection find rate compared to the years preceding the WSIP. This sudden and rapid increase in the volume of EC and LC tags created a sizeable backlog of repair and replacement maintenance.

**ii. PG&E Has Developed a Comprehensive Asset Management Program**

As a result of the 2017 and 2018 fires, we also significantly revised our asset management program. Importantly, we substantially improved our predictive and preventive maintenance programs to reduce the chance of safety or wildfire issues with our electric system facilities. We currently have a multitude of predictive and preventive maintenance programs, as well as proactive replacement programs.

For further detail, section 7.3.4 of our 2022 Revised WMP provides an in-depth description of our asset management and inspection program.<sup>15</sup>

**iii. PG&E Is Implementing a Detailed Plan for Reducing its Asset Tag Backlog**

In creating a plan to reduce our asset tag backlog, we have prioritized reducing the greatest amount of risk first and are prioritizing risk reduction over volume. This is because 99% of the wildfire risk in our territory occurs in HFTD and HFRA locations, so our plan focuses on the work in those areas.<sup>16</sup>

Thus, our plan for our transmission asset tags in HFRA and HFTD areas is that our current backlog of Ignition Risk tags (found prior to 2022) will be resolved by the end of 2022. Going forward, all tags for these facilities will be addressed in the time required by the Commission's General Orders (GO), barring external factors. For substation facilities, we do not currently have a tag backlog and we will continue to address these tags within the required timeframes. For our distribution asset tags in HFRA and HFTD areas, we have analyzed the risk from our outstanding tags and separated them into Ignition-Risk and Non-Ignition Risk categories. For our Ignition Risk backlog, we are further prioritizing these tags based on age and risk. We will reduce our Ignition Risk backlog by 48% by the end of 2023 and reduce all risk associated with this backlog by 2029. This work will further be separated by non-pole work and pole replacements because non-pole tags create a greater ignition risk than pole tags. The non-pole tag backlog will be reduced by 63% by the end of 2023 and eliminated entirely by the end of 2025. Lastly, after January 1, 2023, all new HFTD and HFRA Ignition Risk distribution tags will be completed within the required timelines.

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<sup>15</sup> *Id.*, pp. 613-719.

<sup>16</sup> *Id.*, pp. 102, 338, 676.

Further detail on our plan to reduce the asset tag backlog can be found in our recent Revision Notice filing with Energy Safety, which is included in our Revised WMP.<sup>17</sup>

**D. Theme 4: Emergency and Crisis Management**

**a. Recommendation # 13: Incident Command System Not Fully Implemented**

PG&E should consider full implementation of the Incident Command System (ICS), including for daily operations, as has been done at other major utilities, including ConEd in New York and Consumers Energy in Michigan.

**b. Response to Recommendation # 13**

We respectfully disagree with the recommendation to the extent that it lacks on clarity on the scope of what it is recommending. We have implemented ICS for our all-hazards approach. Since the 2017 and 2018 wildfires, we have developed, updated, or rewritten many new policies, standards, and plans/annexes to provide additional clarity and a framework for an all-hazards approach that has become part of the company's daily operating procedure.

We also continually evaluate threats, hazards, risks, after action reports, and related post-incident or exercise corrected actions as part of our multi-year training strategy. All company emergency responders complete California Specialized Training Institute (CSTI) Type III credentialing for their assigned Emergency Operations Center (EOC) positions. In addition to CSTI training and Independent FEMA training, EOC emergency responders must also annually complete: EPRS-9010 – Company Emergency Response Plan (CERP), an introduction to the CERP and an overview of current-year changes.

We also regularly conduct various types of emergency preparedness exercises: seminars; workshops; tabletop exercises; games; drills; functional exercises; full scale exercises. Depending on the scenario, exercises may include participation from other departments or from external public agencies. Generally, we invite representatives from federal, state, and local agencies to participate in or observe the annual CERP exercise.

**c. Recommendation # 14: Crisis Management Plan**

Redefine the role of the executive management team during an event to that of a Crisis Management Team (CMT). The CMT can deal with a major event that threatens to harm the organization, its stakeholders, or the general public by assessing long-term and company-wide impacts of the incident and providing overarching incident objectives aimed at essential business operations.

**d. Response to Recommendation # 14**

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<sup>17</sup> *Id.*, pp. 675-696.



We agree with the substance of this recommendation and have already implemented a CMT in the time period since the 2017 and 2018 fires, which we have named the Corporate Incident Management Council (CIMC). Our CERP now clearly discusses the redefined roles and responsibilities of the CIMC, which performs the emergency functions described.

The CIMC is responsible for providing executive oversight during significant incidents. Possible examples of significant incidents may include: an operational incident involving broad public safety issues and media attention; a controversy involving a member of senior leadership; criminal activity against the company (e.g., kidnapping, extortion, or a terrorist threat); or other major emergency incidents such as a major fire, catastrophic earthquake, cyber security incident, or Public Safety Power Shutoff (PSPS) event that may affect a large customer base. The CIMC may be activated at the discretion of the CIMC chairperson.

The roles of the CIMC during an emergency incident/Emergency Operations Center (EOC) activation are: to make strategic policy decisions; to make strategic financial decisions; to serve as a media spokesperson, if appropriate; and to serve as senior relationship manager for key company relationships such as those with government officials, regulatory bodies, major customers, and the investor community.

The current CERP also states that the EOC Commander is responsible for coordinating with, and providing regular communication to, PG&E Company Leadership when activated. Members of CIMC receive annual training and attend scheduled exercises as set out in the CERP.

**e. Recommendation # 15: Emergency Preparedness – Officer-in-Charge (OIC)**

PG&E should realign the Officer-In-Charge (OIC) responsibilities to be centralized under the Incident Commander (IC).

**f. Response to Recommendation # 15**

We agree with this recommendation and have centralized the OIC responsibilities under the IC. The roles and responsibilities for these positions have been clarified in our CERP.

#### **IV. FUTURE EVALUATION OF PG&E’S EFFORTS TO REDUCE WILDFIRE RISK**

We appreciate the Report’s analysis of our efforts to reduce wildfire risk since 2017. In particular, we were pleased with the report’s determination that “PG&E continues to aggressively evaluate and assess wildfire risk.”<sup>18</sup> However, we believe that the scope of the report’s analysis captures only a small portion of our wildfire mitigation efforts in the last five years given the instructions provided to Envista. As described above, we have made a significant commitment to reduce wildfire risk in our territory and have implemented myriad programs to that effect. Indeed, our 2022 Revised WMP provides over 1,000 pages of detail on our efforts to combat wildfires, nearly all of which have been implemented in the years since

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<sup>18</sup> Envista Root Cause Analyses Report, p. 137.

2017. Consequently, we believe that the best understanding of our wildfire mitigations efforts can be obtained from our annual WMPs which provide a comprehensive and detailed description of our work in this area. Going forward, we believe our wildfire mitigation efforts should be evaluated through the WMP regulatory proceeding. Given the scope of our WMPs, the fact that our WMPs are continually updated based on the evolving nature of our wildfire risk, and the rigorous regulatory process surrounding the WMPs, this is the best venue for evaluating our wildfire mitigation work.

## **V. PROPOSED CORRECTIVE ACTIONS ARISING OUT OF THE ROOT CAUSE ANALYSES REPORT**

The following three proposed corrective actions are presented based on the recommendations and findings in the Root Cause Analyses Report, as well as feedback from our internal subject matter experts:

1. Accelerating the replacement of overhead # 6 copper conductor in HFTD areas.  
Currently conductor replacement in HFTD areas is done as part of system hardening work and not based solely on conductor material or size.
2. Increasing the number of single-phase reclosers (FuseSavers) installed in HFTD areas.  
Currently plan to install 80 sets per year from 2022 to 2026.
3. Reducing the number of overdue tags in HFTD areas, as described in detail in our Revised WMP.

Please note that these are preliminary recommendations which are subject to change depending on the outcome of forthcoming CPUC workshops, as well as the potential of evolving risks identified from on-going evaluations of wildfires.

## **VI. CONCLUSION**

We appreciate Envista's efforts in preparing and issuing this report and take seriously the recommendations. As can be seen from our responses above, we are in agreement with the majority of the recommendations in the report. Even more importantly, for the majority of the recommendations, we came to the same conclusion as Envista and proactively began implementing these wildfire mitigation efforts years before the report was released. Therefore, many of the recommended efforts are now part of mature programs that we have continued to refine and improve in the intervening years since the time period studied in this report, as set forth in our WMP. As a company, we are firmly committed to the safety of our customers and look forward to continuing working with our stakeholders — through efforts like the present — to eliminate catastrophic wildfires.