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February 3, 2025 **BY ENERGY SAFETY E-FILING**

Shafi Mohammed
Chief Data Officer, Data Analytics Division
Office of Energy Infrastructure Safety
California Natural Resources Agency
715 P Street, 20th Floor
Sacramento, CA 95814

Re: **Q4 2024 Spatial and Non-Spatial Data Submissions**
Docket: 2024-QDR

Dear Mr. Mohammed:

Electrical corporations were requested to provide Geographic Information System (GIS) data in their respective 2019 and 2020 Wildfire Mitigation Plans (WMP) which required significant interpretation and effort to address. Pacific Gas and Electric Company (PG&E) appreciates the efforts of the Office of Energy Infrastructure Safety (Energy Safety) to refine its guidance and provide standardization through the GIS Data Reporting Requirements (GIS Data Standard or Data Guidelines) and Schema released on August 5, 2020, and updated on February 4, 2021 (V2), September 17, 2021 (V2.1), January 14, 2022 (V2.2), December 15, 2022 (V3), March 17, 2023 (V3.1), and January 30, 2024 (V3.2). Below we provide updates on our Q4 2024 Spatial Quarterly Data Report (SQDR) submission, regulatory developments relating to our spatial data submission, and general challenges and technical limitations relating to this submission.

In addition, PG&E provides a narrative outlining improvements to our reporting processes for our Q4 2024 non-spatial data submission, which is submitted as part of our Quarterly Data Report (QDR). These changes will increase consistency in our reporting and better align our data with our peer electrical corporations. PG&E also provides a description of the challenges and technical limitations in our non-spatial data.

Q4 2024 Spatial Data Submission Updates

During Q4 2024, PG&E continued efforts to improve our Data Guidelines report with the introduction of net new data and data quality enhancements. These enhancements required dedicated working sessions across business and technical Subject Matter Experts (SMEs), transformation of data to fit the Spatial QDR (SQDR) requirements, and implementation of quality control techniques. New data in the submission includes:

1. Manufacturer & Model Number fields provided for the Connection Device feature class *(increasing Data Provided from 0 to >15%);*

2. Last Inspection Date field provided for the Asset Point / Substation feature class for Power Generation facilities *(increasing Data Provided from 0 to 75%); and*
3. From Structure ID and To Structure ID for the Connection Device feature class transmission splice data *(reporting data for manually identified 30 records & pursuing additional records via automation*)

Lastly, PG&E continued utilizing our Foundry data platform to further progress alignment across our spatial and tabular WMP data reports. Working with WMP initiative reporting program leads and technical engineers, PG&E transformed and curated data from different source systems to create a single dataset for the VM-18 Vegetation Management for Operations Mitigation (VMOM) program. These datasets were then used to confirm they meet the data reporting needs for both the SQDR and QDR. Prior to this, these program reports were generated at different points in time or generated at the same time but as multiple and different reports (i.e., one for the SQDR and another for the QDR) causing inconsistencies. This is because each report seeks slightly different data points resulting in unique filters or data transformations that result in varying, correct datasets. PG&E will continue efforts to align data included in our SQDR and QDR, respectively. We are targeting continuous improvements towards a single, joint record of evidence for each initiative program to support reporting and tracking consistent and stable target progress externally and internally against our WMP initiatives.

Q4 2024 Regulatory Developments Relating to Spatial Data Submission

On November 19, 2024, Energy Safety released V4 draft Data Guidelines. PG&E provided reply Comments on December 23, 2024, emphasizing the resubmission challenges in Section 2.4 guidelines *Revisions to Previously Submitted Data*.

Energy Safety did not host their usual quarterly data check-in during Q42024 with the electrical corporations. PG&E appreciates these quarterly check-ins as it allows for shared understanding around common reporting gaps, technical limitations, data availability, or other complexities to be understood. PG&E encourages Energy Safety to continue hosting quarterly check-ins on the Data Guidelines throughout 2025.

General Challenges and Technical Limitations Relating to Spatial Data Submission

PG&E reiterates the general challenges and technical limitations that have been outlined in previous cover letters and in our previous comments on draft GIS Data Standards. PG&E's submissions of the requested Status Report and Data Submission are not fully complete as we do not have all the requested data and do not have all the data in the format requested.

Closing reporting gaps will largely require more involved operational and technological changes and a significant investment of resources and time to collect, curate, and organize the SQDR submissions on a recurring basis. This would require several large-scale, multi-year

projects with significant resourcing and may come at increased cost to customers.[1] This would also require reprioritizing resources away from other important wildfire mitigation related work. Additionally, the evolving nature of the Data Guidelines creates complexities around prioritization of efforts to address reporting gaps, especially given that a future version change may modify or remove certain requirements.

Given the estimated level of effort required to meet the standard, regular collaboration with Energy Safety is needed to align on expectations, the prioritization of omitted data, technical feasibility issues, and shape modifications to the schema. PG&E recommends that efforts to close the remaining gaps be approached in a phased manner, and with collaboration with electrical corporations based on value of the data to Energy Safety's objectives and utility business operations.

PG&E remains concerned that there is insufficient time to produce spatial quarterly data at the scale required by the Data Guidelines.[2] Additionally, some of the inputs in the submission report reflect preliminary estimates and may not reflect final results. For example, 'Planned Initiative' data reflects forecasts that are subject to change based on operational developments and work recently completed may not be fully mapped in our GIS source systems given post construction QA/QC processes. Likewise, Risk Events are often still under investigation and subject to changing data as more information is reviewed.

PG&E's existing data and system architecture were independently developed over decades to address specific operational uses. As a result, there are significant challenges to accessing and aligning data to meet Energy Safety's Data Guidelines. The various data requested exist across multiple systems and in the current state require significant time and resources to manually align datasets to the SQDR schemas and extract and format the data. Many of the resources who curate the data are simultaneously involved in core operations work, including emergency response and Public Safety Power Shutoff (PSPS) readiness.

Though our alignments of the SQDR and the tabular QDR have progressed significantly, there are technical limitations to fully align data in certain circumstances. Data included in the spatial submission must meet specific technical criteria for inclusion, including the ability to transform data into Energy Safety's schema and represent geospatially. Tabular reports such as the QDR are not subject to these requirements which can result in differences across reports. In addition, each report contains: (i) differentials in technical and schematic requirements; (ii) differentials in timing of data readiness; and (iii) differentials in data types reported on. This is further described through our Comment on Draft GIS Data Standard V2.2.[3]

PG&E understands Energy Safety is using data included in the SQDR submission to inform efforts related to their Compliance Division field inspections. While use limitations,

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[1] As an example, in the Other Power Line Connection Location feature class, we do not collect some of the information being requested regarding the other line information (e.g., OtherConductorMaterial) for private line owners. We do not keep record of customer owned facilities and views private or customer line owners as separately accountable to compliance with electric line regulations. Collecting this information would require considerable support and coordination with private owners.

[2] PG&E's submissions includes between 12-16 million records, providing limited time to collect, curate, transform, perform antivirus scanning, and submit the data in a file-geodatabase (FGDB) format.

[3] *See* PG&E Comment on Draft GIS Data Reporting Standard Version 2.2 (Dec. 27, 2021).

assumptions and definitions for data submitted are described via our metadata, additional complexities occur when combining distinct datasets for analyses or operations. These complexities can lead to misunderstandings and/or conflicting results when assessing data submitted against field inspection findings. In addition, timing differentials may exist between collection of initiative data and population of said data into the geospatial format/database (GIS) due to the processes needed to document data, verify work performance and update geospatial records. Until a project is completed and mapped, detailed information remains in the design systems and paper job packages.

Once data is mapped in PG&E's GIS systems, it can be formatted to meet the requirements of Energy Safety's File Geodatabase schema and included in our SQDR Submissions. Thus, a job may be visible in the field but will not be present in our submission until mapping processes are completed. PG&E's SQDR submissions represent the best available data that can feasibly be aligned with Energy Safety reporting requirements. PG&E welcomes additional working sessions with Energy Safety to better understand its intended use of data included in our submissions and provide feedback regarding various applications and/or potential limitations.

Finally, PG&E continues to express concerns regarding sharing the SQDR to third parties and requests that Energy Safety inform third parties interested in receiving data to reach out directly to the electrical corporations. This is because each electrical corporation has different WMP Initiatives and as such, there is no single confidentiality designation that can unilaterally be applied to all utilities. For example, PG&E's WMP initiative programs have included: expulsion fuse replacements, SCADA commission sectionalizing device installation, motorized switch operator (MSO) replacements, fuse saver installation, and other critical equipment. The above equipment is either remotely operable, and/or responsible for real-time operation of the electric system and associated with operation and control of the critical bulk electric system (BES) facilities that protected under the North American Electric Reliability Corporation's Critical Infrastructure Protection ("NERC CIP").

General Challenges and Technical Limitations Relating to Non-Spatial Data Submission (QDR)

New Data Issues and Limitations

The non-spatial data submission is subject to the changes and limitations outlined below, as well as the limitations set out in note format in the QDR spreadsheet itself.

QDR Tables 2 and 13

Please note that we are working on improving our processes for reporting the remediation time of Category A and X tags. Upon reviewing our 2024 data, we discovered that we were reporting the date the tags were closed in our data management system, rather than the date they were closed in the field. Therefore, we will provide updated data that provides a more accurate picture of when the work was performed, and the condition was made safe. We anticipate that it will demonstrate that the remediations were being performed more expeditiously than previously represented. We are currently evaluating the extent of previously submitted data that needs to be

revised to reflect this more accurate approach and will be providing updated QDRs once we understand the scope of the revisions. Please note that we are not providing Level 1, Level 2, or Level 3 tag data in this submission as we are still determining the scope of this issue and working on correcting it. We anticipate providing an updated QDR by February 18, 2025.

QDR Tables 2 and 5

Please note that we are evaluating whether it is possible to improve the quality of data in our wires down metric. We believe that our current process may actually be overreporting the total number of wires down events. If we determine we are able to more accurately report the data, we will provide updated QDRs.

QDR Table 11

Please note that we made multiple revisions to the financial data presented in Table 11 to improve its accuracy. Certain costs have been re-categorized among WMP Activities, including the addition and removal of certain costs from this reporting. The 2024 actual costs provided in this submission reflect the re-categorization. Please note that projected amounts for 2024 have not changed to reflect this re-categorization. As a result of these updates, we are working to amend our previous QDR submissions and will provide them shortly. Specifically, costs have been updated for the following WMP Activities:

- Asset Inspections
- Best practice sharing with other utilities
- Collaboration on local wildfire mitigation planning
- Customer support in wildfire and PSPS emergencies
- Distribution pole replacements and reinforcements
- Emergency preparedness plan
- Emergency response vegetation management
- Emerging grid hardening technology installations and pilots
- Engagement with access and functional needs populations
- Environmental monitoring systems
- Equipment maintenance and repair
- Equipment Settings to Reduce Wildfire Risk (Grid Ops)
- External collaboration and coordination
- Fall-in mitigation
- Fire-resillient rights-of-ways
- Quality assurance / quality control
- Grid monitoring systems
- Ignition detection systems
- Line removals (in HFTD)
- Microgrids
- Open work orders
- Other – PSPS
- Other – Wildfire
- Other technologies and systems not listed above
- Personnel Work Procedures and Training in Conditions of Elevated Fire Risk (Grid Ops)
- Pole clearing

- Preparedness and planning for service restoration
- Public emergency communication strategy
- Public outreach and education awareness program
- Risk Methodology and Assessment
- Substation defensible space
- Transmission pole/tower replacements and reinforcements
- Undergrounding of electric lines and/or equipment
- Vegetation Inspections – Distribution
- Vegetation Inspections – Substation
- Vegetation Inspections – Transmission
- Vegetation management enterprise system
- Quality assurance / quality control
- Weather forecasting
- Wildfire Mitigation Strategy Development
- Wood and slash management

Please also note that we corrected typographical errors for certain specific UtilityInitiativeTrackingIDs in Column D of Table 11. The tracking IDs had inadvertently been placed in the wrong row.

Existing Data Issues and Limitations

Given the real-time dynamic nature of our GIS system, the data provided in the QDR is only a view of a specific moment in time and will continue to change as our system evolves in the coming months and years.

Conclusion

PG&E continues to improve our data quantity and quality on a quarterly basis to comply with the Data Guidelines. Additional enhancement opportunities to overall data quantity and quality will largely require more involved operational and technological changes, as well as a significant investment of resources and time to collect, curate and organize the submissions on a recurring basis. Given the estimated level of effort required to meet the Standard, regular collaboration with Energy Safety is needed to align on expectations, prioritization of data and information and technical feasibility issues.

Should you have any questions or concerns about these updates to our data, please do not hesitate to reach out as we would be happy to discuss these matters in detail if it would be helpful.

Very truly yours,

/s/ Jay Leyno

Jay Leyno

APPENDIX:

HISTORICAL SUBMISSION UPDATES AND REGULATORY DEVELOPMENTS

Q3 2024 Submission Updates

- PG&E provided Fire Weather Watch (FWW) Status and FWW Issue Date Time fields in the Ignition feature class.
- PG&E provided Exemption Status field in the Support Structure feature class.
- PG&E provided Distribution Clamps & Connectors data added to Connection Device feature class.
- PG&E provided improved descriptions for VM-02 Pole Clearing Description of Work field.
- PG&E provided data quality enhancements to Critical Facility Backup Power optional surveys data.
- PG&E continued improvements towards a single, joint record of evidence for each initiative program to support reporting and tracking consistent and stable target progress externally and internally against our WMP initiatives. PG&E transformed and curated data from different source systems to create a single dataset for our VM-02 Pole Clearing and GM-03 HFTD/HFRA Open Tag Reduction –Distribution Backlog programs.

Q3 2024 Regulatory Developments Relating to Spatial Data Submission

- Energy Safety informed PG&E of third-party requests for Pole Location and ID data and for Vegetation Management Data. Energy Safety disagreed with PG&E's confidentiality designations and released the vegetation management data. Energy Safety also referenced that the data requested is available on PG&E's public facing website. However, the data available on PG&E's public facing webpage represents only our non-confidential version of the quarterly data submissions. If Energy Safety compares the versions of the data they released to what is posted on our public website, they will see confidential programs, fields, and records were removed from the version PG&E shares externally. When Energy Safety releases the entire dataset in their possession, they are also releasing confidential data which, once shared publicly, now helps fill in a knowledge gap for a bad actor. For example, PG&E has a Vegetation Management for Operational Mitigations (VMOM) program. PG&E removes the program identifier from our non-confidential version by taking out of the UtilityInitiativeTrackingID, WMPInitiativeActivity, and WMPSection fields. The identifier is removed as the program describes mitigation of trees on EPSS capable circuits. By sharing the data publicly, it is now known where PG&E's EPSS circuits are located. EPSS equipment is essential for safeguarding against wildfires and is protected under Govt. Code § 6254(k), (ab); 6 U.S.C. § 131; 6 CFR § 29.2 as critical energy infrastructure data

Q2 2024 Submission Updates

- PG&E provided the Nominal Voltage data field in the 3.6.2.2 Connection Device Feature Class for approximately 48,000 distribution splice records.
- PG&E enhanced the data connection between our OneVM and Foundry platforms by bringing in more OneVM data tables. As a result, more comprehensive vegetation data was brought in for WMP initiatives VM-03, VM-16, VM-17 reporting.

- PG&E further improved the methodology for Major Woody Stem (MWS) exemptions reported by providing the full population of MWS exemption as captured in OneVM. In previous submissions, there was a limitation in reporting that narrowed the dataset to those records with an inspection date.

Q2 2024 Regulatory Developments

- On May 31, 2024, Energy Safety issued a decision on PG&E's January 8, 2024 Change Order for the 2023-2025 Wildfire Mitigation Plan (WMP). All WMP initiative programs operated under the planned changes while the Change Order was under review by Energy Safety. In 2023, two PGEN generating facilities (the Deer Creek Powerhouse and Tule River Powerhouse) were divested and sold to other entities. These two sites, which PG&E no longer owns or operates, were originally in PG&E's portfolio for defensible space as part of initiative VM-07 for 2024. When these facilities were divested, PG&E submitted a Change Order to Energy Safety reducing the count to 59 defensible space inspections, subtracting the Deer Creek Powerhouse and Tule River Powerhouse from the total. Energy Safety denied the requested change causing the number of required inspections to increase back to 61. PG&E no longer owns two of the facilities on the list; therefore, the Company has provided internal communications documenting the transactions accounting for the discrepancy in lieu of spatial reporting. For 2024, the VM-06 target was reduced from 55 to 54 due to the transfer of Belden PH which was absorbed into Power Generation. VM-07 will continue to perform Defensible Space Inspections on all assets at Belden PH.

Q1 2024 Submission Updates

- PG&E transitioned from Data Guidelines Version 3.1 to Version 3.2 during Q1 2024. PG&E adopted Version 3.2 of the Data Guidelines, by conducting working sessions to review requirements and assess the levels of effort needed, ultimately implementing more than 90 revisions.
- PG&E further improved the alignment between the data in the SQDR and the Quarterly Data Report. PG&E integrated the remaining net new WMP Initiative program into the Q1 2024 spatial submission where data was available. We transformed the data to fit the SQDR requirements and implemented quality control processes. This new dataset was:
    - Vegetation Management for Operational Mitigation – WMP Section 8.2.2.3 – Utility Initiative Tracking ID VM-18
- PG&E also incorporated five net new datasets in the Administrative Area feature class
    - Climate Zone
    - Summer Temperature Map
- A new source system data connection was established between Foundry and One VM, PG&E's new vegetation inspection and project management platform. The Major Woody Stem feature class was automated in Foundry for the spatial quarterly reporting.

Q1 2024 Regulatory Developments

- On April 22, 2024, Energy Safety hosted its first quarterly data check-in this year with California electrical corporations to discuss topics relating to the Data Guidelines submission formats. Topics included the transition to Version 3.2 and guidance was provided on QDR Table 11.

- PG&E received three Notices of Violation (NOV): NOV_PGE_CAC18_20231128_0934 on March 20, 2024, NOV_PGE_CAC18_20231129_0945 on March 21, 2024, and PGE_CAC18_20231212_1054 on April 11, 2024, regarding work performed as part of our pole clearing initiative. Energy Safety provided a latitude and longitude, project address and structure number (pole ID) where field verifications were conducted for work reported by PG&E from the Q2 2023 Spatial QDR; however, the unique ID of the job number (the 'VmpID') was not provided, and the geographical information shared by Energy Safety is not an exact match to any of the records PG&E provided in the Q2 2023 submission. As a result, PG&E is had to infer the record based on geographical proximity to the geographical information provided by Energy Safety. In a few violations, there were multiple Q2 2023 projects in the surrounding area, so PG&E's response was limited. PG&E requested Energy Safety provide the unique record ID from the data being referenced to best respond to the NOVs received.

Q4 2023 Submission Updates

- PG&E further improved the alignment between the data in the SQDR and the Quarterly Data Report. PG&E integrated the remaining net new WMP Initiative programs into the Q4 2023 spatial submission where data was available. We transformed the data to fit the SQDR requirements and implemented quality control processes. These new datasets were:
    - Second Patrol Transmission – WMP Section 8.2.2.1.2 / Utility Initiative Tracking ID VM-14;
    - Integrated Vegetation Management Transmission – WMP Section 8.2.2.1.3 / Utility Initiative Tracking ID VM-15;
    - Vegetation Management - Quality Control – WMP Section 8.2.5.2 / Utility Initiative Tracking ID VM-22; and
    - Asset Inspection - Quality Control Audits – WMP Section 8.1.6.2 / Utility Initiative Tracking ID GM-09.
- PG&E also incorporated five net new datasets in the Administrative Area feature class:
    - Surge Protection District;
    - Insulation District2;
    - Corrosion Area;
    - Raptor Concentration Zone; and
    - Snow Loading Area.

Q4 2023 Regulatory Developments

- On November 21, 2023, Energy Safety hosted its fourth quarterly data check-of the year with the electrical corporations. Topics included the utilities preferred file type/format for submitting the Wildfire Mitigation Data tables and, for the spatial data, the feasibility of submitting a file in the GDB file format or feature service.
- On December 15, 2023, Energy Safety released proposed changes to the Data Guidelines in Draft Data Guidelines v3.2.
- On January 16, 2024, PG&E submitted comments on these proposed draft guidelines. Our comments requested the revised Status Report and GDB templates, which were not provided with the v3.2 Draft Data Guidelines. These templates would allow PG&E and

the other utilities to review the domain values, fields, character limits, data type, layout, and instructions to ensure changes are consistent with those outlined in Draft Data Guidelines. Without these templates, PG&E is unable to complete its assessment of the impacts of the Draft Data Guidelines.

Q3 2023 Submission Updates

- PG&E further improved the alignment of the data in the SQDR and the QDR. PG&E integrated three out of four net new WMP Initiative programs into the Q3 2023 spatial submission where progress was made and data was available for reporting [4]. This includes:
    - Routine Transmission NERC and Non-NERC – WMP Section 8.2.2.1.1 / Utility Initiative Tracking ID VM-13;
    - Distribution Routine Patrol – WMP Section 8.2.2.2.1 / Utility Initiative Tracking ID VM-16; and
    - Distribution Second Patrol – WMP Section 8.2.2.2.2 / Utility Initiative Tracking ID VM-17.
- PG&E also incorporated net new data outside of WMP initiatives, including:
    - Last Inspection Date and Installation Date fields in the Substation feature class.[5]
- PG&E utilized final data from the SQDR Risk Event feature class to populate sections of Table 2's QDR to further progress alignment across our spatial and tabular WMP data reports.

Q3 2023 Regulatory Developments

- On August 15, 2023, Energy Safety hosted its third quarterly data check-in this year to allow electrical corporations the opportunity to seek clarity on field definitions for the purpose of potentially including more data and expanded definitions in future submissions.

Q2 2023 Submission Updates

- PG&E incorporated 4 new WMP initiative programs. New programs included:
    - System Hardening - Transmission Shunt Splices – WMP Section 8.1.2.5.1 / Utility Initiative Tracking ID GH-06;
    - Fall-in Mitigation (Tree Removal) – WMP Section 8.2.3.4 / Utility Initiative Tracking ID VM-04;
    - Line Sensor Installations – WMP Section 8.3.3.1 / Utility Initiative Tracking ID SA-02; and
    - Engagement with Access and Functional Needs Populations (Portable Batteries) – WMP Section 8.5.3 / Utility Initiative Tracking ID PS-06.
- PG&E also incorporated net new data outside of WMP initiatives, including:

[4] There were eight new target initiatives introduced in our second WMP on August 7, 2023. Of these eight, four initiatives were not relevant for the Q3 2023 SQDR as no work was performed in Q2 2023. On September 27, 2023, PG&E submitted our third revision of our 2023-2025 WMP. Net new initiatives introduced in this latest revision can be expected for inclusion in our Q4 2023 SQDR submission.

[5] Please see the Q3 2023 Status Report deliverable's availability explanations for additional information relevant to the inclusion of these fields.

- Other Power Line Connection Location feature class with data representing transmission line interties to other corporations;
- Greased and Operating Voltage fields in the Transmission Line feature class;
- Construction Grade field in the Support Structure feature class; and
- Population Impact field in the Critical Facilities feature class.

- Enhanced Critical Facility feature class with additional records for the Backup Power, Backup Type, and Backup Capacity fields.
- Leveraged Palantir Foundry to produce Tables 5 and 6 of Energy Safety's QDR report from data from the final SQDR Risk Event feature classes for better data consistency between the tabular and spatial reports where data overlap exists.
- Automated three additional feature classes in Foundry for the SQDR in support of the Q2 2023 submission: Switchgear, Red Flag Warning Day, and High Wind Warning Day.
- Made available for download a non-confidential version of the SQDR from our WMP webpage.[6]

Q2 2023 Regulatory Developments

- Energy Safety hosted its second quarterly data check-in this year with the electrical corporations to discuss confidentiality and Red Flag Warning Day data. This check-in allowed electrical corporations the opportunity to present the importance of protecting confidential data and provide examples of how data, which would seem non-confidential, can become confidential when displayed spatially.

Q1 2023 Submission Updates

- Continued to progress our adoption of Version 3.1 of the Data Guidelines. This included conducting over 30 working sessions to review requirements, assessing the levels of effort needed to adopt new requirements, and implementing more than 700 data changes. Adopting changes applied to Version 3.1 required approximately 7,200 hours across over 50 resources.
- Provided partial data for more than 95% of all new required fields in our submission.
- Drove efforts to ensure that all WMP initiatives, with relevant completed jobs to report against in Q1 2023, were included in the submission.
- PG&E also incorporated, for the first time, the 'EstimatedAge' field into the Support Structure Asset Point feature class. This was done by leveraging the pole installation year estimation component of the support structure equipment failure model which was created for internal purposes to improve wildfire risk and public safety risk modeling.

Q1 2023 Regulatory Developments

- Data Guidelines V3.1 released on March 17, 2023.
- Energy Safety hosted its first quarterly data check-in for 2023 with the electrical corporations to discuss the newly adopted Version 3.1 of the Data Guidelines. PG&E

[6] *See* (https://www.pge.com/en_US/safety/emergency-preparedness/natural-disaster/wildfires/wildfire-mitigation-plan.page#:~:text=The%202023-2025%20WMP%20addresses%20PG%26E%E2%80%99s%20wildfire%20safety%20programs,and%20containing%20the%20customer%20impact%20of%20EPSS%2FPSPS%20events).

also shared that our wildfire risk model for 2023 was still in progress with a target internal draft date of April 30, 2023, so the newly added 'Ignition Risk', 'PSPS Risk', and 'Overall Utility Risk' schema fields would be using last year's model for the Q1 2023 submission. Similarly, PG&E's 2022 and 2023 models were not designed calculate risks as described in Energy Safety's new version 3.1 Data Guidelines.

Q4 2022 Submission Updates

- Conducted over 30 working sessions regarding the new V.3 Data Guideline requirements to assess the level of effort needed to implement them. Several cross-functional teams were involved in these working sessions to collaborate, review, and identify impacts to existing data pipelines and the feasibility of incorporating new fields or modifying existing ones, including: GIS analytics, information technology (IT), regulatory, legal, and various subject matter experts for the assets, Public Safety Power Shutoff (PSPS) /Risk events, and initiatives depending on the feature class being assessed.
- PG&E incorporated the AiLogID field into the 3.5.4.2 Grid Hardening Log initiative dataset for the SCADA Recloser Installation program.
- Continued pursuing means to align the GIS Data Standard (SQDR) and the Quarterly Initiative Update (QIU) by creating a joint reporting tracker prototype with the goal of ensuring that the same initiative program leads provide the same progress completion unit counts for both quarterly reports. These data governance efforts will help support consistency in reporting.

Q4 2022 Regulatory Developments

- Energy Safety released the draft GIS Data Standard V3 on October 14, 2022. Public comments regarding the draft guidelines were submitted on November 17, 2022, and the final version was adopted December 15, 2022. Version 3 has necessitated more than 700 data changes. Based on previous version implementations, we estimate that implementing Version 3 will require approximately 1,500 hours across over 50 resources.[7] Implementing these requirements will involve collecting and curating data, updating transformation logic, creating lookup tables and relationships between schemas, and more.
- On December 20, 2022, Energy Safety hosted its fourth quarterly data check-in this year with the electrical corporations to discuss the newly adopted Version 3. This meeting allowed electrical corporations the opportunity to raise any questions, suggestions, or general comments. PG&E requested that future utility and Energy Safety check-ins focus on common reporting gaps found in each feature dataset, so that electrical corporations' technical limitations, data availability, or other complexities can be understood. This collaboration with Energy Safety is needed to align on expectations, prioritization of data, technical feasibility issues, shape modifications to schemas, and will assist in more consistent data applications across utility submissions.

Q3 2022 Submission Updates

[7] This estimate is based off of the historical time needed to adopt the previous Data Standard version requirements.

- PG&E incorporated 8 new WMP initiative programs, enhanced quality, and expanded use limitations and definitions in our metadata for our spatial quarterly data reporting.
    - New programs included:
        - Early Fault Detection (EFD) Technology – WMP Section 7.3.2.2.3;
        - Generation for PSPS Mitigation – Temporary Distribution Microgrids – WMP Section 7.3.3.11.1 C;
        - Undergrounding of Electric Lines and / or Equipment (*"10K" Initiative*) – WMP Section 7.3.3.16;
        - HFTD/HFRA Open Tag Reduction – Distribution – WMP Section 7.3.4.17;
        - HFTD/HFRA Open Tag Reduction – Transmission – WMP Section 7.3.4.17;
        - Updates to Grid Topology to Minimize Risk of Ignition in HFTDs – Remote Grid – WMP Section 7.3.3.17.5;
        - Infrared Inspections of Distribution Electric Lines & Equipment – WMP Section 7.3.4.4; and
        - Pole Clearing in State Responsibility Areas – WMP Section 7.3.5.2.
- Incorporated, for the first time, grid hardening photos of completed projects for select initiatives: SCADA Recloser Equipment Installation and Fuse Saver Installation through manually assessing an array of post-installation photos for individual projects and selecting the best available photo.
- Proactively enhanced data quality by bringing in over 87% more CircuitID values from what was previously omitted in the 3.1.2 Connection Device feature class through technical working sessions with subject matter experts and GIS analysts create a lookup table.
- Gathered and updated metadata information for all 8 newly included WMP initiatives and for the 3.5.2 Vegetation Management Projects.

Q3 2022 Regulatory Developments

- On August 16, 2022, Energy Safety hosted their third quarterly data check-in this year with electrical corporations to align on key issues, document feedback, and provide guidance, where applicable on compliance reporting. This discussion focused on how best to show one-to-many relationships between structures, circuits, substations, and other assets. The working session concluded that an asset relate table would provide benefit in depicting complex one-to-many asset relationships.

Q2 2022 Submission Updates

- PG&E incorporated 9 new WMP initiative programs, enhanced quality, and expanded use limitations and definitions in our metadata for our spatial quarterly data reporting.
    - New programs included:
        - LiDAR Ground Inspections Distribution - WMP Section 7.3.5.7;
        - Install Settings on Distribution Line Devices EPSS - WMP Section 7.3.6.8;
        - EPSS Reliability Improvements - WMP Section 7.3.6.8;
        - SCADA Reclosure Installation - WMP Section 7.3.3.9.1;

    - Stakeholder Cooperation and Community Engagement - WMP Section 7.3.10.1;
    - Rincon Transformer Fuse Replacement - WMP Section 7.3.3.11.2;
    - Emergency Back-up Generation - WMP Section 7.3.3.11.3;
    - Butte County Rebuild (Undergrounding) - WMP Section 7.3.3.17.6; and
    - Line Sensor Installation - WMP Section 7.3.2.2.5.
- Developed Stakeholder Community Engagement and Butte County Rebuild Undergrounding initiative data in Palantir Foundry to enable automation of joins across individual data points to package and geospatially represent it through polygon or line dimensions.
- Proactively enhanced data quality by expanding the descriptors in the 'WMPInitiativeActivity' field for the System Hardening Distribution program by adding four additional hybrid activity descriptors: (1) Hybrid project: Covered conductor installation and undergrounding of electric lines and/or equipment; (2) Hybrid project: Removal and retirement of OH conductor and undergrounding of electric lines and/or equipment; (3) Hybrid project: Covered conductor installation and removal and retirement of OH conductor; and (4) Hybrid project: Covered conductor installation, removal and retirement of OH conductor, and undergrounding of electric lines and/or equipment.
- Collected and updated existing metadata information for, but not limited to, 3.1.4 Lightning Arrester, 3.4.2 Wire Down Event, 3.5.1 Vegetation Inspections, 3.5.2 Vegetation Management Projects, 3.5.3 Asset Inspections, and 3.5.4 Grid Hardening. For example, in the 3.5.3.2 and 3.5.3.3 Asset Inspection Log and Point, PG&E clarifies that asset inspection data in the Q2 submission is better aligned to the Quarterly Initiative Update as both reports now reflect inspections that took place in High Fire Risk Areas (HFRAs) or High Fire Threat Districts (HFTDs).

Q2 2022 Regulatory Developments

- On May 17, 2022, Energy Safety hosted their second quarterly data check-in this year with electrical corporations to align on key issues, document feedback, and provide guidance, where applicable on compliance reporting. Much of the feedback raised from the electrical corporations during the working session were topics reiterated from February's quarterly check-in. Additionally, Energy Safety acknowledged responses are underway to provide guidance to PG&E against the discussion topics shared on March 1, 2022.
- Energy Safety also presented their Geographical Information System (GIS) Data Standard Version 2.2 Guidelines for adoption. PG&E provided additional reply comments for this version of the GIS Data Standard on June 8, 2022.[8] Comments outlined technical challenges and urged Energy Safety to employ a phased approach with clear prioritization for closing outstanding requirement gaps.

Q1 2022 Submission Updates

[8] *See* PG&E Comment on OEIS Geographic Information Systems Data Standard, Version 2.2 (June 8, 2022).

- PG&E incorporated 10 new WMP initiatives programs, 3 new field attributes, and enhanced quality in the metadata and in several existing fields in our spatial quarterly data reporting.
    - New programs included:
        - System Hardening Transmission – WMP Section 7.3.3.17.2;
        - Fuse Saver (Single Phase Reclosers) Installations – WMP Section 7.3.3.9.2;
        - Defensible Space Inspections on Distribution Substation – WMP Section 7.3.5.17.1;
        - Defensible Space Inspections on Transmission Substation – WMP Section 7.3.5.17.2;
        - Defensible Space Inspections on Hydroelectric Substations and Powerhouses – WMP Section 7.3.5.17.3;
        - Utility Defensible Space – WMP Section 7.3.5.20;
        - High-Definition Camera Installations – WMP Section 7.3.2.1.4;
        - Weather Station Installations and Optimizations – WMP Section 7.3.2.1.3;
        - LiDAR Routine Vegetation Transmission Inspections – WMP Section 7.3.5.8; and
        - Distribution Fault Anticipators (DFA) Installations – WMP Section 7.3.2.2.3.
    - Net new fields include:
        - Substation Rating – 3.1.6 Substation Feature Class; and
        - Conductor Overall Diameter and Conductor Ampacity – 3.2.3 Secondary Distribution Line Feature Class.
    - Enhanced fields include:
        - Exempt Status – 3.1.10 Transformer Detail Table; and
        - Exempt Status (for distribution splices) – 3.1.2 Connection Device Feature Class.
- Leveraged Palantir Foundry to incorporate camera installation and weather station installation or optimization into the submission which also marked the first '3.5.5 Other Initiative' reporting.
- Expanded on the information included in our metadata including, but not limited to, definitions and methodology used to identify and report on substation facilities.

Q1 2022 Regulatory Developments

- Energy Safety finalized version 2.2 of the GIS Data Standard on January 14, 2022. Initial draft comments provided by PG&E, Southern California Edison, and Cal Advocates, although acknowledged by Energy Safety, largely were not incorporated in the final version of the GIS Data Standard.
- On February 15, 2022, Energy Safety held their joint, quarterly data check-in meeting with the electrical corporations to communicate submission expectations around 2022 WMP data reporting. Additionally, electrical corporations had the opportunity to provide comments relating to the GIS Data Standard. Key topics included: challenges aligning spatial and non-spatial reports; one-to-many data relationships; request for

technical themed workshops on feature dataset sections and confidentiality; and request for a phased approach, prioritization, and partnership to addressing reporting gaps.

Q4 2021 Submission Updates

- Adopted Energy Safety's updated schema (V2.2), incorporating two notable changes – provide scientific name for tree species and match units used for initiative targets with geometry of feature. To adopt these changes PG&E built a lookup table to include the new vegetation genus, species, and common name data.
- Net new data for Conductor Overall Diameter and Ampacity Rating fields added to 3.2.1 Transmission Line and 3.2.2 Primary Distribution Line.
- Included net new data reflecting developments in PG&E's Non-Exempt Surge Arrester Replacement Program (WMP Section 7.3.3.17.3) as part of the 3.5.4.2 Grid Hardening Log and 3.5.4.3 Grid Hardening Point Feature Classes.
- Leveraged Palantir Foundry to include new primary and foreign key identifiers that relate PSPS Event tables to the PSPS Damages tables. For PSPS Event tables we are using multiple data types to create primary key inputs, including Date, Circuit ID, and Isolation Device ID which can be correlated with Primary key inputs for PSPS Damage Event ID tables which include Date and CircuitID.
- Improved the organization and quality of information provided in the metadata for majority of the feature classes and related tables provided in our Q4 2021 submission. Specific improvements included: (i) shifting Summary section inputs to the Description section to align with V2.2's reporting requirements 5; (ii) inclusion of Energy Safety's outlined subsections within each primary section; and (iii) populating the methodology subsection with file and table names for feature classes and related tables provided in the Q4 submission.

Q4 2021 Regulatory Developments

- On December 17, 2021, Energy Safety released V2.2 of the GIS Data Standard. Version 2.2 was the fourth version of the GIS Data Standard used throughout 2021. PG&E filed comments on this latest version of the Data Standard on December 27, 2021.[9] Through these comments, PG&E highlighted (i) the need for technical workgroups for collaboration and consistent implementation of the GIS Data Standard; (ii) request for additional time to assess changes applied to version changes and for release of all files simultaneously (including the need for alignment across guidance materials); (iii) request for clarification regarding geometry requirements; (iv) technical limitations regarding alignment with tabular reports and confidentiality labels.

[9] *See* PG&E Comment on Draft GIS Data Reporting Standard Version 2.2 (Dec. 27, 2021).

Q3 2021 Submission Updates

- Adopted Energy Safety's updated schema (V2.1), accomplished through a series of working sessions with technical and business resources to apply revisions to existing data automation logic used to transform PG&E internal source system data into Energy Safety's updated data schema.
- Developed a Domain Quality Checker Tool via our Foundry Data Management Platform to help ensure that domain values in PG&E's FGDB aligned with Energy Safety's prescribed schema. This tool automates the comparison of PG&Es data outputs (FGDB domain structures) with the domain structures prescribed by Energy Safety.
- Added Expulsion Non-Exempt Fuse Replacements, Transmission Switches, and MSO Switch Replacements in Feature Class 3.5.4.2 & 3.5.4.3 (Grid Hardening Log and Point).

Q3 2021 Regulatory Updates

- On August 20, 2021, Energy Safety released an updated PDF document introducing a new release (V2.1) of the GIS Data Standard. On September 17th, 2021, Energy Safety reissued its GIS Data Standard (V2.1) that incorporated data fields and applied changes to the structure of the data schema with the expectation that electrical corporations adopt this schema for the Q3 2021 submission due November 1st, 2021.
- For its V2.1 assessment, PG&E found discrepancies and misalignments across Energy Safety's requirements documentation, including the PDF document and FGDB, which introduced considerable complexity and resulted in rework to ensure accurate assessment findings.
- PG&E filed Comments on the GIS Data Standard V2.1 on August 27, 2021, highlighting the following: (i) elements of the data schema that are subject to technical limitations; (ii) field requirements that are subject to interpretation and require clarification or are out of alignment with Energy Safety's PG&E 2021 WMP Action Items (iii) proposed methods to improve consistent implementation of the GIS Data Standard across electrical corporations, including the potential benefits of a formalized working group.[8] In addition, PG&E's V2.1 Comment highlighted the technical limitations of labeling confidentiality designations at the record level and outlined our approach to help mitigate the risk of mislabeling confidential records.

Q2 2021 Submission Updates

- Provided data in accordance with the GIS Data Standard (V2).
- Added transmission splice data in Feature Class 3.1.2 – Connection Device and other utility-owned power line data in Feature Class 3.6.1. – Other Power Line Connection Location.
- Progressed data quality through consolidation of Distribution Outage data across multiple source systems and trackers in Palantir Foundry. In addition, leveraged this platform to create connectivity across source systems that contain data for Feature Class 3.4.3 – Ignitions, enabling association between Ignition events and near weather station.

Q2 2021 Regulatory Developments

- On June 23, 2021, Energy Safety held a joint meeting with the electrical corporations to communicate expectations around 2021 WMP data reporting, including desired alignments across spatial and non-spatial reports.
- PG&E performed an initial assessment of overlaps in data reported between the Quarterly Data Report (QDR, non-spatial) and Energy Safety GIS Data Standard (spatial) submissions.

Q1 2021 Submission Updates

- Adopted Energy Safety's updated schema (V2) which introduced significant change. This was accomplished through re-development of existing queries, re-training of Data Stewards (SMEs), and changes in overall data collection, curation, and transformation techniques.
- Incorporated additional fields (e.g., PSPSDays and PSPSDaysDateBasis in the Critical Facilities feature class) and feature classes such as 3.6.5 Major Woody Stem.
- Developed a minimum viable product with our new data management platform to help manage data pipelines across source systems and automate reporting for select feature classes. This platform will continue to develop in future quarters.

Q1 2021 Regulatory Development

- On February 4, 2021, Energy Safety released an updated GIS Data Standard (V2) that incorporated new feature classes and data fields as well as changes to the structure of the data schema.

Q4 2020 Submission Updates

- Expanded mapping of Energy Safety GIS Schema to PG&E's internal SAP schema for feature dataset 3.1 (Asset Point) and 3.2 (Asset Line).
- Enhanced the quality by addressing prioritized findings from Energy Safety Evaluation. For example, PG&E increased the specificity of the Status Report and enhanced its accuracy relative to the FGDB data submitted. Additionally, a baseline Metadata entry was delivered.
- On February 4, Energy Safety released GIS Data Standard Version 2 which incorporated new feature classes and data fields as well as changes to the data schema structure.

Q3 2020 Submission Updates

- Instituted multiple measures to improve the quantity and quality of our submission
- Increased number of Feature Classes and data attributes submitted while providing a more comprehensive Status Report.
- Implemented data collection processes to enable more efficient data collection, curation, and organization, and mapping ES GIS Schema to PG&E's internal GIS schema for 3.1 (Asset Point) and 3.2 (Asset Line).

Q3 2020 Regulatory Developments

- On January 8, 2021, the Wildfire Safety Division (for ease of reference, the Wildfire Safety Division will be referred to by its new name, Energy Safety, throughout this document) provided its Evaluation of Pacific Gas and Electric Company's First Quarterly Report (Energy Safety Evaluation) detailing findings on completeness and quality of GIS data submitted by PG&E on September 9, 2020.

Q2 2020 Submission Updates

- Included 15 of 38 feature classes and 4 of 15 related tables in the FGDB format.
- Data for another 4 feature classes and 2 related tables was submitted in tabular format as an appendix file.

Q2 2020 Regulatory Developments

- Energy Safety released its Draft GIS (Geographic Information System) Data Reporting Requirements and Schema (GIS Data Standard) on August 5, 2020.