State of California – A Natural Resources Agency
Gavin Newsom, Governor

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To: The Public, Local and State Agencies, and Stakeholders for Trans Bay Cable, LLC's 2021 Wildfire Mitigation Plan Independent Evaluator Annual Report on Compliance

July 15, 2022

Enclosed is the Final 2021 Wildfire Mitigation Plan (WMP) Independent Evaluator Annual Report on Compliance detailing the independent evaluator's assessment of Trans Bay Cable, LLC's (TBC) compliance with its 2021 WMP. This report was prepared by TBC's contracted independent evaluator and issued to the Office of Energy Infrastructure Safety (Energy Safety) on July 1, 2022, to fulfill the requirements of Public Utilities Code Section 8386.3(c)(2)(B)(i).

The content of this report is the work product of the respective independent evaluator. The findings and conclusions in this report do not represent the views or opinions of the Office of Energy Infrastructure Safety (Energy Safety) or any of its employees. Pursuant to Public Utilities Code Section 8386.3(c)(2)(B)(ii) the independent evaluator's findings are not binding on Energy Safety. Neither Energy Safety nor the State of California, nor any officer, employee, or any of its contractors or subcontractors makes any warranty, express or implied, or assumes any legal liability whatsoever for the contents of these documents.

On July 15, 2022, a public version of this 2021 WMP Independent Evaluator Annual Report on Compliance is published for public review and comment. Please be advised, information designated by TBC as confidential has been redacted from the published report. Comments must be submitted no later than August 15, 2022.[1] Comments must be submitted to Energy Safety's e-filing system in the 2022 Independent Evaluator docket (#2022-IE).[2]

Sincerely,

Melissa Semcer
Deputy Director | Electrical Safety Directorate
Office of Energy Infrastructure Safety

[1] Dates falling on a Saturday, Sunday, or a holiday as defined in Government Code Section 6700 have been adjusted to the next business day in accordance with Government Code Section 6707.
[2] Submit comments to the 2022-IE docket via the Energy Safety e-filing system here: https://efiling.energysafety.ca.gov/EFiling/DocketInformation.aspx?docketnumber=2022-IE (accessed June 28, 2022)

FINAL INDEPENDENT EVALUATOR ANNUAL REPORT ON COMPLIANCE

June 30, 2022

Bureau Veritas North America
Trans Bay Cable LLC

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Disclaimer

This report has been compiled through the process of observation and the review of provided documents. The report is intended to serve only as a guide to assist with achieving compliance with regulatory requirements instituted by the Office of Energy Infrastructure Safety (OEIS) for an independent evaluation of electric utility providers' Wildfire Mitigation Practices. Bureau Veritas North America, Inc. (BVNA) is not the designer, implementer, or owner of the Wildfire Mitigation Plan (WMP). It is not responsible for its content, implementation, and/or any liabilities, obligations, or responsibilities arising therein.

The report reflects only those conditions and practices which could be ascertained through observation at the time of evaluation. This report is limited to those items specifically identified herein or as may be further required by CPUC at the time of the evaluation. The report does not represent that dangers, hazards, and/or exposures do not exist. BVNA shall only be responsible for the performance of the services identified or defined in our specific scope of services.

BVNA does not assume any responsibility for inaccurate, erroneous, or false information, expressed or implied, given to BVNA as the Independent Evaluator (IE). In addition, BVNA shall have no responsibility to any third party or for any other matters not directly caused by BVNA or beyond the reasonable control of BVNA. BVNA's liability is limited to the cost of the services expressed herein or as otherwise agreed to by BVNA by a separate written contract.

1. EXECUTIVE SUMMARY

BACKGROUND

Pursuant to P.U. Section 8386.3(c)(2)(B)(i), BVNA has been selected as an Independent Evaluator (IE) to review and assess Trans Bay Cable, LLC's (TBC) 2021 Wildfire Mitigation Plan (WMP). BVNA has evaluated TBC's compliance with its 2021 WMP, validated TBC's quality assurance and quality control (QA/QC) programs outlined to support WMP initiatives, and reviewed its WMP funding activities.

SCOPE

Pursuant to the WSD's Final Independent Evaluator Scope of Work (SOW) for the Review of Compliance with 2021 WMP issued on April 21st, 2021, BVNA has reviewed TBC's 2021 WMP and supplemental documents (see Appendix A) for verification of compliance, validation of Quality Assurance (QA)/Quality Control (QC) programs, and assessment of the utility funding activities related to WMP.

TRANS BAY CABLE, LLC

As described within the TBC's Annual Report on Compliance for 2021 dated March 2021 (ARC), TBC, LLC (TBC) is a subsidiary of NextEra Energy Transmission, LLC. TBC is a 53-mile, ~400 MW, high voltage, direct-current (HVDC) submarine transmission cable buried at various depths beneath the San Francisco Bay Waters, with AC/DC converter stations (or substations) at each end. TBC transmission cable extends from the city of Pittsburg, California, where its' system's eastern converter station is located, to its' Potrero converter station and 115kV High Voltage AC Underground Cable in San Francisco, California. TBC interconnects with Pacific Gas and Electric (PG&E) substations in Pittsburg and San Francisco via underground Alternating Current (AC) transmission cables. All above-ground transmission infrastructure is fully contained within the walls of the systems converter station (Figure 1).

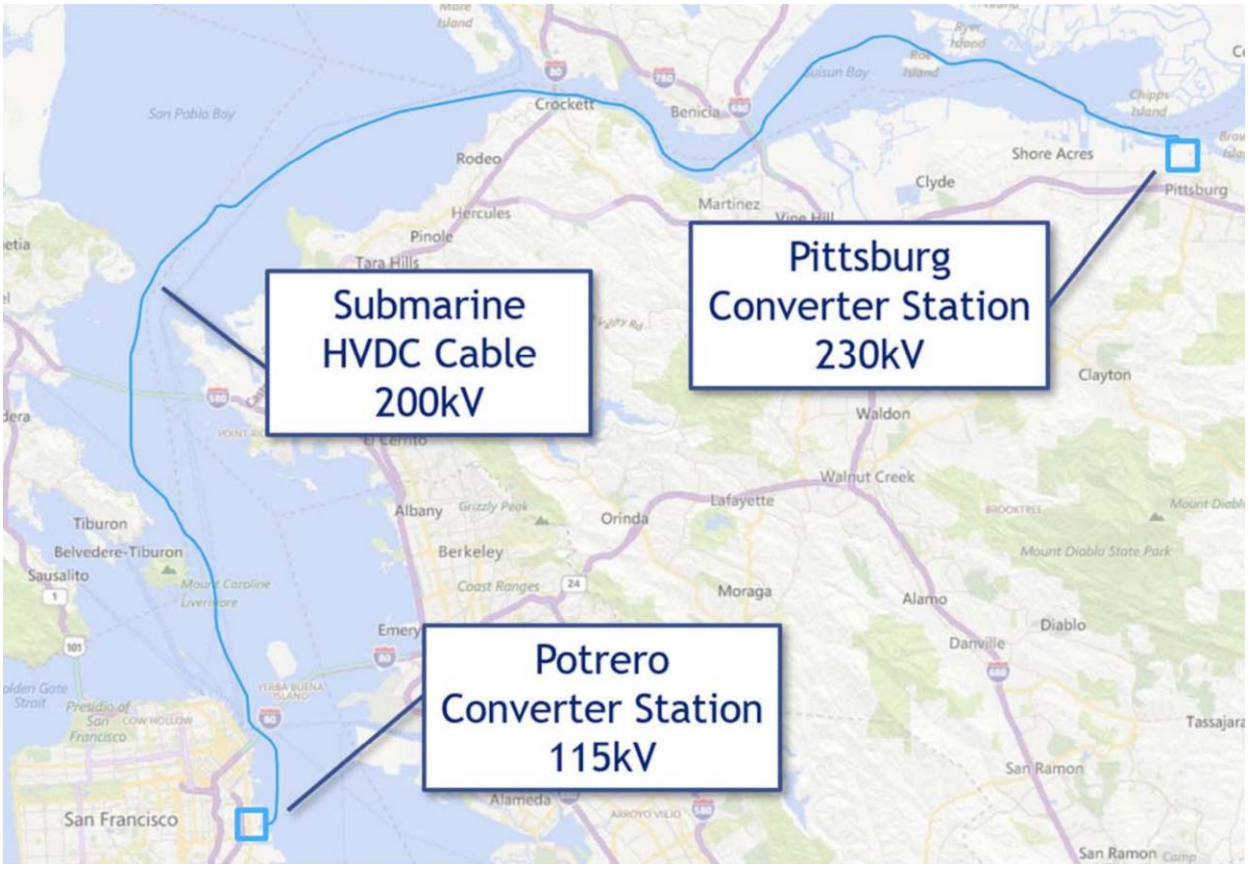
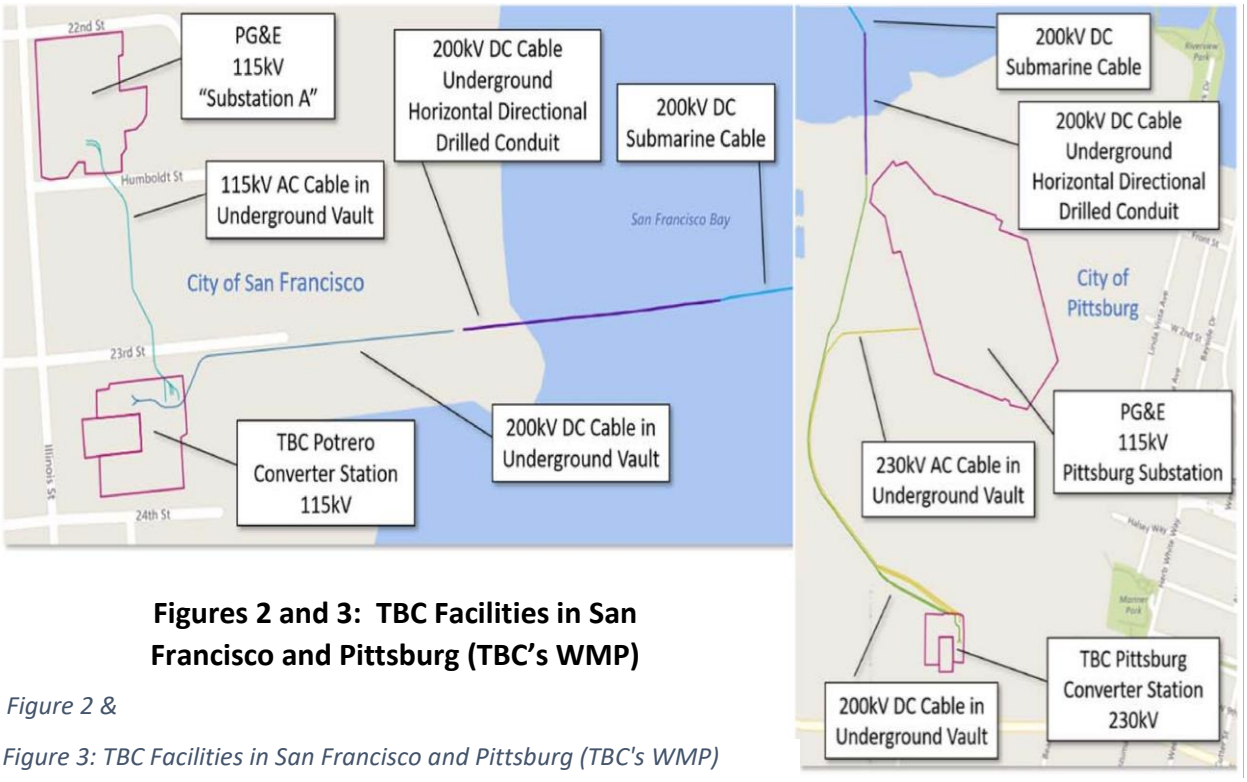


Figure 1-Overview of Trans Bay Cable Facilities and Service Territory (TBC's WMP)

TBC has been in service since November 2010 and is a transmission-only utility with no retail customers, no distribution customers, and no distribution system. The San Francisco substation is surrounded by an entire urban environment and has no potential to cause a wildfire ignition. The Pittsburg substation is also in an urban setting. It is approximately 1.5-miles from an area designated as Tier 2 (Elevated) High Fire-Threat District (HFTD) per the California Public Utility Commission's (CPUC) published fire threat

maps. The TBC transmission facility can transport up to 400-Megawatts between the two PG&E substations and surrounded by PG&E service territory. Other than the equipment within the substation boundaries, TBC has no overhead lines or equipment and is substantially hardened against wildfires (Figures 2 and 3).



Figures 2 and 3: TBC Facilities in San Francisco and Pittsburg (TBC's WMP)

Figure 2 &

Figure 3: TBC Facilities in San Francisco and Pittsburg (TBC's WMP)

KEY FINDINGS

As described in further detail within Section 3, the IE compliance review has found that the 2021 WMP and data found in supplemental documents (see Appendix A), along with confirmation of verifiable field goals, TBC complies with the 2021 WMP:

1. Risk Assessment and Mapping: Through continuing risk assessment TBC maintains engagement to evaluate risks through weather assessments and conditions where red flag warnings (RFW) may limit operations.
2. Situational Awareness and Forecasting: TBC has implemented two continuous monitoring initiatives. The first was an existing cable monitoring system to track various cable conditions in real time. The second is installing a new transformer monitoring system to aid in real-time monitoring of transformer health. System monitoring has proven that early identification of equipment breakdown will further reduce ignition probabilities and improve response times if there is a condition that could result in fire. TBC expects increased situational awareness and forecasting due to these system upgrades.

3. Grid Design and System Hardening: TBC's Pittsburg Facility provides inherent system hardening due to the undergrounding and submergence of its conductors beneath the Bay Area waters. Existing electric transformers and platforms have been modified with seismic isolators in an effort to improve system survivability in the event of an earthquake. In addition, TBC is actively proceeding to undergo modifications that would transition the converter station to Gas Insulated Substation technology to reduce air-insulated conductoring and bus work further, thus reducing the infrastructure's susceptibility to producing an ignition event due to contact. All other equipment at the Pittsburg Facility is located within its 12-foot tall perimeter concrete wall or within its AC/DC Converter Building and is continuously monitored by inward and outward-facing cameras observed by [redacted] personnel.
4. Asset Management and Inspections: TBC utilizes formal checklists specific to fire suppression system functionality, high-voltage equipment condition, and general facility condition. This is not a change from the validation of TBC 2020 WMP.
5. Vegetation Management and Inspections: TBC's Pittsburg Facility is located in an urban/industrial environment demonstrated by its surrounding auto salvage yards. TBC's limited footprint within its perimeter wall is paved with all equipment installed on concrete pads with crushed rock covering surrounding areas. Therefore, vegetation management is limited to weed control within the boundaries of its perimeter wall.
6. Emergency Planning and Preparedness: TBC maintains an Emergency Action Plan specific to the scale and scope of its Pittsburg operations. TBC's emergency planning limits are communication and coordination with CAISO and PG&E. In addition, TBC adheres to practices specified by the National Fire Protection Association at its facilities. To further state, TBC does not have a defined "service area" and therefore has a limited scope of disaster and emergency planning.
7. Site Fire Risk Assessment: TBC purchased and maintains a Phos-Check Dual Agent trailer at the Pittsburg Facility that provides two extinguishing mediums, foam concentrate, and dry chemicals to provide a specialized means of fire protection at the facility in the event of a transformer fire. In addition to the foam trailer, the Pittsburg Facility is equipped with an onsite fire hydrant system that TBC regularly maintains to ensure a complete site-wide fire protection system for local responders. TBC anticipates that the additional suppression capability provided by the dual agent trailer will effectively control and reduce the effects of fire and maximize the efficacy of emergency response efforts.

2. INTRODUCTION

A review of all documents supporting the implementation of the 2021 WMP strategic initiatives has been conducted. BVNA provides the following IE evaluation report (Report) describing the technical review and findings.

TBC is a transmission-only utility that has been in operation since 2010. TBC operations consist of 53-miles of ± 200-kV Direct Current (DC) electrical transmission cable with fiber optic communication cables bundled together and buried in the San Francisco Bay. TBC extends from the cities of Pittsburg, California, to San Francisco, California. TBC interconnects with Pacific Gas and Electric (PG&E) substations in both Pittsburg (230-kV AC) and San Francisco (115-kV AC) via underground Alternating Current (AC) transmission cables.

The TBC Pittsburg Converter Station operates in a medium-density urban area adjacent to West Pittsburg, a high-risk community identified within the Wildland-Urban Interface (WUI). In this area, homes and wildlands intermix, as published in the Federal Register in 2001. TBC notes that in conducting its risk analysis, it applied the defining aspects of the WUI as provided by the California Department of Forestry and Fire Protection (CALFIRE), California's state fire authority. Within the CALFIRE's Fire and Resource Assessment Program (FRAP), the cities in proximity to the Pittsburg Converter Station are also shown as communities at risk from wildfire.

The TBC Pittsburg Converter Station operates proximate to an area with vegetative fuels. The bulk of the biomass of these fuels results from the watch catch coincident with a U.S. Army Corps of Engineers emplaced drainage infrastructure that serves the City of Pittsburg. Various native and non-native species of trees, shrubs, and grasses grow within these five (5) acres.

In Pittsburg, TBC's underground cable infrastructure passes underneath areas proximate to vegetative fuels consisting of primarily marsh scrub. The cable is buried at a nominal depth of 3- to 11-feet and in steel reinforced concrete vaults covered with fluidized thermal backfill and appropriate markings to warn excavators. These transmission lines are contained within XLPE insulating materials and steel cable armor that prevent contact with combustible materials.

TBC's facilities include AC cable risers with associated bus work, transformers, AC-to-DC converter equipment, and DC cable risers with associated bus work. The Pittsburg facility maintains a [redacted]. The [redacted] is responsible for monitoring and managing the status and condition of the operations and equipment at the Converter Station. In addition, the [redacted] monitors the condition of its submarine cable and shipping traffic within the San Francisco Bay adjacent to the location of their cabling.

To manage and control a possible fire event at the Pittsburg facility, TBC completed its commitment to purchase and install a Phos-Check Dual Agent trailer for the Pittsburg facility. BVNA confirmed the placement of the Phos-Check Dual Agent trailer at the Pittsburg facility.

TBC retrofitted its transformer foundations for seismic upgrades. The TBC facilities were de-energized until the completion of TBC's facility improvements. BVNA confirmed this activity during our May 5th meeting at the Pittsburg facility.

TBC filed Data Collection for Wildfire Mitigation Plans report to meet the requirement specified in the California Public Utilities Commission's (CPUC) efforts to develop metrics in Docket No. 19-05-036. This initial plan adopted the applicable standard metrics developed by the CPUC. Unlike other substantially larger utilities, TBC facilities do not encompass wildlands. TBC also has no overhead lines, with the majority of all transmission elements of the system either underground, underwater, or both. This precludes the necessity for a Vegetation Management Program as the opportunity for a bare conductor from TBC's system to interact with vegetation is remote.

TBC's fire prevention performance metrics focus on utilizing existing operational data, metrics, and practices to focus on general fire prevention and maintaining equipment integrity to preclude potential ignition events resulting from equipment derangement or disoperation. TBC also focuses on the risk of uncoordinated excavation that could damage underground cable infrastructure as a possible source of fire risk. This philosophy of fire prevention has proven to be successful to date. The established performance metrics outlined in the 2021 WMP demonstrates an approach to improving awareness of operational conditions that are associated with fire ignition monitoring and fire mitigation preventing ignition event by identifying, documenting, tracking, and monitoring possible ignition sources that result in the highest risk for resulting in faults that may develop flame, sparks, arcs, or similar ignition vulnerabilities.

As TBC is a transmission-only utility, TBC does not have distribution customers. Therefore, those items outlined in PUC section 8386 and the WMP Guidelines relevant to customer communication do not apply, and no reference is made to Public Safety Power Shutoff (PSPS).

The report does include:

- ***Inspection and maintenance of distribution transmission and substation assets***, including conducting system patrols and ground inspections, using technological inspection tools, managing predictive and electrical preventative maintenance, and conducting vegetation inspections and management, vulnerability detection such as Light Detection and Ranging (LiDAR) inspection; and geospatial and topography identification, geographic information system (GIS) mapping data. A key component is identifying collected data elements through each program and understanding how that data is used and shared to improve utility practices.
- ***Vegetation management*** includes routine preventative vegetation maintenance; corrective vegetation management and off-cycle tree work; emergency vegetation clearance, prioritized for portions of the service territory that lie in Tier 2 & 3 HFTD, quality control processes; and resource protection plan, including animal and avian mitigation programs.

- ***System hardening*** includes pole replacement, non-expulsion equipment, advanced fuses, tree attachment removal, less flammable transformer oil, covered wire and wire wrap, and undergrounding where cost beneficial.
- ***Operational practices***, including communications and mustering plans under varying degrees of wildfire risk. Plans to deactivate automatic reclosers, de-energization of "at risk" area power lines based on the type of facility (overhead bare conductions, high voltage, etc.), tree and vegetation density, available dry fuel, and other factors that make specific locations vulnerable to wildfire risk.
- ***Situational awareness*** includes obtaining information from devices and sensors on the actual system, weather, wildfire conductivity conditions, and two-way communication with agencies and key personnel. Programs such as online feeds and websites like the National Fire Danger Rating System. Situational awareness should help achieve a shared understanding of actual conditions and improve collaborative planning and decision-making.
- ***De-Energization actions*** triggered and prioritized by forecasted extreme fire weather conditions: imminent extreme fire weather conditions; validated extreme fire weather conditions; and plans for re-energization when weather subsides to safe levels. Manual or automatic capabilities exist for implementation.
- ***Advanced Technologies***, including Distribution Fault Anticipation technology, tree growth regulators, pulse control fault interrupters, oblique and hyperspectral imagery; advanced transformer fluids; advanced LiDAR, and advanced SCADA, to reduce electrical ignition while also helping to mitigate power outages and equipment damage.
- ***Emergency Preparedness, Outreach, and Response Communication*** before, during, and after emergencies, including but not limited to engaging with key stakeholders that include critical facilities and served customers; local governments, and critical agencies such as the California Department of Forestry and Fire Protection (CAL FIRE), local law enforcement agencies and other first responders, hospitals, local emergency planning committees, other utility providers, California Independent Systems Operator, and the utility's respective Board. A community outreach plan should inform, engage first responders, local leaders, business owners, and others. Coordination agreements such as Mutual Aid or Assistance should be leveraged.

3. INDEPENDENT EVALUATOR REVIEW OF COMPLIANCE

At the commencement of the evaluation, the IE initiated the assessment through a review of TBC's 2021 WMP along with all publicly available documents as listed in Appendix A to identify TBC's stated 2021 WMP goals. For 2021 WMP activities described in the WMP but not provided within the publicly available records, the IE submitted data requests and conducted a site visit to verify activities stated within the 2021 WMP (See Appendix D for Data Requests Submitted and Responses). Along with the document analysis and data requests, the IE conducted a site visit to the TBC facility, the Pittsburg Converter Station, located at [redacted], Pittsburg, CA. The site visit collected images and obtained information from the onsite SMEs to validate compliance with the 2021 WMP activities and initiatives. Each section's analysis and key findings are detailed further within Section 3, the Independent Evaluator Review of Compliance section.

3.1 WMP Activity Completion

WMP activities outlined in TBC's 2021 WMP are limited due to the scale and scope of TBC's Pittsburg operations and the inherent hardening of TBC's transmission infrastructure to wildfire risks. The limited risk is demonstrated by TBC's underground or submerged infrastructure and having no transmission or distribution infrastructure exposed to wildlands. TBC does not maintain a program specifically geared towards wildfire mitigation. As a result, TBC did not identify specific wildfire mitigation initiatives in its 2021 WMP.

TBC has committed to constructing, maintaining, and operating its transmission facilities to minimize the risk of catastrophic wildfire posed by transmission facilities. To meet the requirements of SB 901 and PU Code §8386, TBC has developed objectives that are directly related to maximizing fire prevention efforts such as containing fire to the facility and implementing fire extinguishing strategies to minimize the potential of spread of fire due to facility fault extending to its surrounding environment. In addition, TBC has improved awareness and has employed rapid communication of the start of fire by facility monitoring. The WMP sets forth the methodology for and assessment of the risk of wildfire ignition; leverages preventative strategies and protocols currently in place for fire prevention, directives for operational response in the event of a wildfire or wildfire conditions, and system restoration.

Section 7.3 of the 2021 TBC WMP details the specific wildfire mitigation program activities illustrated as subcategories:

1. Risk assessment and mapping
2. Situational awareness and forecasting
3. Grid design and system hardening
4. Asset management and inspections
5. Vegetation management and inspections
6. Grid operations and protocols

7. Data governance
8. Resource allocation methodology
9. Emergency planning and preparedness
10. Stakeholder cooperation and community engagement

Due to the limited scope and scale of TBC's operation at the Pittsburg site, TBC combines its efforts of managing the risk of wildfire with those efforts to ensure a safe and reliable operation of their facility. With this information, listed below are those categories as identified in the WMP where TBC has provided a narrative of explanation of the efforts:

***Table 1**-WMP Activities to Be Reviewed*

2021 WMP Section	WMP Category
7.3.2.1.5	Risk Assessment and Mapping
7.3.2.2	Situational Awareness and Forecasting
7.3.3.12	Grid Design and Hardening
7.3.6.6	Grid Operations and Protocols

The performance of the above activities is assessed in the following sections of this report. Completion of these activities and adherence to applicable protocols and procedures are summarized in Section 4 Conclusion

3.1.1 SAMPLING METHODOLOGY AND DISCUSSION

Sampling percentages do not apply for this facility as we observed it in its entirety. Information regarding the site and the WMP activities was captured during the onsite field visit of TBC's Pittsburg Facility on May 5th, 2022, which included a question and answer session with TBC personnel. Pictures of all pre-identified items were captured, and a summary of the site findings is produced within this report.

TBC Pittsburg Converter Station - IE Field Visit on May 5, 2022 from 10:00am-12:00pm

Field Visit Attendees:

- [redacted], TBC Operations Manager
- [redacted], TBC Regulator, and Business Manager
- [redacted], Environmental Health & Safety Manager
- [redacted], PE, BVNA Program Director
- [redacted], BVNA Project Manager
- [redacted], BVNA Fire Inspector

Facility Audit, Inside Concrete Perimeter Wall

Introduction

Figure 4: Street view of the TBC Pittsburg Facility

Upon arrival at the Pittsburg Facility, it was observed that the facility is a secured facility surrounded by a 12 ft. high solid concrete wall with access provided by a two gate system, an entrance wrought iron vehicle gate with intercom/keypad, followed by a solid metal vehicle gate located at the southeast corner of the concrete perimeter wall and an exit gate located at the southwest corner of the facility. Outside the perimeter walls, the front of the facility is fully landscaped, including ivy on the front side of the South perimeter wall. All ground surfaces within the concrete perimeter walls are either hardscape (concrete or asphalt) or covered with gravel, with no flammable vegetation observed throughout the facility.

We were greeted by the above-noted TBC staff and proceeded to their meeting room to discuss the objectives of the site visit and to further discuss the completion of prescribed initiatives found in the TBC 2021 WMP. After our short meeting, we proceeded to tour the facility (Figures 5-9) clockwise along the paved access road.

Figure 5: Overview of TBC Pittsburg Facility

Figure 6:180-kV AC Yard

Figure 7: 230/180-kV Transformers and 230-kV AC yard

Figure 8: 230-kV Risers and Circuit Breaker

Figure 9: [redacted]

Targeted Initiatives Completed for 2021

The following initiatives were completed for validation of the 2021 TBC WMP and were ongoing from the 2020 WMP:

- Transformer Oil Monitoring (Figure 10)
- Assembly and placement of the Phos-Check Dual Agent Trailer (Figure 11)
- Transformer seismic retrofit (four (4) transformers total) (Figure 12 & 13)

Figure 10: Serveron Monitoring System

Figure 12: Phos-Check Dual Agent Trailer

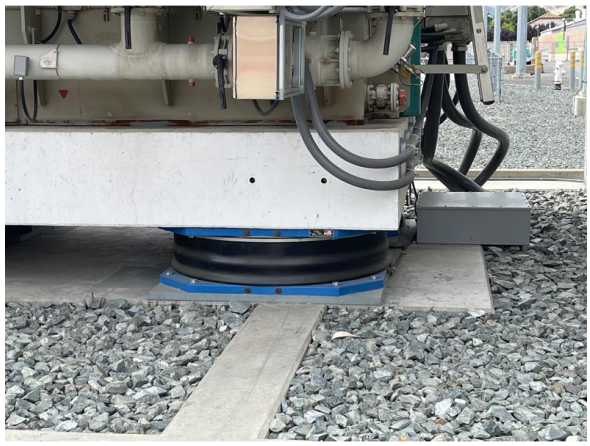


Figure 112: Seismic Base Isolator

Figure 13: Seismic Upgrade Construction

Outside Facility Perimeter

Surrounding the exterior of the Pittsburg facility immediately east and west are auto salvage yards. North of the substation, there appears to be a vegetation swale for drainage, with vegetation up to the concrete perimeter wall of the facility. The south wall of the facility, which fronts the public roadway, has vegetation climbing on the perimeter wall with a four (4) foot wide gravel separation with placed landscaping plants between the wall and the maintained lawn area.

For perimeter security and observance of areas outside the perimeter wall, TBC has installed visual, ultraviolet, and infrared cameras that view both inside and outside their facilities (Figure 14). All cameras are monitored by the facilities [redacted].

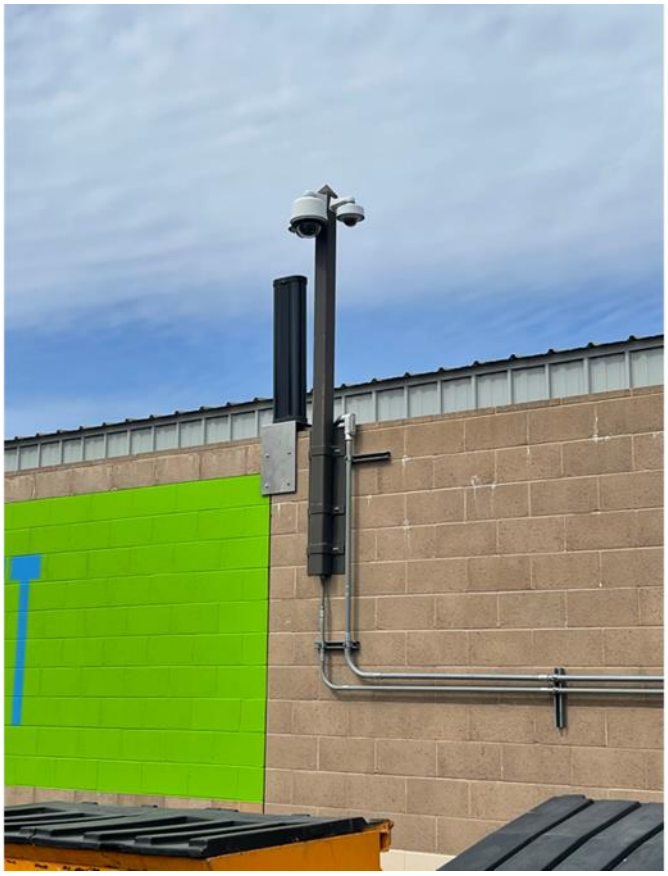


Figure 14: Visual, ultraviolet, and IR Camera

3.1.2 LARGE VOLUME QUANTIFIABLE GOAL/TARGET – FIELD VERIFIABLE

The above categorization of initiative(s) or commitment(s) is not included in the assessment of TBC's Pittsburg facility since these activities are not present in the 2021 WMP list due to the facility's limited operational scope and nature. Therefore, this subject is not applicable or covered in this report.

3.1.3 LARGE VOLUME QUANTIFIABLE GOAL/TARGET – NOT FIELD VERIFIABLE

The above categorization of initiative(s) or commitment(s) is not included in the assessment of TBC's Pittsburg facility since these activities are not present in the 2021 WMP list due to the facility's limited operational scope and nature. Therefore, this subject is not applicable or covered in this report.

3.1.4 SMALL (LESS THAN 100 UNITS) VOLUME QUANTIFIABLE GOAL/TARGET

The above categorization of initiative(s) or commitment(s) is not included in the assessment of TBC's Pittsburg facility since these activities are not present in the 2021 WMP list due to the facility's limited operational scope and nature. Therefore, this subject is not applicable or covered in this report.

3.1.5 QUALITATIVE GOAL/TARGET

The above categorization of initiative(s) or commitment(s) is not included in the assessment of TBC's Pittsburg facility since these activities are not present in the 2021 WMP list due to the facility's limited operational scope and nature. Therefore, this subject is not applicable or covered in this report.

3.1.5.1 Review of Initiatives

The following review of initiatives is demonstrated below as listed in TBC's 2021 WMP and shown in Table 1 – WMP Activities to be Reviewed.

7.3.2.1.5 Risk Assessment and Mapping: TBC engaged in a third-party wildfire assessment that identified key wildfire-related risks for its Pittsburg Converter Station, completed in Q4 of 2020 and documented in the IE assessment of the 2020 WMP. Information was provided through BVNA's site visit with TBC representatives on May 5th, 2022, that indicated TBC evaluates risk through weather assessments and considers conditions where Red Flag Warnings (RFW) may limit operations due to TBC connections with PG&E. Response and verification of the information provided in data request responses, verify that TBC conducts weekly inspections of the facility fire suppression systems and equipment, high voltage equipment and all associated operation and monitoring equipment remains functional. These inspections demonstrate TBC's commitment to monitoring the facility's status and condition.

TBC's risk assessment has identified that the storage of compressed gas cylinders located in the spare parts building creates a risk to the facility since the building is not equipped with an automatic fire sprinkler system. For 2021, TBC provided language and planning for constructing a dedicated gas storage structure for relocation of the compressed gas cylinders adjacent to the spare parts building. Due to the scope of work and availability of vendors, it is scheduled to be constructed in 2022. This initiative is considered partially completed and, therefore, partially verified.

7.3.2.2.2 Situational Awareness and Forecasting: Continuous monitoring of real-time health for electric transformers containing mineral oil provides early identification of transformer degradation of the mineral oil dielectric properties, leading to internal electrical arcing. Completion of the Serveron Transformer Monitoring System was observed during the onsite assessment of TBC's Pittsburg Converter Substation (see figure 10 above). Documentation was also requested and received that provided the IE with manufacturer data sheets and inspection records to install the Serveron Transformer Monitoring System. In addition to performing Dissolved Gas Analysis (DGA) on the transformer's oil once every 4-hours, the Serveron TM8 also supplies graphing and trending of DGA data using IEEE and IEC diagnostic tools such as the Duval Triangle and Rogers Ratios and Duval Triangles 4 & 5 for advanced diagnostics. This graphing allows the condition of the transformer's oil to be determined at a glance and will provide

a clear early warning of the deterioration of any components inside the transformer. This initiative has been reviewed and considered "Validated."

TBC has also implemented its 2020 WMP and 2021 WMP provisions for cable monitoring. The cable monitoring system implemented monitors high voltage transmission cable for physical vibration, temperature, and abnormal electrical discharge at the cable terminations. Early identification provided by cable monitoring of a cable's change in condition provides TBC with the ability to mitigate cable failure, fault, or potential derangement. Cable monitoring systems were initiated in TBC's 2020 WMP and completed by their 2021 WMP in 2020.

7.3.2.3.12 Grid Design and System Hardening: TBC's facilities are located in the seismically active San Francisco Bay Area. Since seismic events cannot be predicted, a single significant seismic event could cause the derangement of one or more transformers resulting in a fire event. Such an event could lead to the engagement of vegetation located outside the facility. TBC facility hardening and seismic retrofit of vibration isolators are viewed as a mitigation action to fire. The IE requested manufacturer data sheets and installation/inspection records for the transformer vibration isolators. The Earthquake Protection System consultant predicts that the Trans Bay Cable transformers have a probability of functional loss of only 0.06% in 50-years with these vibration-absorbing bases. These vibration-absorbing bases intend to allow the equipment to survive an earthquake and remain functional immediately after the event. The San Francisco and Pittsburg sites were each analyzed for potential ground movements, and the use of transformer vibration isolators was designed for each site. The manufacturer's literature on the vibration absorbing bases lists several examples of where their bases were installed under buildings or bridges at several sites worldwide. After severe earthquakes, these buildings/bridges were fully functional (>6.0 on the Richter scale). In contrast, other facilities adjacent to the buildings/bridges sustained moderate to severe damage, requiring either repair or complete replacement. The installation of the transformer vibration isolators was confirmed during the onsite assessment (see figure 12 above) and considered "Validated."

The TBC 2021 WMP also targeted installing a 2-hour rated fire separation between the two auxiliary power rooms as part of the 2021 initiatives. On April 27th, 2022, TBC contracted a third-party consultant to evaluate and provide an opinion on constructing a 2-hour fire separation between the two auxiliary power rooms. It was the Consultant's opinion that due to the non-combustible nature of the building construction, the type and non-combustible nature of the equipment, and the silence of a California Building Code in requiring such a separation, the 2-hour separation would not contribute to the improvement of the Wildfire Mitigation measures for the site. Though the 2021 WMP indicates that TBC will be moving forward to provide the 2-hour separation, it was received via data request documentation that the 2-hour separation would NOT be provided. The IE considers this item NOT Validated.

7.3.2.6.6 Grid Operations and Protocols: Through their third-party Wildfire Mitigation Assessment, TBC identified that the local fire response may have limited capability to address a flammable/combustible liquid fire requiring Class B firefighting foam. Likely, the emergency responders would not have the amount of firefighting foam to address an in-depth liquid pool fire resulting from a transformer and its

significant amount of insulating mineral oil. As a result of this finding, TBC opted to contract with Perimeter Solutions to provide a Phos-Check Dual Agent Trailer (see figure 11 above) to aid in firefighting operations at the facility. The IE considers this to be "Validated."

The IE also requested and received a response for the current state of fire protection for the spare parts building. Although the other buildings on site are fully sprinklered, the spare parts building is not equipped with an automatic fire suppression system. In contrast, the spare parts building is equipped with an automatic fire detection system comprised of spot type smoke detection that is continuously monitored by the facility [redacted]. TBC budgeted within the 2021 WMP funding for installing an automatic fire sprinkler system, but due to the scope of work and availability of vendors, the installation of the fire suppression system is scheduled to be completed in October 2022. The IE considers this as being partially "Validated."

Initiative activities are not explicitly categorized in WMP.

The following categorized mitigation activities are not specifically addressed in section 7.3.2 of TBC's WMP but are included in dialog within the plan. The IE is providing an assessment of the following items.

Asset Management and Inspections: TBC's WMP provided a general description of the implementation of weekly inspections of the converter station's fire suppression systems, high voltage equipment condition, and the overall status of the facility's general condition. The inspections assure the functionality and the condition of its components. The IE submitted a data request and received information confirming the above inspections to confirm the inspection frequency and methods. Documents included an evaluation of TBC's Watch Tracking program, which monitors systems within the facility. Based on the received information, the IE has evaluated the inspections and has determined the inspections to be validated.

Vegetation Management: The IE submitted a data request that addressed vegetation maintenance documentation specific to TBC's Pittsburg facility to validate TBC's vegetation management and weed abatement activities within the Pittsburg Converter Station walls, including the use of pre-emergent and herbicide for the prevention of vegetative growth. It was confirmed that such methods are used and enforced at the facility. The Pittsburg facility has limited opportunities for vegetation growth within the facility's walls. TBC is located in an urban/industrial environment, and its transmission facilities are either buried or submerged beneath the Bay Area waters. TBC's concrete perimeter wall is used as a fire barrier/break to protect the facility from a fire burning in the fuels from other properties. Due to this protection, the facility is not viewed by the IE as having an extreme wildfire threat to the facility. The IE has determined that these vegetation prevention activities are validated.

Emergency Planning and Preparedness: TBC's WMP provided information that discussed the emergency responder's capability to address an in-depth liquid pool fire composed of flammable/combustible liquid that may result from a transformer failure and fire resulting from a release of transformer insulating mineral oil. As part of TBC mitigation of fire extension from a transformer to the surrounding vegetation, TBC began 2020 the construction of two Phos-Check Dual Agent Trailers. The IE requested and received

the manufacturers' information and operations manual for the "Pittsburg Foam Trailer Maintenance Tracker" computer program. The IE also requested any/all training documentation that would indicate who has received operational training on Phos-Check Dual Agent Trailer. Information received indicated that both onsite and fire agency personnel responsible for an emergency response to the facility participated in hands-on training on multiple dates for the operation of the foam trailer currently in service and operational. Through visual confirmation and training records, the IE has determined that the emergency planning and preparedness activities are validated.

3.1.5.2 Trends and Themes

Through the IE's onsite assessment and observations and the review of documentation requested by the IE in data requests, the IE has determined that the Pittsburg Facility meets the outlined activities of TBC's 2021 WMP and is considered validated.

3.2 VERIFICATION OF FUNDING

The IE reviewed Table 3-1 – Summary of the 2021 WMP Expenditures – Total and Table 3-2 – Summary of WMP Expenditures by Category provided in the WMP. The following table demonstrates the IE's findings.

***Table 2**-2021 WMP Funding Verification Summary*

WMP Category	Initiative Name	Funding Discrepancy Amount	Detail on Funding Discrepancy
Grid Operations	Aux Room barrier projected 2021	($900,000)	Initiative activity not completed or validated but considered underspent due to third party consultant finding.
Situational Awareness	Real-time Cable monitoring and Transformer monitoring.	$ 200,000	Overspend of funds for this initiative activity due to supply chain material increases due to Covid -19.
Grid Design / System Hardening	Seismic upgrades to transformer pads.	$ 500,000	Overspend of funds for this initiative activity due to supply chain material increases due to Covid -19.

As demonstrated in the above table, situational awareness is assumed to be due to increased material costs. The 2021 WMP planned spend was under the actual spend for Grid Design and System Hardening. The planned expenditure for Grid Operations was more than the actual spend and is validated as an "underspend" for the Auxiliary Room fire separation. This is a result of information provided by the third-

party Consultant's opinion that the fire barrier would not affect Wildfire mitigation. Currently, TBC indicates that it plans to move forward in this activity.

A comparative financial analysis was completed between TBC's ARC Report dated May 2022 and the Quarter 1 (Q1) 2022 Quarter Data Report dated April 15th, 2022, as summarized in the TBC Financial Analysis document. Through a comparative analysis of publicly available information reported by TBC, it is demonstrated that funding activities are associated with Grid Operations, Situational Awareness, and Grid Design / System Hardening. The IE has confirmed that TBC has funded 100% of all commitments/initiatives of the 2021 WMP.

3.3 VERIFICATION OF QA/QC PROGRAMS

As stated within the 2021 WMP, the TBC's Environmental, Health and Safety (EH&S) Manager "manages TBC's general fire prevention plan, leads training, and assesses overall program compliance." To verify the QA/QC programs, the IE requested and received all documentation related to training for personnel. A TBC employee's required training sample was evaluated and considered complete.

Training provided ensures that TBC personnel are trained on the procedures, protocols, and requirements of the Emergency Action Plan (EAP) for safety and conformance with CAL OSHA requirements. Additionally, Task Guides were presented to identify detailed training manuals for TBC staff related to their job description, including responding to facility emergencies and seismic impacts.

4. CONCLUSION

Through the IE onsite assessment, data requests, and public and non-public documentation review, it is determined that TBC has completed activities outlined in their 2021 WMP or is in the process of completion. TBC interconnects with Pacific Gas and Electric (PG&E) substations in Pittsburg and San Francisco via underground Alternating Current (AC) transmission cables. TBC has no transmission or distribution line. All above-ground transmission infrastructure is fully contained within the walls of the systems converter stations. All current-carrying conductors are entirely contained within the footprint of the AC/DC Converter Station perimeter 12 ft. concrete wall.

TBC activities categorized or generally covered within the WMP include:

- Risk Assessment and Mapping
- Situational Awareness and Forecasting
- Grid Design and System Hardening
- Vegetation Management
- Emergency Planning and Preparedness
- Site Fire Environment Risk Assessment

These activities outlined in TBC's 2021 WMP have been reviewed and confirmed by the IE and have been demonstrated to meet the intent of reducing or eliminating the impact of the fire that would have a likelihood of extending from the TBC Facility and engaging off-site fuels. TBC fire prevention metrics are focused on utilizing existing operational data, metrics, and practices to focus on general fire prevention and maintaining equipment integrity to preclude the potential for ignition events. This philosophy of fire prevention strategy has been demonstrated to be successful due to the lack of historical fire events at the facility. Equipment monitoring and awareness activities are critical to TBC's ongoing success in fire mitigation.

FINAL INDEPENDENT EVALUATOR ANNUAL REPORT ON COMPLIANCE – TRANS BAY CABLE

APPENDIX

2022

5. APPENDICIES

TABLE OF APPENDICES

APPENDIX A

Appendix A: List of Supplemental Documents Reviewed

Item No.	Documents Reviewed	Document Date
1	TBC's Annual Report (ARC) on Compliance for 2021 Wildfire Mitigation Plan	May-22
2	TBC's 2021 TBC-H-103 Annex A Wildfire Mitigation Plan	May-22
3	BVNA Data Request 001 and Response for TBC QA/QC Programs	May-22

APPENDIX B

Appendix B: Field Photos From Field Visit May 25th, 2022

Item No.	Photo Description
1	Front view of Trans Bay Cable - Pittsburg facility
2	Front entrance with electronic security gate
3	180- kV AC Yard
4	230/180-kV transformers
5	Serveron Monitor located at 230/180-kV transformers
6	Seismic base isolators located at 230/180-kV transformers
7	Seismic base isolators located at 230/180-kV transformers
8	230-kV Risers
9	200-kV DC yard
10	FD riser located at [redacted]
11	Generator emergency shutoff
12	Security cameras
13	Phos-Check Dual Agent trailer
14	Auxiliary power rooms

Appendix Figure 1. Front view of Tran Bay Cable

Appendix Figure 2. Front view of Tran Bay Cable

Appendix Figure 3. 180-kV AC yard

Appendix Figure 4.

Appendix Figure 5. 230/180-kV transformers

Appendix Figure 6. Seismic base isolators

Appendix Figure 7. Seismic base isolators (close up)

Appendix Figure 8. ±200-kV DC yard

Appendix Figure 9. 230-kV risers and circuit breaker

Appendix Figure 10. FD riser located at [redacted]

Appendix Figure 11. Generator emergency shutoff

Appendix Figure 12. Phos-Check dual agent trailer

Appendix Figure 13. Security cameras

Appendix Figure 14. Auxiliary rooms

APPENDIX C

List of 2021 WMP Activities

SOW Category	2021 Initiative Number	Initiative Name	Finding	Detail on Finding
WMP Activity Completion	5.4.1	Vegetation inspections	Activity Validated	Compliant with the 2021 WMP
WMP Activity Completion	5.4.2	Vegetation Management Inspections	Activity Validated	Compliant with the 2021 WMP
WMP Activity Completion	5.4.3	Asset Inspections	Activity Validated	Compliant with the 2021 WMP
WMP Activity Completion	5.4.4	Grid Hardening	Activity Validated	Compliant with the 2021 WMP
WMP Activity Completion	5.4.5	Risk Event Inspections	Activity Validated	Compliant with the 2021 WMP
WMP Activity Completion	N/A	Phos-Check Dual Agent Foam Trailer	Activity Validated	Compliant with the 2021 WMP
WMP Activity Completion	N/A	Fire Sprinkler System for Spare Parts Building	Activity Ongoing	Estimated completion in 2022
WMP Activity Completion	N/A	2 Hour Rated Wall Between Axillary Rooms	Activity Ongoing	Estimated completion in 2022

APPENDIX D

Data Requests and Responses

BUREAU VERITAS

DATA REQUEST & RESPONSE for Trans Bay Cable LLC Converter Station; Pittsburg, CA

Data Request Number: 001

Name: [redacted]

Title: Project Manager

Company: Bureau Veritas

Data Request Date: 05.11.2022

Email: [redacted]

Phone #: [redacted]

Preferred Point of Contact: Email or Phone

Program Target	Data Request	DR Response
1. Emergency Planning and Preparedness	Requesting Training documents associated with the Enhanced Fire Awareness, Prevention, and Training Campaigns for TBC Operations Staff, including: TBC-HS-103 Fire Prevention TBC-HS- 200 Emergency Action Plan TBC-OP- 004 Emergency Operations TBC-MP-741 Fire System TBC-OP- 020 Asset Monitoring & Protection	TBC Operations and Maintenance Technicians (OMT) receive a variety of training. As noted in response to Question #2, the operator's initial qualification program includes training on several procedures in emergency operations, both grid emergencies, and onsite emergencies. Example tasks and qual sheets were included as part of that response. Further, as part of the continuing education program, operators participate in regional and national exercises such as CAISO RC West annual system restoration drills and internally as part of NextEra Energy's participation in NERC E-ISAC's GridEx exercise. For example, please see the CEH summary for an operator for the 2022 CAISO RC West Restoration drill, filename "CAISO restoration drill 2022 screenshot_Redacted.pdf". TBC also conducts periodic training on the emergency action plan. The training includes emergency action guidance for many emergencies, including onsite fire system response. See the roster of the most recent training filename: "participant-20220531214329_redacted.pdf". In addition, see the example training roster for [redacted] showing the annual fire extinguisher training refresher through our learning management system, filename "Annual Fire Extinguisher Training_Redacted.pdf."

Program Target	Data Request	DR Response
2. Emergency Planning and Preparedness	We request training documents, including curriculum and records for onsite "System Operators."	In TBC's Quality Training Database, system operator qualifications are delivered and managed via system operator job tasks qualification. A routine assessment of operator tasks ensures system operators can perform their duties. In TBC's online training delivery and management platform, there are links between procedures, operator tasks, and qualifications. As an example from our latest qualified operator, [redacted], please see the filename "[redacted] Task Quals.pdf" for a screenshot of the online platform showing qualification dates for a couple of sample tasks 3.3.1 and 3.3.2 related to TBC procedure TBC-HS-200 Emergency Action Plan. See filename "Tasks By Procedure 20220524.pdf" showing the link with the QTD training platform between those tasks and TBC procedure TBC-HS-200 Emergency Action Plan. See filename "20220524091129992.pdf" for a scanned copy of the OJT training log for [redacted], and also filename "20220524091044503.pdf" for a scanned copy of the Task Qualification Sheet.
3. Fire Protection - Class B Foam Trailer	Requesting Operating Procedure manual for foam trailer. Requesting maintenance records for trailer and foam agent. Requesting training records for onsite and off-site personnel.	For the operating procedure manual for TBC's foam trailer, see filename "Perimeter Dual Agent Trailer Manual V2.pdf' and "Foam Trailer Official Specs Sheet PC_Dual Agent Trailer_PCE-2019055-0.pdf'. The fire trailer manufacturer training team came onsite to train [redacted], System Operator, on the deployment, use, chemical handling, storage, and general trailer information on 3/4/2021. On 08/04/2021, [redacted] hosted the Contra Costa Fire Department at the Pittsburg converter station to train 12 Fire Responders on how to deploy and use the firefighting trailer properly and provided a site walk to identify oil-filled instruments where the trailer would be used in the case of fire. On 10/13/2021, the trailer manufacturer returned to the Pittsburg Converter station to provide the TBC Operations department with additional training. We also operationally tested all the components on each fire trailer and found

Program Target	Data Request	DR Response
		no defects on either unit. For sample training materials for onsite and local Fire Department, see filename "Foam Trailer Presentation.pdf'. For trailer and foam agent maintenance records, see filename "PITTSBURG Foam Trailer Maintenance Tracker.pdf" and "Potrero Foam Trailer Maintenance Tracker.pdf.
4. Fire Protection - Spare Parts Building fire sprinkler system.	We request fire sprinkler plans and inspection records for installation in Spare Parts Building for fire sprinkler system installation.	The spare parts building does not currently have a fire suppression system, only a smoke detection system. TBC is pursuing installing the fire suppression system as part of a project. The project is still in the scoping phase, and a complete project install plan will be created once we have a winning bidder. The estimated in-service date for the project is November 2022.
5. Fire Protection - Onsite fire hydrants.	We are requesting maintenance records for onsite fire hydrants.	Please see the example screenshot below from TBC's Asset Management Program demonstrating how we track work tasks to complete hydrant maintenance aligned with NFPA 25 Chapter 7 reference materials (for your convenience, see filename "FIRE HYDRANT REFERENCE MATERIALS (PDF).pdf."
6. Fire Protection - 2-hour fire-rated separation at auxiliary power rooms.	We request all documents, plans, photos, and inspection records for the 2-hour rated separation between the two auxiliary rooms.	Please find attached the fire hazard evaluation from The Fire Consultants, Inc., filename "LTHS Trans Bay Pittsburg rev 1.pdf".
7. Fire Prevention - Spare Parts Building compressed gas cylinders	Requesting documents showing the removal of compressed gas cylinders from the Spare Parts building and plans for the protective housing of the cylinders outside of the Spare Parts building.	Trans Bay Cable plans to put a flame-resistant gas cage outdoors as part of our file trailer parking area project. The project is in the procurement phase, with an estimated in-service date of October 2022. Conceptually, the location of the proposed garage port parking area is shown in the screenshots below on the site maps for both the Pittsburg and Potrero converter stations.

Program Target	Data Request	DR Response
8. Fire Prevention - Vegetation management.	We are requesting maintenance records and schedules for weed prevention spraying and abatement both onsite and along the perimeter walls of the facility.	Please see the example screenshot below from TBC's Asset Management Program demonstrating how we track work tasks to complete vegetation-related activities aligned with our TBC Converter Station Maintenance Practices document. See the example excerpt from the Vegetation section of the maintenance practices document, filename "Vegetation Inspection.pdf."
9. Fire Prevention - Transformer Monitoring System	We are requesting manufacturer data sheets and inspection records to install the Serveron transformer monitoring system.	Please see manufacturer data sheet filename "AP-G34-02A-03E_Serveron_TM8.pdf" for the online dissolved gas analysis monitors from Qualitrol. The Trans Bay Cable operator has a screen that provides the real-time status of the DGA monitors. See filename "PXL_20220523_220659838.jpg". One of the line items is to visually inspect the DGA monitors for any equipment trouble. In addition, the operations and maintenance technician (OMT) does a weekly inspection of the watch. As an example of the watch's weekly inspection, please see the excerpted screenshot from the OMT logs filename "2022 Inspection of Watch Tracking Rev 1.pdf".
10. Seismic Upgrades	We request manufacturer data sheets and installation inspection records for the transformer vibration isolators.	Please see filename "62HP-231-TS-045 TBC Seismic Isolation Engineering Report.pdf" for the seismic isolation engineering report prepared by Earthquake Protection Systems. For a photograph of the seismic isolation system installed, please see filename "IMG_5184.jpg".

APPENDIX E

Financial Analysis

		From ARC Report 2021			From Qtr. 1, 2022 Quarterly Data Report Dated April 15th, 2022					IE ARC Financial Audit Analysis		
#	WMP Category	2021 WMP Planned	2021 Actual	Difference	Actual CAPEX	Actual OPEX	Total Actual	Difference from 2021 Planned	TBC Comments	2021 WMP Activities	Failed to Fund WMP Activity?	IE Findings
1	Risk and Mapping	--	--	--	--	--	--	--	--	--	--	--
2	Situational Awareness	--	200	200	200	0	200	--	The initiative consisted of two projects: Real-time Cable monitoring and Transformer monitoring. Both completed in 2020. In 2021 transformer oil controls initiative was completed.	1. Large Volume/ Field Verifiable	No	Review of quarterly statement, Field Inspection-Field Verified

		From ARC Report 2021			From Qtr. 1, 2022 Quarterly Data Report Dated April 15th, 2022					IE ARC Financial Audit Analysis		
#	WMP Category	2021 WMP Planned	2021 Actual	Difference	Actual CAPEX	Actual OPEX	Total Actual	Difference from 2021 Planned	TBC Comments	2021 WMP Activities	Failed to Fund WMP Activity?	IE Findings
3	Grid Design / System Hardening	5,100	5,600	500	5,600	--	5,600	--	Initiative consisted of seismic upgrades to transformer pads. Began in 2020 and completed in 2021. Transmission oil controls project began in 2020 and was completed in 2021.	1. Large Volume/ Field Verifiable	No	Review of quarterly statement, Field Inspection-Field Verified
4	Asset Management and Inspections	--	--	--	--	--	--	--	--	--	--	--
5	Vegetation Management	--	--	--	--	--	--	--	--	--	--	--
6	Grid Operations	900	--	(900)	--	--	--	--	--	--	--	--
7	Data Governance	--	--	--	--	--	--	--	--	--	--	--
	Resource Allocation	--	--	--	--	--	--	--	--	--	--	--
9	Emergency Planning	--	--	--	--	--	--	--	--	--	--	--
10	Stakeholder Cooperation and Community Engagement	--	--	--	--	--	--	--	--	--	--	--
	TOTALS	6,000	5,800	(200)	5,800		5,800	--	--	--	--	--

CAPEX = Capital expenditure; OPEX = Operating expenditure.