2021
TRIENNIAL SAFETY REVIEW OF SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT

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2021 TRIENNIAL SAFETY REVIEW OF SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT

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1. EXECUTIVE SUMMARY

The California Public Utilities Commission's Rail Safety Division (RSD), Rail Transit Safety Branch (RTSB) personnel (Staff) conducted an on-site system safety program review of San Francisco Bay Area Rapid Transit District (BART) in November and December of 2021. The review focused on verifying BART's implementation of its safety plans, as well as BART's compliance with State and Federal rules and regulations. This report details Staff's investigatory actions, findings, and recommendations. The review revealed 56 areas of non-compliance, as discussed below.

An opening conference meeting between BART personnel and Staff immediately preceded the initial on-site review activities, on Monday, November 29, 2021. The review took place between November 9, 2021, through December 14, 2021, and focused on verifying the effective implementation of BART's System Safety Program Plan (SSPP) and recently adopted Public Transportation Agency Safety Plan (PTASP).

A post-review conference meeting took place following the review on June 3, 2022, during which Staff provided BART personnel with a synopsis of the review comments, findings, and recommendations. The review results indicate that BART maintains a comprehensive system safety program and has been implementing its SSPP/PTASP. However, Staff made note of several findings of non-compliance and propose recommendations for Corrective Action Plans in response as part of this report.

Section 2 of this report, titled Introduction, provides a summary of the authority under which the California Public Utilities Commission (CPUC, or Commission) performs the triennial reviews and presents a brief chronology of the review. Section 3, Background, includes a description of the BART system. Section 4 explains the procedures used by Staff during the System Safety Review. Staff's findings of non-compliance and recommendations are presented in Section 5, organized by source checklist numbers. Finally, the Appendices include tabulated findings and recommendations, and the complete set of review checklists with summaries of all review activities and the original comments, findings, and recommendations.

This report reflects Staff's triennial safety review of BART. The BART on-site triennial security review report is contained in a separate Report and is brought before the Commission for approval in a separate Resolution.[1]

[1] Staff's security review and report, *"2021 Triennial Security Review of San Francisco Bay Area Rapid Transit District"* is being brought before the Commission concurrently in Resolution ST-249.

2. INTRODUCTION

The Commission's General Order (GO) 164-E *Rules and Regulations Governing State Safety Oversight of Rail Fixed Guideway Systems*, and the Federal Transit Administration's (FTA's) Rule, Title 49 Code of Federal Regulations (CFR) Part 674, *State Safety Oversight*, require the designated State Safety Oversight Agencies to perform reviews of each rail transit agency's system safety program at minimum once every three years. The purpose of the Triennial Review is to verify compliance and evaluate the effectiveness of each rail transit agency's SSPP, and to assess the level of compliance with GO 164-E as well as other Commission safety requirements.

Staff conducted the previous On-Site System Safety Review of BART in September 2017. Due to the COVID-19 pandemic, which essentially began in the first months of 2020, on-site triennial safety and security reviews were suspended during 2020 until late 2021. Commission authorization for delaying and rescheduling the triennials was issued under Resolution ST-241. Staff notified BART's General Manager by letter, dated October 29, 2021, regarding scheduling of the Commission's Safety and Security Review to begin on November 29, 2021. The notifications included preliminary versions of the review checklists for BART to review and provide comments. With respect to BART's continued staffing shortage due to COVID impacts, operational and maintenance needs, Staff coordinated with BART to begin field inspection activities on November 9, 2021.

The Review of records began with an opening conference meeting on November 29, 2021, attended by CPUC Staff and BART's General Manager, and Assistant General Manager of Operations, Chief Safety Officer, Manager of Operations Safety, Safety Management Systems Manager, and additional personnel.

Staff conducted the on-site system safety inspections on November 9, 2021, and continued until December 14, 2021. The review of records and interviews began on November 29, 2021, and continued through December 15, 2021, with follow-up activities with BART staff continuing until March 2022. Staff provided BART personnel with a verbal summary of any preliminary findings and discussed potential recommendations for corrective actions at the conclusion of each review activity.

On June 4, 2022, Staff conducted a post-review exit meeting with BART management to verbally convey all the findings from the Review. Staff provided the attendees with a summary of the findings of non-compliance derived from the 38 checklists used to guide the review and discussed the need for corrective actions where applicable.

3. BACKGROUND

SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT
SYSTEM DESCRIPTION

The Original System

BART began revenue operations on September 11, 1972, along 28 miles of track in Alameda County, servicing Oakland to Fremont. The second segment opened on January 29, 1973, with 12 miles of track extending to Richmond. A 17-mile segment, opening May 21, 1973, offered service from Oakland to Concord. On November 5, 1973, a new, temporarily disconnected 7.5 mile segment opened between Montgomery Street in Downtown San Francisco and Daly City. The Transbay Tube opened on September 16, 1974, fully connecting the 71.5 miles of track of the original BART system. Embarcadero Station opened on May 27, 1976, bringing the total station count to 34 without any additional track.

Completed Extensions

An extension to the Concord line, continuing to the North Concord/Martinez Station, opened on December 16, 1995, adding 2.25 miles of track to the BART system. The Colma Station opened for revenue service on February 24, 1996, adding 1.6 miles of track south of the Daly City Yard. The Pittsburg/Bay Point Station opened on December 7, 1996, completing the 7.8-mile extension from Concord station which included the North Concord/Martinez Station. The Dublin/Pleasanton extension opened on May 10, 1997, adding 14 miles of track and two stations to the system. The San Francisco Airport extension opened on June 22, 2003, adding four stations and 8.7 miles of track. The Warm Springs Extension Project added 5.4 miles of track, extending from the Fremont Station to the Warm Springs Station in South Fremont and opened for revenue service on March 25, 2017. The Berryessa Extension Project expanded the system 10 miles further south from Warm Springs to Berryessa Station, in San Jose, and was opened for revenue service on June 13, 2020.

The **Oakland Airport Connector (OAC),** a 3.2-mile automated people mover system, connects the main BART system from BART Coliseum Station to the Oakland Airport, and was approved for revenue service on November 24, 2014.

The **East Contra Costa BART Extension (eBART, currently the E-Line**), which operates Diesel Multiple Unit vehicles, provides passenger service along 10.1 miles of the California State Route 4 corridor connecting Pittsburg/Bay Point Station to Antioch Station. The segment was opened for revenue service on May 26, 2018.

The current BART system operates on 131 miles of track with 50 stations on the following six operating lines:

- Richmond—Millbrae Line
- Richmond—Berryessa/North San Jose Line
- Antioch—SFO Airport Line
- Daly City—Berryessa/North San Jose Line
- Daly City—Dublin/Pleasanton Line
- Coliseum Station—Oakland Airport Line

Capital Projects

CPUC monitors all system modifications the System Safety or Engineering Departments decide will require a formal system analysis, in accordance with General Order 164-E, Section 11, and the PTASP, Section 7.6.3. BART has several major system extensions and modifications currently in progress.

The **Santa Clara Valley Transportation Authority/Silicon Valley Rapid Transit Project** VTA is completing design and engineering for Phase II (6 miles) of the BART Silicon Valley Extension, which includes a subway tunnel through downtown San Jose, 4 stations and a Newhall Yard Maintenance Facility in the City of Santa Clara. Construction of the second phase is expected to begin in 2023 with passenger service targeted for 2036. The safety and security certification committee (SSCP) for this project was submitted by BART and was approved by the CPUC in Resolution ST-83 (2/15/2007). On June 16, 2021, Staff received the project safety certification plan (SCP) for the phase II, and CPUC approval was sent on August 17, 2021, approving the SCP.

The **Irvington Station Project** will include constructing a new station with twin at-grade side platforms and an overhead concourse, which will be the third station within the City of Fremont, halfway between the existing Fremont and Warm Springs / South Fremont stations. Originally adopted by the BART Board of Directors in 1992 as a two-station extension (Warm Springs and Irvington), the Warm Springs Extension Project was re-scoped, and Irvington Station was made an "optional" station with funding to be identified separately by the City of Fremont. The project was re-scoped and re-adopted throughout the years, with the most recent in 2019 to better comport with current circumstances including updated BART policies and City of Fremont development guidelines. The estimated completion date for construction is 2029, depending upon funding and the availability and extent of construction windows as supported by BART single-tracking operations. The SSCP for this project was submitted by BART and was approved by the CPUC in Resolution ST-240 (11/5/2020). The Project has completed 90% of the final design.

The **Hayward Maintenance Complex Project Phase I** (HMC I) added and replaced four components to the existing Haward Yard facilities. It modified the Hayward Main Shop, replaced the Component Repair Shop, added the Central Warehouse, and added 7,200 ft. of new trackwork. BART submitted the SSCP and was approved by the Commission on 12/17/2015 under Resolution ST-181. BART opened portions of the project under interim approvals as components were completed. The full safety certification verification report (SCVR) was submitted by BART on 7/8/2022 and approved by Commission Staff on 10/6/2022.

The Transbay Corridor Core Capacity Program (TCCCP) is a package of strategic investments that will allow BART to operate up to 30 ten-car trains per hour (300 cars) in each direction through the existing tube, maximizing throughput in the most heavily used part of its system. The program includes four elements: additional railcars to provide the additional trains needed, a new communications-based train control system that will allow closer headways, a new railcar storage yard at the Hayward Maintenance Complex, and additional traction power substations to provide the additional power needed for the more frequent service. The program entered FTA's Core Capacity Project Development in August 2015 and entered Engineering in June 2019.

- The **Traction Power System Improvements Project** (TPSIP) will add new traction power substations (TPSS) in five areas throughout the BART system to meet electrical power requirements to meet the TCCCP. The five sites have been divided into two projects with each project served by a separate General Engineering Consultant (GEC) Preliminary Engineering Team. One project includes the West Bay sites (M-Line Civic Center Station TPSS and M-Line Montgomery Street Station TPSS), and one project includes the East Bay sites (K-Line Thirty Fourth Street TPSS, C-Line David Avenue and Minert Road TPSS, and R-Line Richmond Yard East TPSS). Both projects are monitored by a single BART Project Manager and a GEC Design Oversight Team. The SSCP for this project was submitted by BART and was approved by the CPUC in Resolution ST-239 (10/26/2017). West Bay sites are under construction; East Bay sites are ready for construction bids.

- The **Hayward Maintenance Complex Project Phase II** (HMC II) will add additional storage tracks (East storage yard), Industrial Parkway Overcrossing Structure, Golf Cart/personnel overcrossing structure, and additional facilities. The SSCP for this project was submitted by BART and was approved by the CPUC in Resolution ST-218 (3/28/2019).

- The **Communications-Based Train Control Project** (CBTC) will replace BART's

existing signaling system with Communications-Based Train Control (CBTC). CBTC technology utilizes two-way digital Radio Frequency communication between intelligent trains, and a network of distributed zone controllers. The primary characteristics of a CBTC System include: High-resolution train location determination, by carborne equipment, independent of track circuits; Communication between the carborne equipment and wayside CBTC equipment over a radio frequency train-to-wayside data communications link; Determination of movement authority limit information for each CBTC-equipped train, by the wayside zone controllers, based on derived train location information and inputs from wayside interlockings; and determination and enforcement of the safe speed/distance profile by the carborne CBTC equipment. The project is a design-build project and will be conducted in phases. BART will start CBTC with vehicle specific design and testing. Subsequently, BART will install CBTC wayside equipment on a test track and perform testing with certified vehicles. Lastly, BART will install CBTC on mainline track, and test CBTC with certified vehicles. The mainline testing process will be repeated for all segments. The SSCP for this project was submitted by BART and was approved by the CPUC in Resolution ST-206 (7/16/2020).

- The **New Vehicle Procurement Project** (NVP) will add up to 1000 new rail cars to BART's existing fleet. Alstom (originally Bombardier) is manufacturing a complete replacement of the Legacy fleet. BART is continuing to make progress on the project, and to date 656 cars have been added to the fleet. The entire legacy fleet has been retired as of September 11, 2023. The SSCP for this project was submitted by BART and was approved by the CPUC in Resolution ST-150 (3/22/2013).

FOLLOW-UP STATUS OF THE 2017 BART TRIENNIAL REVIEW

The BART 2017 Triennial On-Site Safety Review demonstrated that BART was in substantial compliance with its SSPP but included 42 findings of non-compliance and 47 recommendations for corrective actions to BART System Safety Department.

CPUC Commission Resolution ST-215 adopted the Staff's final report and ordered that BART submit to RTSB appropriate plans and schedules based on Staff's recommended corrective actions, and implement the submitted plans. ST-215 also ordered BART to submit quarterly status reports on the progress of the corrective actions through completion to RTSS.

BART developed and submitted Corrective Action Plans (CAPs), including a schedule for completion of each item, to address each of the recommendations and kept CPUC informed about the progress of the corrective actions as required by General Order 164-E. Some CAPs, such as issuance of operating bulletins or minor procedural changes, were completed immediately. More substantial procedure and system configuration changes required months or years to complete. BART completed all but 1 CAP, which is still being resolved between BART and PG&E. Staff are continuing to monitor discussions between the two parties as they collect data and are working towards a solution to stray current on the traction power system.*

* See 2021 BART Triennial Review Checklist 15-B for Staff follow-up and additional detail.

4. SYSTEM SAFETY REVIEW PROCEDURE

Staff conducted the 2021 System Safety Review of BART in accordance with Rail Transit Safety Section Procedure RTSB-4, *Procedure for Performing Triennial Safety Audits of Rail Transit Systems*. Staff developed 38 checklists to cover various aspects of system safety responsibilities, based on Commission and FTA requirements, BART's SSPP/PTASP and other safety-related documents, and Staff's knowledge of BART operations. The checklists are included as Appendix C of this report.

Each checklist identified safety-related elements and characteristics that Staff either inspected directly or by reviewing reports and records. The completed checklists include 56 findings of non-compliance, and 48 recommendations pertaining to BART's SSPP/PTASP and its procedures, and/or Commission regulations. The methods used to perform the review included:

- Discussions and interviews with BART management
- Review of rules, procedures, policies, and records
- Observations of operations and maintenance activities
- Interviews with rank-and-file employees
- Inspections and measurements of equipment and infrastructure

The review checklists concentrated on requirements that affect the safety of transit operations and are known or believed to be important in reducing safety hazards and preventing safety incidents.

5. FINDINGS AND RECOMMENDATIONS

The reviewers and inspectors who participated in the On-Site System Safety Review concluded that BART has a comprehensive PTASP and is implementing it. However, Staff observed 56 findings of non-compliance and provided 48 recommendations to improve the system safety program. These findings and recommendations are listed below and grouped by checklist number.

1. Policy Statement and Authority for System Safety Program Plan / Public Transportation Agency Safety Plan: Management Involvement and Commitment to Safety

No findings of non-compliance; no recommendations.

2. System Safety Program Plan / Public Transportation Agency Safety Plan: Goals and Objectives

No findings of non-compliance; no recommendations.

3. Overview of Management Structure

No findings of non-compliance; no recommendations.

4. System Safety Program Plan / Public Transportation Agency Safety Plan: Control and Update Procedures

No findings of non-compliance; no recommendations.

5. System Safety Program Plan / Public Transportation Agency Safety Plan: Implementation, Activities, and Responsibilities

No findings of non-compliance; no recommendations.

6. Hazard Management Process

No findings of non-compliance; no recommendations.

7. System Modifications

Findings of Non-Compliance:

1. Staff determined Safety Department was not able to show communication records, such as review comments, inspections or observations made pertaining to system modifications for in-house projects.
2. Staff found in-house project preliminary hazard analysis (PHA) matrices did not have mitigation tracking status.

Recommendations:

1. BART must document Safety Department involvement during in-house safety certification process.
2. BART must add a column to track mitigation status in the PHA matrix.

8. Safety and Security Certification

Findings of Non-Compliance:

1. Staff found TPSS SCP was not consistent with GO 164-E, Section 11.3, Requirements for Safety Certification Plan, which requires RTA to submit a SCP to Staff for review and Commission for approval during the preliminary engineering phase. TPSS SCP was submitted after final design and ready for construction bids.

2. Staff found HMC Central Warehouse was partially in service as a storage facility prior to SCVR approval.

Recommendations:

1. BART must ensure their staff and consultants who may be working on capital projects become familiar with GO-164E Requirements for Safety Certification Plan and adhere to said rules.

2. BART must ensure facilities, equipment and vehicles are not put into service prior to SCVR approval by Staff or communicate with Staff of any special circumstance.

9. Safety Data Collection and Analysis

No findings of non-compliance; no recommendations.

10. Events - Accident/Incident/Occurrences Investigations

No findings of non-compliance; no recommendations.

11. Emergency Management Program

Findings of Non-Compliance:

1. Staff found After-Action Reports for some exercises were not created. BART is in the process of creating after action reports for each exercise and include critique, evaluations by participants, also track recommended improvements needed related to each exercise through completion.

Recommendations:

1. BART must document an After-Action Report for each exercise/drill performed on BART System including tracking each recommendation and corrective action until resolved.

12. Internal Safety Audits/Reviews

Findings of Non-Compliance:

1. Staff found BART staff did not always notify the RTSB Designated Representative of audits nor provide the checklists prior and when they did, it was less than 30 calendar days in advance. eBART staff produced evidence of a notification, which included the checklists, but it was indeterminable whether it was sent 30 calendar days in advance of audits.

Recommendations:

1. Per General Order 164-E Section 5.4, BART and eBART staff must submit the ISA schedule, including any subsequent changes, to CPUC at least 30 calendar days before any scheduled audits. Per General Order 164-E Section 5.5, BART and eBART staff shall also provide the ISA checklists to CPUC prior to the audit.

13-A. Rules Compliance: Observation and Enforcement

No findings of non-compliance; no recommendations.

13-B. Rules Compliance: Operation Safety Compliance

No findings of non-compliance; no recommendations.

13-C. Rules Compliance: Hours of Service

No findings of non-compliance; no recommendations.

13-D. Rules Compliance: Contractor Safety Program

No findings of non-compliance; no recommendations.

13-E. Rules Compliance: Operating Rules and Procedures Manual and Operating Bulletin Revisions

Findings of Non-Compliance:

1. Staff found BART System Safety has not implemented a process for the data captured during rules checks, assessments, and testing to monitor unsafe patterns, trends and practical drift through the safety management system (SMS) process. System Safety receives an annual update regarding rule checks, assessments and testing from each department but has failed to utilize the captured data as outlined in the BART PTASP and SMS process.
2. Staff found BART has not fully implemented the Hazard Management Process per the BART PTASP. The Hazard Management Process is being utilized in only a couple departments.

Recommendations:

1. BART System Safety must attend all meetings relevant to BART Hazard Management Process and track trends, Practical Drift, and SMS.
2. BART must ensure the Hazard Management Process is being utilized throughout the entire system in all departments as outlined in their PTASP. BART must ensure there is a process to conduct an analysis of the continuous data captured in rules checks, assessments, and testing addressing each safety risk and CAP.

13-F. Rules Compliance: Operations Control Center & SCADA

No findings of non-compliance; no recommendations.

14-A. Facilities Equipment Inspections: Non-Revenue Facilities and Wayside

Findings of Non-Compliance:

1. Staff found monthly inspection forms not properly documented and noted. See Checklist 14-A Comment 1.
2. Staff found hazards are not tracked through resolution, CAPs not developed. See Checklist 14-A Comment 1.

Recommendations:

1. BART must review and sign monthly inspection forms.
2. BART must develop CAPs and track all hazards through resolution.

14-B. Facilities Equipment Inspections: Stations and Emergency Equipment

Findings of Non-Compliance:

1. Staff found BART did not inspect its passenger stations at the required frequency of "…at least once every six months within a calendar year" as required by its SSPP, Section 1401. The same finding was also noted in the previous triennial audit. See Checklist 14-B Comment 1.
2. Staff found inspections were not properly documented, and discrepancies were not corrected in a timely manner. See Checklist 14-B Comment 2.
3. Staff found potential hazards not tracked through to resolution per the SSPP or PTSAP. See Checklist 14-B Comment 2.

Recommendations:

1. BART must complete all inspections according to applicable procedure.
2. BART must ensure inspection forms are accurate and discrepancies corrected.
3. BART must track potential hazards through resolution.

14-C. Facilities Equipment Inspections: Tunnels, Bridges, and Aerial Structures

Findings of Non-Compliance:

1. Staff found the Section Manager in charge of BART's Structural Inspection Program, although having many years of experience in construction trade and structural inspection, is not a Civil Engineer. Industry standards and BART's Structures Inspection Manual (Manual) require this position to be filled by a Registered Civil Engineer.
2. Staff found eBART and the S-Line are not included in Volume 1 of the Structural Inspection Manual (Manual) system description and structural inventory; and the Y-Line is in system description but not in the structural inventory. Staff also found the organization chart has outdated personnel names. The revision log was present documenting changes made to each revision; however, it lacked approval sign off and the name of the book author.
3. Staff found that Volume 2 of the Manual was last updated in 1994, and it does not have: an author sign off, a table of contents, or include BART's newest extensions. Volume 2 of the Manual should be properly referenced in Volume 1.
4. Volume 1 of the Manual has a list of required structural inspector training. Staff found inspectors were not issued a training certificate, and training is not recorded or tracked.
5. Staff found that numerous structures had requests for maintenance (RFMs) opened as early as 2017, and many RFMs have not been completed.
6. Staff found the Manual does not include the FCM list or related inspection procedure.
7. BART indicated TBT cathodic protection (CP) power supply inspections delay was due to pandemic impact. Staff noted delays occurring after March 2020, may have been impacted by the pandemic, but not before.
8. For the 59 detailed CP power source inspection records, Staff found test forms do have essential test values recorded; however, other information is not always filled out, such as multimeter calibration date, associated work order numbers, and follow-up work repair order numbers (if needed). Also, test results prompting a "C" as completed or a "I" as incomplete are marked with a check mark or technician's initials.
9. Staff found that the ranges on the transbay tunnel (TBT) CP power supplies test forms are outdated and need to be revised.

10. Staff found based on BART's provided CP data and interviews with its CP engineers, Staff cannot determine if TBT CP system provides proper corrosion protection due to uncertain baselines and pending results. One-third of TBT CP anodes are not functioning.
11. Staff found the Manual does not cover CP procedure.
12. Staff found a missing expansion joint filler material on aerial structure A-118 C1 was rated a "1" instead of a "3" for corrective action.
13. Staff found TBT seismic joint movement measurements were not recorded, and joints have heavy debris that need to be cleaned.
14. TBT drilled core holes are to be inspected annually. Since the previous triennial audit in 2017, Staff found that the TBT drilled core holes were not inspected in 2019, by either the CP or Structural Inspection group.

Recommendations:

1. The head of BART's Structures Inspection Program must be a registered civil engineer.
2. BART must implement the following changes to BART Structures Inspection Manual (Manual) Volume 1: a) eBART and S-Line must be included in the system description and structural inventory; b) Y-Line should be included in the structural inventory; c) update organization chart outdated personnel names; d) revision log must include approval sign off by applicable departments and include the book author; e) properly reference Volume 2 of Manual.
3. Manual Volume 2 must be updated with a table of contents, newest extensions, and properly reference Volume 1 of the Manual.
4. Inspector training must be documented. Inspectors should be issued training certificates for completing structural inspector training. Certificates should be tracked and retained with BART records.
5. BART must prioritize and resolve all open RFMs since 2017.
6. BART must include fracture critical member (FCM) structures list and their inspection and maintenance procedure in the Manual.
7. BART must demonstrate that the TBT CP power supplies are consistently inspected twice a year and within the 4 to 8-month window.
8. CP rectifier and power supplies maintenance test forms must have a secondary check for completeness before archiving to eliminate blank or incomplete fields.

9. BART must update the range values on the TBT CP power supplies test form and procedure.
10. BART must determine the baselines of TBT CP reference electrodes and electrical resistance probes, and assess if TBT has sufficient corrosion protection with recommended solutions, as appropriate.
11. The Manual must include the responsibility of CP maintenance and include or reference appropriate CP procedures.
12. BART must repair the missing expansion joint filler material on aerial structure A-118 C1.
13. BART must document TBT seismic joint movement measurements in future structural inspections. Seismic joints must be cleaned to perform proper visual inspection and free of debris.
14. BART must inspect TBT drilled core holes annually.

14-D. Facilities Equipment Inspections: GO 95 Right-of-Way Compliance

Findings of Non-Compliance:

1. Staff found at K35 SW261 a traction power ground conduit missing liquid tight as required by GO 95.
2. Staff found at K35 adjacent to SW261 a power junction house has water intrusion through the main door in violation of GO 95.
3. Staff found within the power junction house at K35 adjacent to SW261 the fire extinguisher has no inspection tag per NFPA 130.
4. Staff found during a tunnel inspection that all fire extinguishers are either missing or out of date per NFPA 130.
5. Staff found at SW153, SW153, and SW287 in A05 missing MC500 bonds as required by GO 95 and BART Book 31.
6. Staff found that location A05 was missing the annual test inspection for the third rail in 2021 per section 79.6 of GO 95 and BART Book 31.

Recommendations:

1. BART must seal all traction power ground conduits per GO 95.
2. BART must ensure power junction house K35 adjacent to SW261 has no water intrusion per GO 95.
3. BART must ensure all fire extinguishers throughout the property are in place, properly marked, have inspection tags, are up to date, and comply with NFPA 130.

4. BART must replace missing bonds identified in finding 5 above per GO 95 and BART Book 31.
5. BART must perform all inspections according to GO 95, BART Book 31, and PTASP.

14-E. Facilities Equipment Inspections: Signal Communication and Train COntrol

Findings of Non-Compliance:

1. Staff found BART Train Control department is behind on Preventative Maintenance (PMs) for Relays, Switches, Track Circuits, Signal house inspections, Interlocking, etc., with main BART at 155 days past due and eBART 281 days past due at worst case. (eBART SSPP, BART PTASP, Book 20.)

Recommendations:

1. BART must ensure all Train Control PMs are up to date per standards and procedures. (E-BART SSPP, BART PTASP, Book 20)

14-F. Facilities Equipment Inspections: Measurement and Testing Instrumentation

No findings of non-compliance; no recommendations.

15-A. Maintenance Audits and Inspections: Rail Vehicles (Revenue & Non-Revenue)

Findings of Non-Compliance:

1. Staff found multiple preventive maintenance inspections on revenue vehicles completed outside of the allowable time frame. See Comment 3 below.

Recommendations:

1. BART must complete preventive maintenance inspections within procedural time frames.

15-B. Maintenance Audits and Inspections: Traction Power System

Findings of Non-Compliance:

1. Staff found that COVID-19 related budget shortfall and BART early retirement options resulted in testing and maintenance falling behind. There has been a substantial drop in maintenance staff in all of BART's departments. Due to the lack of staff, the following inspections and equipment testing have not been conducted in their recommended frequency since the inception of COVID-19 international pandemic:
   Bay Area Rapid Transit, Maintenance and Engineering Procedure, Book 31, Chapter 1:
   Section 13: 1K VDC Bus Preventative Maintenance
   Section 17: Wayside Monthly PM
   Section 5: 1K VDC Circuit Breaker & Cubicle Semi & Annual PM Check
2. Staff found substations and the Lake Merritt station are dirty and dusty. West Oakland and MacArthur substations are dusty. BART PTASP Section 7.2.4 states that buildings should maintain General Good Housekeeping. Dirt and dust can lead to electrical arching and should be considered a hazard.

Recommendations:

1. BART must conduct all inspections and testing prescribed by their procedural frequency.
2. BART substations must be clean and free of dirt and dust to minimize the threat of electrical arcing.

15-C. Maintenance Audits and Inspections: Train Control and Signal Systems Maintenance

Findings of Non-Compliance:

1. Staff found at MacArthur Train Control Room that cabinet 79 & 78 relays are not currently up to date in testing. (BART PTASP.)
2. Staff found at MacArthur Train Control Room that the eye wash station maintenance was out of date. (BART PTASP.)
3. Staff found at SW251, and SW287 in A05, the switch indicator lights have either broken lenses or are not working. (BART PTASP, Book 20.)

Recommendations:

1. BART must ensure all vital relays are maintained in compliance with the BART PTASP.
2. BART must ensure eye wash stations are maintained in compliance with the BART PTASP.
3. BART must maintain switch indication stands per BART PTASP and Book 20.

15-D. Maintenance Audits and Inspections: Tracks and Turnouts

Findings of Non-Compliance:

Staff found the following deficiencies:

1. Tie defects throughout K–line turnouts SW365, SW165, SW167, SW463, SW261 (Book 425 S4.2.1C) (Book 425 S4.2.2 B) (Book 425 S4.2.3) (CFR213.109 C1).
2. Loose Frog Bolts and Guardrail Bolts SW165 (Book 425 S6.3 D).
3. Ballast shoulders and walkway defects in addition switch stand pads SW167, SW165, SW463, SW365, and SW261 (Book 425 S4.1) (CFR 213.103) (G.O. 118, Sections 11 through 15).
4. Worn rail head section at C1 & C3 X-OVER SW165 from switch point through closer rail 5/8" head wear (Book 425 S6.2 M).
5. Missing fasteners at track joints SW261 (Book 425 M4.2) (Book 425 M4.3 C).
6. Staff found Missing track bolts SW189 (Book 425 S5.5 D) (CFR 213.121 C).
7. Insulated joints spiked incorrectly at SW287 (Book 425 M5.5 4B).
8. Lubricators left in middle of track creating a tripping hazard SW251. (BARTs documents & Procedures 1001.04 Keeping Areas Clean.)
9. Rail gauge worn ½" at SW131 (Book 425 S6.2 M).
10. Pedestrian concrete crossing panel broken creating tripping hazards, replace or repair. SW251 (BARTs documents & Procedures 1001.04 Keeping Areas Clean) (CCR Title 8, Section 3273 Working Area).
11. Rail fasteners missing at multiple locations, up to 4 or 5 fasteners in a row between SW211 & SW189 (Book 425 M4.2).
12. BART failed to provide requested track inspection records for 2019. (Book 425 S7. 5. D)
13. BART failed to provide requested (T001) & (T002) geometry car defect/exceptions documents for 2019, 2020, 2021.

Recommendations:

1. BART must ensure Defective Tie conditions are remediated in a timely manner throughout the system.
2. BART must remove or repair lubricator and clean area from excessive grease creating a slipping hazard around the switch areas and general housekeeping in track ways (BARTs documents & Procedures 1001.04 Keeping Areas Clean-Section IV. 401 Slip Trips and Fall protection) (California Code of Regulations (CCR) Title 8, Section 3273 Working Area).
3. BART must repair or replace broken crossing panels in compliance with BARTs Procedure 1001.04 Keeping Areas Clean-Section IV. 401 Slip Trips and Fall protection and CCR Title 8, Section 3273 Working Area.
4. BART must ensure that all rail fasteners are being identified and remediated in a timely manner during inspections in compliance with Book 425 M4.2.
5. BART must ensure that all records are available for triennial audits as in compliance with BART Track Safety Standards and Commission General Orders 164 and 143.
6. BART must ensure Geometry Car Data Handling information is tracked through completion in compliance with Book 425, Track Safety Standards and Maintenance Standards, Appendix K procedures.

16-A. Training and Certification Programs: Train Operators, Controllers, and Line Supervisors

No findings of non-compliance; no recommendations.

16-B. Training and Certification Programs: Maintenance Employees

No findings of non-compliance; no recommendations.

16-C. Training and Certification Programs: Maintenance Employees and Contractors

No findings of non-compliance; no recommendations.

17. Configuration Management and Control

No findings of non-compliance; no recommendations.

18. Local, State, and Federal Requirements - Employee Safety Program

No findings of non-compliance; no recommendations.

19. Hazardous Materials Programs

Findings of Non-Compliance:

1. BART Maintenance and Engineering Department (M&E) Oakland Shops HAZMAT/Waste facility and storage area was found to have the following deficiencies: Access gates blocked by pallets containing HAZMAT (improperly labeled, packaged, and segregated), presenting an emergency response hazard, and leaking onto the ground; Eyewash station unserviceable and not inspected or maintained; Spill kit empty and not maintained; HAZMAT storage facility weekly reporting not completed and maintained; Packages within the storage facility are not contained and segregated; HAZMAT being stored shall be disposed of properly.

Recommendations:

1. BART must manage the M&E Oakland Shops HAZMAT/Waste facility and storage area in compliance with BART reference criteria, applicable State and Federal requirements, industry standards, and industry best practices as described by BART Employee/Patron Safety and Environmental Compliance Department.

20. Drug and Alcohol Program

Findings of Non-Compliance:

1. Staff found BART disregarded its own policy and gave Employee #XXX640, a T/O, a second chance rather than terminating her after a second drug and alcohol (D&A) offense.

Recommendations:

1. BART must adhere to their own established D&A policy which includes termination upon finding a second offense.

21. Procurement Process

No findings of non-compliance; no recommendations.

22. CPUC GO 172 – Personal Electronics Device Prohibitions/In-cab Cameras

Findings of Non-Compliance:

1. Staff found only BART operations control center (OCC) Employees follow General Order 172, Section 5.3. All other BART Departments are to create a personal electronic device (PED) refresher course that meets the criteria as outlined in the Recommendation below.

Recommendations:

1. BART must have all Departments and Employees follow General Order 172, Section 5.3: "RTAs [Rail Transit Agencies] shall notify and instruct their employees on the provisions of the RTA's PED zero-tolerance policy and program regarding electronic device use. Each RTA shall provide a refresher course on its zero-tolerance policy and program at least every two (2) years. Records showing compliance with this requirement shall be maintained for a minimum of three (3) years."

23. CPUC GO 175-A – Rules and Regulations Governing Roadway Worker Protection Provided by Rail Transit Agencies and Fixed Guideway Systems

No findings of non-compliance; no recommendations.

APPENDICES

Abbreviation and Acronym List ..... Appendix A.

Checklist Index ..... Appendix B.

Checklists ..... Appendix C.

APPENDIX A. ABBREVIATION AND ACRONYM LIST

Abbreviation or Acronym:	Definition:
AGMO	BART Assistant General Manager of Operations
ATCS	Automatic Train Control System
ATIS	Automated Track Information System
ATP	Automatic Train Protection
BART	San Francisco Bay Area Rapid Transit District
BECO	BART Engineering Change Order
Cal/OSHA	California Division of Occupational Safety and Health
CAP	Corrective Action Plan
CE	BART Chief Engineer
CFR	Code of Federal Regulations
CM	Configuration Management
Commission	California Public Utilities Commission
CPUC	California Public Utilities Commission
CSO	BART Chief Safety Officer
CTO	BART Chief Transportation Officer
DTS	Data Transmission System
eBART	East Contra Costa BART Extension
ECC	Emergency Control Center
ESP	Earthquake Safety Project
FLC	Fire Liaison Committee
FLS	Fire Life Safety
FLSSC	Fire Life Safety and Security Committee
FTA	Federal Transit Administration

Abbreviation or Acronym:	Definition:
GM	BART General Manager
GO	CPUC General Order
IIPP	Injury and Illness Prevention Program
ISA	Internal Safety Audit
ISSA	Internal Safety and Security Audit
JUMSC	Joint Union Management Safety Committee
M&E	Maintenance and Engineering Department
MP	Mile Post
MRB	Material Review Board
MSDS	Material Safety Data Sheet
NFPA	National Fire Protection Association
NTSB	National Transportation Safety Board
NNR	Notice of Needed Repair
OCC	Operations Control Center
OSCP	Operations Safety Compliance Program
OR&P	Operations Rules and Procedures Manual
PE	Preliminary Engineering
PED	Personal Electronic Device
PG&E	Pacific Gas and Electric Company
PHA	Preliminary Hazard Analysis
PM	Preventative Maintenance
QA	Quality Assurance
QR	Quality Report
RS&S	Rolling Stock and Shops Department
RTA	Rail Transit Agency

Abbreviation or Acronym:	Definition:
RTSB	Rail Transit Safety Branch
RTSS	Rail Transit Safety Section
SCADA	Supervisory Control and Data Acquisition
SCP	Safety Certification Plan
SSCC	Safety and Security Certification Committee
SSPP	System Safety Program Plan
SSWP	Site Specific Work Plan
Staff	CPUC Personnel
SVBX	Silicon Valley Berryessa Extension
TBT	TransBay Tube
TC	Train Control
TSS	Track Safety Standards
UOL	Unusual Occurrence Log
UOR	Unusual Occurrence Report

APPENDIX B. CHECKLIST INDEX

Checklist No.:	Element/Characteristic:
1	Policy Statement and Authority for System Safety Program Plan/ Public Transportation Agency Safety Plan – Management Involvement and Commitment to Safety
2	System Safety Program Plan/ Public Transportation Agency Safety Plan – Goals and Objectives
3	Overview of Leadership Structure
4	System Safety Program Plan/ Public Transportation Agency Safety Plan – Control and Update Procedure
5	System Safety Program Plan/ Public Transportation Agency Safety Plan – Implantation
6	Hazard Management Process
7	System Modification
8	Safety and Security Certification
9	Safety Data Collection and Analysis
10	Events - Accident/Incident/Occurrences Investigations
11	Emergency Management Program
12	Internal Safety Audits/Reviews
13-A	Rules Compliance - Observation and Enforcement
13-B	Rules Compliance - Operations Safety Compliance
13-C	Rules Compliance - Hours of Service
13-D	Rules Compliance - Contractor Safety Program
13-E	Rules Compliance - Operating Rules and Maintenance Procedures Manual and Operations Bulletin Revisions
13-F	Rules Compliance - Operations Control Center & SCADA
14-A	Facilities and Equipment Inspections - Non-Revenue Facilities and Wayside

Checklist No.:	Element/Characteristic:
14-B	Facilities and Equipment Inspections - Stations and Emergency Equipment
14-C	Facilities and Equipment Inspections - Tunnels, Bridges, and Aerial Structures
14-D	Facilities and Equipment Inspections - GO 95 Right-of-Way Compliance
14-E	Facilities and Equipment Inspections - Signal Communication and Train Control
14-F	Equipment Maintenance Program - Measurement and Testing Instrumentation
15-A	Maintenance Audits and Inspections - Rail Vehicles (Revenue & Non-revenue)
15-B	Maintenance Audits and Inspections - Traction Power System
15-C	Maintenance Audits and Inspections - Train Control and Signal Systems Maintenance
15-D	Maintenance Audits and Inspections - Tracks and Turnouts
16-A	Training and Certification Programs - Train Operators, Controllers, and Line Supervisors
16-B	Training and Certification Programs - Maintenance Employees
16-C	Training and Certification Programs - Maintenance Employees and Contractors
17	Configuration Management and Control
18	Local, State, and Federal Requirements - Employee Safety Program
19	Hazardous Materials Programs
20	Drug and Alcohol Program
21	Procurement Process
22	CPUC GO 172 – Personal Electronic Device Prohibition/In-cab Cameras
23	CPUC GO 175-A – Rules and Regulations Governing Roadway Worker Protection Provided by Rail Transit Agencies and Fixed Guideway Systems

APPENDIX C. CHECKLISTS

CPUC develops a series of checklists prior to each triennial safety review of California Rail Transit Agencies. These checklists are based on the 21 elements which are required to appear in each agency's SSPP/PTASP and are customized according to the SSPP/PTASP and the unique features of the agency under review. Two additional elements are included based on CPUC General Order 172 and General Order 175-A.

BART received a draft version of these checklists, showing only the Reference Criteria and Element/Characteristics and Method of Verification fields, on October 29, 2021, and CPUC coordinated with BART to modify the checklists to better reflect the nature of the BART system and the intent of CPUC's review. BART provided facilities in appropriate locations throughout the system, and representatives from either agency were carefully selected to attend each checklist activity to maximize the effectiveness of the review. Although each checklist provides guidance for the activities, CPUC reviewers are authorized to inquire about and inspect any aspect of the BART system they determine to be relevant to system safety and the section of the SSPP in question.

CPUC reviewers provided immediate feedback to BART representative regarding any initial findings following a checklist's activities. The reviewers then revise the checklist document to include a summary of their review, findings of non-compliance, recommendations for corrective action, and any additional comments. The complete checklists are provided below.

2021 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT (BART)

Checklist No.	**1**	**Element**	Policy Statement and Authority for System Safety Program Plan/ Public Transportation Agency Safety Plan: Management Involvement and Commitment to Safety
Date of Audit	November 29, 2021	**Department(s)**	Executive Management
Auditor/Inspector	Daren Gilbert Michael Borer Daniel Kwok	**Persons Contacted**	Robert Powers Shane Edwards Jeff Lau

REFERENCE CRITERIA

1. CPUC General Order 164-D/E
2. 49 CFR 659/674
3. BART System Safety Program Plan (SSPP) Revision 11 dated February 2019
4. BART Public Transportation Agency Safety Plan (PTASP) Revision 2 dated June 8, 2020

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

Policy Statement and Authority for System Safety Program Plan and Public Transportation Agency Safety Plan: Executive Management Involvement and Commitment to Safety

Interview RTA's Executive Management to discuss:

1. Source, frequency and depth of safety information provided to Executive Management, whether safety is included as a regular topic at BART Board Meetings, and how safety information is communicated.
2. Methods and incentives included in the management performance system to facilitate a system safety culture within the organization.
3. Types of formal meetings held and attended by Executive Management to discuss safety performance, such as ongoing evaluation of goals and targets.
4. The Executive Management's awareness of high priority safety issues related to operations and capital projects.
5. The Executive Management's awareness of the status of corrective action plans generated by the safety department through Internal Safety and Security Audits, the

hazard management process, accident/incident investigations, inspections, triennial audits, and other sources.

6. What is the level of interaction between the safety department and Executive and Senior management, and how extensively is Executive and Senior management involved in safety activities?
7. Which individuals and departments are involved in making safety decisions and to what degree are executive and senior management involved?
8. Scope of executive and senior management involvement, coordination, and communication in developing SSPP and PTASP revisions.

FINDINGS AND RECOMMENDATIONS

Activities:

CPUC RTSB management met with BART Executive Management and discussed the following:

1. BART Executive Management holds two weekly staff meetings involving all direct reports to the General Manager (GM), involving approximately ten (10) Directors of various BART departments. The primary meeting is held on Tuesday and generally forecasts the week ahead, which concludes and is supplemented by the following Monday meeting. This meeting is attended by Operations, System Safety, Rail Stock and Shops, Maintenance and Engineering, Communications, Admin., and BART Police, and is held virtually. The meeting is also attended by other BART Board of Directors (Board) appointed officers such as: BART District Secretary, Office of Inspector General, and the Independent Police Auditor. The BART GM holds separate bi-weekly meetings with the Chief Safety Officer, and the BART Assistant GM holds weekly meetings with the Chief Safety Officer.
   The Board formally meets every two weeks. If there is a safety issue on the system, the issue can be raised at the various safety meetings and major items may be brought up; however, there are frequent informal texts and emails communicating immediate safety issues to the Board. A Quarterly Performance Review (QPR) is presented to the Board by the Chief of Maintenance and Engineering and Chief of Safety, and trends various initiatives as to what is working and what does not work on the system.
   The BART GM also holds a Frontline Safety Meeting which includes the Unions, Station Agents, Train Operators, etc., totaling approximately 30 people, where safety focused topics identified by frontline employees are discussed. Ideas are discussed and implemented as a result of direct feedback. An example presented is a mobile application created by BART for biohazard response and tracking.
   The Transportation Department and Safety Department have meetings weekly to discuss ongoing rail industry and regulatory items.
   The Safety Department also chairs a variety of task forces touching on various safety topics, such as sleep apnea, COVID, etc.

2. BART presented Staff a "Strategic Plan" which represents a management performance system shown on BART's intranet. Safety is a required metric of the plan and is weighted at approximately 7% of the total evaluation.
3. BART Executive Management discusses safety performance on an ongoing basis during the GM weekly meetings, and metrics are compiled through the QPR, which is presented to the Board.
   Staff reviewed the Board meetings in Q4 FY21 and Q1 FY22 and no deficiencies were found.
4. BART Executive Management is aware of high priority safety issues related to operations and capital projects through the GM weekly staff meetings with department heads. The current most pressing issue is to resolve the ongoing reliability issues with the New Vehicle Project, and the GM meets monthly with the President of Alstom USA, who manufactures the new vehicles. The issues are steadily being resolved, and as of Q1 of 2022, per BART's QPR, the reliability of the new vehicles outperformed the legacy fleet.
5. BART Executive Management is made aware of major items by the Safety Department through interactions with departments identifying the deficiencies and are brought up during bi-weekly discussions. Major items found by CPUC are also topics of discussion during CPUC-BART Quarterly Meetings; meeting minutes are also sent to the GM.
6. BART Executive Management interacts with the Safety Department formally on a bi-weekly basis as well as with other departments interacting with Safety separately throughout the week. For further details see Question 1 above.
   The GM noted that BART is committed to safety, and that, despite the budget shortfall and scaling back of various programs and departments, the Safety Department did not experience budget cuts. Of the 19 Safety positions available, 14 are currently filled and 5 are unfilled but are in the process of recruitment. The Department of Fire-Life Safety was also created in 2019, which works closely with local fire departments.
   Departments are also involved in the Joint Union Management Health and Safety Committee Meeting, which is chaired by the Safety Department, and involves BART Departments and Unions on discussions of safety topics.
7. The General Manager and Chief Safety Officer make major safety decisions each year. Managers, Supervisors and the Control Center staff make safety decisions on a daily basis.
8. System Safety has hired a dedicated Safety Management System (SMS) Manager to coordinate with and oversee the implementation of BART's SMS program. Their role includes communication with various department heads in implementation of the program and PTASP revisions. See Triennial Checklist 5 for further information.

<u>Findings:</u>

No Findings

Comments:

No Comments

Recommendations:

No Recommendations

2021 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT (BART)

Checklist No.	**2**	**Element**	System Safety Program Plan/ Public Transportation Agency Safety Plan: Goals and Objectives
Date of Audit	November 29, 2021	**Department(s)**	Executive Management Safety Department
Auditor/Inspector	Daren Gilbert Mike Borer Daniel Kwok	**Persons Contacted**	Shane Edwards Jeff Lau

REFERENCE CRITERIA

1. CPUC General Order 164-D/E
2. 49 CFR 659/674
3. BART System Safety Program Plan (SSPP) Revision 11 dated February 2019
4. BART Public Transportation Agency Safety Plan (PTASP) Revision 2 dated June 8, 2020

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

System Safety Program Plan (SSPP)/ Public Transportation Agency Safety Plan (PTASP): Goals and Objectives

Interview Executive Management and review appropriate records to:

1. Determine how SSPP/PTASP goals and objectives are established, evaluated, and documented, and whether they were met (i.e., via a reduction in accidents, hazards, rule violations, or improved safety metrics).
2. Determine how safety performance, relative to the goals and objectives established for the SSPP/PTASP, is reported to the GM and Assistant GM or other executive management. (i.e., how do they continuously monitor goals and objectives, are key safety metrics being tracked and reported to the Executive Management?)
3. Does the Executive Management know the progress of the RTA's status of its SSPP to PTASP transition? Do they receive regular updates from their staff? Identify Accountable Executive.

FINDINGS AND RECOMMENDATIONS

Activities:

CPUC RTSB management met with BART Executive Management and discussed the

following:

1. PTASP/SSPP goals and objectives are evaluated, documented, and presented to the BART Board of Directors and Executive management through BART's QPR. From BART's Q1 2022 QPR, they have met their goals for serious injuries, however their goal of 0 fatalities on the system have not been met. These metrics are tracked to determine if there is an overall trend based on the metrics. There are six items dealing specifically with safety in the QPR, and the rest primarily track reliability of the fleet and system. The SMS Manager is in the process of reviewing the PTASP to see if changes are needed in the referenced PTASP table and goals/objective descriptors.
2. Safety performance and relative goals and objectives are reported to the General Manager (GM) and Assistant GM through the QPR. See Q1 above for more information.
3. BART Executive Management was involved with the transition from the SSPP to the PTASP. BART worked with a team of consultants to develop the initial plan. The draft PTASP was circulated through executive management, followed by BART Departments for their comments. Comments received from Maintenance and Engineering, Rail Stock and Shops, Transportation, BART PD, and Safety departments were incorporated into the final draft. The final draft was then circulated back to the GM and Assistant GM. Safety circulated the draft to union presidents for comments at a monthly union presidents meeting. The BART General Manager is the Accountable Executive, as well as maintains a Chief Safety Officer as required by 49 CFR 673.

Findings:

No Findings

Comments:

No Comments

Recommendations:

No Recommendations

2021 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT (BART)

Checklist No.	**3**	**Element**	Overview of Senior Management Structure
Date of Audit	November 29, 2021	**Department(s)**	Safety Department
Auditor/Inspector	Daren Gilbert Mike Borer Daniel Kwok	**Persons Contacted**	Jeff Lau Robb Bury Antony Onisko

REFERENCE CRITERIA

1. CPUC General Order 164-D/E
2. 49 CFR 659/674
3. BART System Safety Program Plan (SSPP) Revision 11 dated February 2019
4. BART Public Transportation Agency Safety Plan (PTASP) Revision 2 dated June 8, 2020

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

Overview of Senior Management Structure

Interview Executive and Senior Management and review appropriate records to:

1. Determine how RTA's process for integrating safety into operations and maintenance activities is accomplished.
2. Identify if any safety program deficiencies are a result of inadequate personnel or resources, such as difficulties in maintaining schedules for SSPP/PTASP updates, completing Internal Safety and Security Audits, implementing corrective action plans, or performing accident/incident investigations.
3. Are resources keeping up with system growth (if any)? Does RTA have data on personnel hours spent on projects/activities?
4. If the RTA makes significant changes to its org chart, does the RTA analyze the impacts on safety before and after implementing the changes?
5. Does the RTA or RTSB have concern in the turnover in key positions (including but not limited to Executive and Senior Management)? If there is a concern, how is the RTA addressing it?
6. Determine whether the safety department has personnel resources allocated to support interdepartmental coordination on safety issues and concerns?

FINDINGS AND RECOMMENDATIONS

Activities:

CPUC RTSB management met with BART Safety Department (Safety) and discussed the following:

1. BART's process for integrating safety is through formal safety department meetings with various operations and maintenance departments. The Chief Safety Officer (CSO) affirms that the Safety Department works closely with operations and maintenance. This is done through the Safety Department's involvement in the development of plans and Standard Operating Procedures (SOPs) for said departments. Safety also affirms SOPs and plans are being followed through the Internal Safety and Security Audit process.
2. BART's CSO indicates there are no deficiencies in the safety program, as indicated in Triennial Checklist 1, there have not been any cuts to staffing in the Safety Department due to the budget shortfall as seen throughout the agency. The Safety Department has also hired a new SMS Manager to oversee BART's transition from the SSPP to the PTASP.
3. BART CSO indicates that current resources are adequate and, if needed, will request additional resources for the Safety Department. This is evidenced by the new SMS Manger position.
4. Organization changes are primarily conducted by department heads, and the General Manager (GM), to determine agency needs in the long run. An example of this is the creation of the new Fire/Life Safety Department, which took over formerly held roles held by the Safety Department. Other large changes are made by their respective departments, but Safety monitors the changes.
5. As a result of COVID and BART's early retirement initiative, RTSB Staff inquired how well BART is staffed departmentally. BART responded with the following data provided by BART's HR department regarding staffing level in Transportation, M&E, and rolling stock and shops (RS&S) departments at four different times. It was noted BART's DRIP (early retirement incentive program) occurred from 1/1/2020 through 10/1/2021.
   The following table is a summary of employee headcounts at 1/1/2020, 10/1/2021, 12/13/2021 (COVID Vaccination Deadline), and as of completion of this report on 3/4/2022.

Department	**1/1/2020**	**10/1/2021**	**12/13/2021**	**3/4/2022**
Transportation	1046	998	1008	982
Train Operators	*474*	*451*	*443*	*427*

Rail Controllers	*27*	*31*	*32*	*32*
All Other Classifications	*545*	*516*	*533*	*523*
Maintenance and Engineering	1378	1283	1276	1265
Rolling Stock and Shops	779	732	759	760
Rest of District	916	868	887	875
Grand Total	**4119**	**3881**	**3930**	**3882**

There were no additional concerns made by BART or RTSB regarding staffing of safety positions. BART Safety indicates there are candidates lined up for current vacancies and they are in process of hiring.

6. BART's CSO indicates the safety department has adequate resources, and most positions are filled as indicated in the Safety Department Organization Chart. There are no concerns for interdepartmental coordination, safety personnel hours are tracked, and time is allocated to particular tasks.

Findings:

No Findings

Comments:

No Comments

Recommendations:

No Recommendations

2021 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT (BART)

Checklist No.	**4**	**Element**	System Safety Program Plan/ Public Transportation Agency Safety Plan: Control and Update Procedure
Date of Audit	November 29, 2021	**Department(s)**	Safety Department
Auditor/Inspector	Daren Gilbert Mike Borer Daniel Kwok	**Persons Contacted**	Jeff Lau Robb Bury Anthony Onisko

REFERENCE CRITERIA

1. CPUC General Order 164-D/E
2. 49 CFR 659/674
3. BART System Safety Program Plan (SSPP) Revision 11 dated February 2019
4. BART Public Transportation Agency Safety Plan (PTASP) Revision 2 dated June 8, 2020

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

System Safety Program Plan/ Public Transportation Agency Safety Plan: Control and Update Procedure

Interview Executive Management and safety department and review appropriate records to:

1. Verify the required annual SSPP/PTASP compliance letter by the General Manager has been sent to the CPUC for the past 3 years in compliance with the SSPP/PTASP.
2. Verify SSPP/PTASP reviews and changes are comprehensive in scope, within required timeframes, and are approved by the designated staff.
3. Verify the SSPP has a change log, version number and date. How does the RTA assure distribution to appropriate personnel?
4. Verify that SOPs and other plans and procedures relevant to the SSPP/PTASP are managed and updated as needed; and were provided to Staff for the 2021 Triennial Review.

FINDINGS AND RECOMMENDATIONS

Activities:

CPUC RTSB management met with BART Safety Department (Safety) and discussed the following:

1. Staff verified BART has submitted required annual SSPP/PTASP compliance letters with General Manager signature to the CPUC over the past 3 years per SSPP/PTASP and General Order 164 D/E requirements. All updates to the PTASP involve the Safety Department, and moving forward will be spearheaded by the SMS Manager, with Operations Safety and Engineering Safety updating their respective sections within the PTASP.
2. Reviews of SSPP/PTASP and changes made for submittal have been within General Order 164-D/E timelines. Staff verified approvals were made by appropriate CPUC Staff. The BART SMS Manager will be working on the next PTASP revision as they take on their new role.
3. Staff verified the PTASP has a change log, version number, and date. The PTASP is accessible by BART employees through a SharePoint link on BART System Safety's site from Employee Connect (BART intranet portal).
4. Staff verified documents provided to CPUC staff through the duration of the Triennial were current and appropriate.

Findings:

No Findings

Comments:

No Comments

Recommendations:

No Recommendations

2021 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT (BART)

Checklist No.	**5**	**Element**	System Safety Program Plan/ Public Transportation Agency Safety Plan: Implementation Activities and Responsibilities
Date of Audit	November 21, 2021	**Department(s)**	Safety Department
Auditor/Inspector	Daren Gilbert Mike Borer Daniel Kwok	**Persons Contacted**	Jeff Lau Robb Bury Joshua Teo Anthony Onisko

REFERENCE CRITERIA

1. CPUC General Order 164-D/E
2. 49 CFR 659/674
3. BART System Safety Program Plan (SSPP) Revision 11 dated February 2019
4. BART Public Transportation Agency Safety Plan (PTASP) Revision 2 dated June 8, 2020

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

System Safety Program Plan/ Public Transportation Agency Safety Plan: Implementation Activities and Responsibilities

Interview Executive Management and safety department and review appropriate records to:

1. Determine how each manager, department, and contractor charged with responsibility and accountability for SSPP/PTASP implementation, ensure enforcement, and effectiveness within their area of purview?
2. Identify any challenges each manager, department, and contractor has had in complying with the SSPP/PTASP or general safety tasks (i.e., timely accident reports, CAPs, inspections, and maintenance).
3. Verify how management is held accountable for the performance of safety-related activities or if serious/potential deficiencies are found?
4. Identify whether the RTA has a documented SMS implementation plan.

FINDINGS AND RECOMMENDATIONS

<u>Activities:</u>

CPUC RTSB management met with BART Safety Department (Safety) and discussed the

following:

1. BART's overall organization has been unchanged with transition to the PTASP regarding implementation, enforcement, and effectiveness. Departments will, however, have new independent oversight in the form of the new SMS Manager position, whose role is to oversee implementation of SMS throughout the organization.
   BART is also moving towards "E-Alert," which is an automated employee reporting system, and moving away from the older paper format of Unusual Occurrence Reporting (UORs). Training for the system will start in 2022 and will be deployed to upper management first, then a wider implementation for the remainder of the organization.
   For riders, BART has in place a "BART Watch" mobile application so any safety issues can be reported by patrons.
   Starting in 2023, BART Safety Department also intends to implement a "Field Observation and Feedback" (FOF) process where the Safety department will regularly engage employees regarding concerns.
2. BART indicates, overall, there have not been major challenges with compliance with the SSPP, PTASP, or general safety tasks. Processes have improved with implementation of regular monthly meetings between CPUC and BART with regards to accident reports, CAPs, and inspections. BART is internally developing processes to mitigate safety concerns, an example of which is the development of a Sleep Apnea Task Force, which is exploring how the future program will impact departments, the number of staff needed for implementation, and identify any challenges the program may face. Overall, Safety facilitates communication with and between other departments if there are any compliance concerns.
3. Department managers are held responsible for performance of safety-related activities and deficiencies through Quarterly Performance Reviews (QPRs) which quantifies datasets and is presented to the General Manger (GM) and the BART Board of Directors. Corrective Actions Plans are also tracked and are shown at CPUC-BART Quarterly Meetings. If any outstanding or major safety deficiencies are identified, the relevant department would need to respond. BART also states that they have also presented to the CPUC Commissioners the Order Instituting Investigation (OII) Annual BART Safety Culture Presentation, which showed safety violations, and has concluded this past January and satisfied BART's requirements from the OII.
4. BART has an SMS implementation plan, which was presented and reviewed by Staff, that indicates goals of increasing employee safety reporting by Q1 of 2022, implementation of an SMS safety dashboard by Q4 of 2022 and implementing Field Observations and Feedback by Q4 of 2023.

Findings:

No Findings

Comments:

No Comments

Recommendations:

No Recommendations

2021 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT (BART)

Checklist No.	**6**	**Element**	Hazard Management Process
Date of Audit	November 29, 2021	**Department(s)**	Rail Operations Safety Engineering Safety E-Line Safety and Training
Auditor/Inspector	Arun Mehta Jimmy Xia Steve Espinal	**Persons Contacted**	Robb Bury Joshua Teo Anthony Onisko Jonathan Rossen

REFERENCE CRITERIA

1. CPUC General Order 164-D/E
2. CPUC General Order 175-A
3. 49 CFR 659/674
4. 49 CFR 672
5. BART System Safety Program Plan (SSPP) Revision 11 dated February 2019
6. eBART System Safety Program Plan (SSPP) dated July 1, 2017
7. BART Public Transportation Agency Safety Plan (PTASP) Revision 2 dated June 8, 2020
8. Annual Top 10 List of Safety Concerning Assets (2017 – 2021)

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

Hazard Management Process

Review hazards reported in the past 4 years by the RTA. Interview RTA representatives and review records from the past 4 years to determine:

1. If RTA identifying hazards according to SSPP/PTASP.
2. If the safety department has a mechanism to track identified hazards through analysis and resolution? How is the RTA communicating their data and analysis to appropriate personnel/departments?
3. How the RTA is reviewing operational hazards to assess risk (probability and severity), and reporting unacceptable hazards to CPUC as specified by the SSPP/PTASP? Provide at least three examples.
4. Identified hazards are evaluated, corrective actions are identified, the department responsible for implementation is identified, and a schedule for completion is established.
5. The RTA follows up on reported hazards to ensure corrective actions are implemented to mitigate or resolve hazards.
6. RTA has a specified process for reporting hazard resolution activities to CPUC as required by General Order 164-D/E.

7. What are the required minimum qualifications (training) for RTA employees performing hazard analysis to promote consistent results?

FINDINGS AND RECOMMENDATIONS

Activities:

Staff interviewed BART representatives regarding the Hazard Management Process program requirements and determined the following:

1. BART personnel assured CPUC Staff that they have been identifying hazards according to the procedures identified in their SSPP/PTASP.
2. BART Safety Department (Safety) has several methods and mechanisms to track hazards within the BART System. Examples include: facilities inspections, employee/patron notifications, and accident investigations. Safety identifies hazards they witness in formal written reports. Some of the hazards come from Employee Safety Notices (ESN) and Unusual Occurrence Reports (UOR). In turn, they submit work requests to the appropriate responsible departments to analyze and mitigate the identified hazards. They use a computer system called "Maximo" that BART uses to track maintenance items and to analyze and mitigate the identified hazards. For example, if they find issues with energized conductors or problems with the lighting system, they document it in the inspection report and input the information in Maximo for the appropriate departments to address the issues. BART had about 500 issues last year that needed to be corrected. They use a reporting system called "Simple but Needed" (SBN). The following are examples of how hazards are reported:
    a. Facility inspection program:
        i. All Safety staff perform facility inspections.
        ii. BART Safety staff document hazardous items in Maximo for mitigation/correction by the appropriate department(s).
        iii. Inspections are performed twice a year for passenger stations and other facilities.
        iv. Four times a year (approximately quarterly) inspections for maintenance shops.
        v. No formal SOP for these inspections, no written procedure.
        vi. Use of mobile tools for inspections using checklists.
        vii. SBN reporting system is used.
    b. Accident investigation is identified as another way to identify hazards.
    c. Hazard notifications received via reports from employees or passengers/patrons:
        i. Approx. 100 per year employee reported hazards are documented using Maximo, Health Safety Environment (HSE); BART Employee Safety Notice (ESN) or Unusual Occurrence Reports (UOR) – these are modules in Maximo.
        ii. Incidents are tracked in Maximo.

3. BART handles hazard data with two departments: Operations Safety, and Employee/Patron Safety. The Manager of Engineering Safety reviews the hazards and uses the Mil Standard to determine if a hazard is acceptable for all capital projects. Safety reviews the hazards and assesses the risk (probability and severity) and establishes the reporting of unacceptable hazards to CPUC as specified by the SSPP/PTASP. The Manager of Employee/Patron Safety does NOT use the Mil Standard matrix to rank identified hazards, as of today. The Employee/Patron Safety Department mostly deals with relatively simple, day to day hazards just requiring "safety Urgent" or "safety Not Urgent" designation to define the urgency of a hazard in Maximo. They have not found the need to use a sophisticated evaluation criterion such as Mil Standard to designate the severity or prioritization of hazards they come across. Staff emphasized to the Manager of Employee/Patron Safety that it is important to consider the use of a Hazard Severity Index to establish the severity and urgency of an identified hazard going forward to be compliant with the new PTASP system. Safety Department identifies a list of "Top 10" risk register to identify and prioritize the severity of hazards at any given time. BART finds the current system with the use of Maximo works well to their satisfaction. BART conducts monthly management meetings where important hazards are discussed. BART has quarterly meetings with CPUC where important hazards and their mitigation efforts/status are discussed along with other issues. BART maintains a list of hazards with Hazard Index rankings associated with it to prioritize mitigation efforts. Staff reviewed several station inspections reports.
4. BART identified hazards are evaluated regarding their severity and seriousness and corrective actions are identified. The department responsible for implementation establishes a schedule for completion and follows through (along with the Safety Department) until the implementation is complete. Staff were shown examples of hazards, their source (employees, patrons, facilities inspection, ESN, UOR), corrective actions and mitigation. BART maintains a Top 10 hazards list according to their severity/ prioritization, and examples were presented to Staff.
5. BART follows up on reported hazards to ensure corrective actions are implemented to mitigate or resolve the hazards in a timely manner. Engineering Safety Department uses severity matrix for hazard assessment for Capital projects. However, Employee/Patron Safety Department does not use the Mil Standard severity matrix for the day to day reported hazards (more than 100 a month) during their facilities inspections. BART is in the process of procuring a BART Watch Module (aka E-Alert) which will be an employee safety reporting tool. The goal is to procure it by 1st Quarter of 2022. This was initiated by the recently hired BART SMS Manager.
6. BART has a working process for reporting hazard resolution activities to CPUC as required by General Order 164-E. BART specifies hazards on a monthly basis via Form V. BART also meets CPUC on a quarterly basis to go over issues including hazards and their resolutions. BART works with CPUC inspectors to resolve and close any hazards identified by the CPUC inspection team.

7. BART requires minimum qualifications (training) for its employees performing hazard analysis to promote consistent results. BART has trained over 300 managers with 32 hours of SMS classroom training with an additional eight hours of Roadway Worker Protection (RWP) training. BART also provides an additional two-hour refresher training.

Findings:
No Findings

Comments:

1. BART Employee Patron Safety Department should use the Hazard Severity Index using Mil Standard type system to establish the severity and urgency of an identified hazard going forward to be compliant with the new PTASP system. This should be considered for "safety critical hazards". The Engineering Safety Department at BART is already using such matrix system for hazard analysis.

Recommendations:
No Recommendations

2021 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT (BART)

Checklist No.	7	**Element**	System Modification
Date of Audit	December 7, 2021	**Department(s)**	Engineering Safety Engineering Documentation
Auditor/Inspector	Jamie Lau Ainsley Kung	**Persons Contacted**	Joshua Teo Jason Eng Willard Lam Michael Lemon Christopher Wasilewski Stuart Restall Wahid Amiri David Silva

REFERENCE CRITERIA

1. CPUC General Order 164-D/E
2. BART System Safety Program Plan (SSPP) Revision 11 dated February 2019
3. eBART System Safety Program Plan (SSPP) dated July 1, 2017
4. BART Public Transportation Agency Safety Plan (PTASP) Revision 2 dated June 8, 2020
5. Book 38, Procedure 30; BART Engineering Change Order Form (BECO) dated September 18, 2017
6. BART Facility Standards Database
7. Safety and Security Certification Plan (SSCP) for planning, development and construction (PD&C) / M&E In-house Projects (Draft)

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

System Modification

Interview RTA representatives and review appropriate records to determine:

1. If the safety department is involved in assessing/ensuring safety concerns are addressed in system modifications by identifying their specific activities in the process such as documentation, participation in testing, inspections and observations performed at work sites.
2. Conformance to relevant Standard Operating Procedures.

Review three recent system modification projects implemented and determine if:

3. The Project followed SSPP/PTASP requirements and subsequent internal procedures which included an evaluation of potential hazards to the system and that no unauthorized modifications were implemented.
4. The hazards were addressed, including an evaluation of potential hazards arising from the proposed modification, and approval was documented.

5. Any system modification changes made are shown in final As-Built drawings for the facility, vehicle and/or equipment specifications.
6. All required approvals are documented prior to implementation.

FINDINGS AND RECOMMENDATIONS

Activities:

On December 7, 2021, Staff interviewed BART representatives and reviewed appropriate records pertaining to System Modification for in-house projects. Staff learned all projects not requiring GO 164-E Safety Certification process are considered as in-house projects. The certification process for in-house projects follows the Safety and Security Certification Plan (SSCP) for PD&C / Maintenance & Engineering (M&E) In-house Project procedures. The process is currently in pilot; therefore, procedure is still in draft and subject to revision. The procedure is estimated to be finalized by the end of 2022. Staff found the specific process for certifying in-house projects is not detailed in PTASP, nor a reference made to the forthcoming procedure. Staff recommend BART to reference the in-house project certifying procedure within PTASP.

Staff learned BART's in-house projects are conducted by M&E or PD&C Departments. M&E projects tend to be smaller in scale, such as sprinkler and fire alarm replacements; PD&C projects are larger in scales such as 19th Street Bike Project.

Staff determined:

1. BART was not able to show examples of the Safety Department's involvement in assessing safety concerns or ensuring safety concerns are addressed during safety modification for in-house projects. BART showed records that they have accepted invitations to related project meetings but were not able to show communication records, such as review comments, inspections or observations made by the Safety Department. Staff recommend the Safety Department start documenting activities related to in-house project certification.
2. BART demonstrates conformance with the in-house project safety certification procedure. Staff reviewed samples from completed projects such as, El Cerrito Del Norte Station Modernization, eBART Maintenance Facility andvital automatic train control Stopping Accuracy Software Update. Sample projects overall demonstrated they have hazard analysis, design review, testing and approval certificates.

Staff reviewed five recently implemented system modification projects. The projects sampled are:

- 19th Street Station Bike Storage Project
- VATC Stopping Accuracy Software Update
- eBART Maintenance Facility Canopy
- El Cerrito Del Norte Station Modernization
- Legacy Station Sprinkler Head Replacement

Staff learned that because the in-house safety certification process is still in pilot process, Safety Department's involvement in each of these sample projects varied based on the projects' timelines of when the pilot process started. For the 19th Street Station Bike Storage Project, Safety Department got involved during the project's design phase and was a part of the Preliminary Hazards Analysis (PHA). For El Cerrito Del Norte Station Modernization Project and eBART Maintenance Facility Canopy Project, the Safety Department got involved during these projects' Construction phase.

Staff determined:

3. The projects followed SSPP/PTASP requirements and subsequent internal procedures which included an evaluation of potential hazards to the system. Staff did not note unauthorized modifications. 19th Street Station Bike and Legacy Station Sprinkler Head Replacement projects have a PHA; other projects do not have a PHA due to scope not requiring one.
4. The projects have identified hazards during preliminary engineering phase including evaluation of hazard risk and proposed mitigations. However, the sampled hazard matrices from 19th Street Station Bike Project and Legacy Station Sprinkler Head Replacement Project did not show tracking of mitigation status. Staff recommend BART to add a column to hazard matrix tracking mitigation status.
5. System modification changes made are shown in final As-Built drawings for the facility specifications. BART provided two samples of electrical as-built drawings, E302 and E307, from El Cerrito Del Norte Station Modernization project. The sample drawings demonstrated system modification changes were documented and outlined in red.
6. All required approvals are documented prior to implementation. Staff sampled El Cerrito Del Norte Station Modernization, eBART Maintenance Facility and VATC Stopping Accuracy Software Update projects, and found they have safety conformance certificates signed off prior to service. BART also provided samples from Fire Suppression System Upgrade Project, 54RR2420, which showed the appropriate approval signatures for the document.

<u>Findings:</u>

1. Staff determined Safety Department was not able to show communication records, such as review comments, inspections or observations made pertaining to system modifications for in-house projects.
2. Staff found in-house project PHA matrices did not have mitigation tracking status.

<u>Comments:</u>

1. Staff identified the pilot safety certification for in-house project process is not mentioned in the PTASP. BART should reference the in-house project safety certification procedure under PTASP, Section 7.6.2, System Modifications in next revision.

Recommendations:

1. BART must document Safety Department involvement during in-house safety certification process.
2. BART must add a column to track mitigation status in the PHA matrix.

2021 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT (BART)

Checklist No.	8	**Element**	Safety and Security Certification
Date of Audit	December 7, 2021	**Department(s)**	Engineering Safety
Auditor/Inspector	Jamie Lau Ainsley Kung	**Persons Contacted**	Joshua Teo Jason Eng Willard Lam

REFERENCE CRITERIA

1. CPUC General Order 164-D/E
2. CPUC Seventh Interim Order for Case #9867, Decision #87376
3. BART System Safety Program Plan (SSPP) Revision 11 dated February 2019
4. eBART System Safety Program Plan (SSPP) dated July 1, 2017
5. BART Public Transportation Agency Safety Plan (PTASP) Revision 2 dated June 8, 2020
6. BART Facilities Standards Database
7. BART Safety Certification Plans (SCPs)

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

Safety and Security Certification

Interview the RTA representative(s) involved in the Safety Certification Plan (SCP) and review the records of their major projects to determine whether:

1. A formal SCP has been submitted by the RTA and approved by the Commission.
2. Each submitted SCP was consistent with General Order 164-D/E, the SSPP/PTASP, and applicable reference documents.
3. CPUC staff have participated throughout Preliminary Engineering Design Phase and other phases.
4. All design and construction changes were properly documented and addressed in the Safety Certification process.
5. All identified hazards have been eliminated or controlled as required under the SCPs.
6. All certifiable elements for Safety Certified projects during the past three years were identified for the Safety Certification Verification Report and submitted to CPUC in a timely manner, according to the requirements of General Order 164-D/E.
7. Review three (3) minor projects to verify they did not require CPUC approval, and to determine whether the RTA followed a similar process for self-certification of the minor projects.

FINDINGS AND RECOMMENDATIONS

Activities:

CPUC Staff interviewed BART representatives involved in the SCP for major projects subject to GO 164-E. Staff reviewed SCP for the following projects:

- Hayward Maintenance Complex (HMC) Phase 1 – Central Warehouse

- Traction Power Substation (TPSS) Project
- eBART
- Irvington Station Project

Staff determined:

1. BART has formally submitted a SCP for all sampled projects and approved by the Commission.
2. TPSS SCP was not consistent with GO 164-E, Section 11.3, Requirements for Safety Certification Plan, which requires BART to submit a SCP to Staff for review and Commission for approval during the preliminary engineering phase. TPSS is comprised of West Bay and East Bay portions. TPSS SCP was first discussed with Staff when the West Bay portion has completed final design and ready for construction bids. BART indicated TPSS is a Maintenance and Engineering (M&E) project, and the M&E project manager was not familiar with GO-164 D/E safety certification process at the time. In addition to M&E project manager's unfamiliarity with the GO-164 D/E safety certification process, there was a personnel change in the Safety Department at the time. Due to the transition, this project was unnoticed until the final design phase. However, Safety Department indicated that they have provided safety certification process training for M&E managers and the managers have also attended Safety Management System training
3. Staff noted other projects' SCPs were consistent with General Order 164-D/E.
4. Except for TPSS project, CPUC staff have participated throughout Preliminary Engineering Design Phase and other phases. See Activity #2 for details related to TPSS.
5. All design and construction changes were properly documented and addressed in the Safety Certification process. BART presented samples of Request For Variance (RFV) during the design phase for Irvington Station and TPSS projects. Samples show a description of the design deviation requested and its justification. BART also presented a sample of a construction change order from eBART project; the sample shows change orders were properly documented with Request For Information (RFI) and approval for change.
6. All identified hazards have been eliminated or controlled as required under the sampled SCPs. Staff reviewed Preliminary Hazard Analysis (PHA) matrices from TPSS and eBART projects. The matrices show identified hazards have been mitigated with verification or referenced documents.
7. Staff noted HMC Central Warehouse was partially placed into service prior to Safety Certification Verification Report (SCVR) approval. Staff learned of the issue during a pre-revenue inspection, when Staff observed the warehouse has been used as a storage facility as intended. If the facility needed to be placed in service early, BART should have submitted the SCVR at an earlier time or discussed the situation with Staff beforehand. Otherwise, Staff noted all certifiable elements for sampled Safety Certified projects during the past three years were identified for the Safety

Certification Verification Report and submitted to CPUC in a timely manner, according to the requirements of General Order 164-D/E.

8. See Triennial Safety Checklist 7, System Modification.

Findings:

1. Staff found TPSS SCP was not consistent with GO 164-E, Section 11.3, Requirements for Safety Certification Plan, which requires RTA to submit a SCP to Staff for review and Commission for approval during preliminary engineering phase. TPSS SCP was submitted after final design and ready for construction bids.
2. Staff found HMC Central Warehouse was partially in service as a storage facility prior to SCVR approval.

Comments:

No Comments

Recommendations:

1. BART must ensure their staff and consultants who may be working on capital projects to become familiar with GO-164 Requirements for Safety Certification Plan and adhere to said rules.
2. BART must ensure facilities, equipment and vehicles are not put into service prior to SCVR approval by Staff or communicate with Staff of any special circumstance.

2021 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT (BART)

Checklist No.	**9**	**Element**	Safety Data Collection and Analysis
Date of Audit	November 29, 2021	**Department(s)**	System Safety
Auditor/Inspector	Arun Mehta Jimmy Xia Steve Espinal	**Persons Contacted**	Robb Bury Jonathan Rossen Joshua Teo Anthony Onisko

REFERENCE CRITERIA

1. CPUC General Order 164-D/E
2. BART System Safety Program Plan (SSPP) Revision 11 dated February 2019
3. eBART System Safety Program Plan (SSPP) dated July 1, 2017
4. BART Public Transportation Agency Safety Plan (PTASP) Revision 2 dated June 8, 2020
5. Annual Top 10 List of Safety Concerning Assets

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

Safety Data Collection and Analysis

Interview the RTA representative(s) responsible for safety data acquisition and analysis, and review the safety data acquisition and analysis program requirements to determine whether:

1. The data collected includes at minimum: information concerning accident and incidents, near misses, employee performance failures, equipment failures, procedural deficiencies, derailments, and rules violations, etc.
2. The safety data is supplied by, and collected from, all appropriate departments.
3. The safety data collected is analyzed and incorporated into their Safety Risk Assessment process as necessary.
4. The safety data and analyses are made available to departments for use in planning their safety-related activities and implemented according to SSPP/PTASP.
5. Periodic reporting regarding the results of the safety data analysis is provided to the Executive Management as appropriate.
6. Review the process for reporting to FTA's National Transportation Database (NTD).

FINDINGS AND RECOMMENDATIONS

Activities:

Staff interviewed BART representatives regarding the safety data acquisition and analysis program requirements and determined the following:

1. The data collected includes at minimum information concerning accidents and incidents, near misses, employee performance failures, equipment failures, procedural deficiencies, derailments, and rules violations as follows.
    a. Every month, BART provides the monthly Accident, Hazard, and Corrective Action Summary Report (CPUC Form V) to CPUC. The monthly Form V

provides a summary of the reportable accidents/incidents and hazards, if they occurred that month, and the status of all open corrective actions from previous accidents/incidents.

b. Information concerning accidents/incidents is reported on the monthly Form Vs. The information is regularly discussed by System Safety and the CPUC staff at the monthly meetings they conduct. BART's system safety usually works with CPUC staff to resolve pending questions for accident reports.
c. The data collected includes near misses. However, BART does not officially produce reports for near misses, but it does track them. Near misses may sometimes be discussed at the CPUC-BART Quarterly Meetings. Occasionally, CPUC Staff will ask BART system safety for a quick informal report on near misses. BART's SMS Manager stated that, with reference to employee safety reporting, he is making many options available regarding the employee safety report form, so employees may report a near miss, a hazard, or other safety issues, while performing their jobs.
d. At the quarterly meeting with CPUC, BART provides rules violations reports.
e. BART performs random/routine compliance checks regarding employee performance, including Personal Electronic Device (PED) checks.
f. During BART's accident investigations, if system safety determines that there has been an equipment failure, then the resulting Corrective Action Plan (CAP) will involve working on a mitigation, including either a system wide approach or just a singular asset.
g. Procedural deficiencies or modified procedures are documented through a CAP. Once they are resolved, BART will close out the CAP.
h. If BART has an incident or event that meets the threshold to be CPUC reportable, it will generate a report, issue CAPs, work through the closure of the CAPs, and then send substantiation to CPUC for final closure.

2. The safety data is supplied by, and collected from, all appropriate departments. At the end of each day, a safety person will go through BART's central control log and document incidents or factors for which they need to collect data and is imported or inputted into the Maximo database system, for trending. They haven't used this feature much in the past due to lack of staffing. BART has hired its new SMS manager who has the appropriate skillset. System Safety will ensure all departments have access to the tools for reporting safety data, know how to report safety data to system safety, and these tools are being publicized on BART's websites.
   BART's Manager of Employee/Patron Safety stated that as an example to address this audit element, BART provides the GO 95 reports to CPUC on an annual basis.
3. When System Safety receives a BART Safety Notice (BSN), it is entered into Maximo, they analyze it and make sure it gets closed out. BART has all transit departments that go to the monthly Joint Union/Management Health & Safety Committee (JUMHSC) meetings report safety data. They report various types of data at the meeting, including vehicle accidents, employee injuries, and other issues.

4. All the safety data and analyses from the JUMHSC meetings are given to departments either electronically (e-mail) or in hard copy, which they then use in planning their safety-related activities.
5. Every quarter, BART's Chief Safety Officer (CSO) reports the quarterly performance reviews (QPR) report data to BART's General Manager, which is then reported to the BART Board of Directors. The QPR includes the results of the safety data analysis.
6. Any reporting criterion which meets the NTD threshold is reported by System Safety staff to the NTD. Usually at the end of each month and certainly at the end of each year, there are slight corrections to the NTD data entries needed, for which CPUC staff contacts BART to resolve. BART's Operations Safety Manager stated that there are currently no issues with this process. The BART CSO verifies both safety and security data reported to NTD every month. He receives emails from NTD if there are issues with BART's reporting.

Findings:
No Findings

Comments:
No Comments

Recommendations:
No Recommendations

2021 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT (BART)

Checklist No.	**10**	**Element**	Events – Accident/Incident/Occurrences Investigations
Date of Audit	November 30, 2021	**Department(s)**	Rail Operations Safety E-Line Safety & Training
Auditor/Inspector	Noel Takahara Madeline Ocampo Daniel Kwok (Observer)	**Persons Contacted**	Robb Bury Anthony Onisko Brian Spring

REFERENCE CRITERIA

1. CPUC General Order 164-D/E
2. CPUC General Order 172
3. BART System Safety Program Plan (SSPP) Revision 11 dated February 2019
4. BART Public Transportation Agency Safety Plan (PTASP) Revision 2 dated June 8, 2020
5. BART PTASP Section 7.4: Event Reporting and Investigation dated June 8, 2020

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

Events – Accident/Incident/Occurrences Investigations

Interview the RTA representative(s) responsible, and randomly select at least four FTA-reportable accidents (preferably include a fatality, serious injury, and/or derailment) to determine whether:

1. Accidents and incidents were reported within two hours of occurrence, as required by General Order 164-D/E.
2. Immediately reportable accident or incident notifications to CPUC contained all the information required by General Order 164-D/E.
3. Accidents and incidents were investigated in compliance with the requirements of General Order 164-D/E, and the RTA accident investigation procedures.
4. Video recordings from inward-facing in-cab cameras are reviewed under the required conditions listed in General Order 172, Section 4.3.
5. Verify if FRA (on joint corridor), National Transportation Safety Board, and National Transportation Database notifications were provided according to applicable requirements.

6. A final report was submitted for each accident or incident according to the requirements in General Order 164-D/E.
7. Each final report includes identification of:
    a. All evidence processed during the investigation;
    b. Findings of the most probable cause(s);
    c. Findings of contributory cause(s);
    d. Corrective Action Plans (CAPs) to address the identified causes with the goal of minimizing the probability of recurrence;
    e. A schedule for implementing CAPs (if any), including completion date or plan for monitoring progress on an on-going basis.
8. Whether the RTA is collecting data on incidents and occurrences, in addition to accidents.

FINDINGS AND RECOMMENDATIONS

Activities:

Staff interviewed BART representatives regarding the accident and incident investigations and determined the following:

1. The following six reportable accidents were randomly selected for review: INCT 2019040009 on 4/8/19, INCT 2019050034 on 5/29/19, INCT 2020090025 on 9/16/20, INCT 2021010021 on 1/23/21, INCT 2021040005 on 4/8/21, and INCT 2020080007 on 8/9/2020. These accidents (five occurring at BART, one at eBART) were reported by BART to CPUC within 2 hours of occurrence according to a review of the accident entries on RSSIMS (CPUC database).
2. BART safety personnel report accidents to CPUC via the CPUC reportable accident webform. According to a review of webform entries, BART notifications of reportable accidents contained all the information required by GO 164-E.
3. BART and eBART event reporting and investigation procedures are in section 7.4 of the BART PTASP. The CPUC auditors reviewed section 7.4 and found it to be in compliance with GO 164-E. The CPUC reviewed the six randomly selected accident reports and found the format of the reports to be compliant with GO 164-E and BART PTASP requirements.
4. Section 7.4 of the BART PTASP (pages 91-92) state the requirement that for applicable reportable accidents that occur on the BART and eBART system, in-cab video records shall be reviewed to check for GO-172 related violations. BART safety personnel stated during discussion that they review all relevant video, including in cab video for reportable accidents.
5. BART safety personnel informed that FRA joint corridor accident notifications are not applicable to their system, and that NTD notifications are handled on a monthly basis. Section 7.4.1 of the BART PTASP (page 84) states that BART should notify NTSB of accidents that meet the criteria of 49 CFR Part 840. The BART PTASP outlines the

thresholds for two-hour and four-hour reportable NTSB incidents. BART is also of the understanding that submittal of the CPUC webform will also notify the U.S. DOT's Transportation Operations Center /FTA of reportable incidents which will in turn notify the NTSB in accordance with the reporting requirements.

6. A review of internal CPUC records indicates that BART submits accident investigation reports for reportable accidents in accordance with GO 164-E requirements. BART safety personnel further explained that in general they will submit final reports within 60 days when possible and for more complicated or controversial accidents they will submit a preliminary report within 60 days if a final report is not ready.
7. Staff reviewed the six randomly selected BART accident investigation reports. Staff found the reports to be descriptive of the accident and informative. Staff found that the reports were well written and in compliance with GO 164-E requirements. BART safety personnel explained that contributory causes can be identified indirectly in the reports. Staff suggest BART include a specific contributory causes section in the reports, whether or not any have been identified, for the purpose of accident report format consistency for all CA RTAs.
8. Staff discussed GO 164-E Section 7.8 NTD incident reporting requirements. BART safety personnel informed Staff that NTD reporting is handled on a monthly basis. Staff discussed Section 7.9 requirements regarding collecting, tracking, and analyzing data on occurrences and making the information available to Staff and/or the FTA upon request. BART safety personnel informed Staff that, in addition to reportable accidents, they also collect information on incidents and occurrences on the BART Maximo system. BART safety personnel explained that Maximo was purchased primarily to track, monitor, and schedule preventive maintenance but they also incorporated a module that includes safety information. Responding specifically to GO 164-E Section 9, BART safety personnel explained that occurrences with no personal injuries are reported via their Manager Notification Log (MNL) system, which is an internal paging system. Reportable accidents are also announced as alerts via the MNL system. Personal injuries would be alerted by MNL and then filed into an OCC log. Close calls or near misses are logged outside of Maximo. Safety rule violations are filed into the OCC log or documented per the Operations Safety Compliance program and tracked via internal excel spreadsheets. Occurrences regarding damage to equipment would be filed in Maximo as a maintenance item. Vandalism and theft would be handled by the BART Police Department, however items such as graffiti would be tracked in Maximo as a maintenance item.

Findings:

No Findings

Comments:

1. Staff suggest that BART consider including a specific contributory causes section in the accident investigation reports whether or not any have been identified for the purpose of accident report format consistency for all CA RTAs.

Recommendations:

No Recommendations

2021 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT (BART)

Checklist No.	**11**	**Element**	Emergency Management Program
Date of Audit	December 1, 2021	**Department(s)**	Fire Life Safety BART PD, Security Division E-Line Safety & Training
Auditor/Inspector	Rupa Shitole Joey Bigornia Michael Warren	**Persons Contacted**	Tom Moloney, Director FLS Mimi Bolaffi, Director of Security Programs Michael Brill, Manager of Emergency Preparedness Harlow Church, Program Administrator FLS Kevin Franklin, Deputy Chief of Police

REFERENCE CRITERIA

1. CPUC General Order 164-D/E
2. 49 CFR Part 659/673
3. BART System Safety Program Plan (SSPP) Revision 11 dated February 2019
4. BART System Security Plan (SSP) dated July 2021
5. BART Public Transportation Agency Safety Plan (PTASP) Revision 2 dated June 8, 2020
6. BART Book 346; Emergency Operations Plan dated January 2020

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

Emergency Management Program

Conduct the necessary interviews regarding RTA's emergency planning, training, and drill/exercise program and review appropriate records prepared during the last three years to:

1. Determine if RTA's emergency response planning addressed both safety and security related emergency events and performs three emergency exercise drills per year.
2. Determine whether after action reports were developed, and whether any changes to RTA's Emergency Familiarization Response and/or procedures were necessary. If changes were necessary, how are these changes communicated to RTA personnel?
3. Determine whether RTA has held periodic Fire Life Safety meetings, emergency response agency familiarization activities have occurred as scheduled, and corrective actions have been implemented.
4. Review training programs to verify they contain training curriculums for emergency response procedures and activities appropriate for each job classification.

5. Verify that emergency drills were critiqued and evaluated by participants and any corrective action plans that entail RTA, were recorded, scheduled, and tracked to completion in a timely manner.
6. Review disaster (including earthquake, fire, flood, major power outage, etc.) recovery plan/continuity of operations plan.

FINDINGS AND RECOMMENDATIONS

Activities:

Staff interviewed BART Emergency Planning personnel and Police Department (PD) regarding the Emergency Management Program and determined the following:

1. BART is required to perform three (3) emergency exercise drills with fire and police per year. BART also participates in Bay Area Exercise and Regional Exercises as needed. BART uses the Fire Liaison Committee (FLC) to discuss the emergency drills to be conducted throughout the year and plan for exercises as required. BART participates in several planning meetings with Fire Life Safety. Scenarios are developed and documented for further discussions and execution. TransBay Tube (TBT) exercises, an aerial structure exercise, and other familiarization trainings are conducted annually. Fire Departments (FDs) from different cities are involved in these exercises and training. Checklists are created and shared with FDs. Debriefing and hotwashes are conducted after every exercise. The exercises' intent is to test personnel's procedures and policies to see if any changes are needed. BART provided the following documents:
    - **Fire Life Safety Department Exercise Announcement** – January 12, 19, 20 & 26, 2020 (3 weeks) Trans Bay Tube (TBT) Fire Exercises, all tracks between Embarcadero and West Oakland stations. Stalled train scenario with smoke under lead car with no trouble shooting efforts working. Oakland FD and SFFD participated in the unified command. Fleet of the Future (FOTF) was involved during this exercise. BART did not document an After-Action Report due to COVID staff shortages.
    - **Car Familiarization Richmond Shop dated 9/21/21** – Train the trainer for Berkeley, El Cerrito, and Contra Costa County Fire Departments. New and Old car exterior and interior familiarization was conducted.
    - **TBT Fire Exercise dated January 26, 2020** – Additional information to the Train Operator
    - **The Great Shake Out (earthquake drill) dated 10/21/2021:** Testing of internal system for activations of OCC and Public Information Office using the program used by the public. Annual exercises are in conjunction with other agencies in the State of California.
    - **Gold Eagle Exercise dated 11/3/2021**– PIO tied into other regional agency simulated media posts. Utilized resource requesting processes across transit agencies, activated the Bay Area Joint Information System., communications among agencies, satellite phones, O.A.S.I.S (Operational Area Satellite

Information System), M.O.S.E.S (Mobile Operations Satellite Emergency System) was verified. Purpose of exercise simulated an earthquake.

- **Transbay Tube M-Line Aerial Exercise dated 9/2021** – Staff reviewed the PowerPoint slides that were presented on a computer during the audit. Areas of Improvement slide was discussed briefly.
- **Bay Area Full-Exercise Plan at Millbrae Station dated January 28, 29, 2019** - Complex Coordinated Terrorist Attack with Chemical, Biological, Radiological, and Nuclear **agents** substances and materials. Sponsored by 9th Weapons of Mass Destruction Civil Support Team (WMD-CST). Five incidents were performed at different locations (Golden Gate Bridge/Fort Sutter, Alcatraz Island, Millbrae BART Station, Coliseum AMTRAK, and Bay Ferry Incident) throughout the Bay Area.
- **San Francisco Chemical, Biological, Radiological, Nuclear, and Explosive agents Table-Top Exercise dated 5/19/2021**: Simulated attack scenario involving chemical agents at Oracle Park during an expected attendance of 9,000 at the park for movie night.
- **Santa Clara County BART Exercise dated August 11, 2018**: Full scale exercise at Milpitas BART Station and adjacent associated structures in Milpitas. Threat simulated was an active shooter and suspicious package/person.
- **Fire Department Training Summary CY 2018** – Summary table identifies dates, time, location, and drill types (walk thru, familiarization, TBT drill planning, full TBT, rescue drill, parking structure, full aerial) and participating fire departments (SDFD, Oakland FD, BFD Academy, Milpitas and San Jose, Contra Costa County Fire Protection Department, Alameda FD, Alameda PD, Richmond/El Cerrito, San Francisco/alameda County + Honolulu FD, and Oakland Fire Department).
- **Station Familiarization dated 9/1/2021 at North Berkeley Station** – Training of station exterior (e.g. Fire lane, Fire dept, gates, surface command post, etc.) Concourse (station agent booth, red phone escalators, and incident command), platform (deluge systems, third rail trip, hose cabinets, PABX (emergency) phones, under platform lip, emergency exit, and track identification), Ancillary Buildings/Fire Stations.
- **Transbay Tube Fire Exercises dated 5/16, 5/23, 5/30/21** – Fire Incident with a stalled train in the Transbay tube on the Antioch bound train stopped on the M2 track in the TBT. Train reports smoke under the car at MP4.10. BART controls the incident until the Fire Department Incident Command (FDIC) is in place and then it is governed by the directions of the Fire Department Unified Command for the duration of the drill. BART personnel support the FDIC. Objective is to evaluate fire department and BART response plans, familiarize fire department personnel, and determine communications efficiency.

- **2020 New Year Event dated January 1, 2020** – Staff reviewed AAR for the event including planning and corrective actions.
- **Bomb Threat BART San Francisco Airport Station Event dated July 15, 2020** – Staff reviewed AAR for the event including corrective actions.

2. BART's current practice is to track AAR's generated on a FLS tab in Maximo. The status/progress is identified by date generated, along with the person responsible, reported date, etc. Monitored on a weekly (Monday) basis with report updated. BART is still working on efforts between safety and security on tracking after action reports. BART does not track after-action for FDs. BART showed a PowerPoint on a computer related to areas of improvements related to the September 2021 M-Line Aerial exercise.
3. BART reports the training programs are being formalized with training curriculum for emergency response procedures and activities appropriate for each job classification. In the past, FLS wasn't involved with training curriculum, and they requested active participation in the planning and implementation of the training programs.
   The exercises are effectively an efficiency test of the Operations Control Center, the current SOP's, and sets the stage for ability of Fire Departments within BART's jurisdiction to have an established Unified Command Post and communications amongst each other and BART with a debriefing. Year 2022 exercises are planned according to schedule. The aerial exercises alternates: east to west bay is performed one year and the next year is north to south.
   FLS Committee quarterly meetings are conducted, and Staff reviewed the following meeting minutes: February 12, 2019, November 5, 2019, February 4, 2020, November 17, 2020, and August 8, 2021. Beginning in CY2020, all action items are tracked in the Maximo database under FLS tab. The database identified 17 action items as open, under discussion, and will be tracked to completion. BART Director of Security reports review of the open items every Monday. There are 23 members from fire departments across the BART system that are invited along with CPUC to participate in the drills.
4. BART includes relevant emergency management training as part of their employee training. In 2019, BART started a Supervisor Role in System Security training. In June 2021, the Supervisor Role in System Security course was replaced with a TSA approved training course for all identified security sensitive positions. In addition, all employees will go through Active Shooter training. Active Shooter training started in February 2020, and BART is currently getting all employees caught up.
5. AAR for 2021 wasn't available for review since it was scheduled for completion in January 2022. In the M-Line Aerial for 2021, one observer found that the Supervisor was coaching the T/O. The Fire Department has their own findings, recommendations, and they handle their own corrective actions. BART does not have

a formal after-action plan to share for some exercises. BART is in process of improving and creating these reports for future exercises.

6. BART has Continuity of Operations Plan (COOP) dated 6-12-2018 currently in draft form. The COOP plan wasn't complete due to an employee leaving BART, Covid Response. Its focus was establishing the Emergency Operations Plan (EOP) which was signed February 2020. Most employees who are needed for input and comment were working from home and didn't have the opportunity to review the COOP. BART anticipates completion of COOP by June 2022. The current Emergency Operations Plan dated January 2020 has been issued to 200 employees. A sign-in sheet is maintained by BART Security Manager.
   BART Emergency Operations Plan Book 346 was last updated June 2020 (SVBX extension information addition). Staff reviewed the plan, and it requires BART to conduct a minimum of three (3) emergency exercise drills involving fire and police per year. The EOP covers situations such as Fire/Smoke, Train Derailment/collision, Death or Injury on the ROW, ROW intrusion, Hazardous Materials spill/leak, Earthquakes, High Velocity winds, Flooding, Explosions, Hostage or barricaded subject, Bomb Threat, Power Outage, Public Demonstrations, Procedures for reports of Suspicious powders, Tsunamis, and Active Shooter. BART also has an After-Action Feedback Form to assist BART in identifying improvements that can be made to BART's emergency management efforts.

Findings:

1. Staff found After-Action Reports for some exercises were not created. BART is in the process of creating after action reports for each exercise and include critique, evaluations by participants, and also track recommended improvements needed related to each exercise through completion.

Comments:

1. BART has created a new position, Director of Fire Life Safety, that has improved day-to-day communication with external agencies such as Fire Departments in BART's jurisdiction. The FLS department is expanding and adding new members to the team to achieve open communications with all BART departments and outside agencies, prepare and track all exercises, create after action reports, and document/track/resolve all recommendations using the Maximo FLS tab that was created recently.

Recommendations:

1. BART must document an After-Action Report for each exercise/drill performed on BART System including tracking each recommendation and corrective action until resolved.

2021 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT (BART)

Checklist No.	**12**	**Element**	Internal Safety Audits/Reviews
Date of Audit	November 30, 2021	**Department(s)**	Operations Safety E-Line Safety & Training
Auditor/Inspector	Madeline Ocampo Noel Takahara Daniel Kwok (observer)	**Persons Contacted**	Robb Bury Brian Spring Anthony Onisko

REFERENCE CRITERIA

1. CPUC General Order 164-D/E
2. BART System Safety Program Plan (SSPP) Revision 11 dated February 2019
3. eBART System Safety Program Plan (SSPP) dated July 1, 2017
4. BART Public Transportation Agency Safety Plan (PTASP) Revision 2 dated June 8, 2020
5. BART ISA Audit Schedule 2017-2021

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

Internal Safety Audits (ISA)/Reviews

Interview the RTA representatives involved in ISAs, and review appropriate records to:

1. Determine if a three-year internal audit schedule was developed and submitted to CPUC.
2. Verify that all 21-SSPP elements, and GO 172 and 175 series compliance, were evaluated within a three-year period.
3. Verify CPUC was notified 30 days in advance of the scheduled audit via a letter and or an email and draft checklist(s) were submitted for review.
4. Verify each audit identifies the appropriate RTA departments, personnel, the safety-related activities addressed, and the reference criteria.
5. Verify audits have been properly documented, include references for documents, activities reviewed, criteria for evaluation, and notes to support findings and recommendations.
6. Verify Annual Reports for 2017-2021 are accompanied by annual compliance letters from the Accountable Executive stating RTA's compliance status with its SSPP and identify Corrective Action Plans for non-compliant elements.
7. Verify Corrective Actions from the internal safety audit process were scheduled, tracked, and implemented.

FINDINGS AND RECOMMENDATIONS

Activities:

The checklist was done via Microsoft Teams.

1. BART Operations (Ops) Safety Manager explained that they submit to CPUC a hard copy of the annual certification letter and ISA packet, which includes ISAs of BART, eBART, and OAC. The annual ISA submittal included a three-year schedule for both BART and eBART. The latest ISA cycle for BART was 2019-2021, while the latest cycle for eBART was 2018-2020. Via the share screen function, the Ops. Safety Manager showed a letter addressed to RTSB Program Manager (PM) dated 2/8/2020 for the 2019 audits. In the ISA report, there was a summary of audits conducted in 2019 and a three-year schedule. The Ops. Safety Manager also showed a letter addressed to RTSB Program Manager dated 2/5/2021 for the 2020 audits. In the ISA report, there was a summary of audits conducted in 2020 and a 3-year schedule.
   Staff reviewed the reports for the BART ISAs performed in 2017, 2018, 2019, and 2020. Staff verified that a three-year schedule for 2019-2021 was included in the 2018 ISA report. For the 2017, 2019, and 2020 ISA reports, staff verified that a schedule of audits for the remainder of the three-year cycle was included along with a summary of audits performed that year.
   Staff reviewed the reports for the eBART ISAs performed in 2018, 2019, and 2020. eBART was not in operation at the time of the 2017 ISA program. Staff verified that all the ISA reports contained a three-year schedule.
   Prior to the PTASP, eBART had their own SSPP and was separate from BART. For three years, eBART performed their own ISAs, with the three-year cycle ending at the end of 2020. In February 2021 eBART was merged into BART as the E Line. Now the eBART ISA will be part of the BART ISA. Moving forward, there will be only two entities: BART and OAC.
2. Via the share screen function, Ops. Safety Manager showed the 2021 February submittal for the 2020 audits. There are SSPP chapter numbers in a table and SSPP chapters up to 21 were listed. eBART was able to maintain the audit schedule, however BART was not able to maintain the audit schedule in 2020 because of challenges due to COVID-19. At the time, BART staff had explained this to RTSB PM. The objective was to complete all audits within a 3-year cycle, and they completed approximately 40% in 2020 and then carried over the remaining 60% into 2021. Currently they are caught up with 2020 and 2021 audits. The 2021 ISA report will be submitted in 2022.
   Staff compared the BART three-year schedule (2019-2021) with the BART "Summary of Audits Performed During 2020" and verified that a portion of audits in 2020 had not been completed as planned. On the other hand, the audits in 2019 were completed as planned.
   Staff compared the eBART three-year schedule with the eBART ISA reports and verified that audits were completed as planned.
   Staff asked how GO 172 and GO 175 were audited. Via the share screen function, the BART audit report was displayed that contained "Transportation PED check" CL 19-02. For GO 175, BART staff audit the training records and verify that Train Operators (TOs) have maintained recertification, which includes RWP training. The Ops. Safety Manager showed CL 19-05 completed in 2019 in which the recertification was verified.

Staff reviewed the 2019 ISA report and verified that CL 19-02 and CL 19-05 were completed in 2019.

The eBART GO 175-A/GO 172 audit in 2019 was also shown. Staff reviewed the eBART 2019 ISA report and verified that in Audit Number 7 there were questions pertaining to GO 175-A and GO 172 (e.g. tests covering RWP, inward-facing cab camera reviews, and random head in train rides).

BART staff commented that their internal audit schedule is organized by three departments; the first year was for Transportation, the second year was for Maintenance and Engineering, and the third year was for Rolling Stock and Shops (RSS). For example, in 2019 Transportation was audited. Instead of one department per year, now 30% in each department will be audited per year. Staff reviewed the BART 2019 ISA report and verified that in 2019 the Transportation Department was audited.

3. BART staff did not always notify the RTSB Designated Representative of audits nor provide the checklists prior, and when they did, it was less than 30 calendar days in advance. This was partially due to staffing challenges caused by COVID-19. The current Designated Representative confirmed that he would receive the checklists with an invitation. Via the share screen function, an email to the current Designated Representative on 9/22/2021 was displayed for an audit scheduled for 9/30/21. The Ops Safety Manager explained that he had lost 50% of his staff at the time, and as a result, a Safety Specialist shifted to the day shift from the graveyard shift and was tasked to handle the entire audit program. BART staff indicated they would send the previous Designated Representative the ISA schedule. Via the share screen function, the OPs Safety Manager displayed an email sent to the former Designated Representative on 3/11/2020 with the April Audit schedule for 2020. Another email was sent to the former Designated Representative on 2/19/20 for ISAs in March 2020. eBART sent the 30-day notice to CPUC, but not all email notifications were retained since emails are permanently deleted after a certain period. When the former Designated Representative attended, it was documented in the audit checklists at the time. Via the share screen function, the SMS Manager displayed the Outlook invitation that was sent to the former Designated Representative for an eBART ISA #7 scheduled for 12/18/19. The Outlook invitation contains the checklists and the associated SSPP section, but unfortunately it would not show when it was sent.
4. Based on the BART and eBART ISA checklists shown via share screen, Staff confirmed the date of the audit, auditor, persons contacted (the person being audited), department, reference criteria, methods of verification, and activity of the audit. From document review, Staff observed that in eBART checklists, the RTA departments were not listed in a designated section but were noted in other parts of the checklist. Staff asked how auditors are chosen. The Ops. Safety Manager explained that it depends on availability and their skill sets. He assigns the auditors and if he has questions, he can talk to the Chief Safety Officer, Jeff Lau.

5. Based on the BART and eBART ISA checklists shown via the share screen function, Staff confirmed that the checklists list the references for documents, method of verification, activity of the audit, results, comments, findings, and recommendations.
6. The yearly completed audit letter is typically attached to the front of the packet of audits, which is then sent to CPUC in an envelope. Via the share screen function, three accompanying reports for the 2020 audits (BART, eBART, OAC). The letter is signed by the General Manager (GM) Robert Powers and the GM is also the Accountable Executive. The GM is directly below the BART Board of Directors. Ops Safety Manager then screenshared the letter dated 2/8/20 addressed to RTSB PM from BART GM with his signature. Finally, Staff viewed the letter dated 2/8/19 addressed to RTSB PM and it is signed by the former GM.
   Regarding the 2017 ISA report submitted in 2018, Staff reviewed the CPUC Letter of Approval dated 2/15/18, which was addressed from and signed by RTSB Program and Project Supervisor.
7. Each CAP for OAC, BART, and eBART would have been handled separately. The goal is to close the CAPS before they submit the ISA to CPUC. BART ISA CAPs are not usually high in number, so they are easily managed and do not warrant a spreadsheet. For example, Staff observed that the 2020 BART ISA had one CAP. CAPs are not considered closed until CPUC approves it. CAPs may also be covered in the quarterly meeting with CPUC.
   Staff reviewed the 2017 BART ISA and randomly chose the CAPs in checklists 17-02, 17-08, and 17-19 for review. A CAP description was present, but the implementation schedule, date of completion, and verification were not consistently provided even though the "Summary of Audits Performed During 2017" indicated all CAPs were closed. However, Staff viewed internal RSSIMS records and verified that the CAPs for checklists 17-02, 17-08, and 17-19 were closed. The 2018, 2019, and 2020 BART ISA reports all contained "Corrective Action Plan" forms for CAPs. The forms contained a description, person responsible, schedule of implementation, completion date with signature, and verification date with signature.
   Staff reviewed the 2018, 2019, and 2020 eBART ISA reports and observed that in total there was one CAP in 2018, which had a description and date of implementation. Staff observed that BART checklists use similar terminology as CPUC checklists; BART checklists have sections for "Results/Comments," "Recommendation," and "Corrective Action Plan." On the other hand, eBART checklists have sections for "Results/recommendations" and "Corrective actions." BART Staff explained that for eBART, findings lead to CAPs but recommendations do not have to lead to a CAP and are more like comments. For example, in the 2019 ISA Audit Number 7 there was a recommendation to enhance the Operations Safety Compliance Plan to expand the scope of employees being tested. When they made the changes, they sent them to the BART Designated Representative at the time. Staff reviewed the 2019 ISA Audit Number 7 and verified that there was a "Recommendation" for the Operations Safety Compliance Plan, but no CAP was listed. As another example, Staff observed that in the 2018 ISA Audit Number 3, a "Recommendation" did not have a CAP, but a

"Finding" had a CAP. The 2018 ISA also had a "Note: Finding" in Audit Number 2, but no CAP was listed.

Findings:

1. Staff found BART staff did not always notify the RTSB Designated Representative of audits nor provide the checklists prior, and when they did, it was less than 30 calendar days in advance. eBART staff produced evidence of a notification, which included the checklists, but it was indeterminable whether it was sent 30 calendar days in advance of audits.

Comments:

1. In future BART three-year schedules and schedules for remainder of cycle, Staff suggest adding a column for the checklist number and the GO 164-E element, identical to the columns in the "Summary of Audits Performed" tables. That would provide uniformity across the documents and assist with tracking the audits and GO 164-E elements.
2. Staff understand that in February 2021 eBART was merged into BART and will be part of the same ISA moving forward. BART and eBART CAP documentation differed and did not always contain relevant CAP details. For uniformity and record-keeping, staff suggest that the "Corrective Action Plan" form that was used in the 2018, 2019, and 2020 BART ISA reports continue to be used for all ISA CAPs.
3. The eBART ISA terminology differed from that of BART ISAs and was unclear. For uniformity and clarity, staff suggest that all ISA checklists follow the same terminology as CPUC audit checklists (i.e. "Activities," "Findings," "Comments," and "Recommendations").
4. In eBART checklists, the RTA departments were not listed in a designated section, but were noted in other parts of the checklist. Staff suggest that all ISA checklists have a designated section to input the department(s) of the auditees.

Recommendations:

1. Per General Order 164-E Section 5.4, BART and eBART staff must submit the ISA schedule, including any subsequent changes, to CPUC at least 30 calendar days before any scheduled audits. Per General Order 164-E Section 5.5, BART and eBART staff shall also provide the ISA checklists to CPUC prior to the audit.

2021 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT (BART)

Checklist No.	**13-A**	**Element**	Rules Compliance: Observation and Enforcement
Date of Audit	December 10, 2021	**Department(s)**	Transportation Rolling Stock & Shop Maintenance & Engineering Safety
Auditor/Inspector	Mike Rose Richard Fernandez	**Persons Contacted**	Robb Bury Asiann Chan-Velasco Roman Kotlyar Leo Pica Martin Atkinson Michael Lemon Anthony Onisko

REFERENCE CRITERIA

1. CPUC General Order 164-D/E
2. CPUC General Order 172
3. CPUC General Order 175-A
4. BART System Safety Program Plan (SSPP) Revision 11 dated February 2019
5. eBART System Safety Program Plan (SSPP) dated July 1, 2017
6. BART Public Transportation Agency Safety Plan (PTASP) Revision 2 dated June 8, 2020
7. BART Operations Safety Compliance Plan dated March 22, 2018
8. BART M&E Operations Safety Compliance Program Plan dated October 7, 2019
9. BART RS&S Operations Safety Compliance Program Plan dated February 6, 2019
10. BART Operations Rules and Procedures Manual (OR&P) dated September 2015
11. BART Train Operator Manual Rev. March 2018
12. BART E-Line DMU Engineer Evaluation Program dated April 9, 2018
13. BART E-Line DMU Engineer Manual Revenue Service dated June 2019

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

Rules Compliance: Observation and Enforcement

Interview the appropriate RTA representatives, perform field observation of RTA staff and review appropriate records to:

1. Verify Transportation Department performs formal observations of Train Operators as specified in the SSPP/PTASP and/or supporting procedures by accompanying a Transportation Operations Manager, or Transportation Supervisor during compliance checks, assess how compliance checks are conducted, and ensure that the final report matches field findings.

2. Verify RTA performs observation of Maintenance and Engineering, as well as Rolling Stock and Shops Employees as specified in the SSPP/PTASP and/or supporting procedures. Interview operations and supervisory staff to determine their familiarity with rules and procedures and how they monitor employee compliance with rules and procedures.
3. Review documentation to verify Supervisors are citing train operating personnel for rule violations. Conduct a random sample inspection of transit operators to determine if they are carrying their rulebook, if they have the proper safety equipment in their cabs, and if their radios are functioning.
4. Verify operations and maintenance employees are evaluated based on their performance during unannounced observations to assess their compliance with safety rules, procedures, and/or practices. Conduct random interviews of operators to verify how often they receive training on rules and procedures and how the transit agency monitors their compliance with rules and procedures.
5. Determine how RTA performs efficiency testing of operating and maintenance personnel and verify CAPs are implemented when appropriate.
6. Verify the Safety Department receives reports from Transportation, Maintenance and Engineering, and Rail Stock and Shops Departments regarding rules compliance assessment and testing. Are hazards identified from the rules compliance process, reported to Safety Department, and tracked through the Hazard Management Process?
7. Select a minimum of four or five Train Operator's Manual Procedures and ride the RTA system to verify rules are followed (such as horn signaling, any speed restrictions, end of line vehicle inspections, etc.).

FINDINGS AND RECOMMENDATIONS

Activities:

1. CPUC Staff conducted field observations of Transportation Supervisors including BART and eBART, while they conducted multiple compliance checks on Train Operators from their respective systems. Both Transportation Supervisors observed failures, which were resolved utilizing the coaching method. The compliance checks were input into BART's Maximo Program, and a copy of the recorded failure and coaching were supplied to Staff verifying that the recorded field events were documented and matched the final findings.
2. BART Maintenance and Engineering (M&E) and Rolling Stock and Shops (RS&S) Departments conduct compliance checks on their respective employees. Both Departments require a minimum number of inspections to be conducted by supervisors per month. The compliance checks are documented in the Maximo System. Both departments were able to show Staff compliance checks and inspections from June 2019. Staff reviewed the Maximo System and BART Personnel were able to verify that there was a Corrective Action Plan (CAP) for failures and work orders generated for faulty equipment needing repair. The Maximo System also showed when the work order was completed and closed out.

3. The Transportation Department was able to show Staff completed compliance checks, to include any failures, the failure details, and any coaching or discipline that was merited. Staff conducted check rides on BART and eBART lines and were able to verify that Operators had their rule book and working radios in their possession.
4. Operations and Maintenance Departments showed Staff how they assessed their employees' compliance with safety rules, procedures and/or practices through documented compliance testing, which are then entered into Maximo. Staff conducted random interviews with Operation and Maintenance employees to ascertain their working knowledge of safety rules, procedures, and/or practices. During these interviews, employees were able to inform Staff of their required training and were familiar with how BART monitors their compliance with rules and procedures.
5. Each BART Department designates a minimum number of compliance checks to be performed by supervisors. These compliance checks are documented in the Maximo System, and if warranted, the supervisor can input a Corrective Action Plan (CAP). Staff were able to verify this on multiple occasions during the Triennial Audit by reviewing the Maximo data from randomly selected dates.
6. Transportation, Maintenance and Engineering, and Rolling Stock and Shops Departments gather the information obtained through compliance checks and testing, which is discussed in monthly, quarterly and yearly meetings. System Safety only receives this information in the yearly meeting, although the information can be obtained by System Safety via Maximo, there is no hazard analysis being conducted by System Safety at this time.
7. Staff observed and interviewed BART Train Operators for the duration of the Triennial Audit, throughout the BART System and verified that safety rules and procedures were being followed.

Findings:
No Findings

Comments:
1. System Safety should attend the BART Transportation, Maintenance and Engineering, and Rolling Stock and Shops Departments, monthly and quarterly meetings to get the most current safety data. This will enable System Safety to process the most continuous data and help track trends and conduct Hazard Analysis Systemwide.

Recommendations:
No Recommendations

2021 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT (BART)

Checklist No.	**13-B**	**Element**	Rules Compliance: Operations Safety Compliance
Date of Audit	December 10, 2021	**Department(s)**	Transportation Rolling Stock & Shop Maintenance & Engineering Safety
Auditor/Inspector	Michael Rose Richard Fernandez	**Persons Contacted**	Asiann Chan-Velasco Roman Kotlyar Fred Edwards Marshalette Ramsey Leo Pica Martin Atkinson Michael Lemon Anthony Onisko

REFERENCE CRITERIA

1. CPUC General Order 164-D/E
2. CPUC General Order 172
3. CPUC General Order 175-A
4. BART System Safety Program Plan (SSPP) Revision 11 dated February 2019
5. eBART System Safety Program Plan (SSPP) dated July 1, 2017
6. BART Public Transportation Agency Safety Plan (PTASP) Revision 2 dated June 8, 2020
7. BART Book 315; Train Operator Manual Rev. March 2018
8. BART Operations Control Center Rules and Procedures Manual dated March 17, 2021
9. BART Book 489; Roadway Worker Protection (RWP) Manual, dated May 2016
10. BART E-Line DMU Engineer Manual Revenue Service dated June 2019
11. BART E-Line DMU Engineer Evaluation Program dated April 9, 2018

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

Rules Compliance: Operations Safety Compliance

Interview RTA representatives responsible for the Transportation Department, and randomly select at least ten (10) Wayside staff, Controllers, Train Operators, and Supervisors, with at least one (1) employee in each of the above categories from the E-Line, and perform ride-along or on-site inspections to verify their compliance to determine whether:

1. Maintenance of Way - Wayside Workers:
   a. Know and understand applicable wayside safety rules;
   b. Comply with the Personal Electronic Devices (PED) Rules and Roadway Worker Protection (RWP) rules when performing any duties on or near railways;

c. Know and understand the rules and procedures for mainline operations.

2. Train Operators:
   a. Are in compliance with the applicable rules and procedures;
   b. Comply with PED Rules while inside operator cabins;
   c. Are properly trained and knowledgeable in handling accident/incidents and emergency response situations, and coordinating with Operations Control Center during an incident
3. Controllers:
   a. Are properly preparing and maintaining records, reports, and logs;
   b. Perform duties in accordance with standard operating procedures, rule books, and bulletins;
   c. Are trained and knowledgeable in dealing with accidents/incidents and emergency response situations and coordinating with RTA personnel and other agencies during the same.

FINDINGS AND RECOMMENDATIONS

Activities:

1. CPUC Staff conducted field observations of Wayside Personnel throughout the BART System. BART Personnel was knowledgeable of the rules, operating procedures and the PED Policy was followed during all observations.
2. Staff rode all lines, including E-line and found each BART Operator/DMU Engineer interviewed, to be knowledgeable of the rules, operating procedures and had their PED's off and stowed while operating. Each operator had in their possession a BART Rule Book, Radio, and used professional courtesy when speaking with passengers.
3. Staff conducted onsite inspections of the ECC and OCC speaking with BART Controllers at both locations. Staff viewed the Controller Log Sheets, and how data is captured by the Controllers and relayed to M&E when a BART Car has an issue while in operation. Staff also watched how OCC management interacts and assists Controllers when a delay or issue arises to create a plan of action and correct the issue to restore normal service.

Findings:
No Findings

Comments:
No Comments

Recommendations:
No Recommendations

2021 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT (BART)

Checklist No.	**13-C**	**Element**	Rules Compliance: Operator, Controller, and Maintenance Personnel Hours of Service
Date of Audit	December 9, 2021	**Department(s)**	Transportation Payroll Safety
Auditor/Inspector	Michael Rose Richard Fernandez Laura Espinoza	**Persons Contacted**	Robb Bury Raphael Bejarano Shawn Jackson Leo Pica Mike Lemon Matthew Gill Anthony Onisko

REFERENCE CRITERIA

1. CPUC General Order 164-D/E
2. CPUC General Order 172
3. CPUC General Order 175-A
4. BART System Safety Program Plan (SSPP) Revision 11 dated February 2019
5. eBART System Safety Program Plan (SSPP) dated July 1, 2017
6. BART Public Transportation Agency Safety Plan (PTASP) Revision 2 dated June 8, 2020
7. BART Book 315; Train Operator Manual Rev. March 2018
8. BART Book 489; Roadway Worker Protection (RWP) Manual, dated May 2016
9. ATU Labor Agreement 2013 – 2021
10. AFSCME Labor Agreement 2013 – 2021

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

Rules Compliance: Operator, Controller, and Maintenance Personnel Hours of Service

Select at least 5% safety-sensitive employees at random from each of the following employee classifications:

- Train Controllers
- Power/Support Controllers
- Train Operators
- Station Agents
- Tower Foreworkers
- Transit Vehicle Mechanics
- Electricians
- Electronic Technicians (Revenue Vehicles)

- Electronic Technicians (Train Control)
- Electronic Technicians (Communications)
- On-Rail Equipment Operators

With at least one (1) employee from the E-Line:

- Composite Vehicle Maintainers
- Diesel Train Engineers (Class 1)

Review the employees' timecards for a three-month period during the past 18 months to determine whether:

1. The employee was in compliance with safety-sensitive employee requirements and did not remain on duty for more than 12 consecutive hours, or for more than 12 hours in any 16-hour period.
2. Each initial on-duty status was preceded by eight consecutive hours of off-duty status.

FINDINGS AND RECOMMENDATIONS

Activities:

1. CPUC Staff randomly selected and reviewed the following employee timesheets for the dates of October, November, and December 2019 regarding safety sensitive employee requirements:

   DMU Operator Employee ID's: 063759, 064011, 065501, 066432
   Composite Vehicle Maintainer IDs: 063973
   Train and Power/Support Controller ID's: 062037, 061271, 057843, 061741, 061622,
   Foreworker ID's: 063181, 056724, 060227, 056583, 056095, 056731, 055349, 055368, 062124
   Transit Vehicle Mechanic and Transit Vehicle Electronic Tech ID's: 062987, 060436, 058034, 066070, 062049, 062780, 062486, 061567, 062022, 053294, 064386, 063575, 064800, 058320
   Station Agent ID's: 061406, 065701, 056480, 056077, 062262, 063024, 057662, 064016, 056199, 058039
   Train Operator ID's: 060065, 060327, 061124, 060465, 060895, 058255, 057230, 058128, 057149, 060163 064306, 061444, 055976, 063680, 060565, 055985, 060093, 061734, 056018, 057136, 058378, 056577, 055525, 056578
   Transportation Supervisor ID's: 055387, 060525
   Electrician ID's: 057389, 060940, 061890
   Communications Electronic Technicians IDs: 062544, 065048, 057389, 060940, 061890
   Train Control Electric Tech ID's: 057626, 061365, 058474
   On-Rail Equipment Operator IDs: 058474, 060814, 063792, 065032

Findings:

No Findings

Comments:

1. BART should follow Nationwide Industry Standard and General Order 143-B requirements as guidance for safety sensitive employees and disallow safety sensitive employees to exceed twelve consecutive hours on-duty and require a minimum of eight consecutive hours off-duty.
   Staff noted several job classifications considered by BART to be safety sensitive positions and exceeded these standards:

   Mechanical:

   Employee #064386 worked 16 hours on each of the following days 11/13/2019, 11/14/2019, 11/15/2019 12/2/2019, 12/3/2019, 12/6/2019, 12/10/2019, 12/11/2019, 12/16/2019, 12/17/2019, and 12/18/2019 (11 days total).

   Train Operator:

   Worked 13 hours on 10/13/2019.

   Transit Supervisor:

   #055387 worked 14 hours on 10/29/2019, and 13 hours on 12/09/2019.

   Transit Vehicle Electronic Tech:

   #062780 worked 16 hours overtime on 9/24/2019

   Transit Vehicle Mechanic:

   #064386 worked at least 16 hours on 11/13/2019, 11/14/2019, 11/15/2019, 12/2/2019, 12/3/2019, 12/10/2019, 12/11/2019, 12/16/2019, 12/17/2019, and 12/18/2019.

   On-Rail Equipment Operator:

   #058474 worked at least 14 hours on 10/2/2019, 10/3/2019, 10/4/2019, 10/5/2019, 10/26/2019, 11/10/2019, 11/24/2019, 12/7/2019, and 12/14/2019.
   #060814 worked at least 13 hours on 10/10/2019, 10/11/2019, 10/12/2019, 10/13/2019, 10/14/2019, 10/15/2019, 10/16/2019, 10/17/2019, 10/18/2019, 10/19/2019, 10/20/2019, 10/21/2019, 10/22/2019, 10/23/2019, 10/24/2019, 10/25/2019, 10/26/2019, 10/27/2019, 10/28/2019, 10/30/2019, 11/1/2019, 11/2/2019, 11/3/2019, 11/4/2019, 11/6/2019, 11/9/2019, 11/11/2019, 12/6/2019, 12/7/2019, 12/8/2019, 12/9/2019, 12/10/2019, 12/22/2019, 12/23/2019, and 12/29/2019.
   #063792 worked at least 13 hours on 11/1/2019, 11/2/2019, 11/6/2019, 11/11/2019, 11/14/2017, 11/17/2019, 11/24/2019, 11/25/2019, and 11/26/2019.
   #063792 was off-duty for 6 hours on 12/16/2019, and was off-duty for 5 hours on 12/19/2019.

2. Staff noted the following cases of work shifts exceeding the acceptable work period due to the Daylight Savings Time change. BART should also be conscious of the times employees are working including daylight savings for its hours-of-service program.

   Transportation:

   #056724 worked 12 hours 15 minutes on 11/2/2019.
   #061622 worked 13 hours on 11/2/2019.

Recommendations:
No recommendations

2021 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT (BART)

Checklist No.	**13-D**	**Element**	Rules Compliance: Contractor Safety Program
Date of Audit	December 6, 2021	**Department(s)**	System Safety Engineering
Auditor/Inspector	Michael Rose Richard Fernandez	**Persons Contacted**	Josh Teo Phoebe Cheng Mimi Lee Jason Eng Simona Valdez Doug Kennedy Dennis Acma

REFERENCE CRITERIA

1. CPUC General Order 164-D/E
2. CPUC General Order 172
3. CPUC General Order 175-A
4. BART System Safety Program Plan (SSPP) Revision 11 dated February 2019
5. eBART System Safety Program Plan (SSPP) dated July 1, 2017
6. BART Public Transportation Agency Safety Plan (PTASP) Revision 2 dated June 8, 2020
7. BART Book 489; Roadway Worker Protection (RWP) Manual, dated May 2016
8. BART Management Procedure 31 dated 2021
9. BART Operating Rules and Procedures Manual (OR&P) dated September 2015
10. BART Facilities Standard; Section 01 35 24; Construction Safety dated December 2020

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

Rules Compliance: Contractor Safety Program

Interview the RTA representative responsible for the Contractor Safety Program and review documentation to determine whether:

1. Contractor safety program establishes responsibilities and requirements for training, certification, rules, regulations, and procedures applicable to all employees/contractors.
2. Standard operating procedures establish the range of activities for monitoring Contractors and their employees, and are enforcing compliance with safety requirements through regular unscheduled and unannounced compliance checks, and scheduled periodic audits and inspections of construction sites to monitor compliance with its safety requirements.

3. Monitoring and enforcement activities are properly recorded, distributed, and filed. Ensuring all contractors followed RTA's requirements of Track Allocation/Work Permit process.

FINDINGS AND RECOMMENDATIONS

Activities:

1. CPUC Staff reviewed Contract number 15EJ-180 and 15EK-102. Both Contracts clearly establish responsibilities and requirements for training, certification, rules, regulations, and procedures applicable to employees/contractors. BART Management Procedure 31, Standard for access to the BART Operating System dated 2016 and then revised in 2021 also clearly establishes the responsibilities and procedures applicable to performing work on the BART Operating System.
2. Staff reviewed the BART Management Procedure, Operations Safety Compliance Program Procedure 84.00 Rev 1 dated 10/01/2016. This program requires the three primary Operations departments (Transportation & System Service, Maintenance and Engineering, and Rolling Stock and Shops) to develop an Operations Safety Compliance Plan (OSCP) that contains 1) the safety aspects that will be covered, 2) the frequency of safety compliance exercises, 3) the format of the standard checklists that will be used, and 4) the responsibilities for the various program activities.
3. In accordance with the individual Transportation Department's Operations Safety Compliance Plan (OSCP), The monitoring and enforcement activities shall be reported on the online form in Maximo and shall include the date, reference number of the test conducted, names of those tested, and the results of the test. These tests can be viewed in the Maximo System. Staff reviewed the data results from several compliance tests from the different departments verifying that the monitoring and enforcement activities are properly recorded, filed and distributed. The Maximo System also showed the Corrective Action Plan (CAP) associated with any failures that were documented.
4. Contractors are required to follow the process as outlined in BART's Management Procedure 31, Standard Procedure for Access to the BART Operating System. Prior to approval by the System Access Committee (SAC), Contractors are required to submit via the BART EGIS System a Site-Specific Work Plan, and, if required, an Interim Operating Procedure. If BART's minimum requirements are not met, access to their System will be denied.

Findings:

No Findings

Comments:

1. Staff were informed that System Safety is not involved with any compliance checks or safety oversight of contractors. System Safety only receives information about contractor safety during the yearly meeting.

Recommendations:
No Recommendations

2021 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT (BART)

Checklist No.	**13-E**	**Element**	Rules Compliance: Operating Rules and Maintenance Procedures Manual and Operations Bulletin Revisions
Date of Audit	December 6, 2021	**Department(s)**	System Safety
Auditor/Inspector	Michael Rose Richard Fernandez	**Persons Contacted**	Robb Bury Jonathan Rossen Anthony Onisko Transportation | M&E

REFERENCE CRITERIA

1. CPUC General Order 164-D/E
2. CPUC General Order 172
3. CPUC General Order 175-A
4. CPUC Decision No. 95-12-034
5. BART System Safety Program Plan (SSPP) Revision 11 dated February 2019
6. eBART System Safety Program Plan (SSPP) dated July 1, 2017
7. BART Public Transportation Agency Safety Plan (PTASP) Revision 2 dated June 8, 2020
8. BART Book 315; Train Operator Manual Rev. March 2018
9. BART Operating Bulletins dated 2021
10. BART Book 489; Roadway Worker Protection (RWP) Manual, dated May 2016
11. BART Operations Rules and Procedures (OR&P) Manual September 2015

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

Rules Compliance:
Operating Rules and Maintenance Procedures Manual and Operations Bulletin Revisions
Interview RTA representative responsible for operations rules and procedures, maintenance procedures, and review necessary documentation to determine whether:

1. The Standard Operating Procedures, Wayside Maintenance Procedures and all active Rail Operations Bulletins are reviewed, revised systematically and distributed to the relevant personnel.
2. All Rail Operations Bulletins were approved by the Chief Safety Officer with concurrence of affected departments, if applicable, and issued in a timely manner.

3. An employee record of all Operations Bulletins was issued and received.
4. Active Operations Bulletins are posted in specified locations, and inactive bulletins are removed in a timely manner.
5. CPUC received all new operating rules and bulletins during the past 12 months, and issuance was tracked.
6. Conduct interviews with Safety Department representatives to discuss their role in ensuring that safety concerns are addressed in rules compliance program.
7. Does the Safety Department representative receive reports from the operations and maintenance departments regarding the performance of rules checks, assessments, and testing?
8. Are hazards identified from the rules compliance process and reported to Safety Department and managed through the hazard management process?

FINDINGS AND RECOMMENDATIONS

Activities:

1. CPUC Staff observed BART's process of reviewing, and revising Standard Operating Procedures, Wayside Maintenance Procedures and Rail Operations Bulletins. Bulletins reviewed by System Safety are revised, re-numbered and reissued annually. Staff were shown how the process of the Operating Rules and Procedures Manual (OR&P), ongoing revision of EBART to the E-Line and its individual rule book are being integrated into the OR&P.
   Staff reviewed eCOR Rule Modification for E-Line Transition 3-9-2021.
   Staff reviewed Maintenance Bulletin 2040: 9-21-2021, and roster Sign-For.
   Staff reviewed Transportation Notice OB 20-39: 9-9-2020 Category Y Work Area Clearance, and roster Sign-For.
2. Staff reviewed the above Bulletins, along with OB 21-33 and OB 19-33. All Bulletins shown to Staff were approved by the Chief Safety Officer with concurrence of affected departments, if applicable, and issued in a timely manner.
3. Employees receive Operations Bulletins by email and are also available at BART computer terminals at all on duty locations.
4. All Bulletins are emailed to management then distributed to the employees. Foreworkers notify the Operators as they come on duty of the updated Operating Bulletins. There are computers located at on duty locations where employees can access all Bulletins and print them if needed.
5. CPUC received all new operating rules and bulletins during the past 12 months, and issuance was tracked and stored in CPUC Content Server.
6. Safety Department ensures safety concerns are addressed in rules compliance program through the department monthly safety meeting. BART Safety Notices are reviewed in the meeting and addressed for a corrective action plan.
7. Operations, Maintenance and Engineering, and Rolling Stock and Shops, review their respective departments Safety Compliance Program monthly and then compose a quarterly report. System Safety only receives a report from each department at the yearly meeting.

8. The Hazard Management Process is currently being performed in Maintenance and Engineering, and the E-Line respectively. The other departments, including System Safety, have yet to adopt this portion of the SMS process, and BART is currently in the process of hiring an SMS expert. This way BART can fully implement SMS Hazard Management Process in compliance with the BART PTASP.

Findings:

1. Staff found BART System Safety has not implemented a process for the data captured during rules checks, assessments, and testing to monitor unsafe patterns, trends and practical drift through the SMS process. System Safety receives an annual update regarding rule checks, assessments and testing from each department but has failed to utilize the captured data as outlined in the BART PTASP and SMS process.
2. Staff found BART has not fully implemented the Hazard Management Process per the BART PTASP. The Hazard Management Process is being utilized in only a couple of departments.

Comments:

No Comments

Recommendations:

1. BART System Safety must attend all meetings relevant to BART Hazard Management Process and track trends, Practical Drift, and SMS.
2. BART must ensure the Hazard Management Process is being utilized throughout the entire system in all departments as outlined in the PTASP. BART must ensure there is a process to conduct an analysis of the continuous data captured in rules checks, assessments, and testing addressing each safety risk and CAP.

2021 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT (BART)

Checklist No.	**13-F**	**Element**	Rules Compliance: Operations Control Center & SCADA
Date of Audit	eBART ECC December 1, 2021 BART OCC December 2, 2021	**Department(s)**	Transportation Communications Engineering
Auditor/Inspector	Michael Rose Richard Fernandez	**Persons Contacted**	Fred Edwards Randell

REFERENCE CRITERIA

1. CPUC General Order 164-D/E
2. CPUC General Order 172
3. CPUC General Order 175-A
4. BART System Safety Program Plan (SSPP) Revision 11 dated February 2019
5. eBART System Safety Program Plan (SSPP) dated July 1, 2017
6. BART Public Transportation Agency Safety Plan (PTASP) Revision 2 dated June 8, 2020
7. BART Operations Control Center (OCC) Rules and Procedures Manual dated August 17, 2021
8. BART SCADA AB Controllogix Maintenance Job Plan dated May 21, 2018
9. BART SCADA SEL Maintenance Job Plan dated May 21, 2018
10. BART SCADA S Maintenance Job Plan dated May 21, 2018
11. BART E-Line Supervisor of Operations Manual dated 2020
12. BART E-Line MOW 200 – SCADA Inspection System dated June 8, 2017

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

Rules Compliance: Operations Central Control, E-Line Control Center, & SCADA

Interview RTA representatives responsible for operations rules and procedures and review necessary documentation to:

1. Verify revisions to the OCC Rules and Procedures Manual and E-Line Supervisor of Operations Manual are made either through Operating Bulletins, or other written documents signed by the appropriate Department Managers.
2. Determine whether SCADA records have been maintained as required, and that all preventative and corrective maintenance practices comply with the applicable reference criteria.
3. Review SCADA reports/logs related to intrusion alarms, false presence, and others associated with SCADA monitoring.
4. Verify conformance to the reference criteria documents as applicable.

FINDINGS AND RECOMMENDATIONS

Activities:

1. CPUC Staff interviewed BART Assistant Chief Transportation Officer and was informed that the revisions to the OCC Rules and Procedures Manuals are currently in draft form with the newest revision to encompass BART and eBART as one entity. All current OCC Rules and Procedures Manual revisions unify Controller duties for BART and eBART. Both modes, BART and eBART will operate as one unit under BART and the new designation of eBART will be named the BART E-Line.
   Staff reviewed the following:
   - 2/28/2020 Sign-For, Supervisor of Operations On-Duty Phone.
   - 3/21/2019 eBART Bulletin Daily Inspection Form and DMU Manual Rule #226.
   - 8/26/2019 Rule 311 changes OCC Manual Rule 458 Train Manual Door Cycles.
   - 8/23/2019 OCC Communications with OAC and eBART.
2. BART Personnel explained the SCADA System standalone system, and it is not connected to the internet to ensure hacking is not possible. OCC Managers log all intrusion detections and showed Staff the computer log and its accessibility. Staff also viewed the Communications SCADA System PM Check Sheet that is used to report findings and corrective actions for a failure in the SCADA System. The SCADA System is a self-checking system and will flag any errors in the system. BART does have a repository for data backup in case of a system failure to reboot the system. BART has a Computer System Engineering SOP for maintenance on the SCADA system.
3. Staff viewed SCADA intrusion detection logs and the new infrared and laser detection system for the SVBX project.
4. BART verified that the reference material listed in this checklist is what they are currently utilizing for the SCADA System.

Findings:
No Findings

Comments:
No Comments

Recommendations:
No Recommendations

2021 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT (BART)

Checklist No.	**14-A**	**Element**	Facilities and Equipment Inspections: Non-Revenue Facilities and Wayside
Date of Audit	November 9, 2021 – November 18, 2021	**Department(s)**	System Safety Fire Life Safety Electrical Rolling Stock & Shop
Auditor/Inspector	Laura Espinoza Shane Roberson Nicholas Denny Eric Madero	**Persons Contacted**	Jonathan Rossen Tom Moloney Yard Superintendents

REFERENCE CRITERIA

1. CPUC General Order 164-D/E
2. BART System Safety Program Plan (SSPP) Revision 11 dated February 2019
3. eBART System Safety Program Plan (SSPP) dated July 1, 2017
4. BART Public Transportation Agency Safety Plan (PTASP) Revision 2 dated June 8, 2020
5. BART Book 4, Mechanical Maintenance Procedures
6. BART Book 31, Power and Way Electrical Maintenance Procedures

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

Facilities and Equipment Inspections: Non-Revenue Facilities and Wayside

Interview RTA representatives, perform field observations of RTA staff inspecting the equipment and review appropriate records for past 3 years to determine whether:

1. Required inspections were performed consistent with supporting references.
2. Inspections were properly documented and noted, and discrepancies were corrected in a timely manner.
3. Potential hazards found during inspections are immediately reported, documented, and tracked through resolution, Corrective Action Plans developed, and implemented in a timely manner.

FINDINGS AND RECOMMENDATIONS

Activities:

CPUC staff met with BART staff and performed field observations, inspections, and reviewed records and found the following:

1. CPUC staff reviewed inspection records and performed field inspections of Concord, Daly City, E-Line (Antioch), Hayward, Oakland, and Richmond shops. Staff noted monthly inspection forms for the Richmond shop are missing review signatures and inspection items marked "No" or "Urgent" do not show CAP or follow up information.

2. CPUC staff performed field inspections and reviewed records of facilities including eye wash stations, fire extinguishers, electrical panels, hazardous materials, general housekeeping, and lighting. Staff noted eyewash bottle missing at Hayward shop. BART personnel explained that spare eyewash bottles were usually in stock. Replacements had been ordered but not yet delivered.
3. Per the Safety Inspection Program, BART personnel are to conduct monthly safety inspections. Hazards should be tracked through resolution and Corrective Action Plans (CAPs) developed consistent with the SSPP and PTASP. Staff reviewed monthly inspections, biannual crane inspections (performed by contractor), portable jack inspections.

Findings:

1. Staff found monthly inspection forms not properly documented and noted. See Comment 1.
2. Staff found hazards are not tracked through resolution, CAPs not developed. See Comment 1.

Comments:

1. Staff noted monthly inspection forms for the Richmond shop are missing review signatures and inspection items marked "No" or "Urgent" do not show CAP or follow up information.
2. Staff noted eyewash bottle missing at Hayward shop. BART personnel explained that spare eyewash bottles were usually in stock. Replacements had been ordered but not yet delivered.

Recommendations:

1. BART must review and sign monthly inspection forms.
2. BART must develop CAPs and track all hazards through resolution.

2021 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT (BART)

Checklist No.	**14-B**	**Element**	Facilities and Equipment Inspections: Stations and Emergency Equipment
Date of Audit	December 7, 2021	**Department(s)**	Fire/Life Safety Employee/Patron Safety Electrical
Auditor/Inspector	Laura Espinoza Nicholas Denny Samuel Herroz	**Persons Contacted**	Jonathan Rossen Tom Moloney

REFERENCE CRITERIA

1. CPUC General Order 164-D/E
2. BART System Safety Program Plan (SSPP) Revision 11 dated February 2019
3. eBART System Safety Program Plan (SSPP) dated July 1, 2017
4. BART Public Transportation Agency Safety Plan (PTASP) Revision 2 dated June 8, 2020
5. BART Book 4, Mechanical Maintenance Procedures
6. BART Book 31, Electrical Maintenance Procedures
7. BART Emergency Telephone Inspection Procedures dated February 2, 2018

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

Facilities and Equipment Inspections: Stations and Emergency Equipment

Interview RTA representatives, perform field observation of them inspecting equipment for at least one (1) station, and perform field observations for at least one (1) station per line in the following areas:

- A/L/S Lines
- K/C/R Lines
- M/W/Y Lines
- E Line

And review appropriate records to determine whether, including:

1. Required inspections were performed in accordance with reference criteria.
2. Inspections were properly documented and noted discrepancies were corrected in a timely manner.
3. Potential hazards found during inspections were tracked from recommendations, Corrective Action Plans, and implementation.

FINDINGS AND RECOMMENDATIONS

Activities:

CPUC staff reviewed inspection records of the following stations: Hayward, El Cerrito Plaza, Orinda, San Bruno, Balboa, MacArthur.

1. Most of the inspections reviewed by CPUC staff fall under the SSPP requirements of once every 6 months within a calendar year. The PTASP requires the inspections to take place once every 12 months within a calendar year. Per the SSPP, stations were to be inspected at least once every 6 months within a calendar year and discrepancies corrected within 30 days. BART did not inspect its passenger stations at the required frequency of "…at least once every six months within a calendar year." As required by its SSPP, Section 1401. The same finding was also noted in the previous triennial audit.
2. After reviewing the inspection records, Staff and BART personnel inspected MacArthur station on the K/C/R line. Staff also inspected San Bruno station (M/W/Y line), Hayward station (A/L/S line), and Antioch station (E line). Discrepancies noted on inspection forms were marked closed, but field inspection showed that the items had not been corrected. Other discrepancies were not corrected Per SSPP

   Examples from MacArthur station:

   - Exposed rotating shaft, identified August 2020 (marked as closed), still exposed.
   - Eyewash not checked monthly, identified December 2020 (marked as closed), still not checked monthly.
   - Biowaste container full, identified July 2021, still full.
   - Emergency Exit sign not working, identified July 2021, still not working.
   - Cover on light pole missing, identified in past BART inspection, still missing.

   San Bruno station:

   - Multiple lights out over stairs and escalators, identified in past BART inspection, lights are still out plus additional lights not previously identified are also out.
3. See #2 above.

Findings:

1. Staff found BART did not inspect its passenger stations at the required frequency of "…at least once every six months within a calendar year." As required by its SSPP, Section 1401. The same findings were also noted in the previous triennial audit. See Comment 1.
2. Staff found inspections were not properly documented, and discrepancies were not corrected in a timely manner. See Comment 2.
3. Staff found potential hazards not tracked through to resolution per the SSPP or PTSAP. See Comment 2.

Comments:

1. Staff noted most of the inspections reviewed by CPUC staff fall under the SSPP requirements of once every 6 months within a calendar year. The PTASP requires the inspections to take place once every 12 months within a calendar year.
2. Staff noted discrepancies noted on inspection forms were marked closed, but field inspection showed that the items had not been corrected. Other discrepancies were not corrected Per SSPP.

   Examples from MacArthur station:

   - Exposed rotating shaft, identified August 2020 (marked as closed), still exposed.
   - Eyewash not checked monthly, identified December 2020 (marked as closed), still not checked monthly.
   - Biowaste container full, identified July 2021, still full.
   - Emergency Exit sign not working, identified July 2021, still not working.
   - Cover on light pole missing, identified in past BART inspection, still missing San Bruno station.
   - Multiple lights out over stairs and escalators, identified in past BART inspection, lights are still out plus additional lights not previously identified are also out.

Recommendations:

1. BART must complete all inspections according to applicable procedure.
2. BART must ensure inspection forms are accurate and discrepancies corrected.
3. BART must track potential hazards through resolution.

2021 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT (BART)

Checklist No.	**14-C**	**Element**	Facilities and Equipment Inspections: Tunnels, Bridges, and Aerial Structures
Date of Audit	December 9, 2021	**Department(s)**	M&E Engineering, Structural Inspection Section Employee/Patron Safety
Auditor/Inspector	Jamie Lau Matthew Ames Steve Espinal	**Persons Contacted**	Qing Liu Octavio Rodriguez Javier (Danny) Marticorena Robb Bury Kristyl Horton Darryl Archie Shontae Britton Frank Carvalho Brent Coulter Josh Teo Maansii Sheth Shamal Lal Javed Khan

REFERENCE CRITERIA

1. CPUC General Order 164-D/E
2. BART System Safety Program Plan (SSPP) Revision 11 dated February 2019
3. eBART System Safety Program Plan (SSPP) dated July 1, 2017
4. BART Public Transportation Agency Safety Plan (PTASP) Revision 2 dated June 8, 2020
5. Transit Asset Management Plan dated October 1, 2018
6. BART Book 130, Structures Inspection Manual, Rev. 2 dated 2005
7. BART Book 130, Structures Inspection Manual, Rev. 3 dated 2019
8. BART Book 4, Mechanical Maintenance Procedures
9. Annual Top 10 List of Safety Concerning Assets (2018)
10. APTA RT-FS-S-001-02 Rev 1 - Rail Transit Fixed Structures Inspection and Maintenance Standards (APTA)

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

Facilities and Equipment Inspections: Tunnels, Bridges, and Aerial Structures

Interview RTA representatives, perform field observation of structures, and review appropriate records to determine whether:

1. Structures inspections were performed in accordance with reference criteria.
2. Inspections were properly documented and noted, and discrepancies were corrected in a timely manner.

3. Potential hazards found during inspections were tracked until resolution.
4. There is a mechanism to report any safety related findings to the Safety Department.

FINDINGS AND RECOMMENDATIONS

Activities:

Staff interviewed BART representatives from Maintenance and Engineering (M&E): Structural Inspection, Civil Engineering, and Electrical Engineering groups. Staff performed field observations of aerial and tunnel structures. Staff reviewed appropriate records for the past 3 years. Staff determined:

1. Structures inspections were generally performed in accordance with reference criteria. BART performed inspections about once every two years as required by its procedure.
2. Not all inspected elements are documented and rated for conditions. Low-priority repairs were not resolved in a timely manner. However, critical inspections are documented properly, and high-priority repairs are done in a timely manner.
3. Potential hazards found during inspections are tracked using Maximo software with Request for Maintenance (RFM) and Work Order forms. Many RFMs remain open. The Section Manager or Foreworker will notify the Structural Engineer with noted conditions of concern through Maximo software and/or email communication. This communication is not common. The Section Manager will communicate hazards and risks to the Safety Department. A Safety Notice or email may be used for this communication. Safety notices are tracked with the safety notice software.
4. Email and Safety Notices are the mechanisms used to report to the Safety Department any safety related findings. There have been no system reliability failures related to structures in the past four years. No structural related safety issues part of the Annual Top 10 list of Safety Concerns in the years 2020 or 2021.

Checklist 14-C activity is comprised of various BART personnel interviews, records review, and field observations over multiple days. Staff interviewed BART M&E personnel on 12/9/2021 (in-person) and 2/2/2022 (virtually). Staff also interviewed personnel responsible for cathodic protection, fracture critical members, and TBT drilled core holes inspection and maintenance between 12/22/2021 and 3/17/2022. Staff conducted field observations on C-Line aerial structures and Transbay Tube (TBT) on 12/14/2021. Various activities and observations are summarized below by category.

BART Infrastructure Overview

BART is a rapid transit serving 131 miles of track included in the mainline system, and Oakland Airport Connector (OAC) and eBART systems. The scope of this checklist excludes OAC, which will be covered under a separate CPUC Triennial Audit.

There are seven geographic lines: the A-Line or Alameda line; the R-Line or Richmond line; the C-Line or Concord line; the M-Line or Market Street line of San Francisco; the L-Line or Livermore line; the W-Line or West Bay Line; Y-Line to San Francisco International Airport; S-Line or the Berryessa line; eBART – East Contra Costa line. Each line consists of a two-track system. Staff found eBART, S-Line are not included in the Structural Inspection Manual

(Manual) system description and structural inventory; Y-Line is in the system description but not in the structural inventory.

Seven major types of construction were used in the BART system: at grade; bridge; aerial; sunken tube; cut and cover; hard rock tunnel and soft soil tunnel. All structures are owned and maintained by BART. Structural life is designed for 100 years.

Structural Inspection Program
Staff interviewed BART representatives from the Structural Inspection Program. The program is part of BART's M&E department. The program is managed by the Structural Inspection Section Manager. The inspection program has day and night shifts. Day shift teams inspect aerial structures from the ground level without accessing right-of-way (ROW); night shift teams inspect areas requiring ROW access during blanket hours, such as tunnels and deck level of aerial structures. Inspectors typically work in a team of two for safety. During inspections, inspectors bring previous inspection reports as a baseline to compare with as-found conditions. Inspector would note "N/C" for no change or note new findings on the inspection reports. Inspectors would rate structures with priority rating codes from 1 to 4: "1" for being in good condition, and "4" for being a condition needing immediate attention. With exception for graffiti, inspectors would take photos for conditions with "2" or higher rating. Condition rating "3" will generate an RFM assigned to the appropriate department. Condition "4" requires immediate attention from the Safety Department, either through a BART Safety Notice or direct contact with the Safety Department Manager.
After inspections are completed, a Foreworker would review the inspection reports before inspectors enter the inspection and any RFMs into Maximo. Other departments within the agency have access to view the reports, if needed. The Section Manager will review reports before closing them on Maximo. After entering data into Maximo, the paper inspection reports are archived in storage.

The Section Manager performs field audits regarding quality of inspections approximately three times a month. The Section Manager also performs safety compliance field checks of inspectors at least eight times a month, to ensure worker safety such as PPE and rules compliance.

BART Safety Department personnel indicated there have not been any Condition 4 alerts from Structural Inspection team in the past three years. Staff verified by sampling various inspection records and have not found any Condition 4 rated structures.

According to BART's Manual, a Section Manager overseeing the program shall be a registered civil engineer. Industry standards and APTA also require a structural inspection program manager to be a registered civil engineer. Staff found the Section Manager, although having many years of experience in construction trade and structural inspection, is not a civil engineer.

M&E Civil Engineering group provides support to the Structural Inspection group but does not report to the inspection group. The engineering group only reviews biennial Fracture Critical Member (FCM) reports developed by consultants. Civil Engineering group does not participate in routine structural inspection or review inspection records done by Structural Inspection group.

Structures Inspection Manual
The inspection manual was last updated in 2019. It consists of two volumes. Volume 1 contains inspection procedures and Volume 2 contains drawings of typical structures and system maps. Staff noted Volume 2 was last updated in 1994, it does not have an author sign-off, a table of contents, or include BART's newest extensions. Staff also noted Volume 1 of Manual does not have updated system lines in the description and Appendix. System lines in the Manual should be updated to match present conditions. Volume 2 of the Manual should be properly referenced in Volume 1. As for Volume 1 of Manual, revision log was present documenting changes made to each revision; however, it lacks approval sign off and the name of book author.

While reviewing the organizational and flow charts in Volume 1 of the Manual, Staff found the M&E Engineering Department is supposed to provide "full" structural inspection reports to CPUC upon request. Per Staff's understanding, structural inspection reports other than FCM and TBT Drilled Core Holes Ultrasonic Thickness Measurement Reports are provided by Structural Inspection group instead of Engineering group. Staff also found the organization chart has outdated personnel names.

Volume 1 of Manual includes a description of an 89-day new inspector training curriculum. Staff noted inspectors were not issued a training certificate and training is not recorded. BART has rail turntables in its yards. Rail turntables are considered railroad bridges and have structural components that should be routinely inspected. Rail turntables should be included in the Manual, but Staff did not find turntables in the Manual. The Manual should include a list of rail turntables and the procedure for maintenance and inspection.

Transit Asset Management (TAM) of Structures
Staff interviewed BART's TAM representative regarding structures included in the TAM Asset List. BART personnel indicated there are a total of 575 structures registered in the database. The average rating is good. There are three structures rated in "marginal" condition and "needing replacement." The condition ratings are provided by the M&E Superintendent overseeing the structural inspection group.

Staff verified that the three structures rated as marginal or needing replacement are being evaluated by BART personnel or have been repaired.

Routine Structural Inspection Records

Staff interviewed a structural inspector about the typical findings of various structure types. Below are the inspector's general impressions and highlights for each type:

- Aerial Structures – Usually find minor cracks near girders without exposing rebar. There are homeless encampments in Oakland area but did not deter inspections.
- Subway Tunnels – Usually find seepage and efflorescence. M-line will have a chemical grouting retrofit to address overall seepage issue; project is at 95% design. Seepage is more severe between Civic Center and 16th Street.
- TBT – Inspection takes about 4 days to inspect including the upper and lower galleries. Mostly walking inspections are conducted. Parts of TBT are undergoing seismic retrofit. TBT seepage is monitored and repaired as necessary. If water is found within a core plug during inspection, a sample would be extracted and tested.
- Berkeley Hill Tunnel (BHT) – Inspection takes about 4 days to include checking cross passage doors. Typically, BART inspectors find minor cracks. Lighting was an issue before being repaired.

To verify the above conditions, Staff sampled records from A-Line 3001 Fruitvale aerials, C-Line 1005 BTH, C-Line 3003 aerials, M-Line TBT, and Vent structures. Staff found most findings are rated 1 or 2 priority code, meaning conditions not needing an RFM. Staff found the recorded conditions are consistent with Inspector's descriptions. Staff also found inspections do not describe what elements have been checked, but noted findings only, or inspection by exception only. Also, Staff found numerous structures had RFMs opened as old as 2017 and have yet to be completed.

Structural Inspector indicated structures are inspected about once every two years. To verify that, Staff sampled structures inspection schedule data from the previous two cycles:

Line	Assent Number	Inspection Cycle #1	Inspection Cycle #2
A	12001526	Feb 2019	Feb 2021
A	12001559	Dec 2018	Oct 2020
C	12001710	Mar 2019	Mar 2021
C	12001662	Aug 2018	May 2019
C	12001590	Mar 2019	Mar 2021
K	12001727	Dec 2017	Aug 2019
L	12001746	Apr 2019	Mar 2021
L	12001750	Apr 2019	Mar 2021
M	12001832	Feb 2018	Feb 2020
M	12001840	Feb 2018	Mar 2020
R	12001864	Sep 2018	Jul 2020
R	12001849	Apr 2018	Mar 2020
S	15373037	Jun 2019	2020
S	15373036	Jun 2019	2020
W	12001915	Sep 2017	May 2019
W	12001908	Apr 2019	Mar 2021
Y	12001931	Feb 2018	Jun 2020

Y	12001930	Apr 2019	Mar 2021

Staff found S Line has structures that were inspected in 2019 but was noted as "NPCLOSE" or "not performed closed" in 2021. Section Manager indicated structures were initially inspected in 2019, and shortly again in 2020. However, the 2020 inspection was not entered into Maximo. The structures were not inspected in 2021 because they will be inspected in 2022 to be consistent with the 2-year cycle; therefore, the scheduled 2021 inspection was marked as NPCLOSE.

According to the sampled records, Staff noted BART generally inspected structures about every two years as required by its procedure.

Fracture Critical Member (FCM) Reports

A FCM is a steel member in tension, or with a tension element, whose failure could potentially cause a portion of or the entire bridge to collapse. BART has a total of 29 steel girder bridges with FCMs. Per industry standards, a structural inspection manual should cover inspection procedures for FCMs. Although BART has a list of FCMs and inspection procedures within individual FCM reports, Staff found the Manual does not include the FCM list or related inspection procedures.

M&E Civil Engineering personnel indicated their department reviews all FCM reports written by a hired consultant, AECOM. In the past three years, the only finding requiring repair is an A-Line steel box girder aerial structure located in San Leandro, built in 1970. In the 2017 FCM inspection, cracked welded connections between the diaphragm and girder web were found. Per Staff's review of its repair report, the cracks in question were repaired in 2018. In the subsequent 2019 biennial inspection, BART found additional cracks that prompted more repairs as well as modification of the diaphragm connections. The additional cracks found in 2019 were likely not new cracks, but cracks not noted in the previous 2017 inspection. M&E Personnel indicated the repair design plan is completed and associated repairs have been scheduled. Staff verified repair contract drawings have been prepared and dated May 2021. Staff plans to revisit the state of the San Leandro aerial structure repair in the next triennial audit.

Staff reviewed three FCM inspection reports: A-02-2019, L-01-2019, and M-03-2019. Staff noted reports generally have good details of documented inspection activities with recommendations for repair work. Staff noted defects were scheduled for repair.

FCM vs. Routine Structural Inspection Reports

To compare the visual inspection findings between BART's structural inspection group and engineering consultant, Staff reviewed separate inspection reports from the two groups on Bridge M-03. Staff focused on the site condition and structural deficiencies that could be identified from exterior. Bridge M-03 is a pair of bridges crossing over John Daly Blvd. in Daly City.

Staff reviewed the 2019 FCM inspection report done by an engineering consultant. The inspection report documented: Piers 211-A and B do not have sole plates "fully bearing on

the elastomeric pad" and are offset about 1 inch. A light fixture attached to Pier 211-A has a deteriorated support bracket, and a conduit attached to the bottom flange of a girder is missing a clip. BART Engineering personnel indicated the elastomeric pad is scheduled to be repaired, however, the deteriorated light fixture support bracket and missing conduit clip attached to the structure will not be added to a work order because the structural inspection group should have picked up these findings during routine inspections and assessed for needed repairs.
Staff reviewed the 2020 routine structural inspections done by the structural inspection group. Staff did not see the same findings as noted in the FCM report, including the deteriorated light fixture support bracket and missing conduit clip attached to the structure. Structural Manager indicated FCM reports are not sent to them by the engineering group. Therefore, the Structural Inspection group has no knowledge of FCM report findings and has not assessed them for repair at this location.
The routine structural inspection report did, however, identify the same rust condition as the FCM report.
During an interview on 3/17/2022, BART personnel indicated the light fixture bracket and conduit clip defects at Bridge M-03 were later reviewed again and determined they do not pose hazards to traffic or pedestrians. The conditions are safe to leave in place.

Cathodic Protection (CP)
On 12/22/2021 and 3/10/2022, Staff interviewed BART's Electrical Engineering group overseeing BART's cathodic protection program responsible for the protection of steel structures from corrosion. BART has cathodic protection for Transbay Tube (TBT) and San Francisco Vent (SFV) structures. Cathodic protection power source for TBT, or the TBT Power Supplies (PS), are to be inspected twice a year, 4 to 8 months apart. Cathodic protection power sources for SFV, or the SFV Rectifiers, are to be inspected every 12 months. BART has a total of 286 TBT PS and SFV rectifiers inspections between 2018 and 2021; Staff randomly picked 59 of the inspections for record review.
For the TBT PS inspection, Staff found 45 inspection cycles have less than 4 months or more than 8 months apart from 2018 through 2020. BART indicated the delay was due to pandemic impact; Staff noted it may be the case for the inspections missed after March 2020, but not prior. Nevertheless, Staff noted inspection cycles appear to be on-time in 2021. BART indicated TBT PS inspections are on track to meet the schedule moving forward.
The SFV Rectifiers were first commissioned in 2019, replacing the old ones. Therefore, initial inspection records were first dated in 2019. Staff noted SFV rectifiers have been inspected on time since 2019.
For the 59 detailed CP inspection form records, Staff found test forms do have essential test values recorded; however, other information was not always filled out, such as multimeter calibration date, associated work order numbers, and follow-up work repair order numbers (if needed). Also, test results prompting a "C" as completed or an "I" as incomplete would sometimes be a check mark or technician's initials. Staff determined that test forms should have a secondary check for completeness before archiving.

Staff found many of the TBT PS inspection records show data being out-of-range per form, such as phase line-to-line values. Staff learned that the ranges on the TBT PS test forms are outdated and need to be revised.
CP inspections are usually done in a team of two if possible. Technicians record test results on a test form and then scan completed forms to Maximo for archiving. Technicians typically inspect two locations per day.
There are a total of 30 anodes for the TBT system. In August 2021, BART learned 10 out of 30 anodes are not functioning and need to be repaired or replaced. Corrosion Protection engineer indicates the repairs will go through a procurement process as it requires divers with special skills. Staff verified the project is in the design phase as BART personnel shared over the screen project documents showing its drawing plans. Staff will revisit TBT anodes replacement project status in the next triennial audit. As for SFV system, there are about 200 anodes, and they are all in service.
TBT historically had reference electrodes installed at various locations in the upper gallery. The purpose of reference electrodes is to monitor TBT's CP potential to ensure the structure is neither under nor overprotected for corrosion. BART currently has a total of 11 silver/silver-chloride reference electrodes, in which two are out of service, while three are non-functioning - leaving six functioning. There are different baselines to monitor CP potential. According to BART's data, the electrodes did not meet the first baseline of -800 mV polarized potential. BART indicated the same electrodes recently had a survey using a different baseline of 100 mV polarized shift and results are pending.
BART also installed four new electrical resistance (ER) probes monitoring the corrosion rate and metal loss for TBT; one of them was not in service at the time of the interview. The ER probes were installed in 2019. BART has not yet determined the baselines of these probes and is working with a consultant on this matter.
Based on BART's provided cathodic protection data and interview with its CP engineers, Staff cannot determine if the TBT CP system provides proper corrosion protection due to uncertain baselines and pending results. BART should determine these baselines and if TBT has sufficient CP.
Staff inquired with the CP Engineer if there are any plans for conducting an over the water cell-to-cell survey to assess the effectiveness of the TBT CP system, as recommended by the 2020 TBT Ultrasonic Thickness Measurement Report. Per discussion, Staff understood that such survey would only be meaningful after non-functioning TBT anodes are replaced. The focus now is to replace the anodes and determine the baselines for CP monitoring system. Staff will revisit the cell-to-cell survey topic in the next triennial audit.
Staff found the structural inspection manual does not cover cathodic protection procedure. Staff recommends that the manual add language covering the responsibility of cathodic protection maintenance, and reference the appropriate cathodic protection procedures within Book 4.
Overall, Staff were not able to determine if BART CP system provides proper corrosion protection for the TBT. Staff understand BART is seeking baselines for reference electrodes/ER probes and working on replacing the non-functioning TBT anodes. Staff will revisit the CP topic in the next triennial audit.

Aerial Structures Site Visit
On 12/14/2021, Staff visited C-Line aerial and bridge structures in Oakland and Lafayette. In Oakland, Staff visited aerial concrete girders supported by pier structures, from A-56 to A-63. In Lafayette, Staff visited concrete girder bridge structures supported by abutments A-117 and A-118.
In Oakland, Staff found pier P-58 C1 has a formwork (plywood) not removed after a spall repair from 2019. In Lafayette, Staff found that a tree appears to be encroaching trackway at A-118 C2. The condition might have been recently developed, so was not noted on last inspection. Staff noted a missing expansion joint filler material on A-118 C1 was rated a "1" instead of a "3" for corrective action. Otherwise, Staff observed existing conditions for both sites and determined that existing conditions are consistent with inspection records. Various fence and vegetation repairs were confirmed.

TBT Site Visit:
On 12/14/2021 during blanket hours, Staff inspected TBT for the following activities:

- Discuss with structural inspectors what they are inspecting for: concrete, steel, seismic joints, walkways and 35 core plugs.
- Observe concrete trackway walls, crown, invert of lower gallery, steel, and concrete joint areas for cracks, spalling, and deterioration.
- Observe seismic joints, tube joints, door & hatch frames (Doors 23 -25, 38 & 39), steel sheeting (bottom of upper gallery, ceiling of lower gallery), structural pipe supports at section 24 & 38 for corrosion, cracked welds, and stress.

Structural Inspectors indicated they typically repair seepage areas by injecting chemical grout. There are a total of 35 core plugs that are inspected periodically for water accumulation and shell thickness using ultrasonic test equipment.
Structural Inspectors should be measuring transverse and longitudinal movement of seismic joints and compare them with previous measurements for any new movements. New movements need to be reported to the Engineering group. Seismic joints are also to be inspected for leaks and debris accumulation. Staff found seismic joint movement measurements were not recorded, and joints have heavy debris that need to be cleaned.
Staff also visited the lower gallery. Staff noted an Epoxy repair from 1999 appears to be in good condition.
Staff observed the M1 Tunnel from Door 24 to 25 and noted that there is general surface cracking in the ceiling.
Staff noted the following on-going projects with TBT:

- M1 Bore Retrofit completed in September 2021.
- M2 Bore Retrofit is being constructed now. Currently installing Retrofit Plates in M2 Bore.
- Upper Gallery:
    a. West Side: installed 12" discharge pipe.
    b. East Side: erecting 10" discharge pipe.

- Lower Gallery:
    a. Retrofit plate installation completed.
    b. Miscellaneous floor anchor installation is needed.

TBT Drilled Core Holes Inspection

The Manual requires the TBT drilled core holes to be inspected annually. There are a total of 35 drilled core holes in the TBT. Inspection methods include using Ultrasonic tests to measure outer steel shell thickness, observations of water accumulation, and surface rust on steel shell. While the Manual requires the TBT drilled core holes to be inspected annually, the most recent TBT Ultrasonic Thickness (UT) Measurement report in 2020 recommended core hole inspections should be prioritized between 6 months, 12 months, and 24 months depending on their corrosion rates.

Staff reviewed BART's TBT UT reports in 2018 and 2020. Staff found BART has been inspecting TBT core holes biennially in 2020, 2018 and 2016. Staff noted TBT has three locations with corrosion rates higher than the industry standards of 1 mil per year (mpy) for structures with the application of CP. The 2020 inspection showed one more core hole, LG-50, with corrosion rate greater than 1 mpy compared to 2018. BART CP Engineer indicated their team will implement the prioritized inspection interval to monitor the locations with higher corrosion rates. Staff will revisit the TBT core holes topic in the next triennial audit to verify whether prioritized inspections have been implemented.

In the 2020 UT report, one of the core holes, LG-53, was found with standing water in it. The same core hole was also the one with the highest corrosion rate. The water source is undetermined. During an interview on 3/17/2022, BART engineer indicated that they believe the water might have come from a power wash event occurring nearby prior to the 2020 UT measurement, causing water to seep into the core hole. He does not believe the water source is bay water because the amount was too significant for bay water seepage, and water has not been observed since extraction. Bay water in TBT core holes may indicate an entry point from steel skin shell, which they do not believe is the case for LG-53 core hole. Staff encouraged BART engineers to continue to monitor TBT core holes for any standing water through scheduled inspections.

Staff verified that the TBT drilled core holes were also visually inspected in 2017, 2018, and 2021 by BART's Structural Inspection group. Core holes were not visually inspected by the group in 2019 and 2020. Visual inspections include removing the plugs and rust and water accumulation, which Staff found also performed in the biennial UT measurements done by BART's CP group. CP group performed UT measurements of core holes in 2018 and 2020. Staff found 2019 to be the only year that the core holes were not inspected by either the CP or Structural Inspection group. Staff learned that Structural Inspection group thought the core holes were to be inspected biennially, instead of annually as required per Manual.

Staff found BART TBT's 35 drilled core hole inspections and maintenance to be generally adequate. However, annual visual inspections only recorded locations with findings, therefore, Staff were uncertain if all core holes were visually inspected yearly. 2019 was the only year the core holes were not inspected.

Findings:

1. Staff found the Section Manager in charge of BART's Structural Inspection Program, although having many years of experience in construction trade and structural inspection, is not a Civil Engineer. Industry standards and BART's Structures Inspection Manual (Manual) require this position to be filled by a Registered Civil Engineer.
2. Staff found eBART and S-Line are not included in Volume 1 of the Structural Inspection Manual (Manual) system description and structural inventory; Y-Line is in system description but not in the structural inventory. Staff also found the organization chart has outdated personnel names. Revision log was present documenting changes made to each revision; however, it lacks approval sign off and the name of the book author.
3. Staff found that Volume 2 of the Manual was last updated in 1994, and it does not have: an author sign off, a table of contents, or include BART's newest extensions. Volume 2 of Manual should be properly referenced in Volume 1.
4. The Volume 1 of the Manual has a list of required structural inspector training. Staff found inspectors were not issued a training certificate, and training is not recorded or tracked.
5. Staff found that numerous structures had RFMs opened as early as 2017, and many RFMs have not been completed.
6. Staff found the Manual does not include the FCM list or related inspection procedure.
7. BART indicated TBT cathodic protection (CP) power supply inspections delay was due to pandemic impact. Staff noted it may be the case for the ones occurring after March 2020, but not before.
8. For the 59 detailed CP power source inspection records, Staff found test forms do have essential test values recorded; however, other information is not always filled out, such as multimeter calibration date, associated work order numbers, and follow-up work repair order numbers (if needed). Also, test results prompting a "C" as completed or a "I" as incomplete are marked with a check mark or technician's initials.
9. Staff found that the ranges on the TBT CP power supplies test forms are outdated and need to be revised.
10. Staff found, based on BART's provided CP data and interviews with its CP engineers, Staff cannot determine if TBT CP system provides proper corrosion protection due to uncertain baselines and pending results. One-third of TBT CP anodes are not functioning.
11. Staff found the Manual does not cover CP procedure.
12. Staff found a missing expansion joint filler material on aerial structure A-118 C1 was rated a "1" instead of a "3" for corrective action.
13. Staff found TBT seismic joint movement measurements were not recorded, and joints have heavy debris that need to be cleaned.
14. TBT drilled core holes are to be inspected annually. Since previous triennial audit in 2017, Staff found that the TBT drilled core holes were not inspected in 2019, by either the CP or Structural Inspection group.

Comments:

1. S-Line extension from Warm Springs to Berryessa was commissioned in 2020 and is due for an initial inspection. BART should inspect these new structures.
2. Staff noted inspectors use pencils to write field notes on inspection reports and erase to make corrections. To be consistent with industry best practice, BART inspectors should use a pen for field notes and strike out errors with initials instead of erasing for making corrections.
3. Staff noted Inspectors would review site photos at the office before heading out to inspection. The photos, however, are not available for viewing on-site, because they are not attached to the paperwork that inspectors bring to the field. BART inspectors should have photos readily available on-site for comparing findings.
4. Staff noted pier P-58 C1 has formwork (plywood) not removed after repairing a concrete spall from 2019. BART should remove the formwork.
5. Staff noted a tree appears to be encroaching trackway at A-118 C2. BART should investigate and correct as necessary.
6. Staff reviewed three FCM inspection reports and inquired about each of the recommended repair work. BART considered most of the defects were non-critical, but they have added them to the scheduled work list. Staff verified the work orders were first generated in February 2022, after Staff's inquiry in January. BART should schedule all recommended repair work and prioritize accordingly.
7. Although most of the non-critical FCM defects were added to schedule for repair lists, the construction materials left inside of box girders from prior work at L-01 and A-02 bridges were not scheduled for repair. BART Engineering personnel indicated the formwork left in L-01 bridge box girder only covers the bottom of concrete bridge deck, which can be inspected from deck top. Also, removing the formwork at this point could damage the deck. It is better to leave as-is. As for the plywood pieces left inside of A-02 bridge girder interior, they are removable and can be taken aside while inspecting the area. As an industry best practice, BART should remove construction materials that may hinder visual inspection of structural elements or create inconvenience for inspectors in the future.
8. Staff noted some of the cathodic protection inspection forms are filled with check marks instead of the prompted "p" or "f" for pass/fail test results. BART technicians should fill out test results as prompted.
9. BART is aware of the 10 non-functioning anodes in the TBT CP system. Staff have been assured the anodes will be repaired in a timely manner.
10. Staff noted some of the CP inspection Maximo records do not have descriptions of the specific device within the location. BART personnel should include device numbers in the Maximo description field.
11. Staff inspected fall protection equipment for a Structural Inspector and noted daily inspection record is not present. BART personnel should complete and file a fall protection daily inspection.

12. Staff noted TBT lower gallery near Door 38 has cart impact damage on the wall that is 8" x 10" and 2.5 inches deep; the damage should be repaired.
13. Staff noted TBT lower gallery Door 38 pipe structure has surface cracking and the Door 24 pipe support structure has freshwater seepage and a 6" diameter and 3/4" deep floor spall. BART should assess these conditions and repair as necessary.
14. PTASP Section 7.1 tables and Section 7.3 narrative should be updated to include structures' inspections and frequencies.
15. Structural Inspectors should receive a supervisory review at least annually for continuous improvement, competency, and compliance with rules and regulations.
16. BART has rail turntables in its yards. Rail turntables are considered railroad bridges and have structural components that should be routinely inspected. Rail turntables should be included in the Manual, but Staff did not find turntables in the Manual. The Manual should include a list of rail turntables and the procedure for maintenance and inspection.

Recommendations:

1. The head of BART's Structures Inspection Program must be a registered civil engineer.
2. BART must implement the following changes to BART Structures Inspection Manual (Manual) Volume 1: a) eBART and S-Line must be included in the system description and structural inventory; b) Y-Line should be included in the structural inventory; c) update organization chart outdated personnel names; d) revision log must include approval sign off by applicable departments and include the book author; e) properly reference Volume 2 of Manual.
3. Manual Volume 2 must be updated with a table of contents, newest extensions, and properly reference Volume 1 of the Manual.
4. Inspector training must be documented. Inspectors should be issued training certificates for completing structural inspector training. Certificates should be tracked and retained with BART records.
5. BART must prioritize and resolve all open RFMs since 2017.
6. BART must include fracture critical member (FCM) structures list and their inspection and maintenance procedure in the Manual.
7. BART must demonstrate that the TBT CP power supplies are consistently inspected twice a year and within the 4 to 8-month window.
8. CP rectifier and power supplies maintenance test forms must have a secondary check for completeness before archiving to eliminate blank or incomplete fields.
9. BART must update the range values on the TBT CP power supplies test form and procedure.
10. BART must determine the baselines of TBT CP reference electrodes and electrical resistance probes and assess whether TBT has sufficient corrosion protection with recommended solutions, as appropriate.
11. The Manual must include the responsibility of CP maintenance and include or reference appropriate CP procedures.

12. BART must repair the missing expansion joint filler material on aerial structure A-118 C1.
13. BART must document TBT seismic joint movement measurements in future structural inspections. Seismic joints must be cleaned to perform proper visual inspection and free of debris.
14. BART must inspect TBT drilled core holes annually.

2021 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT (BART)

Checklist No.	**14-D**	**Element**	Facilities and Equipment Inspections: GO 95 Right-of-Way Compliance
Date of Audit	December 9, 2021	**Department(s)**	Electrical Employee/Patron Safety
Auditor/Inspector	Shane Roberson Eric Madero Samuel Herroz	**Persons Contacted**	John Vergara John Matthews Ron DelaVega Bill Kephart Richard Donaldson Glen Eddy

REFERENCE CRITERIA

1. CPUC General Order 164-D/E
2. CPUC General Order 95
3. Resolution ST-77, April 21, 2005
4. BART System Safety Program Plan (SSPP) Revision 11 dated February 2019
5. eBART System Safety Program Plan (SSPP) dated July 1, 2017
6. BART Public Transportation Agency Safety Plan (PTASP) Revision 2 dated June 8, 2020
7. BART Book 31, Electrical Maintenance Procedures
8. BART Right-of-Way Fence Inspection Program dated December 1, 2008

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

Facilities and Equipment Inspections: GO 95 Right-of-Way Compliance

Select at least two (2) of mainline or yard track sections at random from the:

- A/L/S Lines
- K/C/R Lines
- M/W/Y Lines

And perform field observation of RTA representatives inspecting sections to determine whether for each line section:

1. The required monthly, semi-annual, and annual inspections were performed during the past 3 years.
2. Inspections were properly documented and noted, and discrepancies were corrected in a timely manner.
3. Potential hazards found during inspections were tracked from recommendation, Corrective Action Plans, and implementation.

4. All right-of-way components are in compliance with the applicable reference criteria, or variances approved by CPUC.

FINDINGS AND RECOMMENDATIONS

Activities:

CPUC staff conducted random records and field inspections for

- A/L/S Lines
- K/C/R Lines
- M/W/Y Lines

Staff performed field observation of BART representatives inspecting sections to determine whether for each line section:

1. CPUC noted BART is only keeping up with their Emergency (Fire Life Safety) and Critical (PTASP monthly) Inspections due to their manpower and limited resources.
2. Staff found during tunnel inspections that all fire extinguishers are either missing or out of date. Other inspections were documented and noted, and discrepancies were corrected in a timely manner.
3. Potential hazards found during inspections were tracked from recommendation, Corrective Action Plans, and implementation.
4. All right-of-way components are in compliance with the applicable reference criteria, or variances approved by CPUC.

Findings:

1. Staff found at K35 SW261 a traction power ground conduit was missing liquid tight as required by GO 95.
2. Staff found at K35 adjacent to the SW261 power junction house has water intrusion through the main door in violation of GO 95.
3. Staff found within power junction house at K35 adjacent to SW261 the fire extinguisher has no inspection tag per NFPA 130.
4. Staff found during tunnel inspection all fire extinguishers are either missing or out of date per NFPA 130.
5. Staff found at SW153, SW153, and SW287 in A05 missing MC500 bonds per GO 95 and BART Book 31.
6. Staff found location A05 was missing annual test inspection for third rail in 2021 as required by GO 95 and BART Book 31.

Comments:

1. CPUC noted BART is only keeping up with their Emergency (Fire Life Safety) and Critical (PTASP monthly) Inspections due to their manpower and limited resources.

Recommendations:

1. BART must seal conduit in compliance with GO 95.
2. BART must ensure the powerhouse has no water intrusion in compliance with GO 95.
3. BART must ensure all fire extinguishers throughout the property are in place, properly marked, have inspection tags, and are up to date in compliance with NFPA 130.

4. BART must replace missing bonds identified in finding 5 above per GO 95 and BART Book 31.
5. BART must perform all inspection according to GO 95, Book 31, PTASP.

2021 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT (BART)

Checklist No.	**14-E**	**Element**	Facilities and Equipment Inspections: Signal Communication and Train Control
Date of Audit	December 7, 2021	**Department(s)**	Train Control
Auditor/Inspector	Shane Roberson Eric Madero Samuel Herroz	**Persons Contacted**	Albert Bautista Alan Wong Patrick Tanjoco

REFERENCE CRITERIA

1. CPUC General Order 164-D/E
2. BART System Safety Program Plan (SSPP) Revision 11 dated February 2019
3. eBART System Safety Program Plan (SSPP) dated July 1, 2017
4. BART Public Transportation Agency Safety Plan (PTASP) Revision 2 dated June 8, 2020
5. Book 20 - Train Control Maintenance Procedure
6. BART Preventative Maintenance Database

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

Facilities and Equipment Inspections: Signal Communication and Train Control

Interview RTA's representative responsible for Wayside Maintenance, and perform field observations of RTA inspecting equipment and randomly select Preventative Maintenance (PM) records from the past 3 years to verify compliance for:

1. RTA's Switch Maintenance:
   a. Inspections of the mainline switches in at least one (1) of the following areas:
      - A/L/S Lines
      - K/C/R Lines
      - M/W/Y Lines
      - E Line

      Determine whether they are in compliance with the applicable reference criteria.
   b. All required PM activities were properly documented and corrected in a timely manner.
   c. Defects and non-compliances noted on inspection report forms were tracked from recommendation, Corrective Action Plan, and implementation.
2. Vital Relays Preventative Maintenance:
   a. Review the records of preventive maintenance, scheduled and unscheduled maintenance activities for vital relays to determine whether inspections were performed at the required frequencies as specified in the reference criteria.

b. All required PM activities were properly documented and corrected in a timely manner.

FINDINGS AND RECOMMENDATIONS

Activities:

CPUC conducted field inspection at

- A/L/S Lines
- K/C/R Lines
- M/W/Y Lines
- E Line

CPUC reviewed records for all Relays, Switches, Track Circuits, Signal house inspections, Interlocking, etc. BART Train Control department is behind on PMs for Relays, Switches, Track Circuits, Signal house inspections, Interlocking, etc., with main BART as long as 155 days past due, and eBART is 281 days past due at worst case.
BART received a notice from the manufacturer of switch machines advising them a safety critical device within the switch had been recalled. After receiving the notice, BART stopped all PMs to ensure all switches were up to safety standards. This action put BART past due on all stated PM schedules. This compounds on an already depleted work force due to COVID and retirement buy outs put the PM schedule behind BART's stated frequencies.

Findings:

1. Staff found the BART Train Control department is behind on PMs for Relays, Switches, Track Circuits, Signal house inspections, Interlocking, etc., with main BART at 155 days past due and eBART at 281 days past due at worst case. (eBART SSPP, BART PTASP, Book 20.)

Comments:

1. CPUC noted BART received a notice from the manufacturer of switch machines advising them a safety critical device within the switch had been recalled. As such, BART stopped all PMs to ensure all switches were up to safety standards, putting BART behind on the PM schedules. This, on top of an already depleted work force due to COVID, and retirement buy outs, put the PMs behind schedule.

Recommendations:

1. BART must ensure all Train Control PMs are up to date as required by standards and procedures. (E-BART SSPP, BART PTASP, Book 20.)

2021 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT (BART)

Checklist No.	**14-F**	**Element**	Equipment Maintenance Program: Measurement and Testing Instrumentation
Date of Audit	November 9, 2021 – December 6, 2021	**Department(s)**	Rolling Stock & Shops Non-Revenue Vehicle Equipment
Auditor/Inspector	Laura Espinoza Nicholas Denny	**Persons Contacted**	Leo Pica Richard Severo Sandy Miniz Matthew Martinez Luis Leon Shop Superintendents

REFERENCE CRITERIA

1. CPUC General Order 164-D/E
2. CPUC Seventh Interim Order for Case #9867, Decision #87376
3. BART System Safety Program Plan (SSPP) Revision 11 dated February 2019
4. eBART System Safety Program Plan (SSPP) dated July 1, 2017
5. BART Public Transportation Agency Safety Plan (PTASP) Revision 2 dated June 8, 2020
6. Book 429 - Rolling Stock and Shops Standard Operating Procedures dated 3/27/2017

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

Facilities and Equipment Inspections: Measurement and Testing Instrumentation
Interview responsible RTA representatives from each department, review appropriate records, and inspect no fewer than eight (8) measuring or testing instruments to determine whether:

1. The selected gauges, micrometers, calipers, torque wrenches, multi-meters, etc., are properly inventoried, stored, distributed for use, calibrated at prescribed intervals, and marked, tagged, or otherwise identified to show current calibration status.
2. The next scheduled testing/calibration due date is shown on each measuring or testing instrument.

FINDINGS AND RECOMMENDATIONS

Activities:

1. CPUC staff inspected at least eight randomly selected measuring or testing instruments at each of the following shop locations: Concord, E-Line, Daly City, Richmond, Hayward, and Oakland. Staff inspected storage and inventory of tools, interviewed BART personnel, inspected calibration records, and inspected calibration tags on the tools for next due date. No deficiencies were found.

2. Staff verified the next calibration date was also shown on the equipment inspected.

Findings:
No Findings

Comments:
No Comments

Recommendations:
No Recommendations

2021 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT (BART)

Checklist No.	**15-A**	**Element**	Maintenance Audits and Inspections: Rail Vehicles (Revenue & Non-revenue)
Date of Audit	November 9, 2021 – December 6, 2021	**Department(s)**	Rolling Stock & Shop Non-Revenue Vehicle Equipment Safety
Auditor/Inspector	Laura Espinoza Nicholas Denny	**Persons Contacted**	Leo Pica Richard Severo Mathew Martinez Luis Leon Anthony Onisko Shop Superintendents

REFERENCE CRITERIA

1. CPUC General Order 164-D/E
2. BART System Safety Program Plan (SSPP) Revision 11 dated February 2019
3. eBART System Safety Program Plan (SSPP) dated July 1, 2017
4. BART Public Transportation Agency Safety Plan (PTASP) Revision 2 dated June 8, 2020
5. BART Book 4, Mechanical Maintenance Procedures
6. BART Book 9, A2/B2, C1, and C2 Cars Minimum Operating Standards & Equipment List dated Jun. 2017
7. BART Book 9, D and E Cars Minimum Operating Standards & Equipment List dated Sept. 2018
8. BART Book 50, C Car Preventative Maintenance Manual dated February 28, 2020
9. BART Book 86, A/B Car Preventative Maintenance Manual dated July 25, 2019
10. BART D/E Car Intermediate Manual

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

Maintenance Audits and Inspections: Rail Vehicles

1. Perform field observations of RTA staff inspecting revenue and non-revenue rail vehicles to determine if the following components are properly and adequately maintained:
    a. Axle-mounted gearbox
    b. Truck, axle, and wheel assemblies
    c. Brake systems
    d. Door assemblies
    e. Lighting

f. Passenger doors
g. Passenger component and safety appliances
h. Public address and intercom systems

2. Randomly select at least 10% of fleet (A2-Car, B2-Car, C1-Car, FotF D/L-Car, FotF E/M-Cars, and E-Line DMUs and review the maintenance records for each vehicle model for the past 3 years to verify:
   a. The preventive maintenance (PM) performed was at the required maintenance interval;
   b. The records were properly documented with the necessary review and approval; and
   c. Noted defects were corrected in a timely manner.
3. Verify if RTA has performed their major change-out/overhaul of safety critical systems and or structure integrity of the Rail Vehicle(s) as per maintenance procedures.
4. Randomly select a minimum of three (3) Non-Revenue maintenance vehicles to review the completed Preventative Maintenance (PM) and unscheduled maintenance records associated with each car selected over the last three years to determine whether or not:
   a. The vehicles were inspected during preventative maintenance at the required frequencies as specified in the referenced criteria.
   b. The records were properly documented with the necessary review and approval.
   c. Noted defects were corrected in a timely manner.
   d. Any necessary adjustments or modifications to the rail system are tracked and monitored for performance and safety.

FINDINGS AND RECOMMENDATIONS

Activities:

CPUC staff reviewed maintenance records, performed field observations, and conducted visual inspections of revenue and non-revenue vehicles at Concord, Daly City, E-Line, Hayward, Oakland, and Richmond shops for compliance with BART's SSPP, PTASP, maintenance manuals and CPUC General Orders. Per BART's Vehicle Maintenance Books, preventive maintenance inspections should be performed at the following intervals:

- A2/B2 cars at 800 hrs., -50/+25
- C cars at 600 hrs., +50
- FOTF cars at 900 hrs., -200/+25
- E-Line cars at 30 days

1. Staff reviewed preventive maintenance records for 10% of the revenue vehicles assigned to the Concord shop (352, 1232, 1251, 1519, 1560, 1595, 1647, 1688, 1707, 1738, 1834, 1844, 1913, 3080, 3092, 4009, 4028, 4052, 4071, and 4142). Staff observed and interviewed BART personnel inspecting axle gearboxes, trucks, brakes, passenger doors, lighting, passenger area, and the PA system on vehicle #1574. Staff noted

multiple inspections that were completed outside of the allowable time criteria. Staff reviewed a random selection of discrepancies identified on PM inspections to confirm they were corrected in a timely manner.
Staff reviewed preventive maintenance records for 10% of the revenue vehicles assigned to the Daly City shop (338, 367, 1508, 1599, 1652, 1667, 1839, 1911, 3078, 4067, 4162, and 4164). Staff noted multiple inspections that were completed outside of the allowable time criteria.
Staff reviewed preventive maintenance records for 10% of the revenue vehicles assigned to the E-line shop (103, 105). All inspections were completed on time.
Staff reviewed PM records for 10% of the revenue vehicles assigned to the Hayward shop (306, 371, 1234, 1568, 349, 1905). Staff noted multiple inspections that were completed outside of the allowable time criteria.
Staff reviewed preventive maintenance records for 10% of the revenue vehicles assigned to the Richmond shop (393, 1236, 1247, 1515, 1561, 1568, 1591, 1678, 1619, 1625, 3010, 3024, 3028, 3029, 4078, 4147, 4156, and 4157). Staff noted multiple inspections that were completed outside of the allowable time criteria.

2. At Daly City shop, Staff reviewed a random selection of discrepancies identified on PM inspections to confirm they were corrected in a timely manner.
   At E-Line shop, Staff observed and interviewed BART personnel inspecting axle gearbox, trucks, brakes, passenger doors, lighting, passenger area, and the PA system on vehicle #103.
   At Hayward shop, Staff observed and interviewed BART personnel performing a PM on revenue vehicle #349 including couplers, trucks, wheels, brakes, passenger compartment, fire extinguishers, PED decals, and door obstruction test.
   At Richmond shop, Staff reviewed a random selection of discrepancies identified on PM inspections to confirm they were corrected in a timely manner.
3. At Concord shop, Staff reviewed overhaul records for couplers and trucks. No discrepancies found.
   At Daly City shop, Staff reviewed overhaul records for axles and traction motors. Staff observed and interviewed BART personnel performing a 900-hr. PM on vehicle #4105 including tire measurement, undercar components, passenger area, PED decals, and fire extinguishers. Staff inspected vehicles #378, 4042, and 4152 with no defects noted.
   At E-line shop, major overhauls are not due yet. It was noted to Staff that BART recently signed a contract for upcoming engine overhauls.
   At Hayward shop, Staff inspected overhaul records of three vehicles (371, 1670, and 3008) for journal bearings.
   At Richmond shop, Staff reviewed overhaul records for axle assemblies, traction motors, and trucks. Staff observed and interviewed BART personnel performing a PM on vehicle #4137 including undercar components, passenger area, fire extinguishers, PED decals, PA system, and camera system.
   At Daly City shop, Staff observed BART personnel perform a daily inspection on non-revenue vehicle #3802. Staff noted a missing cotter key on flange lube stick and BART

personnel immediately replaced it. Staff reviewed daily inspection forms for a non-revenue vehicle and Request for Maintenance (RFM) to confirm that noted defects are corrected in a timely manner. Staff noted that daily inspection checklists for non-revenue vehicles have lines drawn through all checkboxes instead of individual checkmarks.

At Hayward shop Staff inspected non-revenue vehicle #3800 and the daily inspection logbook.

At Richmond shop Staff reviewed the daily inspection form for non-revenue vehicle #3805, which was being used that day. Staff inspected vehicle #3805 lights, horn, and back up buzzer. Staff reviewed recent daily inspection records for non-revenue vehicles #3805 and 3642. Staff noted corrective tape used on forms and lines drawn through checklist items. Staff reviewed RFM to confirm that noted defects on non-revenue vehicles were corrected in a timely manner.

Findings:

1. Staff found multiple preventive maintenance inspections on revenue vehicles completed outside of the allowable time frame. See Comment 3 below.

Comments:

1. Multiple daily inspection checklists for non-revenue vehicles had correction fluid or tape. BART should stop the practice of using correction fluid or tape on inspection forms.
2. Multiple daily inspection checklists for non-revenue vehicles had lines drawn through checkboxes. BART should stop drawing lines through groups of checkboxes on forms and check each box individually.
3. Staff noted multiple inspections that were completed outside of the allowable time criteria. In each instance the inspection was completed early. No late inspections were noted.
4. Staff noted that some shop locations have multiple car movers listed on the daily inspection form. When only one car mover is used, nothing is noted on the form for the other car mover. This practice makes it impossible to tell whether the vehicle was used. Staff suggests BART complete the form with "N/A" as applicable or develop another means of identifying the dates that the car movers were not used.
5. Staff observed multiple BART revenue vehicles that had very faded car number decals on the roofs.

Recommendations:

1. BART must complete preventive maintenance inspections within procedural time frames.

2021 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT (BART)

Checklist No.	**15-B**	**Element**	Maintenance Audits and Inspections: Traction Power System
Date of Audit	December 2, 2021	**Department(s)**	Engineering Electrical Engineering Safety
Auditor/Inspector	Steven Espinal	**Persons Contacted**	John Vergara John Matthews Javed Khan Juan Ulloa Joshua Teo

REFERENCE CRITERIA

1. CPUC General Order 164-D/E
2. CPUC General Order 95
3. BART System Safety Program Plan (SSPP) Revision 11 dated February 2019
4. eBART System Safety Program Plan (SSPP) dated July 1, 2017
5. BART Public Transportation Agency Safety Plan (PTASP) Revision 2 dated June 8, 2020
6. BART Book 4, Mechanical Maintenance Procedures

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

Maintenance Audits and Inspections: Traction Power System

Interview RTA representatives and select at least one substation from each of the following areas:

1. A/L/S Line
2. K/C/R Line
3. M/W/Y Line

For each area, review the appropriate documentation and perform a visual inspection to determine whether:

1. The rail traction power system is inspected and maintained in compliance with RTA's standards.
2. Substations and are inspected and maintained in compliance with RTA's standards.

Review status of the following items:

3. Any open Corrective Action Plans from the 2017 BART Triennial Review, if applicable.

FINDINGS AND RECOMMENDATIONS

Activities:

1. CPUC Staff reviewed the following procedures for adherence:
   Bay Area Rapid Transit, Maintenance and Engineering Procedure, Book 31, Chapter 1
   Section 1 & 2: Annual and Monthly Inspection of the Axial Flow Line Section Ventilation Fans (Except Berkeley Hills Tunnel)
   Section 5: 1K VDC Circuit Breaker & Cubicle Semi & Annual PM Check
   Section 13: 1K VDC Bus Preventative Maintenance
   Section 17: Wayside Monthly PM

   Staff performed inspections at the following locations and noted:

   MacArthur Substation
   K-line
   - Land line phone disconnected NFPA-130 violation.
   - Fire extinguisher Fire Marshall Inspection current.
   - Sub-station is dusty which can cause arcing.

   West Oakland Substation
   M-line
   - Fire extinguisher Fire Marshall Inspection is current.
   - Monthly inspection was conducted 11/25/21.
   - Land line phone works properly.
   - Nitrogen tanks are in storage.
   - Debris and exposed wires on the exterior of the buildings.
   - The substation is a bit dusty which is a cause of arcing.

   Lake Merritt Substation
   A-Line
   - Winding Temperatures were 40 degrees and 36 degrees Celsius.
   - Land line phone is working properly.
   - The substation needs to be swept out. Very dirty and source of potential dust.
   - Fire extinguisher Fire Marshall Inspection is current.

2. Staff interviewed BART staff regarding the aforementioned procedures were being adhered to for the previous three years. BART staff stated since the inception of COVID-19, in concert with BART providing early retirement options, staff have been depleted and in turn maintenance procedures are impossible to sustain. None of the above procedures have been adhered to since March of 2020, the beginning of COVID-19, and the subsequent shutdown of the state of California. BART Electrical Maintenance staff has been reduced from a high of 73 to the current staff of 55. BART staff stated they have been adhering to maintaining all fire and life safety procedures in the current PTASP. BART staff also stated all repairs, when necessary, are completed.

BART staff referred to PTASP for details of the systems which are being maintained. The equipment being maintained as cited in the BART PTASP includes:

- Power and Way Electrical Maintenance Procedures, Book 31, Chapter 1, Section 17
- Standpipes and Associated Pumps in Walnut Creek, Berkeley Hills, and Transbay Tube Tunnels
  - Service Test Procedure for Horizontal Class I Standpipes in the Walnut Creek, Berkeley Hills, and Transbay Tunnels
- Station Fire Alarms and Sprinkler Systems, Periodic Maintenance Requirements for Fire Alarm and Fire Sprinkler Systems (Passenger Stations)
- Emergency Ventilation Fans, Power and Way Electrical Maintenance Procedures Book 31

3. Regarding the open Corrective Action Plan from the 2017 BART Triennial Review regarding stray current, which states:

   "BART, PG&E and CPUC shall meet to discuss stray current. PG&E is stating it is emanating from the BART system. BART shall work closely with PG&E to correct the stray current issue."

   BART was able to install the 2nd monitoring unit in December 2021. BART will have a second internal meeting to discuss the data from both monitoring sites. BART proposes a meeting with PG&E to discuss their results in late December 2021.

Findings:

1. Staff found that the COVID-19 related budget shortfall and BART early retirement option resulted in testing and maintenance falling behind. There has been a substantial drop in maintenance staff in all BART departments. Due to the lack of staff, the following inspections and equipment testing have not been conducted in their recommended frequency since the inception of COVID-19 international pandemic:

   Bay Area Rapid Transit, Maintenance and Engineering Procedure, Book 31, Chapter 1;

   Section 13: 1K VDC Bus Preventative Maintenance Section 17: Wayside Monthly PM

   Section 5: 1K VDC Circuit Breaker & Cubicle Semi & Annual PM Check
2. Staff found Lake Merritt station is dirty and dusty. West Oakland and MacArthur substations are dusty. BART PTASP Section 7.2.4 states that buildings should maintain General Good Housekeeping. Dirt and dust can lead to electrical arching and should be considered a hazard.

Comments:

No Comments

Recommendations:

1. BART must conduct all inspections and testing prescribed by their procedural frequency.
2. BART substations must be clean, free of dirt and dust to minimize the threat of electrical arcing.

2021 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT (BART)

Checklist No.	**15-C**	**Element**	Maintenance Audits and Inspections: Train Control and Signal Systems Maintenance
Date of Audit	November, 30, 2021 December 1, 2021 December 8, 2021	**Department(s)**	Train Control
Auditor/Inspector	Shane Roberson Eric Madero Samuel Herroz	**Persons Contacted**	Albert Bautista Alan Wong Patrick Tanjoco

REFERENCE CRITERIA

1. CPUC General Order 164-D/E
2. BART System Safety Program Plan (SSPP) Revision 11 dated February 2019
3. eBART System Safety Program Plan (SSPP) dated July 1, 2017
4. BART Public Transportation Agency Safety Plan (PTASP) Revision 2 dated June 8, 2020
5. BART Book 20, Train Control Maintenance Procedures
6. BART Book 425, Track Safety and Maintenance Standards dated July 1, 2012
7. BART Maintenance Management Information System (access onsite)

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

Maintenance Audits and Inspections: Signal Systems Maintenance

Perform field observations of RTA staff inspecting the signal system components to determine whether or not they are in compliance with applicable reference criteria. Select at least one (1) track section at random from four (4) lines of the following areas to inspect, including at least one tunnel section and one aerial section (review records for past 3 years and conduct field inspections):

- A/L/S Lines
- K/C/R Lines
- M/W/Y Lines
- E Line

Determine if the sections were inspected at required frequency interval.

FINDINGS AND RECOMMENDATIONS

Activities:

CPUC performed field observations or RTA staff inspection the signal system components at random on:

- A/L/S Lines
- K/C/R Lines
- M/W/Y Lines

- E Line

Findings:

1. Staff found at the MacArthur Train Control Room cabinet 79 & 78 relays are not currently up to date in testing. (BART PTASP.)
2. Staff found at the MacArthur Train Control Room that the eye wash station maintenance is out of date. (BART PTASP.)
3. Staff found at SW251 and SW287 in A05 that switch indicator lights have either broken lenses or are not working. (BART PTASP, Book 20.)

Comments:
No Comments.

Recommendations:
1. BART must ensure all vital relays are maintained per BART PTASP.
2. BART must ensure maintain eye wash stations per BART PTASP.
3. BART must maintain switch indication stands per BART PTASP and Book 20.

2021 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT (BART)

Checklist No.	**15-D**	**Element**	Maintenance Audits and Inspections: Tracks and Turnouts
Date of Audit	November 30, 2021 December 1, 2021 December 2, 2021 December 8, 2021	**Department(s)**	Track
Auditor/Inspector	Samuel Herroz Salvador Herrera	**Persons Contacted**	Darryl Archie Juan Mares-Ayala Bill Pairman

REFERENCE CRITERIA

1. CPUC General Order 164-D/E
2. BART System Safety Program Plan (SSPP) Revision 11 dated February 2019
3. eBART System Safety Program Plan (SSPP) dated July 1, 2017
4. BART Public Transportation Agency Safety Plan (PTASP) Revision 2 dated June 8, 2020
5. Book 425, Track Safety Standards and Maintenance Standards dated July 1, 2012
6. BART Maintenance Management Information System

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

Maintenance Audits and Inspections: Tracks and Turnouts

Perform field observations of RTA staff inspecting mainline tracks to determine whether they are in compliance with applicable reference criteria. Select at least one-track section from each of the following areas to inspect, including at least one tunnel section and one aerial section, where applicable:

1. A/L/S Line
2. C/R Line
3. K/M Line
4. W/Y Line
5. E Line

Review RTA's preventative maintenance records, schedule, and unscheduled maintenance activities for two separate 6-month periods in the past 3 years:

1. Track Inspection:
    a. Review the track inspection reports from field inspection to determine whether:
        i. Mainline tracks, yard leads, and transfer tracks were inspected at the proper frequency.

ii. Inspections were properly documented and noted defects were corrected in a timely manner and tracked until completion.
iii. Potential hazards found during inspections are immediately reported, documented, and tracked through resolution, Corrective Action Plans, developed, and implemented in a timely manner.

b. Randomly select at least two separate recorded geometry car inspection reports to determine whether:
i. Mainline tracks, yard leads, and transfer tracks were inspected at the proper frequency.
ii. Inspections were properly documented and noted defects were corrected in a timely manner and tracked until completion.
iii. Potential hazards found during inspections are immediately reported, documented, and tracked through resolution, Corrective Action Plans, developed, and implemented in a timely manner.

c. Review RTA internal rail defect reports to determine whether:
i. Mainline tracks, yard leads, and transfer tracks were inspected at the proper frequency.
ii. Inspections were properly documented and noted defects were corrected in a timely manner and tracked until completion.

2. Turnout Inspection:
a. Review at least two separate turnout inspection reports from field inspection to determine whether:
i. Mainline tracks, yard leads, and transfer tracks were inspected at the proper frequency.
ii. Inspections were properly documented and noted defects were corrected in a timely manner and tracked until completion.

FINDINGS AND RECOMMENDATIONS

Activities:

- Inspected tracks and turnouts on A/L/S, line C/R, line K/M, Line W/Y line & E- line.
- Turnout inspection on K line SW365, SW165, SW167, SW463, SW261
- Turnout inspection A, C, M, K, R, Line at the Wye & Tunnel SW211, SW189, SW287, SW207, SW153, SW251, SW131
- E-Line SW231, SW329, SW229

1a. The required inspection was performed during the past three years per supporting references for 2020 and 2021.

i. 2020 and 2021 records for track inspections and turnout inspections were reviewed.

ii. Noted that records reviewed in order weekly, monthly, and quarterly frequencies.

b. CPUC staff inspected three years of Geometry Car test records 2019, 2020, 2021

i. Records reviewed showed proper frequencies for inspection using the geometry car.

c. CPUC staff reviewed Ultra Sonic test records 2019, 2020, 2021

i. Main tracks, Yard leads, Transfer tracks, inspected at correct frequencies.

ii. BART records show that inspection frequencies for ultra-sonic testing 2019, 2020, 2021 are in order and documented with defects found and tracked through resolution.

2. CPUC staff conducted several turnout records reviews to determine frequencies.

i. Main track, Yard lead, Transfer track, were all documented at the proper frequencies.

Findings:

Staff found the following deficiencies:

1. Tie defects throughout K–line turnouts SW365, SW165, SW167, SW463, SW261 (Book 425 S4.2.1C) (Book 425 S4.2.2 B) (Book 425 S4.2.3) (CFR 213.109 C1).
2. Loose Frog Bolts and Guardrail Bolts SW165 (Book 425 S6.3 D).
3. Ballast shoulders and walkway defects in addition switch stand pads SW167, SW165, SW463, SW365, and SW261 (Book 425 S4.1) (CFR 213.103) (G.O. 118 Sections 11 through 15).
4. Worn rail head section at C1 & C3 X-OVER SW165 from switch point through closer rail 5/8" head wear (Book 425 S6.2 M).
5. Missing fasteners at track joints SW261 (Book 425 M4.2) (Book 425 M4.3 C).
6. Staff found Missing track bolts SW189 (Book 425 S5.5 D) (CFR 213.121 C).
7. Insulated joints spiked incorrectly at SW287 (Book 425 M5.5 4B).
8. Lubricators left in middle of track creating a tripping hazard SW251. (BARTs documents & Procedures 1001.04 Keeping Areas Clean).
9. Rail gauge worn ½" at SW131 (Book 425 S6.2 M).
10. Pedestrian concrete crossing panel broken, creating tripping hazards. Replace or repair. SW251 (BARTs documents & Procedures 1001.04 Keeping Areas Clean) (CCR Title 8, Section 3273 Working Area).
11. Rail fasteners missing at multiple locations, up to 4 or 5 fasteners in a row between SW211 & SW189 (Book 425 M4.2).
12. BART failed to provide requested track inspection records for 2019. (Book 425 S7. 5. D.)
13. BART failed to provide requested (T001) & (T002) geometry car defect/exceptions documents for 2019, 2020, 2021.

Comments:

1. BART has a robust protocol for defects found during ultra-sonic testing and tracking through resolution.
2. BART should ensure that Wayside is familiar with Book 425, CFR 213 track Standards, and GO 164E.

Recommendations:

1. BART must ensure Defective Tie conditions are remediated in a timely manner throughout the system.
2. BART must remove or repair lubricator and clean area from excessive grease creating a slipping hazard around the switch areas and general housekeeping in track ways (BARTs

documents & Procedures 1001.04 Keeping Areas Clean) (Section IV. 401 Slip Trips and Fall protection) (CCR Title 8, Section 3273 Working Area).

3. BART must repair or replace broken crossing panels per (Section IV. 401 Slip Trips and Fall protection) (CCR Title 8, Section 3273 Working Area)
4. BART must ensure that all rail fasteners are being identified and remediated in a timely manner during inspections per Book 425 M4.2.
5. BART must ensure that all records are available for triennial audits as per the BART Track Safety Standards and Commission General Orders 164 and 143.
6. BART must ensure Geometry Car Data Handling information is tracked through completion as per Book 425, Track Safety Standards and Maintenance Standards, Appendix K procedures.

2021 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT (BART)

Checklist No.	**16-A**	**Element**	Training and Certification Programs: Train Operators, Controllers, and Line Supervisors
Date of Audit	December 7, 2021	**Department(s)**	Transportation
Auditor/Inspector	Michael Rose Richard Fernandez	**Persons Contacted**	Roy Aguilera Anthony Onisko Michael Forte Fred Edwards Marshalette Ramsey Asiann Chan-Velasco

REFERENCE CRITERIA

1. CPUC General Order 164-D/E
2. CPUC Seventh Interim Order for Case #9867, Decision #87376
3. BART System Safety Program Plan (SSPP) Revision 11 dated February 2019
4. eBART System Safety Program Plan (SSPP) dated July 1, 2017
5. BART Public Transportation Agency Safety Plan (PTASP) Revision 2 dated June 8, 2020
6. BART Employee Certification Plan dated August 2016
7. BART E-Line Employee Certification Plan dated January, 2020

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

Training and Certification Programs: Train Operators, Controllers, and Supervisors

Select at least 5% of BART employees at random in each of the following classifications:

- Central Managers
- Central Power and Support Controllers
- Central Train Controllers
- Operations Foreworkers
- Tower Foreworkers
- Train Operators
- Station Agents

With at least one (1) of the following classifications from the E-Line;

- Diesel Train Engineers (Class 1)

1. Review training, certification, and recertification records of the selected employees related to Roadway Worker Protection, Personal Equipment Device, and other specific job required training to determine whether:
    a. All employees successfully completed initial training programs, and any discrepancies were addressed and resolved.

b. All employees have been recertified at the required frequency and are currently certified to perform their duties.

2. Verify that a process for maintaining and accessing employee training records is in place.
3. Verify categories of safety-related work requiring training and certification have been identified.
4. Verify employee and contractor job classifications requiring initial and refresher training and certification have been identified.
5. Verify RTA has a process in place to assess compliance with its training and certification requirements.
6. Verify corrective actions taken to discipline employees and contractors for failure to follow established procedures after training and certification are established and consistent.

FINDINGS AND RECOMMENDATIONS

Activities:

1. CPUC Staff reviewed the following training records:

   Power & Support Controller ID 061741,
   Rail Operations Controller ID's 061622, 061406
   E-Line DMU Engineers ID's 063759, 064011, 065501, 066432
   Operations Foreworker ID's 056724, 057057, 056583, 056095, 056731, 055349, 055368, 062124
   Station Agent Employee ID's 06181, 061532, 065701, 062262, 065701, 061532, 062262, 064016, 056416, 056480, 063024, 057662, 068134, 058039, 060065
   BART Operators ID's 060327, 061124, 060465, 060895, 058255, 057230, 058128, 057149, 060163, 064306, 061444, 055976, 055976, 063680, 060565, 055985, 060093, 061734, 056018, 057136, 058378, 055525, 062339, 056578, 063180, 061611, 062646, 062705, 056184, 056484, 065715, 065938
   Transportation Supervisor ID's 055387, 060525

   All employees reviewed, except one, have successfully completed initial training and refresher courses as outlined in BART PTASP and Employee Certification Plan.
2. BART's process for maintaining and accessing employee training records is completed through a computer program in their shared drive. This is where all hard copies of employee records are filed, easily accessible and can be printed out.
3. All categories of safety-related work requiring training and certification are identified and outlined in the BART Employee Certification Plan.
4. Employee and contractor job classifications requiring initial and refresher training and certification are also outlined in the BART Employee Certification Plan.
5. BART has a computer program called Pathlore Learning Management System. This system initiates emails to the employee and their respective supervisor to advise them of required upcoming training. The system resends email notifications of 90 days, 60 days, 30 days, then by weeks and days with corresponding yellow, orange, and red highlights as the deadline for training approaches.

6. BART Personnel informed Staff of the discipline/training process, which includes holding the employee out of service until the employee training has been achieved. Personnel printed Employee ID's 063181, 063759 for Staff to show the ease of use for the program. The contractor program is set up where the contractor is not allowed on BART property until all training is completed.

Findings:
No Findings

Comments:

1. BART Train Operator #055525 is not current with any of his training records. BART Personnel has #055525 pulled from the active roster on account of being Union President. BART Personnel told Staff Train Operator #055525 does not need to keep up on his qualifications because he is not on an active roster. Staff question how Employee #055525 remains qualified to respond to incidents on BART Property without the required recertification and training. BART should train Employee #055525 and any other Union Officer who are non-compliant with all required training.

Recommendations:
No Recommendations

2021 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT (BART)

Checklist No.	**16-B**	**Element**	Training and Certification Programs: Maintenance Employees
Date of Audit	December 8, 2021	**Department(s)**	Rolling Stock & Shops
Auditor/Inspector	Laura Espinoza Nicholas Denny	**Persons Contacted**	Leo Pica Jeff Raven Richard Severo Matthew Martinez Anthony Onisko

REFERENCE CRITERIA

1. CPUC General Order 164-D/E
2. CPUC Seventh Interim Order for Case #9867, Decision #87376
3. BART System Safety Program Plan (SSPP) Revision 11 dated February 2019
4. eBART System Safety Program Plan (SSPP) dated July 1, 2017
5. BART Public Transportation Agency Safety Plan (PTASP) Revision 2 dated June 8, 2020
6. BART Employee Certification Plan dated August 2016
7. BART E-Line Employee Certification Plan dated January 2020

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

Training and Certification Programs: Maintenance Employees

Select at least 10% employees from the Rail Stock & Shops classification:

- Transit Vehicle Electronic Technicians
- Transit Vehicle Mechanics
- Quality Team Lead

With at least one (1) of the following classifications from the E-Line (eBART);

- Composite Vehicle Maintainers

1. Review the training and certification records for the last three years to determine whether:
   a. The employee has received the required training to perform their duties.
   b. The employee qualifications are on file.
   c. The employee has been re-certified at the required frequency.
2. Verify that RTA has a process is in place to assess compliance with its training and certification requirements.
3. Verify corrective actions to discipline employees and contractors for failure to follow established procedures after training and certification are established and consistent.

FINDINGS AND RECOMMENDATIONS

Activities:

1. CPUC Staff reviewed training records for 10% of Transit Vehicle Electronic Technicians, Transit Vehicle Mechanics, Quality Team Leads, and Composite Vehicle Maintainers. The review included initial training (if applicable during the past 3 years), forklift, first aid, and skill specific training for each classification.
2. BART utilizes Pathlore to ensure training and certifications are tracked and all employees are current.
3. For the few instances when it appeared that an employee had exceeded the timeline for refresher training, BART was able to provide information to show the employee was not available due to an excused absence and that the employee received the required training shortly after returning to work. BART does a good job of tracking the training and certifications.

Findings:

No findings

Comments:

1. For the few instances when it appeared that an employee had exceeded the timeline for refresher training, BART was able to provide information to show the employee was not available due to an excused absence and that the employee received the required training shortly after returning to work. BART does a good job of tracking the training and certification.

Recommendations:

No Recommendations

2021 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT (BART)

Checklist No.	**16-C**	**Element**	Training and Certification Programs: Maintenance Employees and Contractors
Date of Audit	December 3, 2021	**Department(s)**	Training
Auditor/Inspector	Laura Espinoza Nicholas Denny Shane Roberson Eric Madero Samuel Herroz	**Persons Contacted**	Michael Lemon Celine Schafer Anthony Onisko

REFERENCE CRITERIA

1. CPUC General Order 164-D/E
2. CPUC Seventh Interim Order for Case #9867, Decision #87376
3. BART System Safety Program Plan (SSPP) Revision 11 dated February 2019
4. eBART System Safety Program Plan (SSPP) dated July 1, 2017
5. BART Public Transportation Agency Safety Plan (PTASP) Revision 2 dated June 8, 2020
6. BART Employee Certification Plan dated August 2016
7. BART Operations Rules and Procedures Manual (OR&P) dated September 2015
8. BART Facilities Standard (BFS) Section 01 35 14, Operating System Interface dated December 2020
9. BFS Section 01 35 24, Construction Safety dated December 2020
10. BART E-Line Employee Certification Plan dated January 2020

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

Training and Certification Programs: Maintenance Employees

1. Select at least 10% employees from the following classifications:
   - Signal Main Power & Mechanical Traction Power Electricians
   - Communication Electronic Technicians
   - Train Control Electronic Technicians
   - Computer Technicians
   - Safety Monitors (Operations Senior Liaisons (OSL))
   - Track Workers
   - Structures Workers
   - Grounds Workers
   - Non-Revenue Vehicle Mechanics
   - Buildings Workers / Painters

- Consultants, Contractor Supervisors, and any classification or worker whose work is governed by General Order 175 - Roadway Worker Protection
- On-rail Operators

2. Review the training and certification records for the last three years to determine whether or not:
   a. The employee has received the required training to perform his/her duties.
   b. The employee qualifications are on file.
   c. The employee has been re-certified at the required frequency.
3. Verify that RTA has a process in place to assess compliance with its training and certification requirements.
4. Verify that contractor training requirements are specified in contract documents.
5. Verify corrective actions to discipline employees and contractors for failure to follow established procedures after training and certification are established and consistent.

FINDINGS AND RECOMMENDATIONS

Activities:

1. CPUC Staff reviewed training records for 10% of Maintenance Employees and Contractors. The review included initial training (if applicable in the past three years), General Order 175, and skill specific training for each classification.
2. See Q1 above.
3. BART utilizes Pathlore to ensure training and certification are tracked and employees are current.
4. Staff reviewed contract documents to verify that contractor training requirements are specified.
5. For the few instances when it appeared that an employee had exceeded the timeline for refresher training, BART was able to provide information that the employee was not available due to an excused absence and that the employee received the training shortly after returning to work. BART does a good job of tracking the training and certifications.

Findings:

No findings

Comments:

1. For the few instances when it appeared that an employee had exceeded the timeline for refresher training, BART was able to provide information that the employee was not available due to an excused absence and that the employee received the training shortly after returning to work. BART does a good job of tracking the training and certifications.

Recommendations:

No Recommendations

2021 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT (BART)

Checklist No.	**17**	**Element**	Configuration Management and Control
Date of Audit	December 7, 2021	**Department(s)**	Engineering Safety Documentation
Auditor/Inspector	Jamie Lau Ainsley Kung	**Persons Contacted**	Joshua Teo Stuart Restall Jeff Lau Willard Lam Jason Eng Michael Lemon

REFERENCE CRITERIA

1. CPUC General Order 164-D/E
2. CPUC Seventh Interim Order for Case #9867, Decision #87376
3. BART System Safety Program Plan (SSPP) Revision 11 dated February 2019
4. eBART System Safety Program Plan (SSPP) dated July 1, 2017
5. BART Public Transportation Agency Safety Plan (PTASP) Revision 2 dated June 8, 2020
6. Book 38, Procedure 30; BART Engineering Change Order (BECO) dated September 18, 2017

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

Configuration Management and Control

1. Verify that System Modification/Configuration Changes were reviewed and approved in accordance with the reference criteria or any SOPs identified during the review.
2. Verify that a coordination process exists that ensures all organizational entities have an opportunity to review preliminary design and acceptance of final design.
3. Verify that any hazards identified with system expansions or modifications of any kind are resolved.
4. Have significant changes in the organizational structure been analyzed for configuration change management?
5. Randomly select two BART system modifications or changes during the last 3 years to ensure configuration management includes at minimum:
    a. Engineering Design Peer Review;
    b. Design and Analysis Review by the Systems Safety Department and/or other departments, if required;
    c. Design and Analysis Review by CPUC, if required.

FINDINGS AND RECOMMENDATIONS

Activities:

1. Staff verified that sampled System Modification/Configuration Changes were reviewed and approved in accordance with BECO procedure. Staff reviewed BECO samples from a Richmond Yard Fence Rehabilitation project and a BART legacy car part drawing change. Samples show BECO forms were properly filled with supportive drawings and documentation.
2. Staff verified that a coordination process exists that ensures all organizational entities have an opportunity to review preliminary design and acceptance of final design. RTA provided staff with a sample design review checklist for the 19th Street Station Bike Project. The checklist shows designers of different disciplines had reviewed their subjects and rated progress for each item.
3. Staff verified that hazards identified with system modification have proposed mitigation. RTA provided a sample PHA matrix for the 19th Street Station Bike and Fire Suppression System Upgrade project showing identified hazards and the proposed mitigation but did not indicate mitigation status. See Comment #1 below.
4. Significant changes in the organizational structure have been analyzed for configuration change management during the annual preliminary budget review by each department. Each department controls its own staffing and organization chart. During the annual budget preparation, the departments analyze their departmental staffing needs and submit their proposed changes to the Budgets Office, which includes the Controller/Treasure Office. The RTA General Manager Office will review the proposed changes once they are submitted. The review process ensures concerns are addressed before the General Manager adopts any proposed changes. RTA provided the most recent Preliminary Budget Memo report for Fiscal Year 2022 on RTA's website showing the most updated organizational chart with the description of key roles.
5. Staff reviewed two BECO samples from Richmond Yard Fence Rehabilitation and a BART legacy car part drawing change. The changes were made in the past three years. Staff verified the configuration management included at minimum:
    a. Engineering Design Peer Review.
    b. Design and Analysis Review by the Systems Safety Department and/or other departments.
    c. Design and Analysis Review by CPUC was not required for these in-house projects, but RTA provided documentation showing a quarterly meeting has initiated with CPUC BART representative to routinely discuss all projects including in-house projects that may involve the BECO process.

Findings:

No Findings

Comments:

1. RTA should add a column on PHA matrix to indicate mitigation status. Since the same recommendation has been identified on Checklist 7, Staff only noted it as a comment on this checklist.
2. BECO Procedure should be updated to remove reference of RTA's Safety Management Procedure. This reference document is no longer used within the agency.

Recommendations:
No Recommendations

2021 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT (BART)

Checklist No.	**18**	**Element**	Local, State, and Federal Requirements: Employee Safety Program
Date of Audit	December 3, 2021	**Department(s)**	Employee/Patron Safety Engineering Safety
Auditor/Inspector	Arun Mehta Jimmy Xia	**Persons Contacted**	Jonathan Rossen Josh Teo

REFERENCE CRITERIA

1. CPUC General Order 164-D/E
2. BART System Safety Program Plan (SSPP) Revision 11 dated February 2019
3. eBART System Safety Program Plan (SSPP) dated July 1, 2017
4. BART Public Transportation Agency Safety Plan (PTASP) Revision 2 dated June 8, 2020
5. BART Injury and Illness Prevention Program (IIPP) dated December 22, 2016
6. BART Safety Notice dated January 25, 2017

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

Local, State, and Federal Requirements: Employee Safety Program

Interview RTA personnel and review appropriate records for last 4 years to determine whether or not:

1. RTA holds monthly Joint Union/Management Health and Safety Committee (JUMHSC) meetings with Safety, Transportation, Wayside, and Rolling Stock & Shop Departments.
2. The JUMHSC Meetings appropriately responds to employees' complaints regarding safety problems.
3. An appropriate procedure and reporting form for workplace safety hazards are implemented and distributed to all employees.
4. Employees are aware of the safety training and certification programs and, any safety training and certification are properly documented.
5. Employee safety corrective actions have been satisfactorily completed, tracked, and documented to closure.
6. Verify construction projects have specific procedures in place to ensure worker protection and public safety on the job site.
7. Verify procedure implementation is the responsibility of the contractor organization performing the work at RTA.
8. Verify RTA's operating and maintenance safety rules and procedures are included in construction contracts to bind contractors and employees to fulfill their roles and responsibilities safely.

FINDINGS AND RECOMMENDATIONS

Activities:

Staff interviewed BART representatives regarding Local, State, and Federal Requirements and determined the following:

1. BART holds monthly Joint Union/Management Health and Safety Committee (JUMHSC) meetings with Safety, Transportation, Wayside, and Rolling Stock & Shop Departments.
    a. The JUMHSC meetings are held on the first Wednesday of every month. Top managers from Transportation, Rolling Stock and Shop, Maintenance and Engineering, and Union Representatives attend. Records of attendance are kept. Since COVID's inception, the meetings are primarily conducted online. The JUMHSC committee has elected members who vote on matters of concern.
    b. Different unions have delegates who attend including union reps from ATU and SEI. There are other unions who typically do not attend, such as BART police. The Chief of Police delegate is also a union member and is usually in attendance. Union representatives from SEIU are represented with Rolling Stock and Shops, and Maintenance and Engineering.
    c. These meetings are usually held on 18th Floor of BART's LKS building. Prior to April 2020, they held in-person meetings, subsequently due to COVID-19, on-line meetings are conducted. They go over rail and motor vehicle accidents that occur, open BART safety notices, and there's also an open business section where members or observers can bring up new topics. During recent meetings, they have been tracking an issue with Rule 3-11 of the Operating Manual dealing with incorrect positioning of train stops on the platforms. If a train doesn't stop at the right location at a platform, T/O has to move the train up to the end of the platform. This issue is caused by malfunctioning Train Control equipment. If the train doesn't align with the platform, the doors won't open. In turn, some passengers have pulled the emergency door open handle to get off. Maintenance has been working on the correction. They have seen a decline in the number of 3-11 incidents because of improvements BART has been instituting.
    d. BART Safety is working on getting an upgrade module for driving safety in their Maximo system. They are looking into a program to facilitate reporting of unsafe driving for non-revenue vehicles. They are trying to combat the number of collisions they have. The issue relates to rubber tire vehicles.
    e. Unusual Occurrence Reports (UORs) are not discussed in these meetings. They do publish status reports for BART Safety Notices (BSN). It was noted BART has been receiving a number of BSNs of late. If an employee has a safety hazard issue, they need to raise it to their supervisor. If they are not satisfied with resolution by the supervisor, they file a BSN. Most of

the BSNs they receive are related to maintenance not being done (deferred maintenance), mostly related to maintenance of minor items like burnt lightbulbs.

2. BART JUMHSC meetings appropriately respond to employees' complaints regarding safety problems. This is mainly done by discussions of BART Safety Notices (BSN) as discussed in Question 1 above.
3. BSNs are a response with an appropriate procedure and form for workplace safety hazards for all the employees, as discussed in Question 1. The employees can also send an email to the supervisors, HR, and other departments to voice any concerns. They can also write an UOR. BART encourages employees to bring all safety concerns through any of these safety notification vehicles, such as email, UOR, or BSN.
4. Employees are aware of the safety training and certification programs. Staff determined safety training and certification are properly documented. There are around 30 training classes for employees at BART. The employee training depends on job classification. Different departments have different training programs. The objective is for employees to learn the proper way to do their jobs. All departments have procedures for the work that they do. Most of the training classes are OSHA related; some are related to teaching hazardous materials codes in California and hazardous materials business plans. BART is a government agency, and it requires everyone to complete their safety training, depending on their role. Some roles require more training. Every employee is subject to undergo safety training when they join the agency. It is a 3-year cycle for training unless there is a statutory requirement. The frequency is under the purview of the safety department. BART uses "Pathlore" program for tracking employee training. They have many training departments in different divisions. This training is provided by the Safety Department. The employees mostly use online training. When a manager logs on to Pathlore, which is administered by M&E, they will see training requirements. Some of the training classes require formal classroom training. These include fall protection, blood pathogen, asbestos, lead, PCB management, and underground storage tank compliance. Whether it is online or in-person, the test results are recorded on Pathlore. Every BART employee has a training transcript in Pathlore, which acts as the complete repository of employee training. Pathlore sends out a monthly report that shows who has completed what training, and who needs to complete training.
5. BART ensures that employee safety concerns such as BSNs are followed through completion via corrective actions which are tracked, documented, and completed to closure. They don't close safety complaints unless there is resolution. Employees may not agree with the resolution, but they are tracked and closed in a reasonable time frame. Most of the complaints to BART are related to "deferred maintenance" like burned out lights. In some situations, BART will close a request for maintenance upon submission. For some, they will require corrective action plans. If it is resolved to the satisfaction of the Safety Department, it won't remain

open. The Safety Department is the ultimate arbitrator to decide if a BSN is closed or remains open. They have 14 employees in the Safety Department. There are cases where they do close BSNs where there is no merit. They do make sure there is a response. The Maximo system includes a software feature that sends a response to the employee. If employees are not satisfied with the resolution, they can bring the matter up to JUMHSC monthly meetings, or up to HR. BART maintains first aid supplies. If BART departments are short of first aid supplies, they can order what is needed from the BART storeroom.

6. BART incorporates "construction projects specific procedure modules" in place in all their construction contracts to ensure worker protection and public safety on the job site. Engineering Manager provided an example contract, which lists IIPP, and BART lock-out/tag-out procedures. The contractors have to follow BART operating rules and procedures. All new contracts go through System Safety, Maintenance, and Engineering Departments, for review and approvals. This applies to both large and small projects. BART has instituted a new role called Operations Liaisons (OL) which is a part of Maintenance & Engineering (M&E). OL replaced an old classification called Safety Monitors. BART has approximately 30 OL employees now. The Operations Liaisons process has been a huge upgrade over Safety Monitors. BART has also introduced a new Site-Specific Work Plan (SSWP) process. The Operation Liaison makes sure everything in SSWP is implemented and will perform the safety briefing. They must have good understanding of work scope. Their function is to prevent contractor activity from having an impact on BART operations. They keep a close eye on what's going on in the field, and a couple of them were formerly from the Safety Department. Previously, BART used contractors as Safety Monitor, but now OLs are all BART employees.
7. BART ensures that procedure implementation is the responsibility of the contractor organization performing the work at BART. BART personnel noted that this requirement is also specified in their new PTASP Section 4.2.
8. Staff verified BART's operating and maintenance safety rules and procedures are included in construction contracts to bind contractors and employees to fulfill their roles and responsibilities safely.
    a. The lead safety representative for the construction company goes through BART's 48-hour RWP training. BART also trains the contractor employees. They keep a record of their employee training.
    b. PED policy is easy to miss. If BART observes prohibited electronic device usage, they will write them up and require retraining. If the electronic device usage is a repeat offender, the BART employee may be terminated.

<u>Findings:</u>
No Findings

Comments:
No Comments

Recommendations:
No Recommendations

2021 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT (BART)

Checklist No.	**19**	**Element**	Hazardous Materials Program
Date of Audit	December 2, 2021 December 10, 2021 December 14, 2021	**Department(s)**	Employee/Patron Safety Environmental Compliance
Auditor/Inspector	Matthew Ames Laura Espinoza	**Persons Contacted**	Jonathan Rossen – Employee/Patron Safety Manager Ed Moore – Senior Principal Engineer – Environmental – Safety Raphael Bejarano – Principal Safety Specialist

REFERENCE CRITERIA

1. CPUC General Order 164-D/E
2. BART System Safety Program Plan (SSPP) Revision 11 dated February 2019
3. eBART System Safety Program Plan (SSPP) dated July 1, 2017
4. BART Public Transportation Agency Safety Plan (PTASP) Revision 2 dated June 8, 2020
5. BART Hazard Communications Program dated September 14, 2017 (IIPP B-01)
6. BART Hazardous Material Business Plan
7. BART Spill Prevention Control & Countermeasure Plan
8. BART Injury and Illness Prevention Program (IIPP) dated December 22, 2016
9. BART Safety Data Sheets (SDS)

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

Hazardous Materials Program

1. Interview RTA safety department representatives to discuss RTA's hazardous materials program and the role of the safety department in enforcing this program and determine the following:
    a. The procurement process for insecticides, herbicides, chemicals, and solvents.
    b. If a Safety Data Sheet (SDS) for each hazardous material is on file with the safety department.
    c. All approved SDS are on-file and available for all employee access and verify process for employee access to the SDS.
2. Select at least six (6) RTA employees responsible for handling hazardous materials; and review their training records to verify they are qualified for reporting requirements, product release or spill, and spill incident response and clean-up.

3. Verify hazardous materials discharge/spill reports for incidents reported in the past 3 years have been prepared and filed properly.

FINDINGS AND RECOMMENDATIONS

Activities:

1. CPUC Staff interviewed multiple BART Safety Department representatives concerning procurement of, handling, and waste disposal of Hazardous Materials (HAZMAT). BART Safety Department Personnel (SDP) will be involved in the purchase of, for example, new HAZMAT, cleaning brushes, cleaners, and batteries. The Buyers' procedure for new materials is provided in Sharepoint.
    a. BART Personnel (Buyer) will use SpheraCloud software (replaced Sitehawk software) to request new chemicals and HAZMAT. The software is used to manage material approval requests. The Buyer will request new product, and the software routes the request to approvers and reviewers. The Buyer uploads the new product's Safety Data Sheet (SDS) from the manufacturer to the request. BART SDP reviews the request, SDS, Personal Protective Equipment (PPE) required for handling and use, tools needed, and material handling and disposal requirements. Procurement is notified if approval is provided by BART SDP. An outline of how a Buyer uses the software to make a request is available for review within the portal.
    The SDP that approves new requests uses BART's Hazardous Communication process, their experience in the field, training and education as an Environmental Health and Safety Specialist, and their experience as a professional Industrial Hygienist.
    SDP also reviews new requests for compliance with requirements of the California Air Resources Board (CARB), Environmental Protection Agency (EPA), and other State and Federal agencies. Other items considered are disposal of chemicals and the effects on storm and wastewater. The SDP review vendor/manufacturer data, review patch test results, and verify chemicals are tested appropriately.
    Recently a chemical was requested by a Buyer from the RS&S Department. The chemical was requested to aid in cleaning revenue vehicle surfaces to improve appearance. The chemical was determined to be extremely toxic, difficult to handle safely, and required high levels of PPE. The chemical request was rejected. SDP found alternative products that could be used that were determined to be safe.
    The BART Procurement Manual Section 3.2 describes that any user Department/Project Manager requesting the procurement of chemicals or safety equipment (e.g. solvents, oils, cleaners, epoxies, or welding rods) must submit the requisition to the System Safety Department for review and approval prior to sending the request to the Procurement Department. This process was described by SDP. BART Procurement Manual Section II-6, Sections 1.1, 4.1, 4.2, & 5.3, describes the Procurement and Qualification of new

Chemical Commodities utilizing a Standardization Committee. The Committee is informal and includes the following steps:

- A review of Chemical Evaluations;
- The SDS is forwarded to the Purchasing Department Division & Safety with Chemical Evaluation Review Form (CERF);
- A Patch Test and Lab results are provided to Safety;
- Safety completes a CERF;
- Safety assists requesting Department with review of Vendor data;
- Safety approves or rejects all chemical or hazard materials used in the district; and
- Safety evaluates environmental/safety impact of the initial filed test (Chemical Evaluation Review).

SperaCloud has replaced the CERF process. Patch and Lab tests performed by manufacturers and consulting labs. Consulting labs will perform chemical evaluation reviews for BART.

b. All approved Chemicals and HAZMAT have SDSs maintained within the SpheraCloud software. Users of the software can also look up most chemicals in the SpheraCloud library. The library contains SDSs for most known chemicals. The SpheraCloud software maintains communication with chemical manufactures for updated SDSs and other changes. For example, Isopropyl Alcohol and Permatex thread sealant was found on site and the SDS was available on SpheraCloud with approval.

c. SDSs for all approved chemicals are available via employee terminals, district computers, and via mobile application. Random sampling demonstrates that the software system provides SDS for chemicals found at locations where chemicals are used and stored. BART has 1733 chemicals on site. SDP performs audits every five years to verify that all chemicals are approved and represented with SDSs.

2. Training records were reviewed for Six (6) BART employees who are responsible for handling HAZMAT. The review verified that each employee was trained and qualified for reporting requirements, product release or spill, and spill incident response and clean-up. Training consists of approximately 30 safety classes, which includes six classes for CALOSHA Titles 8 and 22.

   BART utilizes PATHLORE software to track employee training. The software uses a color-coding system to notify Managers, SDP, and Employees of their training status. As an Employee nears required training renewal, the color of the completion date of a specific class will change until it is red, meaning overdue. Managers and SDP hold employees accountable for these training dates.

   The following Employees, in applicable rail positions, were up to date for HAZMAT Training: 057587, 060124, 055809, 062066, 055743, & 064722.

   BART PTASP Sections 8.1 & 8.2 describe training by Safety Department personnel, which includes the Hazard Communication Program and the HAZMAT Program. This program provides employee training in the proper storage, handling and use of

products containing HAZMAT. The BART System Safety Department and eBART Safety disseminate training information, pertinent to the storage, handling, and use of HAZMAT, to Maintenance managers. HMBP's describe specific training regarding reporting requirements, inventory control and storage, product release or spill, and the response and cleanup of spill incidents. The System Safety Department is responsible for maintaining this plan and audits its implementation to ensure compliance.

3. BART SDP discussed HAZMAT discharges and spills within the past 4 years. Most events have been low volume and handled by BART Personnel. These events were typically able to be cleaned up with dry sweep, and then packaged, labeled, and disposed of by a HAZMAT disposal contractor.
   For example, an event occurred on Independence Day weekend in 2021, when wastewater overflowed from a containment unit at the BART Hayward Yard. BART submitted the required report within the allowable ten calendar days. BART SDP corresponded with applicable agencies created a Corrective Action Plan (CAP), and reported the event. Event correspondence, CAP, and reports were reviewed.
4. CPUC Staff performed field inspections of BART facilities and shop locations where HAZMAT is handled and stored.
   a. The BART M&E Oakland Shops HAZMAT/Waste area was found to have the following deficiencies: Access gates blocked by pallets containing HAZMAT (improperly labeled, packaged, and segregated), presenting an emergency response hazard, and leaking onto the ground; Eyewash station unserviceable and not inspected or maintained; Spill kit empty and not maintained; HAZMAT storage facility weekly reporting not completed and maintained; Packages within the storage facility are not contained and segregated; and HAZMAT being stored should be disposed of properly.
   b. Inspections of HAZMAT storage and waste areas, chemicals and available SDSs, and general HAZMAT related housekeeping were found to be in compliance at RS&S locations Daly City, Richmond, and Hayward.
5. CPUC Staff reviewed reference criteria and interviewed BART Personnel to determine their compliance with and understanding of applicable reference criteria.
   a. BART PTASP includes a description of the hazardous materials program, including the process used to ensure knowledge of and compliance with program requirements.
   b. The Hazard Communication Program (IIPP B-01 4.0 Responsibilities) (HCP) describes the District Industrial Hygienist (DIH) of the System Safety Department position. This person is responsible for the HCP and will act as the program administrator. The DIH position has mostly been unfilled for seven years. The Manager who supervises this position has been fulfilling the duties of the DIH.
   c. BART PTASP Section 7.2.4 describes the Safety Department conducting safety inspections of maintenance and storage facilities, and administration facilities. SDP performs random site audits. An informal audit will review each product on site and verify compliance with site specific Hazardous Material Business Plans

(HMBP). HMBPs are updated if needed. These inspections have resulted in the removal of unapproved epoxies (containing lead and asbestos) in the last three years.

A formal audit program is being developed which includes, on an annual basis, two service yards, two stations, and two substations. In January 2021 a gap analysis was conducted by SDP to determine compliance with CARB, EPA, wastewater, and HAZMAT handling.

In addition, all Employees perform facility inspections and will address HAZMAT issues found. SDP performed HAZMAT inspections of facilities at quarterly and annual intervals depending on the location. Inspections are recorded and tracked with Simple But Needed (SBN) software. If issues are found during inspections, Maximo software is used to issue Requests for Maintenance and Work Orders. For example, an issue was discovered during an inspection, and remedial action was implemented when SDP discovered that proper PPE was not being worn where fire resistant clothing was required.

Implementation of HMBPs is audited annually. These audits are recorded and tracked using SBN software. The M&E Oakland Shops HMBP is audited monthly due to non-compliance. RS&S HMBP is audited quarterly.

d. BART Book 429 and the BART Spill Prevention, Control & Countermeasure Plan (SPCCP) describes that hazardous waste should be removed by a qualified waste management company for disposal off premises as often as necessary, that waste removal must be documented including type, quantity, time, date, waste company name, and that it was removed from the BART hayward Shop (OHY)). Containers are inspected as part of weekly hazardous materials/waste inspection program. SDP and RS&S Personnel verified that waste is removed and disposed of properly in compliance with Book 429 and the SPCCP.

   RS&S assigns, as an additional duty to an Employee, to conduct weekly inspections of HAZMAT storage and waste areas. This Employee will also manage proper storage and disposal processes.

   The M&E Safety Committee is aware of the issues with HAZMAT storage and waste disposal. M&E does not have a process to manage proper storage and disposal.

   BART has had issues with waste disposal contractors not being paid for services rendered.

e. Discuss with M&E and/or Safety Department Personnel who are involved with the processes described in Book 125: How are Safety Department Personnel included in the QA and Purchasing process for M&E? BART Personnel replied: "Safety Dept. is involved in the purchase of hazardous materials only (oil, solvents, soap, etc.). Their approval is necessary before a chemical can be used in the District."

Findings:

1. BART M&E Oakland Shops HAZMAT/Waste facility and storage area was found to have the following deficiencies: Access gates blocked by pallets containing HAZMAT (improperly labeled, packaged, and segregated), presenting an emergency response hazard, and leaking onto the ground; Eyewash station unserviceable and not inspected or maintained; Spill kit empty and not maintained; HAZMAT storage facility weekly reporting not completed and maintained; Packages within the storage facility are not contained and segregated; HAZMAT being stored shall be disposed of properly.

Comments:

1. BART Reference Criteria should be updated to represent the HAZMAT procurement process used by BART Personnel. Procurement and site audit process should be formalized. Several informal processes were discussed during interviews. BART SDP discussed formalizing processes in 2022.
2. BART Reference Criteria should be updated to represent the software that is used to maintain SDSs. For example, reference criteria states that Sitehawk is used. Some SDP utilized Sitehawk, and other SDP utilized SpheraCloud.
3. BART should fill the District Industrial Hygienist position as described in the reference criteria.

Recommendations:

1. BART must manage the M&E Oakland Shops HAZMAT/Waste facility and storage area in compliance with BART reference criteria, applicable State and Federal requirements, industry standards, and industry best practices as described by BART Employee/Patron Safety and Environmental Compliance Department.

2021 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT (BART)

Checklist No.	**20**	**Element**	Drug and Alcohol Program
Date of Audit	December 3, 2021	**Department(s)**	Human Resources Safety
Auditor/Inspector	Arun Mehta Jimmy Xia	**Persons Contacted**	Reggie Smith – Substance Abuse Manager Raphael Bejarano – Principal Safety Specialist

REFERENCE CRITERIA

1. CPUC General Order 164-D/E
2. BART System Safety Program Plan (SSPP) Revision 11 dated February 2019
3. eBART System Safety Program Plan (SSPP) dated July 1, 2017
4. BART Public Transportation Agency Safety Plan (PTASP) Revision 2 dated June 8, 2020
5. 49 CRF Part 655 – Prevention of Alcohol Misuse and Prohibited Use in Transit Operations
6. BART Operations Rules and Procedures (OR&P) Manual dated September 2015
7. BART Substance Abuse Program dated September 2016

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

Drug and Alcohol Program

Interview RTA representatives and review appropriate records prepared in the past 4 years to:

1. Verify RTA has a policy for managing the use of over-the-counter drugs.
2. Verify that RTA has a termination policy upon positive testing. Select at least two (2) safety-sensitive employees who tested positive for drugs or alcohol in the past 4 years and determine whether:
   a. The employee was evaluated and released to duty by a Substance Abuse Professional (SAP);
   b. The employee was administered a return-to-duty test with verified negative results;
   c. Follow-up testing was performed as directed by the SAP according to required follow-up testing frequencies in the reference documents after the employee returned to duty.
   d. Employees who retested positive are disciplined in accordance with the RTA's zero-tolerance policy.
3. Determine whether RTA has ever undergone a federal audit of its drug and alcohol program.
   a. What were the recommendations if any?

b. Have corrective actions to recommendations been addressed?

4. Confirm that this information was accurately reported to FTA through the RTA's annual submission to the Drug and Alcohol Management Information System (DAMIS).

FINDINGS AND RECOMMENDATIONS

Activities:

Staff met with BART personnel to discuss their Drug and Alcohol Program.
Interviewed RTA representatives and reviewed appropriate records prepared in the past 4 years to determine that:

1. BART has a policy for managing the use of over-the-counter drugs. It is referenced in BART's SSPP, PTASP, and SAP document, page 5.
2. BART has a termination policy for its employees found positive upon testing. This is a part of their SAP Policy which states that employees are given a second chance to rehabilitate upon first violation, but they have to be terminated upon second violation. The Substance Abuse Manager (SAM) gave us two examples:
   - Employee #XXX122 tested positive for cocaine on 6/24/19 from a random test. The employee was referred to the SAP. The SAP assessed the employee on 7/3/19 and advised for outpatient treatment starting on 7/8/19 at Kaiser hospital. The employee satisfactorily completed the program on 7/18/19. They submitted a negative test for both alcohol and drugs as a part of "Return to Duty test" on 7/22/19. Results came back on 7/23/19 saying they were eligible to come back to work. The employee returned to work officially on 7/23/19. If the employee holds a safety sensitive position they are subject to follow-up testing. Follow-up testing plans state: to be tested 6 times in the first year, 3 times in second year, and 2 times in the 3rd, 4th, and 5th years. The employee in question got follow-up tested on 9/10/19, 11/15/19, 3/19/20, 4/21/20, 8/18/20, and 1/21/21. Every time, the test results were negative.
   - Employee #XXX048. On 6/30/20, they tested positive for cocaine from a random test. The employee was referred to the SAP on 7/13/20 and subsequently to an outpatient program at Mills Peninsula hospital. SAP is normally a contractor. The out-patient program ran from 7/24/20 - 8/20/20. This person returned to duty on 8/26/20. Follow-up testing plan is 12 tests within 1st year, 10 in 2nd year, 8 the 3rd year, 6 the 4th year, and 8 the 5th year. The testing program changed from the previous case. The follow-up testing plan is at the discretion of the SAP. The SAP was same as in case 1 and increased testing. Follow-up tests occurred on 1/22/21, 2/23/21, 4/20/21, 5/13/21, 6/10/21, 8/25/21, and 11/30/21. The recorded tests were short by five tests in this case, most likely due to COVID and perhaps an oversight on the SAM's part. The Substance Abuse Manager (SAM) stated they will increase the testing to double in 2022, instead of one test per month, and will increase the testing to two tests per month. Hopefully the substance abuse program will catch up in 24-month period on a total of 22 tests. During all the testing thus far, the employee had tested negative.

- When asked whether BART found somebody in the last 4 years who was a repeat offender and who again tested positive during the testing period again, the SAM gave the following example. Employee #XXX640 was a T/O who tested positive on 8/19/19 for marijuana. They went through the rehab program from 9/4/19 to 12/9/19 at New Bridge Foundation. This was a Day Treatment which is like a residential treatment program. Staff requiring testing must be present at the end of the day and come back the next day. The person in question went from 11/4/19 to 12/9/19 every day, including the weekends. They did their return to duty test on 12/11/19. Then, the employee was eligible to return to work and was supposed to be administered 12 follow-up tests in first year, 10 in the 2nd year, 8 in the 3rd and 4th year, and 6 in the 5th year. They did follow-up tests on 1/22/20, 4/21/20, 6/28/20, and 7/11/20, but on 10/24/20 the employee refused to take a test. Under BART's policy, the employee should have been terminated, but there was a Union/Management hearing, and they decided to give the person another chance. The SAM objected to this decision, but the Management made the final decision. In this case, the union apparently argued that the employee is a young person, and they should be given another opportunity and a last chance. The employee kept the same job duties as a T/O throughout. They went back to rehab treatment and took a "return to duty" test on 2/2/21 and tested negative. The employee had follow-up tests on 2/11/21, 2/25/21, and 6/23/21, and on 9/21/21 they refused test again. The employee was terminated on 11/3/21 via a notice for termination.
- The Finding of Noncompliance from the case above was that BART disregarded their policy and recommendation.
- When asked how many D&A positive statistics were identified at BART in last four years, the BART SAM gave the following numbers.
    - 2018: 7 positives
    - 2019: 13 positives
    - 2020: 9 positives
    - 2021: 5 positives

  During years 2020 and 2021, there was only 1 termination.

3. BART has undergone a federal audit of its drug and alcohol program in 2015. There were many findings and recommendations. They corrected the findings from 2015 before the current SAP took office in 2020. They had 90 days to correct findings detailed in the federal audit.
4. BART submits its drug and alcohol testing data to the FTA through its annual submission to the Drug and Alcohol Management Information System (DAMIS). They must compile this report by 3/15 of every year. They provide a breakdown of all the different test types and different safety sensitive categories. The last report was about 456 pages long. They must test 50% of random pool of employees for drugs and 10% of the random pool for alcohol. The current SAP did it for 2020 to March 2021. For 2021, they must complete the final report by 3/15/22.

Findings:

1. Staff found BART disregarded its own policy and gave Employee #XXX640, a T/O, a second chance rather than terminating the employee after a second D&A offense.

Comments:

1. Under what basis can BART disregard their policy? There should be no exceptions.

Recommendations:

1. BART must adhere to their own established Drug & Alcohol policy which includes termination upon finding a second offense.

2021 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT (BART)

Checklist No.	**21**	**Element**	Procurement Process
Date of Audit	December 2, 2021 December 10, 2021	**Department(s)**	Procurement
Auditor/Inspector	Matthew Ames	**Persons Contacted**	John Mazza – Director Procurement Roland Fowlks – Manager of Logistics Regina Robinson – Manager of Purchasing Alessandro O'Brien – Inventory Manager Sunni Gunawardena – Manager contract administration Jason Eng – Principal Safety Engineer Raphael Bejarano – Principal Safety Specialist for EH Martin Atkinson – Group Manager/Product Support Sandy Miniz – Manager of QA

REFERENCE CRITERIA

1. CPUC General Order 164-D/E
2. CPUC Seventh Interim Order for Case #9867, Decision #87376
3. BART System Safety Program Plan (SSPP) Revision 11 dated February 2019
4. eBART System Safety Program Plan (SSPP) dated July 1, 2017
5. BART Public Transportation Agency Safety Plan (PTASP) Revision 2 dated June 8, 2020
6. BART Book 429, Volume 3, Chapter 3, Section 3, Material Inspection dated July 16, 2021
7. BART Book 429, Volume 3, Chapter 2, Section 7, First Article Inspection Requirements, dated October 4, 2019
8. BART Book 429, Volume 3, Chapter 2, Section 8, Receiving Inspection Procedure, dated November 7, 2017
9. BART Book 429, Volume 3, Chapter 2, Section 6, Material Review Board of Handling Rejected Material, dated September 20, 2019
10. BART Book 125, M&E Quality Management Plan dated February 2018

11. BART Procurement Manual dated August 11, 2021

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

Procurement Process

Interview RTA representatives and review appropriate documentation for the past 3 years to:

1. Verify RTA personnel follow applicable Procurement Policy and Procedures and ensure safety issues and concerns are addressed in the procurement process.
2. Determine adequate procedures and controls are in place to preclude the introduction of defective or deficient equipment into the RTA System.
    a. Are procurements of new equipment and material first reviewed by engineering, transportation, and/or maintenance staff to verify the new equipment or materials won't present a hazard to the existing system?
    b. Do all procurement processes for hazardous materials address all appropriate rules and regulations?
3. Have unexpected problems or process complications delayed the procurement of necessary goods or services available for use?

FINDINGS AND RECOMMENDATIONS

Activities:

CPUC Staff interviewed BART representatives and reviewed appropriate documentation for the past four years to determine compliance with reference criteria.

1. The Procurement Department (PD) is the controller of Procurement Policies and Procedures. The PD verifies that formal processes are followed. The Buyer and Department Inspector represent the PD when parts are initially ordered and received. Safety issues and concerns are addressed by Safety Department Personnel (SDP) and departmental Engineers. SDP are involved in procurement of new materials. For example, SDP is directly involved in the procurement of cleaning brushes, cleaners, batteries, and Hazardous Materials (HAZMAT).
   CPUC Staff asked, "How are Safety Department Personnel included in the QA and Purchasing process for M&E?" BART Personnel responded: "The Safety Department is identified as a reviewer of Book 125. All Purchase Requisitions involving procurements of chemicals or safety equipment (e.g. solvents, oils, cleaners, epoxies, or welding rods) are routed to the Safety Department for their review and concurrence prior to sending the request to the procurement Department. This process is documented in the BART Procurement Manual, Chapter II (Initiating a Procurement) Section 3.2."
2. BART generally maintains adequate procedures and controls to preclude the introduction of defective or deficient equipment into the system. RS&S maintains formal processes. M&E processes are planned to be written and are not formalized.
    a. Procurements of new equipment and material are reviewed by engineering, transportation, and/or maintenance personnel to verify the new equipment or materials won't present a hazard to the existing system.
       A Buyer will request an established part to be procured. The part will have already been approved by Safety and Engineering within the Maximo software. BART Personnel use the "Item Master Addition (New)/Change

(Update) Request" form. The form must accompany each request to add or update an Item/Part Number into Maximo software. The form is transferred through all approvers using PeopleSoft software.
The Procurement Department verifies that all new and/or updated requests comply with the Procurement Manual. Procurement will not proceed with a request until all required documentation is submitted to produce a parts order. Procurement will request the participation of Department Project Managers and Engineers when necessary. Department Project Managers and Engineers will involve SDP when necessary. SDP will be notified when an Engineering Change Order (ECO) is created. SDP signs the ECO.
Materials Review Board (MRB) and Logistics Personnel coordinate delivery of new materials. A DI will inspect the materials for damage and compliance with specifications. Rejected materials are pulled from the delivery. The DI coordinates with the Buyer to determine if the material needs to be scrapped, repaired, or returned to the vendor. SDP and Engineering Personnel will be involved in the MRB process.

b. SDP verify that procurement processes for HAZMAT address applicable rules and regulations. HAZMAT and environmentally impactful requests are reviewed by SDP. New chemical and HAZMAT requests are tracked by email and Sitehawk or SpheraCloud software.
For example, SDP reviewed a request for sanitizing materials for compliance with applicable rules and regulations. The sanitizing materials were requested for COVID management. SDP reviewed the SDSs for the materials and conducted testing. The process was not documented, and the testing was informal.
Also, SDP denied procurement of new cleaning chemicals for vehicles due to the toxicity. SDP investigated the need for the chemicals and determined that repairing the existing car washes was the more appropriate solution. The car wash brushes are worn to a point where they do not contact the surface of the vehicles being washed.
The BART Procurement Manual, Section 3.2, states that requesting procurement of chemicals/safety equipment must submit requisition to Safety for approval. Section II-6 states that procurement and qualification of new chemical commodities will be issued to a Standardization Committee. The Committee is an informal process.

3. Procurement will verify that all documentation is submitted by the Buyer to reduce any delays. Occasionally, when a part becomes obsolete, there may be a delay in procurement as Engineering and Safety coordinate a request for a new part.
Based on interview responses, problems with procurement and finance are experienced when various vendors/contractors do not receive payment for services or

materials rendered. Non-payment results in the vendor/contractor not providing needed services or materials.

Based on interview responses, procurement process complications typically result from buyers not understanding the process, the use of informal processes that are not written, and various types of software being used for one purchase.

Based on interview responses, necessary goods or services were not available for use for handling of hazardous waste due to vendor non-payment.

CPUC Staff reviewed reference criteria and interviewed BART Personnel to determine their compliance with and understanding of applicable reference criteria.

a. BART PTASP includes a description of the measures, controls, and assurances in place to ensure that safety principles, requirements and representatives are included in the procurement process. The PTASP includes procurement in the Management of Change section. Procurement, Parts Material and Purchasing and Inventory Control Safety stated critical parts can only be purchased through the Purchasing Department using only those purchase specifications approved by BART Engineering. Engineering defines the receiving inspection requirements. Modes performing receiving inspections are also responsible for segregating rejected parts to prevent them from being used.
b. BART Book 125 M&E SOPs, Section 8.6, states that M&E will have a defined and documented supplier approval process. This process should be formalized and was noted in the 2017 Triennial report. Section 9.3 states that M&E will establish a system to ensure that materials, parts, components, and work, which do not conform to specified requirements is prevented from inadvertent use or installation. This process should be formalized. Section 8.6, M&E Department Material Inspectors will validate that incoming product is not released until verification occurs. CPUC Staff ask "How does the Material Inspector validate that incoming product is not released until verification occurs?" BART Personnel responded: "Materials receiving process is conducted by RS&S group."
c. Book 429 RS&S SOPs, Material Review Board (MRB) Handling of Rejected Material is a paper form process. The form is created by the Engineer and is routed to other Departments including Safety. The process is informal. Resolution of MRBs for repairable parts is the responsibility of Secondary Shop. Resolution for consumable parts is the responsibility of Quality Assurance. The Exception Report and MRB Report are the same report. The Vehicle Configuration Management System is used to track purchasing and can issue a change order if necessary. Vehicle Systems Engineer considers safety, fit, and function.
d. CPUC Staff asked: "When is Book 125 going to be updated?" BART Personnel responded: "The new revision of the Book 125 is expected to be released Jul-01-2022. BART's quality, maintenance and engineering teams as well as the Safety Department provide input, review and sign off to revisions of Book 125."
e. CPUC Staff asked: "When will M&E have a defined and documented supplier approval process?" BART Personnel responded: "M&E does not have a formal vendor approval process yet. There is an initiative by the procurement department in

progress that includes supplier evaluation/approval process. Purchases are made through historical data and proprietary methods" and "The revised Book 125, Section 8.4.2 refers to the BART Procurement Manual for supplier approval process criteria related to a purchase order or contract."

f. CPUC Staff asked: "Is 2017 Triennial Comment # 2 going to be included in the next Book 125 update?" BART Personnel responded: "In order for me to provide a better response to your question, could you please identify which of the CPUC requirements pertain to our QA program?" and "Yes, M&E is still developing SOPs related to quality procedures for Maintenance, Engineering and Construction similar to those supplied by RS&S. This is an ongoing continuous improvement initiative."
g. CPUC Staff asked: "Is 2017 Triennial Comment # 1 going to be included in the next Book 125 update?" BART Personnel responded: "This will be addressed in the next update of Book 125" and "The revised revision of Book 125 does not contain this typo. This requirement of section 8.7.9 (Nonconformance) is included in 'section 8.7, Control of Nonconforming Outputs' of the revised revision of Book 125."
h. CPUC Staff asked: "When will M&E establish a system as described in Book 125, Section 9.3?" BART Personnel responded: "RS&S currently performs material receiving process for M&E at Wayside Stores and/or Central Warehouse" and "M&E currently has a documented procedure called: "Control of Nonconformity Product/Nonconforming Reports Procedure (QP 1.00)" that describes this process.
i. The received materials, parts, components, and work, which do not conform to specified requirements are tagged and segregated."
j. CPUC Staff asked: "For Section 9.3, what is the verification system?" BART Personnel responded: "Received materials are labeled when rejected and quarantined at Hayward and Wayside Stores. There is an initiative by procurement department in progress to improve this process" and "M&E utilizes the Non-Conformance Report (NCR) as the verification system. M&E has established a documented procedure called Control of Nonconformity Product/Nonconforming Reports Procedure QP 1.00 that defines this process."
k. CPUC Staff asked: "M&E Department Material Inspectors – will validate incoming product is not released until verification occurs, how does the Material Inspector validate that incoming product is not released until verification occurs?" BART Personnel responded: "The incoming product is verified against the specifications by an RS&S inspector who coordinates with an M&E subject matter expert. If the product meets specifications, it will be received in Maximo and released for consumption."

<u>Findings:</u>
No Findings of non-compliance

Comments:

1. The BART Procurement Manual should be updated to include current formal and informal processes. The Manual should also be updated to reflect current software used for procurement processes.

Recommendations:
No Recommendations

2021 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT (BART)

Checklist No.	**22**	**Element**	CPUC GO 172 – Personal Electronic Device Prohibitions/In-cab Cameras
Date of Audit	December 8, 2021	**Department(s)**	Operations Safety E-Line Safety & Training
Auditor/Inspector	Michael Rose Richard Fernandez Daniel Kwok	**Persons Contacted**	Roy Aguilera Mike Forte Robb Bury Anthony Onisko Leo Pica Martin Atkinson Fred Edwards

REFERENCE CRITERIA

1. CPUC General Order 172
2. BART System Safety Program Plan (SSPP) Revision 11 dated February 2019
3. eBART System Safety Program Plan (SSPP) dated July 1, 2017
4. BART Public Transportation Agency Safety Plan (PTASP) Revision 2 dated June 8, 2020
5. BART Use of Personal Electronic Devices Policy
6. BART E-Line E100-OPS-102, Operations Safety Compliance Program dated Feb. 1, 2020
7. BART E-Line eCOR

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

GO 172 Personal Electronic Device (PED) Prohibitions/In-cab Cameras Compliance

Interview RTA Safety Department representatives and review appropriate documentation to documentation to determine the following:

1. Determine if RTA has developed and implemented a PED zero-tolerance policy and program usage, as required by General Order 172, Section 5.
2. Is RTA's zero tolerance policy being enforced?
3. If RTA provides a refresher course on its zero-tolerance policy and program at least every two (2) years.
4. What is the failure rate of in-cab cameras and how many video recording systems (cameras and digital recording drive) failed in the last three years? Verify RTA's recording retention complies with General Order 172.
5. Verify RTA has conducted random evaluations and video-based enforcement for PED usage as required by General Order 172 Section 6.
6. Verify RTA's PED procedures comply with General Order 172.
7. Verify if train operator(s) comply with PED rules (Field Activity See checklist 13-B).

FINDINGS AND RECOMMENDATIONS

Activities:

1. CPUC Staff reviewed BART's PED Policy pertaining to Section 5 of General Order 172. The policy does include a Zero Tolerance program with levels of discipline up to and including discharge. The PED Policy is also referenced in BART's Operations Rules and Procedures Manual and SSPP. BART Personnel explained in detail the three occurrences of PED violations that have been enforced during the Triennial Audit Period. The first occurrence was found by BART during a random evaluation of the inward facing camera requirement. The Second occurrence was the result of Staff subpoenaing the records of an employee's personal cell phone, after an investigation into an incident with that Operator. The Third occurrence was also found by Staff who observed a BART Operator wearing an Apple Watch while in the operating cab of a BART Car. All three occurrences BART Employees received the level of discipline as outlined in the BART PED Policy.
2. Currently, BART OCC is the only department that is conducting a PED refresher course as outlined in CPUC General Order 172. All other departments discuss PEDs within the RWP recertification class, which does not cover the required material outlined in General Order 172 or with BART PED Policy.
3. BART has had four inward facing cameras and 139 camera system failures noted since 2018. BART conducts an inward facing camera check on each BART Car during its hours based PM. Cars A2 at 800 hrs, Cars C1 at 600 hours and D and L at 900 hrs of run time. Cars A2 and C1 do not have an alert that notifies the operator of an inward facing camera fault. The D and L cars show a fault on the operator screen when the camera system is not working.
4. Staff reviewed BART records for video-based enforcement, May 2021 through September 2021. BART recently changed their record keeping process for video-based enforcement to include employee name, location, date, observer name, pass or fail, shift, and status to meet CPUC Guidelines.
5. BART Personnel showed Staff the procedures by which employees addressed in General Order 172 can be contacted in the event of a personal or family emergency. Each employee was given an attachment of the rule book where it outlines all emergency contact phone numbers for BART. BART Foreworkers are the contact point for employee family members who have an emergency at home who need to speak with an employee on duty.
6. Staff conducted ride along inspections throughout the BART system during the triennial audit period. Staff noted that all BART cars inspected had the appropriate PED outward facing sticker on the cab doors and BART Operators had their PED's off and stowed.

Findings:

1. Staff found only BART OCC Employees follow General Order 172, Section 5.3. All other BART Departments are to create a PED refresher course that meets the criteria as outlined in the Recommendation below.

Comments:
No Comments

Recommendations:

1. BART must have all Departments and Employees follow General Order 172, Section 5.3: "RTAs shall notify and instruct their employees on the provisions of the RTA's PED zero-tolerance policy and program regarding electronic device use. Each RTA shall provide a refresher course on its zero-tolerance policy and program at least every two (2) years. Records showing compliance with this requirement shall be maintained for a minimum of three (3) years."

2021 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT (BART)

Checklist No.	**23**	**Element**	CPUC GO 175-A – Rules and Regulations Governing Roadway Worker Protection Provided by Rail Transit Agencies and Fixed Guideway Systems
Date of Audit	December 6, 2021	**Department(s)**	Training Operations Safety E-Line Safety & Training
Auditor/Inspector	Salvador Herrera Shane Roberson Samuel Herroz	**Persons Contacted**	Celine Schafer Jeff Raven Mike Forte Joshua Teo

REFERENCE CRITERIA

1. CPUC General Order 175-A
2. BART System Safety Program Plan (SSPP) Revision 11 dated February 2019
3. eBART System Safety Program Plan (SSPP) dated July 1, 2017
4. BART Public Transportation Agency Safety Plan (PTASP) Revision 2 dated June 8, 2020
5. BART Book 489; Roadway Worker Protection Manual Rev. May 2016
6. BART Standard Procedure for Access to the BART Operating System
7. BART E-Line E100-OPS-102, Operations Safety Compliance Program dated Feb. 1, 2020
8. BART E-Line eCOR

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

GO 175-A Rules and Regulations Governing Roadway Worker Protection Provided by Rail Transit Agencies and Fixed Guideway Systems

Interview RTA Safety Department representatives and review appropriate documentation to determine the following:

1. Determine if RTA is following their procedure and adhering to General Order 175-A.
2. Verify RWP training records and compliance testing (Sections 9.3 and 9.4) have been performed and:
    a. Verify employees whose duties require work on the right-of-way have received the required training, at maximum intervals of 24 months.
    b. Verify training records for employees in different job classifications have been on file for the past 3 years, per GO 175-A.
3. Verify RTA documents their near-miss program, unsafe acts, and right to challenge rule, and has these records available for 3 years.

4. Witness a job safety briefing, if possible, and work site for verification. (Field Activity See checklist 13-B.)
5. Verify if roadway workers have a roadway worker rule book (Field Activity See checklist 13-B.)
6. What is the status of RTA's early warning alarm technology?

FINDINGS AND RECOMMENDATIONS

Activities:

CPUC Staff performed field observations and record inspections during the audit period and have determined the following:

1. Staff randomly inspected RWP test records for all personnel who are required by RTA to have RWP training. Staff also observed maintenance staff conduct safety briefings and have found BART to be adhering to BART procedures and 175-A. No defects were noted in their records or the field.

Per #1 above, Staff inspected RWP records and have found no non-compliance.

2. CPUC conducted RWP field inspections during the course of the audit to determine if RTA personnel are following GO 175 and BARTS policies.
3. Staff witnessed a job safety briefing during field inspections and found BART staff were compliant per BART procedures. See Checklist 13-B for further details.
4. Staff inspected various BART personnel during field inspections for RWP books and found BART staff compliant per BART procedures. See Checklist 13-B for further details.
5. BART indicates they are implementing the following early warning technologies:
   E-Line: EMTRAC is the Early Warning Technology, and it is being tested for field validation. Rules and procedures need to be developed and then employees trained.
   BART: ZoneGuard is the Early Warning Technology, and rules and procedures need to be developed and then employees trained.
   Both systems plan to be implemented in 2022

Findings:

No Findings

Comments:

No Comments

Recommendations:

No Recommendations