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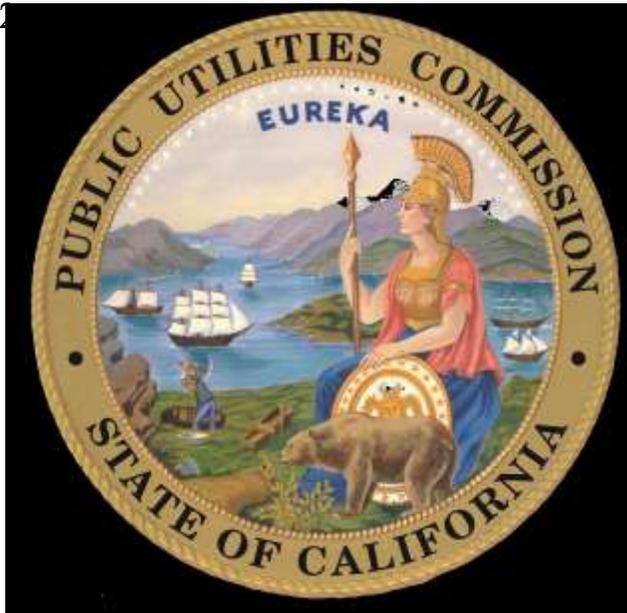
TRIENNIAL ON-SITE SYSTEM SAFETY REVIEW OF SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT

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February 26, 2015

Final Report

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2014 TRIENNIAL ON-SITE SYSTEM SAFETY REVIEW OF SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT

ACKNOWLEDGEMENT

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1. EXECUTIVE SUMMARY

The California Public Utilities Commission's Safety and Enforcement Division, 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 January and February of 2014. The triennial safety review was delayed from its originally scheduled Fall 2013 due date due to a number of factors straining both BART and RTSB's resources at that time.

An opening conference meeting between BART personnel and Staff immediately preceded the initial on-site review activities, on Monday, January 27, 2014. The review took place between January 27 and February 7, 2014, and focused on verifying the effective implementation of BART's System Safety Program Plan (SSPP), as well as its compliance with State and Federal rules and regulations.

A post-review conference meeting took place following the review on March 12, 2014, during which Staff provided BART personnel with a synopsis of the review findings. The review results indicate that BART maintains a comprehensive system safety program, and has generally been effectively implementing its SSPP. However, Staff made note of a number of findings of non-compliance and issues 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 50 findings of non-compliance and 36 recommendations are presented in Section 5, organized by source checklist numbers, and followed by an additional staff recommendation regarding General Order 143-B. Finally, the Appendices include a list of abbreviations and acronyms used in the report and checklists, tabulated findings and recommendations, and the complete set of review checklists with summaries of all review activities and the original comments, findings, and recommendations.

2. INTRODUCTION

The Commission's General Order (GO) 164-D *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 659, *Rail Fixed Guideway Systems: 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. These are commonly known as Triennial Safety Reviews. 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-D as well as other Commission safety requirements. Staff conducted the previous On-Site System Safety Review of BART in May, 2010.

Staff first notified BART's General Manager by letter, dated October 11, 2013, of the scheduling of the Commission's Safety Review to begin on November 12, 2013. A second letter, dated October 14, 2013, notified BART of the Commission's Security Review to begin on November 18, 2013. Both notifications included preliminary versions of the review checklists for BART to review and provide comments. For multiple reasons, including an extended labor strike and ongoing accident investigations at BART, the Commission decided to delay both the Safety and Security portions of the review. Staff issued a final notification to BART on December 11, 2013, that both the Safety and Security Reviews would take place between January 27 and February 7, 2014. Staff and BART personnel had been communicating regarding the checklists that would be used to guide the Triennial Review and eventually agreed upon 37 checklists, organized according to the 21 essential SSPP elements identified in 49 CFR 659.19 and included within BART's SSPP. The checklists are included in Appendix E.

The Review began with an opening conference meeting on January 27, 2014, attended by CPUC Staff and BART's General Manager, Assistant General Manager of Operations, Chief Safety Officer, Manager of Employee and Patron Safety, Manager of Engineering Safety, and additional personnel.

Staff conducted the on-site system safety inspections and records review from January 27 through February 7, 2014. Staff provided attending BART personnel a verbal summary of any preliminary findings, and discussed potential recommendations for corrective actions at the conclusion of each review activity.

On March 12, 2014, Staff conducted a post-review exit meeting with BART management to verbally convey all the findings from the Review.

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. Finally, the San Francisco Airport extension opened on June 22, 2003 adding four stations and 8.7 miles of track.

The current BART system operates on 104 miles of track with 43 stations, on the following five lines:

- Fremont—Daly City Line
- Dublin/Pleasanton—Millbrae Line
- Richmond—Millbrae Line
- Pittsburg/Bay Point—SFO Line
- Richmond—Fremont Line

BART's Oakland Airport Connector Project is a newly completed Automated People Mover system designed to integrate with BART at the Coliseum Station, to convey passengers to and from the Oakland International Airport. The pinched-loop cable-driven system is 3.2 miles in length, including two passenger stations and a vehicle

maintenance facility which houses the traction motors. Revenue operations commenced in November of 2014, subsequent to the completion of the field portion of this Triennial Review. Staff monitored the engineering design and construction phases of this project through the Safety Certification process. CPUC Staff will treat this system as a separate inspection unit that will warrant a separate Triennial Review and separate report.

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-D, Section 11, and the SSPP, Section 8. BART has several major system extensions and modifications currently in progress.

The **Warm Springs Extension Project** will add 5.4 miles of track, extending from the Fremont Station to the new Warm Springs Station in South Fremont. Staff has been monitoring the engineering design and construction phases of this project through its Safety Certification process, and the Commission approved BART's Safety Certification Plan with Resolution ST-80.

The **Santa Clara Valley Transportation Authority/Silicon Valley Rapid Transit Project** is a 16.3 mile extension from the planned Warm Springs Station to Milpitas alongside Union Pacific Railroad tracks, continuing to 28th Street and Santa Clara Street in San Jose, then proceeding underground through downtown San Jose to the Diridon Caltrain Station and finally terminating at the Santa Clara Station. Staff has been monitoring the engineering design and construction phases of this project through the Safety Certification process, and the Commission approved BART's Safety Certification Plan with Resolution ST-83.

The **East Contra Costa BART Extension (eBART) Project** will provide passenger service along 10 miles of the California State Route 4 corridor connecting east of the Pittsburg/Bay Point Station. The extension will use unique Diesel Multiple Unit vehicles running on standard gauge tracks instead of BART's typical heavy rail trains on wide-gauge tracks, and includes two new stations and a transfer platform to provide timed transfers between eBART and traditional BART trains. Staff has been monitoring the engineering design and construction phases of this project through the Safety Certification process, and the Commission approved BART's Safety Certification Plan with Resolution ST-112.

Additionally, BART is making progress on its **New Vehicle Procurement Project** which

will add up to 1000 new rail cars to its existing fleet. The new cars will be deployed between 2015 and 2023. Staff has been monitoring the procurement project through the Safety Certification process, and the Commission approved BART's Safety Certification Plan with Resolution ST-150.

FOLLOW-UP STATUS OF THE 2010 BART TRIENNIAL REVIEW

The BART 2010 Triennial On-Site Safety Review demonstrated that BART was in substantial compliance with its SSPP, but included 10 findings of non-compliance and 10 recommendations for corrective actions to BART System Safety Department.

Commission Resolution ST-115 adopted the Staff's final report, and ordered that BART submit appropriate plans and schedules based on Staff's recommended corrective actions, and implement the submitted plans. ST-115 also ordered BART to submit quarterly status reports on the progress of the corrective actions through completion.

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-D. 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 CAPs, fulfilling all recommendations from the 2010 Triennial Review on December 31, 2012.

4. SYSTEM SAFETY REVIEW PROCEDURE

Staff conducted the 2014 System Safety Review of BART in accordance with Rail Transit Safety Section (Now Branch) Procedure RTSS-4, *Procedure for Performing Triennial Safety Audits of Rail Transit Systems*. Staff developed 37 checklists to cover various aspects of system safety responsibilities, based on Commission and FTA requirements, BART's SSPP and other safety-related documents, and Staff's knowledge of BART operations. The checklists are included as Appendix E 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 50 findings of non-compliance, and 36 recommendations pertaining to BART's SSPP and its procedures, and/or Commission regulations. Also, one additional Recommendation unrelated to a specific finding is issued to BART that urges BART to begin developing processes and procedures compliant with GO 143-B to improve safety and bring it into alignment with requirements placed on all other California rail transit agencies.

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 SSPP, and is generally effectively implementing it. However, Staff observed 50 findings of non-compliance, and provided 36 recommendations to improve the system safety program and BART's overall safety. These findings and recommendations are listed below, and grouped by checklist number.

1. **Policy Statement and Authority for System Safety Program Plan: Management Involvement and Commitment to Safety**

No findings of non-compliance; no recommendations.

2. **System Safety Program 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: Control and Update Procedures**

No findings of non-compliance; no recommendations.

5. **System Safety Program Plan: Implementation, Activities, and Responsibilities**

No findings of non-compliance; no recommendations.

6. **Hazard Management Process**

Findings of Non-Compliance:

1. BART is not consistently documenting and analyzing hazards identified through reports of unsafe conditions and operational issues.
2. BART is not consistently evaluating hazards through the Hazard Resolution Matrix as required by its SSPP.

3. BART may not be tracking hazards from all information sources.

Recommendations:

1. BART shall take the necessary steps to fully implement its Hazard Management Program as stated in its SSPP and required by General Order 164-D.

7. **System Modifications**

No findings of non-compliance; no recommendations.

8. **Safety and Security Certification**

No findings of non-compliance; no recommendations.

9. **Safety Data Collection and Analysis**

Findings of Non-Compliance:

1. BART has no documentation that shows what analysis has been done before categorizing in the safety data matrix. See Checklist 6 for recommendation.
2. BART has no documentation that shows how correctible items from patron injuries are tracked.

Recommendations:

1. BART should further refine its Safety Data Collection and Analysis Program to provide for more efficient tracking of corrective actions for safety issues.
2. BART should track correctible items from patron injuries.

10. **Accident/Incident Investigations**

Findings of Non-Compliance:

1. UOR 13-041 and UOR 13-067 were both reported significantly outside the 2-Hour timeframe required by 49 CFR 659 and GO 164-D.
2. At least two incidents occurring on BART-controlled property between 2010 and 2013 were not reported as required by GO 164-D.
3. The Corrective Action Plans on UOR 13-065 and UOR 12-014 did not include

information required by the SSPP, Section 1007, specifically regarding CAP schedules.

Recommendations:

1. BART shall issue a written reminder to applicable personnel in both BART System Safety and BART Police Departments of the minimum CPUC reportable incident thresholds defined in GO 164-D, Sections 7.1 and 7.2, for accidents and incidents, and instruct to forward “courtesy notifications” in cases of any doubt whether an incident is reportable. BART submitted a memorandum satisfying this recommendation on February 12, 2014.
2. BART shall issue a memorandum to the Safety Department reminding personnel of the SSPP’s requirements for CAPs, and BART will ensure that future CAPs generated through incident reports with all required information, including specified timelines for completion

11. Emergency Management Program

No findings of non-compliance; no recommendations.

12. Internal Safety Audits/Reviews

No findings of non-compliance; no recommendations.

13-A. Rules Compliance: Observation and Enforcement

Findings of Non-Compliance:

1. BART does not perform employee evaluations in compliance with the SSPP, Section 1305.
2. The Maintenance and Engineering Department has failed to comply with the requirements of their Operations Safety Compliance Program regarding GO 172.
3. BART has failed to provide a corrective action consistent with the SSPP, Section 1007, regarding any closed Human Factor Incident Reports.

Recommendations:

1. BART Maintenance and Engineering Department shall comply with the

Employee Evaluation requirements outlined in the SSPP and OSCP.

2. BART Operations Department shall comply with the OSCP requirements to submit an annual summary to the Safety Department by March 15 of each year.
3. See Checklist 10, Recommendation 2: “ BART shall issue a memorandum to the Safety Department reminding personnel of the SSPP’s requirements for CAPs, and BART will ensure that future CAPs generated through incident reports with contain all required information, including specified timelines for completion”

13-B. Rules Compliance: Operation Safety Compliance

Findings of Non-Compliance:

1. BART does not retain any Work Orders and Simple Approval documents for one year as required by the TSS, Table S7.1.

Recommendations:

1. Although “Simple Approval” has been discontinued by BART policy, BART shall retain whatever wayside access records it generates for the durations specified in applicable procedures.

13-C. Rules Compliance: Operator, Controller, and Maintenance Personnel Hours of Service

Findings of Non-Compliance:

1. Train Operators, Power Controllers, and Foreworkers have violated the hours of service requirements set forth by BART’s Labor Agreement, outlined in the supplemental document provided by the System Safety Department.

Recommendations:

1. BART shall enforce the hours of service requirements established in the BART Labor Agreement.

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

No findings of non-compliance; no recommendations.

13-F. Rules Compliance: Operations Control Center Manual Revisions

No findings of non-compliance; no recommendations.

14-A. Facilities Equipment Inspections: Fire Emergency Systems

No findings of non-compliance; no recommendations.

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

Findings of Non-Compliance:

1. BART does not inspect its passenger stations at the required frequencies, fails to document inspections adequately by, for instance, completing Station Inspection Audit Checklists, and does not correct reported defects in a timely manner.
2. The inspection report for A10 Lake Merritt Station from November 4, 2013, does not comply with the SSPP Sections 1401 and 1402.
3. Corrective Actions generated through facility inspections did not receive proper follow-up as required by the SSPP, Section 1404.
4. Several fire extinguishers placed at subway wayside locations on the A-, C-, and W-lines were expired.

Recommendations:

1. BART shall ensure station and facilities inspections are performed and documented according to the SSPP, Section 1401, by using the "Station Inspection/Audit Checklist" and including the checklists in the inspection record documents.
2. BART shall ensure fire extinguisher inspections are conducted as required.

14-C. Facilities Equipment Inspections: Non-Revenue Facilities

Findings of Non-Compliance:

1. Staff noted several defects and discrepancies regarding the conditions of BART's non-revenue shop and yard in Oakland.

Recommendations:

1. BART personnel shall be knowledgeable in and comply with the SSPP, Section 1402.

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

Findings of Non-Compliance:

1. No formal process exists for feedback from external departments regarding Trouble Tickets, and verifying timely resolution of reported hazardous conditions is nearly impossible.

Recommendations:

1. BART should analyze its procedures for inter-departmental communications, and revise as needed to allow for proper tracking of hazard resolution by all affected parties.

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

Findings of Non-Compliance:

1. Coverboard inspections are conducted at a frequency lower than that required by GO 95, Section 79.6.
2. Coverboard defects noted on Coverboard Incident Logs are not effectively tracked and repaired.

Recommendations:

1. BART shall conduct monthly third rail inspections as required by GO 95, Section 79.6.
2. BART shall ensure that all coverboard defects noted on Coverboard Incident Logs are repaired and that all the repairs are properly documented in accordance with Book 31, Electrical Maintenance Procedures.

14-F. Facilities Equipment Inspections: Train Control and Signal Facilities

Findings of Non-Compliance:

1. Data in the PM Schedule and UOL is inaccurate, and Work Orders are not completed to allow Maximo to close out the PM records after actual work is done.
2. Work Order close out documentation indicates PM tests are not performed at the required frequencies.

Recommendations:

1. BART shall require that appropriate personnel receive proper training in using the Maximo database, and provide procedures for creating Work Order completion timelines and coordinating Work Order statuses across multiple departments, in order to provide accurate data for the TC Weekly PM Schedule/UOL Trouble Work Order spreadsheets.
2. BART shall perform testing to meet the required frequencies outlined in the SSPP, Section 1501, Train Control Inspection and Maintenance Program.

14-G. Facilities Equipment Inspections: Communication Equipment

Findings of Non-Compliance:

1. BART is not testing its DTS at the semiannual frequency required by the SSPP, Section 1501, instead monitoring its status by System Monitor through a log recorded hourly.
2. BART NET system testing procedures require a 90 day testing frequency. This requirement is not listed in the SSPP, Section 1501 Communication Testing Frequency Table.
3. The Emergency Telephone System testing procedures require a 90 day testing frequency. This is inconsistent with the SSPP, Section 1501.2, which requires testing once every 2 months.
4. Emergency Communication System testing procedures require a 60 day testing frequency. This is inconsistent with the SSPP, Section 1501.3 which requires quarterly testing.
5. The Trunk Radio System testing procedures require annual testing for the underground system only. This is inconsistent with the SSPP, Section 1501.1, which requires annual testing for both underground and above-ground systems.

Recommendations:

1. BART shall ensure that the SSPP and all PM procedures specify the same inspection and testing frequency requirements.

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

Findings of Non-Compliance:

1. The Oakland Non-Revenue Maintenance Shop does not consistently maintain accurate calibration date labels or No Calibration Required stickers on measurement and testing instruments.
2. Some measurement and testing equipment at each shop inspected is past due for calibration.

Recommendations:

1. BART shall review Oakland Shop control of Test and Measurement Equipment and develop procedures as necessary to ensure equipment is calibrated at the proper frequency.

15-A. Maintenance Audits and Inspections: Rail Vehicles

Findings of Non-Compliance:

1. Several defects were observed on vehicles #3656 and #3517 at Oakland Shop.
2. A crane rope for vehicle #3517 at Oakland Shop was improperly stowed, which could result in damage to the rope.

Recommendations:

1. BART shall note defects on drivers' pre-check at Oakland Shops to include items present. Torches and welders shall be inspected prior to use, and items that present a danger to the operator shall be repaired before work commences.
2. Lifting ropes at Oakland Shops shall be stored properly to prevent rope breaks.

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

Findings of Non-Compliance:

1. BART lacks detailed written Operation and Maintenance procedures for the Cathodic Protection System, the Ultrasonic Testing Program, and Seismic Analysis, based on the 1994 Parsons Brinkerhoff report.
2. The Maintenance and Engineering Department has not performed PM at the proper frequencies: monthly weekly FPE/GE inspections, rather than the required weekly inspections; FPE 34.5 KV AC BUS maintenance every 3-5 years, rather than the required annual maintenance; semi-annual GE Battery & Charger maintenance, rather than the required quarterly maintenance; GE 1KV DC BUS maintenance every 3-5 years, rather than the required annual maintenance; and quarterly ventilation inspections, rather than the required monthly inspections.
3. Broken coverboards were found at the M10 West Oakland Station platform and at the maintenance facility at 601 8th St. in Oakland.
4. The A2 Substation at A50 Bay Fair Station had exposed communication wires and an open circuit cabinet door.

Recommendations:

1. BART shall develop written procedures, operation standards, and maintenance standards for the Cathodic Protection System, including requirements for inspection frequency, rectifier voltage range, current range, system design, and specifications. The program shall also include the metal to ground voltage drop goals and associated rational. Procedures shall also include ultrasound testing frequency, nondestructive and destructive testing methods, repairs, training, calibration, etc.
2. BART Engineering shall issue and follow procedures that accurately reflect the frequency of the inspections and PM being conducted for all procedures, including monthly inspections of the third rail system and associated components, as required by General Order 95, section 79.6.
3. BART shall repair the broken coverboards discovered during this review.
4. BART shall enclose the exposed communication wiring at the A50 Bay Fair Station A2 Substation.

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

Findings of Non-Compliance:

1. As-built plans for the K30 Train Control Room, Cabinet D1 are inaccurate.
2. Some equipment at A05 Train Control Room is out-of-date on calibration.

Recommendations:

1. BART shall revise the as-built plans for the K-30 Train Control Room, Cabinet D1 for accuracy.
2. BART shall routinely calibrate all equipment according to manufacturer specifications and BART procedures.

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

Findings of Non-Compliance:

1. Internal rail defect inspections were not performed two times per year, as required by the TSS, Section S7.1.
2. Corrective actions for rail defects are not properly tracked and documented through completion.
3. Geometry Car track inspections were not performed two times per year, as required by TSS, Section S7.1.
4. Corrective actions generated through Geometry Car track inspection reports were not properly tracked and documented through completion.

Recommendations:

1. BART shall conduct internal rail defect inspections and Geometry Car track inspections on their mainline track at the frequencies specified in the TSS, Section S7.1.
2. BART shall implement a systematic program to track and document corrective actions for all internal rail defects and Geometry Car track inspections.

16-A. Training and Certification Programs: Operators, Controllers, and Foreworkers

No findings of non-compliance; no recommendations.

16-B. Training and Certification Programs: Employees and Contractors

Findings of Non-Compliance:

1. Training schedules for the selected employees did not comply with the frequency requirements specified in the SSPP.
2. BART is not complying with the IIPP and SSPP by failing to train its maintenance personnel in SSOSHA03A, SSOSHA08, SSOSHA18, SSOSHA21, and STREG001T courses.
3. BART has failed to provide training/retraining records for Contractors working on the projects reviewed, as required by the SSPP, Chapter 16.
4. BART has failed to provide Wayside Safety Training to on-rail equipment operators and track foreworkers every 24 months, as required in the SSPP, Section 1604.
5. BART has failed to provide training records for the Safety Monitors used to provide protection for Contractors related to the projects reviewed, as required by the OR&P Manual and the SSPP, Chapter 16.
6. BART has failed to provide Track Allocations for project 15PN-110. Staff could not verify that the project met all of BART's safety requirements.
7. BART's Resident Engineer failed to meet the guidelines listed in BART's SSPP, Section 1605, by signing off on each project despite them not meeting the outlined requirements listed.

Recommendations:

1. BART shall revise the three-year recertification program to comply with the 24 month recertification requirements in the SSPP, and require that all employees receive wayside training regardless of position.
2. BART shall review the IIPP and SSPP for training requirements, and audit employee records to ensure training intervals are as required.
3. BART shall ensure that all Contractors are trained according to BART policy, including any training and retraining specified in SSWPs.
4. BART should develop procedures to ensure that all training records related to Contractors and Contractor Projects are kept for a minimum of four years.
5. BART's Resident Engineer shall ensure that all project guidelines have been met prior to approving any work, consistent with BART policy.

17. Configuration Management and Control

No findings of non-compliance; no recommendations.

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

No findings of non-compliance; no recommendations.

19. Hazardous Materials Programs

Findings of Non-Compliance:

1. Each of the employees inspected received Hazardous Waste Management training in 2013 approximately one month later than the 2012 training expiration dates.

Recommendations:

1. BART shall take action to ensure employees responsible for handling hazardous waste receive annual Hazardous Waste Management training before the expiration dates noted on their training certificates for the previous training sessions.

20. Drug and Alcohol Program

No findings of non-compliance; no recommendations.

21. Procurement Process

No findings of non-compliance; no recommendations.

ADDITIONAL STAFF RECOMMENDATION

The Commission has acknowledged in prior proceedings that GO 143-B does not apply to BART, because it is not classified as "Light Rail." GO 143-B is titled "Safety Rules and Regulations Governing Light-Rail Transit." However, GO 143-B includes numerous requirements that should be equally applicable to BART's rail transit system and the other heavy-rail rapid transit system in California, Los Angeles County Metropolitan Transportation Authority's Red Line subway. Because BART's system is

classified as “Heavy-Rail Rapid Transit,” BART escapes GO 143-B requirements that would otherwise be applicable to it. RTSB Staff believes that the majority of GO 143-B requirements should apply to such systems, and notes that GO 143-B includes language in Section 1.03 stating “(t)he safety of Patrons, employees and the public is of primary importance in the application of these regulations.” Therefore, Staff will in its proposed upcoming rulemaking proceeding to revise GO 143-B propose to revise the title of GO 143 and make the appropriate requirements within it applicable to all rail transit systems in California, including BART.

In anticipation of that process, Staff recommends as part of this triennial safety review, that BART immediately begin to voluntarily incorporate processes and procedures that are in compliance with GO 143-B into its system operations and facilities. This makes even more sense when one considers that BART’s East Contra Costa County extension will be light rail, which makes GO 143-B applicable to it when it is completed.

One particular and significant concern is that BART does not have a medical evaluation requirement for their Safety Sensitive Employees, consistent with the industry standard throughout California and the nation, which requires Safety Sensitive Employees to have a physical evaluation prior to any form of certification or recertification, particularly the rail transit vehicle operators. GO 143-B requires in Section 12.02 that operators of light rail vehicles and streetcars be subject to a physical examination in accordance with Class B licensing requirements.

BART should begin taking steps to develop a medical evaluation requirement, including a Physical Evaluation, as part of certification and recertification of Safety Sensitive Employees, including its vehicle operators, in accordance with industry standards and GO 143-B Section 12.02 requirements.

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
Ca/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
ESP	Earthquake Safety Project
FLC	Fire Liaison Committee
FLSSC	Fire Life Safety and Security Committee
FTA	Federal Transit Administration
GM	BART General Manager
GO	CPUC General Order

Abbreviation or Acronym:	Definition:
IIPP	Injury and Illness Prevention Program
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
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
RTSB	Rail Transit Safety Branch
SCADA	Supervisory Control and Data Acquisition
SCP	Safety Certification Plan
SSCC	Safety and Security Certification Committee
SSPP	System Safety Program Plan

Abbreviation or Acronym:	Definition:
SSWP	Site Specific Work Plan
Staff	CPUC Personnel
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: (Leadership Involvement and Commitment to Safety)
2	System Safety Program Plan: Goals and Objectives
3	Overview of Leadership Structure
4	System Safety Program Plan: Control and Update Procedure
5	System Safety Program Plan: Implementation, Activities, and Responsibilities
6	Hazard Management Process
7	System Modification
8	Safety and Security Certification
9	Safety Data Collection and Analysis
10	Accident/Incident Investigations
11	Emergency Management Program
12	Internal Safety Audits/Reviews
13-A	Rules Compliance: Observation and Enforcement
13-B	Rules Compliance: Operation Safety Compliance
13-C	Rules Compliance: Operator, Controller, and Maintenance Personnel Hours of Service
13-D	Rules Compliance: Contractor Safety Program
13-E	Rules Compliance: Operating Rules and Procedures Manual and Operations Bulletin Revisions
13-F	Rules Compliance: Operations Control Center Manual Revisions
14-A	Facilities and Equipment Inspections: Fire Emergency Systems
14-B	Facilities and Equipment Inspections: Stations and Emergency Equipment
14-C	Facilities and Equipment Inspections: Non-Revenue Facilities

Checklist No.:	Element/Characteristic:
14-D	Facilities and Equipment Inspections: Tunnels, Bridges, and Aerial Structures
14-E	Facilities and Equipment Inspections: GO 95 Right-of-Way Compliance
14-F	Facilities and Equipment Inspections: Train Control and Signal Facilities
14-G	Facilities and Equipment Inspections: Communications Equipment
14-H	Facilities and Equipment Inspections: Measurement and Testing Instrumentation
15-A	Maintenance Audits and Inspections: Rail Vehicles
15-B	Maintenance Audits and Inspections: Traction Power Systems
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: Operators, Controllers, and Foreworkers
16-B	Training and Certification Programs: 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

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, and are customized according to the SSPP and the unique features of the agency under review.

BART received a draft version of these checklists, showing only the Reference Criteria and Element/Characteristics and Method of Verification fields, on October 11, 2013, 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 37 complete checklists are provided below.

2014 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR SAN FRANCISCO BAYAREA RAPID TRANSIT DISTRICT

Checklist No.	1	Element	Policy Statement and Authority for System Safety Program Plan: Management Involvement and Commitment to Safety
Date of Audit	January 27, 2014 LKS-23	Department(s)	BART Senior Management System Safety Department
Auditors/ Inspectors	Raed Dwairi Stephen Artus Steve Espinal Colleen Sullivan Robert Hansen Daren Gilbert	Persons Contacted	Grace Crunican , General Manager Paul Oversier, Assistant General Manager of Operations Jeff Lau, Chief Safety Officer

REFERENCE CRITERIA

1. CPUC General Order 164-D
2. BART System Safety Program Plan (SSPP) Rev. 9

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

Policy Statement and Authority for System Safety Program Plan:

BART Senior Management Involvement and Commitment to Safety

Interview BART's General Manager (GM), Assistant General Manager of Operations (AGMO), Chief Transportation Officer, and Chief Safety Officer (CSO) to discuss:

1. Source, frequency, and depth of safety information provided to Senior Management, whether safety is included as a regular topic at BART Senior Management 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. Formal meetings held and attended by BART Senior Management to discuss safety performance, such as ongoing evaluation of goals and targets.
4. The GM's and AGMO's awareness of high priority safety issues related to operations and capital projects.
5. The AGMO's awareness of the status of all corrective actions generated by the Safety Department through internal safety and security audits, the hazard management process, accident/incident investigations, or other channels.
6. The System Safety Department's reporting relationship to BART's executive and senior management, and management's participation in safety activities.
7. Which individuals and departments are involved in making safety decisions, and

to what degree senior management is involved.

8. Scope of senior management involvement, coordination, and communication in developing SSPP revisions.

FINDINGS AND RECOMMENDATIONS

Activities:

Staff interviewed BART's GM , AGMO, and CSO, and reviewed relevant documentation to determine the following in summary:

- The CSO reports directly to the GM, which highlights BART's focus on safety and ensures independence of the safety function at BART.
- The CSO attends weekly meetings every Wednesday where safety statistics are shared and discussed.
- Quarterly performance reports are prepared, which include a section dedicated to safety in which safety performance indicators are presented by the CSO and discussed. The CSO delivers safety presentations at these quarterly meetings. When major incidents occur, the CSO prepares and delivers presentations to BART Board members.
- BART participates in peer reviews and solicits the expertise of professional groups such as American Public Transportation Association to improve its safety culture.
- BART is active in Joint Union Management Safety Committee meetings during which safety reports from each department are discussed.
- BART management is aware of high priority issues such as asset management, state of good repair, resources needed to comply with regulations such as GO 175, employee compliance, and construction safety.
- BART changed performance evaluations to include safety as a line item, which shows the district's commitment to safety and the desire to improve the safety culture at BART.
- BART has a safety incentive program, which rewards employees for good safety practices.
- The GM conducts operational observations and field visits, and discusses safety issues with the Train Operators and the Station Agents. If safety issues arise during these discussions, the GM discusses them with the CSO.

Findings:

None.

Recommendations:

None.

2014 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT

Checklist No.	2	Element	System Safety Program Plan: Goals and Objectives
Date of Audit	January 27, 2014 LKS-23	Department(s)	BART Senior Management System Safety Department
Auditors/ Inspectors	Raed Dwairi Stephen Artus Steve Espinal Colleen Sullivan Robert Hansen Daren Gilbert	Persons Contacted	Paul Oversier , Assistant General Manager of Operations Jeff Lau, Chief Safety Officer

REFERENCE CRITERIA

1. CPUC General Order 164-D
2. BART System Safety Program Plan (SSPP) Rev. 9

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

System Safety Program Plan: Goals and Objectives

Interview BART Senior Management and review appropriate records to:

1. Determine whether BART is making significant progress toward the ongoing goals and objectives identified in SSPP Sections 202 and 203.
2. Obtain examples of how goals are evaluated (metrics and measures) and review documentation used to track BART activities to meet the goals and objectives. For example, if BART set a goal of reducing incidents by 10%, has this been achieved? How is this metric tracked and reported?
3. Determine how safety performance is reported to the Assistant General Manager of Operations (AGMO) or other senior management.
4. Assess the adequacy of safety information provided to the AGMO. Is the AGMO receiving sufficient information to ensure BART is meeting its safety goals and objectives? Are rule violations and other key safety metrics being tracked and reported to the AGMO?

FINDINGS AND RECOMMENDATIONS

Activities:

Staff interviewed BART's AGMO and CSO, reviewed relevant documentation, and concluded the following in summary:

- BART uses Quarterly Service Performance Reviews and quarterly safety statistics to track its activities to meet the goals and objectives stated in its SSPP. BART is planning on revising its metrics to improve and better evaluate its goals and objectives.
- Safety performance is reported to upper management on a regular and quarterly basis by the CSO, and contains such important safety performance as employee injury and near-miss incidents specific to roadway workers.
- Staff determined that the safety information provided to the AGMO is sufficient to ensure that BART is meeting its goals and objectives with greater emphasis planned on yard hazards and nonrevenue maintenance incidents.

Findings:

None.

Recommendations:

None.

2014 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT

Checklist No.	3	Element	Overview of Management Structure
Date of Audit	January 27, 2014 LKS-23	Department(s)	System Safety Department
Auditors/ Inspectors	Raed Dwairi Stephen Artus Steve Espinal Colleen Sullivan Robert Hansen Daren Gilbert	Persons Contacted	Jeff Lau, Chief Safety Officer Jonathan Rossen, Manager of Employee and Patron Safety

REFERENCE CRITERIA

1. CPUC General Order 164-D
2. BART System Safety Program Plan (SSPP) Rev. 9

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

Overview of Management Structure

Interview BART Senior Management and review appropriate records to:

1. Discuss BART's process for integrating safety into BART operations and maintenance activities.
2. Solicit opinions regarding the effectiveness of the organization and request a few examples of how this organization has worked to resolve identified safety issues.
3. Identify any specific deficiencies in the safety and security program due to limitations in personnel or resources. For example, discuss any difficulties in maintaining schedules for SSPP updates, completing ISSAs, or performing Accident/Incident Investigations.
4. Review Joint Union/Management Safety Committee Meeting agendas and minutes from the past twelve months to verify that the meetings were held according to the requirements in SSPP Section 1801.

FINDINGS AND RECOMMENDATIONS

Activities:

Staff interviewed BART representatives and reviewed relevant documentation and identified the following in summary:

- BART integrates safety into operations and maintenance activities by actively

investigating more employee and patron incidents, improving its safety culture, monitoring construction safety of capital projects, and encouraging its employees to bring any safety issues not resolved at the local level to management's attention by submitting a Safety Notice.

- Staff did not identify any difficulties in maintaining schedules for SSPP updates, completing internal audits, or performing investigations but BART Safety is planning on conducting more field inspections to improve the safety program at the district.
- Safety Committee Meetings were held as required by the SSPP.

Findings:

None.

Recommendations:

None.

2014 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT

Checklist No.	4	Element	System Safety Program Plan: Control and Update Procedure
Date of Audit	January 27, 2014 LKS-23	Department(s)	System Safety Department
Auditors/ Inspectors	Raed Dwairi Stephen Artus Steve Espinal Colleen Sullivan Robert Hansen Daren Gilbert	Persons Contacted	Jeff Lau , Chief Safety Officer Mark Chan, Manager of Engineering Safety

REFERENCE CRITERIA

1. CPUC General Order 164-D
2. BART System Safety Program Plan (SSPP) Rev. 9

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

System Safety Program Plan: Control and Update Procedure

Interview BART Senior Management and review appropriate records to:

1. Ensure that Management understands and is implementing the procedure requirements in SSPP Chapter 4.
2. Verify that the required annual SSPP review process is being implemented according to the approved process specified in the SSPP, Chapter 4.
3. Review responsibility for SSPP reviews and comments, and verify SSPP reviews and changes progress according to internal timeframes, are comprehensive in scope, and are signed-off by the designated staff.

FINDINGS AND RECOMMENDATIONS

Activities:

Staff interviewed BART's Manager of Engineering Safety and the Chief Safety Officer and reviewed appropriate records and determined the following in summary:

BART management understands and is correctly implementing the Control and Update Procedure requirements in its SSPP. Annual reviews of the SSPP are being conducted and if there are necessary changes, BART revises its SSPP. BART is planning on revising its SSPP as a result of GO 175 and will also introduce other needed changes. BART consistently provides the CPUC

with a copy of its Annual Certification Letter each year which certifies that the SSPP has been reviewed by BART to determine if modifications or updates are required.

Findings:

None.

Recommendations:

None.

2014 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT

Checklist No.	5	Element	System Safety Program Plan: Implementation, Activities and Responsibilities
Date of Audit	January 27, 2014 LKS-23	Department(s)	System Safety Department
Auditors/ Inspectors	Raed Dwairi Stephen Artus Steve Espinal Colleen Sullivan Robert Hansen Daren Gilbert	Persons Contacted	Jeff Lau, Chief Safety Officer

REFERENCE CRITERIA

1. CPUC General Order 164-D
2. BART System Safety Program Plan (SSPP) Rev. 9

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

System Safety Program Plan: Implementation, Activities and Responsibilities

Interview BART Senior Management and review appropriate records to:

1. Verify each manager, department, and contractor is charged with responsibility and accountability for SSPP implementation, enforcement, and effectiveness.
2. Identify any challenges each manager, department, and contractor has in performing tasks relating to the SSPP or general safety.
3. Verify management accountability for the performance of safety-related activities, and, if serious or potentially serious deficiencies are found, expand the review to include additional and/or related activities.

FINDINGS AND RECOMMENDATIONS

Activities:

Staff interviewed BART's Chief Safety Officer and reviewed documentation that showed BART management is held accountable for SSPP implementation, enforcement, and effectiveness through the weekly safety meetings and the inclusion of safety in their performance evaluations. Staff did not identify any challenges in performing tasks related to the SSPP or general safety.

Findings:

None.

Recommendations:

None.

2014 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT

Checklist No.	6	Element	Hazard Management Process
Date of Audit	January 27, 2014 LKS-18	Department(s)	System Safety Department
Auditors/ Inspectors	Claudia Lam Steve Espinal Raed Dwairi	Persons Contacted	Jeff Lau , Chief Safety Officer Jonathan Rossen, Manager of Employee and Patron Safety

REFERENCE CRITERIA

1. CPUC General Order 164-D
2. BART System Safety Program Plan (SSPP) Rev. 9

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

Hazard Management Process

Interview BART representatives and review appropriate records to determine whether:

1. BART is identifying hazards through the sources described in the SSPP, Section 604.
2. The System Safety Department maintains a mechanism to capture and track identified hazards through analysis and resolution.
3. The Chief Safety Officer is reviewing operational hazards to assess severity, and reporting unacceptable hazards to CPUC as specified by the SSPP, Section 604.
4. BART has a specified process for reporting hazard resolution activities to CPUC as required by General Order 164-D, Sections 6e and 6f.
5. Identified hazards are being evaluated according to the methods established in the SSPP, Chapter 6.
6. Corrective actions are developed to address identified hazards, and identify the individual or department responsible for implementation and a schedule for completion.
7. The System Safety Department follows up on outstanding corrective actions to mitigate or resolve hazards.

FINDINGS AND RECOMMENDATIONS

Activities:

Staff interviewed BART representatives in charge of the hazard management program and reviewed relevant documentation and data. Staff determined the following in summary:

- No documentation was presented to provide evidence that BART is consistently performing statistical and trend analysis, and subsequently not identifying hazards, from the unsafe conditions it collects and stores in databases such as the one used to track operational issues (rule violations, unscheduled door opening incidents, etc.).
- No documentation was provided to show that BART is consistently evaluating and categorizing hazards by using the Hazard Resolution Matrix (Figure 6.1) as required by its SSPP. This may have resulted in hazards not either identified or categorized as unacceptable, and therefore, may have not been reported to the CPUC as required. These could have included the unscheduled door opening incidents. For example according to BART's Unusual Occurrence Report Database on October 13, 2011:

"Patrons confirmed it was door #1 on C1506 and it opened fully while the train was moving and a patron was leaning against it."

If BART had performed hazard analysis as required by its SSPP, this incident would have been reported to the CPUC as an unacceptable condition hazard.
- No evidence was presented to show that BART is tracking hazards from all the sources available to it such as patron injuries. This was dealt with in checklist 9 regarding safety data collection and analysis and a recommendation was issued.

Findings:

1. BART is not consistently documenting and analyzing hazards identified through reports of unsafe conditions and operational issues.
2. BART is not consistently evaluating hazards through the Hazard Resolution Matrix as required by its SSPP.
3. BART may not be tracking hazards from all information sources.

Recommendations:

1. BART shall take the necessary steps to fully implement its Hazard Management Program as stated in its SSPP and required by General Order 164-D.

2014 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT

Checklist No.	7	Element	System Modification
Date of Audit	January 28, 2014 LKS-18	Department(s)	System Safety Department
Auditors/ Inspectors	Joey Bigornia Jimmy Xia Michael Warren Yan Solopov	Persons Contacted	Mark Chan, Manager of Engineering Safety Carlina Leong, Senior Safety Engineer
REFERENCE CRITERIA			
<ol style="list-style-type: none"> 1. CPUC General Order 164-D 2. BART System Safety Program Plan (SSPP) Rev. 9 3. BART Engineering Change Order Form (BECO) 4. BART Facility Standards Database (access onsite) 			
ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION			
<p>System Modification</p> <p>Interview BART representatives and review appropriate records to determine whether:</p> <ol style="list-style-type: none"> 1. The SSPP and referenced and supporting procedures specify a process for addressing safety issues and concerns in system modifications. 2. The System Safety Department is involved in assessing system modifications. Verify that, in at least two randomly selected system modifications implemented in the past three years, the process was consistent with SSPP requirements and included an evaluation of potential hazards arising from the proposed modification. 3. System modification projects meet the specifications or project requirements, and no unauthorized modifications were implemented. Select three system modification projects implemented at random, e.g. fire protection system changes. 			
FINDINGS AND RECOMMENDATIONS			
<p><u>Activities:</u></p> <p>Staff interviewed the BART Safety Department representatives responsible for assessing System Modification and determined the following:</p> <ol style="list-style-type: none"> 1. SSPP Section 8 identifies Configuration Management (CM) and describes the process as 			

two tiers: one for smaller in-house projects and the other for Capital Project Design.

2. Staff reviewed projects:

- a. Vehicle Automatic Train Control Refurbishment Project Phase 2.5.3, Volume 2 of 12. Safety Certification Documents dated 1-10-2011.
- b. BECO Safety Improvement Project – Fall Protection (Fall Protection – Cable Rail) – used during a modification. Received July 25, 2012, and due date August 12, 2012.
- c. BECO NO. EM001821. The sample contained all blue prints which required modification.

All projects reviewed contained the required documentation as required by the CM Program.

3. Staff reviewed projects:

- a. Glass Replacement Project application of a protective film– approximately 13 of 17 Stations. Two incidents were noticed by BART Safety Department: in first incident a BART police officer cut his hand while arresting someone when he was pushed up against a glass shelter and it shattered; second incident at Daly City Station where a patron was under the influence and glass shattered. Safety Department surveyed all stations to determine if glass was safe (tempered) and found the aerial station glass glazing was within reachable distances from patrons. Safety Department recommended priorities were to address glass above elevators, escalators, (BA-line stations), glass lower than 6 feet subject to body parts contact (e.g. leaning on), and glass behind bench windscreens. The budget for glass window replacement was provided through the Earthquake Seismic Retrofit Program with Contract received October 25, 2010, and due date February 22, 2011. This project followed all required CM Program documentation in accordance with BART's SSPP.
- b. Please see Checklist #8 Safety Certification for additional system modification projects reviewed.

Findings:

None.

Recommendations:

None.

2014 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT

Checklist No.	8	Element	Safety and Security Certification
Date of Audit	January 29, 2014 LKS-18	Department(s)	System Safety Department
Auditors/ Inspectors	Jimmy Xia Joey Bigornia Noel Takahara Michael Warren Yan Solopov	Persons Contacted	Mark Chan , Manager of Engineering Safety

REFERENCE CRITERIA

1. CPUC General Order 164-D
2. BART System Safety Program Plan (SSPP) Rev. 9
3. BART Facilities Standards Database (access onsite)
4. BART Safety Certification Plans (SCPs) for all major projects:
 - a. Central Contra Costa County Crossover Project
 - b. Earthquake Safety Project (ESP)
 - c. East Contra Costa BART Extension (eBART)
 - d. New Vehicle Procurement
 - e. Oakland Airport Connector
 - f. Santa Clara Valley Transportation Authority Silicon Valley Rapid Transit
 - g. Warm Springs Extension

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

Safety and Security Certification

Interview the BART representative(s) involved in the Safety Certification Program and review the records of all major projects to determine whether:

1. A formal SCP has been submitted by BART and approved by the Commission.
2. Each submitted SCP was consistent with General Order 164-D, the SSPP, and applicable reference documents.
3. There has been effective communication with CPUC staff throughout the lives of current and planned projects, including the Preliminary Engineering Design Phase.
4. All design and construction changes were properly coordinated 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.

FINDINGS AND RECOMMENDATIONS

Activities:

Staff interviewed the BART representatives in charge of the Safety Certification Program, reviewed the BART Safety Certification conformance criteria, and supporting documents for the following seven projects:

1. Central Contra Costa County Crossover Project
 - a. Safety Certification Committee Meeting sign-in sheets, agendas, and minutes for the following dates:

January 18, 2011	June 23, 2011
March 10, 2011	August 11, 2011
April 21, 2011	October 6, 2011
May 26, 2011	May 18, 2012
2. Earthquake Safety Project (ESP)
 - a. Safety Certification Committee Meeting sign-in sheets, agendas, and quarterly minutes dated June 26, 2013, September 25, 2013, and January 8, 2014.
 - b. BART's Certificate of Conformance for hazard analysis for Contract 15PE-110: R-Line North, signed on May 10, 2010
 - c. BART's hazard analysis matrix for Contract #15PE-110: R-Line North
 - d. Staff reviewed the Certificate of Conformance Hazard Analysis Certificate (BART Earthquake Safety Program), dated May 10, 2010. CF contained all necessary documentation and approvals as required R-Line South. R-Line North Aerial is currently in process.
3. East Contra Costa BART Extension
 - a. Safety and Security Certification Committee Meeting sign-in sheets, agendas, and meeting minutes dated October 2013 through present.
 - b. Letter dated May 30, 2012 regarding eBART Safety and Security Certification GEC Input to the Preliminary Hazard Analysis (PHA)
 - c. PHA for eBART Transfer Platform and Guideway, Rev. 1, dated December 2011
4. New Vehicle Procurement
 - a. Safety Certification Committee Meeting sign-in sheets, agendas, and quarterly minutes dated September 4, 2013, and December 4, 2013.
 - b. Technical specifications for new vehicles
5. Oakland Airport Connector
 - a. Safety/Security Certification Committee Meeting sign-in sheets, agendas, and minutes dated:

April 21, 2011	January 10, 2013
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- | | |
|-------------------|--------------------|
| June 30, 2011 | February 7, 2013 |
| August 18, 2011 | March 7, 2013 |
| October 27, 2011 | April 18, 2013 |
| December 22, 2011 | May 23, 2013 |
| February 16, 2012 | June 25, 2013 |
| March 29, 2012 | July 25, 2013 |
| May 31, 2012 | August 22, 2013 |
| July 12, 2012 | September 26, 2013 |
| August 30, 2012 | October 31, 2013 |
| October 11, 2012 | December 5, 2013 |
- b. Fire Life Safety and Security Committee (FLSSC) Meeting agendas and minutes dated:

December 13, 2012	June 4, 2013
February 28, 2013	July 16, 2013
March 28, 2013	November 5, 2013
 - c. Oakland Airport Connector PHA Revision 7, dated January 20, 2013
6. Santa Clara Valley Transportation Authority Silicon Valley Rapid Transit
- a. Safety and Security Review Committee Meeting sign-in sheets, agendas, and minutes dated:

May 17, 2012	March 28, 2013
August 23, 2012	April 25, 2013
October 25, 2013	June 6, 2013
January 17, 2013	July 11, 2013
February 28, 2013	September 12, 2013
 - b. FLSSC Meeting sign-in sheets, agendas, and minutes dated:

February 9, 2012	February 28, 2013
May 17, 2012	April 25, 2013
August 23, 2012	June 6, 2013
October 25, 2012	July 11, 2013
December 13, 2012	August 8, 2013
January 17, 2013	September 12, 2013
 - c. Project-wide PHA Report, Rev. 0, dated September 2006
 - d. PHA and Hazard Tracking Matrix for the guideway portion of the project, dated April 19, 2012
 - e. PHA and Hazard Tracking Matrices for Milpitas Station and Berryessa Station, dated March 29, 2012
7. Warm Springs Extension
- a. Safety and Security Certification Program Committee Meeting sign-in sheets, agendas, and minutes dated February 12, 2013 and April 30, 2013
 - b. PHA for the Preliminary Engineering phase of the Warm Springs Extension Project, Rev. 0, dated December 23, 2004
 - c. A letter dated July 11, 2013 regarding Safety and Security Certification: Hazard

Analysis for the Subway Part of the project

Staff noted the following from the interviews and records review:

1. The SCPs for BART's seven projects were submitted by BART to CPUC. All SCPs have been formally approved by Commission Resolutions corresponding to each SCP.
2. Each submitted SC Plan was consistent with General Order 164-D, the SSPP, and applicable requirements.
3. BART maintains effective communications with CPUC staff throughout the entire projects, including the Preliminary Engineering (PE) Design Phase by using the following methods:
 - a. BART invites CPUC staff to the Safety and Security Certification Committee (SSCC) Meetings for all seven major projects, and to the Security Review Committee Meetings for item 4 f above by email.
 - b. CPUC staff is invited to attend BART's FLSSC Meetings for the seven projects. The FLSSC meetings are either combined with the SSCC meetings or separate standalone meetings. The meetings provide project status updates and track the safety and security certification processes of the projects.
 - c. CPUC staff is invited to BART's project construction sites.
 - d. BART submits to CPUC project updates for the certificates of conformance and PHAs as the safety and security certification activities progress.
4. BART's design review process and configuration management process addresses construction changes for all seven projects. BART representatives summarized the process as follows. The project consultant creates the design change checklist and change order and sends these to the responsible BART engineer for review and approval. The BART engineer reviews and approves the change order and checklist, and then sends the approved change order and checklist back to project consultant. At that point, the project's contractor will start constructing the changes.

The design and construction changes matrix identifies the changes and includes signatures to show changes are completed. BART's project's contractor and BART engineer are responsible for verifying the changes are in conformance with BART's Configuration Management Process prior to Safety Certification Conformance Certificate completion.
5. Preliminary Hazard Assessments
 - a. A PHA is not necessary for the Central Contra Costa County Crossover Project, because it is based on an existing BART crossover design and constructed to the BART Facilities Standards (BFS). This project adds a crossover to an existing crossover on the mainline.
 - b. BART's Earthquake Safety Project contractor is required to provide what they have to adjust for this project to BART. Project work consists of column straightening and lodging the footing. BART is working with the contractor to determine when work for this project will be done. BART has over 21 contracts (over 21 locations) for this project

and to date, has completed approximately 18 or 19 of these contracts. Staff reviewed Certificate of Conformance Hazard Analysis Certificate dated May 10, 2010 which contained all necessary documentation and approvals as required for the R-Line South. The R-Line North Aerial Hazard Analysis review is currently in process. Staff reviewed the completed ESP Conformance Certificates for Hazard Analysis Conformance Certification Contract 15PF-110, Certifiable Element A: West Oakland Station, dated April 15, 2009.

- c. The eBART Project Transfer Platform and Guideway portion PHA was completed as required by SC Plan and the PHA was provided to CPUC. The Diesel Multiple Unit Vehicle Project PHA will also be developed as the project progresses. The identified project hazards have not been eliminated or controlled to date since Vehicle portion is in PE phase.
 - d. BART has not completed the New Vehicle Procurement Project PHA to date since it is in the PE phase.
 - e. BART's Oakland Airport Connector project's contractor completed the PHA and submitted the PHA to CPUC. The PHA evaluates:
 - i. Systems hazard analysis, and
 - ii. Support operations hazard analysis.BART is currently evaluating, eliminating, and controlling the hazards and expects completion by late 2014.
 - f. BART's Silicon Valley Berryessa Extension project final designs for the guideway and stations portions are complete. BART's project contractor is addressing the hazards identified in the PHA and Hazard Tracking Matrices through design. The systems portion PE PHA is complete; however the final design is not. The project contractor is developing the PHA.
 - g. The Warm Springs Extension Project subway portion resident engineer sent to BART the Certificate of Conformance for the PHA by letter dated July 11, 2013. The PHA states there are no known hazards for the subway. For the project's Line, Track, Stations, and Systems contract, BART generated the draft PHA, dated July 12, 2013, by adopting the PHA for the PE project phase. The draft PHA identified hazards for the contract are being addressed through final design.
6. There are no completed Safety Certification Verification Reports available for review since none of the projects are complete.

Findings:

None.

Recommendations:

None.

2014 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT

Checklist No.	9	Element	Safety Data Collection and Analysis
Date of Audit	January 28, 2014 LKS-18	Department(s)	System Safety Department
Auditors/ Inspectors	Claudia Lam Steve Espinal	Persons Contacted	Robb Bury , Industrial Hygienist Carlina Leong, Senior Engineer, System Safety

REFERENCE CRITERIA

1. CPUC General Order 164-D
2. BART System Safety Program Plan (SSPP) Rev. 9

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

Safety Data Collection and Analysis

Interview the BART representative(s) responsible for safety data acquisition and analysis, and review the last four publications of the *BART Safety Statistics Report*, and analyze the safety data acquisition and analysis program requirements to determine whether:

1. The data collected includes, at minimum, information concerning employee injury and illness reports, patron accident reports, rules and procedures violations, Unusual Occurrence Reports (UORs), and BART Safety Notifications.
2. The safety data is supplied by, and collected from, all departments, including Operations, Claims Management, and Maintenance, as appropriate.
3. The safety data collected is analyzed and incorporated into BART's Hazard Identification and Resolution Process as necessary.
4. The safety data and analysis is made available to all BART departments for use in planning their safety-related activities.
5. Periodic reporting regarding the results of the safety data analysis is provided to the BART Senior Management as appropriate.
6. Submitted UORs regarding operations are reviewed and approved by the personnel responsible, and addressed by the appropriate departments.
7. Any discrepancies in UORs and corrective actions were addressed in a timely manner and tracked until completion.

FINDINGS AND RECOMMENDATIONS

Activities:

Staff interviewed BART Personnel regarding the Safety Data Acquisition and Analysis Program and reviewed relevant program documentation. Staff determined the following:

- BART analyzes some safety data, such as patron safety, employee safety, and operations safety, and presents the statistics in the quarterly BART Safety Statistics Report. The report is distributed to BART upper management and the Joint Union/Management Safety Committee.
- Consistent and periodic reporting of safety data analysis and issues that address immediate action are reported by the Safety Manager to the Chief Safety Officer.
- BART collects safety data from a variety of sources, such as the Accident/Injury Report Form for patron injury, Form 0030 for employee injury, and Form 0836 for employee safety complaint. BART keeps data for patron safety, employees' safety, and operations safety in different databases. For example, a third party administrator maintains the database for employee injury. BART has access to the database. The System Safety Department maintains the databases for Operations safety, and Patrons' Safety, but no documentation shows how correctable items from patron injuries are tracked to completion. BART Employee Robb Bury mentioned that Jonathan Rossen may have the tracking matrix for CAPs of patron injury, but BART had not submitted this matrix for review at the time of writing.

Staff reviewed documentation and a database showing how BART collects, analyzes, and incorporates safety data into its Hazard Identification and Resolution Process. Staff selected unscheduled door opening issues and requested documentation to show analysis performed for unscheduled door opening issues. BART does not have such documentation.

Comments:

1. BART should consider establishing a centralized database for tracking correctible items.

Findings:

1. BART has no documentation that shows what analysis has been done before categorizing in the safety data matrix. See Checklist 6 for recommendation.
2. BART has no documentation that shows how correctible items from patron injuries are tracked.

Recommendations:

1. BART should further refine its Safety Data Collection and Analysis Program to provide for more efficient tracking of corrective actions for safety issues.
2. BART should track correctible items from patron injuries.

2014 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT

Checklist No.	10	Element	Accident/Incident Investigations
Date of Audit	February 4, 2014 LKS-18	Department(s)	System Safety Department
Auditors/ Inspectors	Robert Hansen Steve Espinal	Persons Contacted	Ni Lee, System Safety Engineer

REFERENCE CRITERIA

1. Code of Federal Regulations, Title 49 Parts 659.33, 659.35, and 659.37
2. CPUC General Order 164-D, Sections 7, 8, and 9
3. CPUC General Order 172, Section 4
4. BART System Safety Program Plan (SSPP) Rev. 9, Chapter 10

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

Accident/Incident Investigations

Interview the BART representative(s) responsible, and randomly select at least four CPUC-reportable accidents and/or incidents involving an injury or fatality to determine whether:

1. All accidents and incidents were reported to CPUC according to the requirements in General Order 164-D.
2. All accidents and incidents were reported within two hours of occurrence, as required by General Order 164-D, Sections 7.1 and 7.2.
3. All immediately reportable accident or incident notifications to CPUC contained all the information required by General Order 164-D, Section 7.3.
4. All accidents and incidents were investigated in compliance with the requirements of General Order 164-D, Section 8, and the AIIP.
5. Video recordings from inward-facing in-cab cameras are reviewed under the required conditions listed in General Order 172, Section 4.3.
6. A final report was submitted for each accident or incident according to the requirements in General Order 164-D.
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 to address the identified causes with the goal of minimizing the probability of recurrence;
 - e. A schedule for implementing the CAPs, including completion date or plan for

monitoring progress on an on-going basis.

FINDINGS AND RECOMMENDATIONS

Activities:

1. BART provided Staff with a list of all reportable incidents occurring from 2010 through 2013, along with selected Unusual Occurrence Reports. The following four incidents were selected at random, and Staff performed a detailed review of each Incident Report to verify compliance with 49 CFR 659, GO 164-D, GO 172, and BART's SSPP (BART incident number followed by CPUC transit incident number in parentheses):

UOR 12-014 (INCT 2012020022) – Hi-Rail Derailment, February 25, 2012

- BART and CPUC have no information confirming that information about the involved vehicle was submitted to CPUC in the initial notification.
- Information about responding emergency agencies is similarly absent.
- Both BART and CPUC staff responsible have since retired, thus reporting discrepancies cannot be verified.

UOR 12-093 (INCT 2012100012) – Train vs. Pedestrian, October 27, 2012

- Initial notification was submitted 8 minutes late.
- The final Incident Report was submitted 48 days after the 60 day deadline. No investigation updates were submitted to CPUC in that time.

UOR 13-041 (INCT 2013050026) – Collision between Two Maintenance Vehicles, May 31, 2013

- Initial notification was submitted nearly 2 hours late.
- The late notice is attributed to uncertainty in determining whether the incident was CPUC reportable.

UOR 13-109 (INCT 2013120006) – Vehicle Fire in Berkeley Hills Tunnel, December 4, 2013

- Staff found no issues with the initial notification.
- This incident is currently under investigation, so the final Incident Report was unavailable for review.

2. In addition to the randomly selected incidents, Staff elected to review the final report for the following incident to assess compliance of the related Corrective Action Plan:

UOR 13-065 (INCT 2013070017) – Mainline Derailment of Hi-Rail Vehicle, July 24, 2013

- The details in the "RECOMMENDATION" section of the Incident Report lack

satisfactory specificity, but further details are provided in a section entitled "CORRECTIVE ACTION".

- Corrective Actions do not include a schedule for completion, as is required by the SSPP, Section 1007. It is Staff's opinion that a schedule includes dates of completion for each task, whereas the report states only "The corrective action is complete and closed."
- Descriptions of tasks and personnel assignments for Corrective Actions are satisfactory.

3. While assessing timeliness of accident/incident notification, Staff performed a comprehensive search of reported BART incidents in CPUC's Rail Safety and Security Information Management System database, resulting in an examination of the two following apparently delinquent reports not otherwise reviewed above:

UOR 13-019 (INCT 2013050009) – Fatality in Embarcadero Station Elevator, March 10, 2013

- The fatal incident occurred at approximately 21:38 hrs.
- Emergency responders arrived at 21:50 hrs.
- Emergency responders confirmed the fatality at 00:04 hrs. on March 11.
- The incident was reported to CPUC at 00:08 hrs.
- BART's initial report was late by 26 minutes.

UOR 13-067 (INCT 2013080001) – Substation Fire at Richmond Yard, July 28, 2013

- BART became aware of the fire at 08:00 hrs.
- The final damage estimate exceeded \$25,000, making the incident reportable.
- One BART employee was reported to be injured
- The incident was reported to CPUC at 16:43 hrs.
- BART's initial report was late by 8 hours and 43 minutes.
- BART reported the cause for late notice was uncertainty of the extent of damage.

4. Staff reviewed the final Incident Reports for the following two incidents to assess compliance with investigation requirements defined in GO 172 for in-cab cameras:

UOR 13-050 (INCT 2013060011) – Fatal Collision with Trespasser at Colma Station, June 18, 2013

- The final Incident Report included an analysis of in-cab camera footage for lead car 2514, as required by the SSPP, Section 1008.

UOR 13-052 (INCT 2013060012) – Fatal Collision with Trespasser at Hayward Station, June 18, 2013

- The final Incident Report included an analysis of in-cab camera footage for lead car

2561, as required by the SSPP, Section 1008.

5. Finally, Staff reviewed discrepancies between the National Transit Database and CPUC's accident/incident database to identify incidents that were not reported to CPUC. Staff discovered four incidents during the Triennial Review cycle which occurred on BART-controlled property which may have exceeded GO 164-D thresholds for reporting to CPUC:

January 20, 2012 – Assault resulting in 2 injuries

June 18, 2012 – Robbery resulting in 2 injuries

Findings:

1. UOR 13-041 and UOR 13-067 were both reported significantly outside the 2-Hour timeframe required by 49 CFR 659 and GO 164-D.
2. At least two incidents occurring on BART-controlled property between 2010 and 2013 were not reported as required by GO 164-D.
3. The Corrective Action Plans on UOR 13-065 and UOR 12-014 did not include information required by the SSPP, Section 1007, specifically regarding CAP schedules.

Recommendations:

1. BART shall issue a written reminder to applicable personnel in both BART System Safety and BART Police Departments of the minimum CPUC reportable incident thresholds defined in GO 164-D, Sections 7.1 and 7.2, for accidents and incidents, and instruct to forward "courtesy notifications" in cases of any doubt regarding whether an incident is reportable. BART submitted a memorandum satisfying this recommendation on February 12, 2014.
2. BART shall issue a memorandum to the Safety Department reminding personnel of the SSPP's requirements for CAPs, and BART will ensure that future CAPs generated through incident reports with all required information, including specified timelines for completion

2014 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT

Checklist No.	11	Element	Emergency Management Program
Date of Audit	February 6, 2014 LKS-18	Department(s)	Operations Department System Safety Department
Auditors/ Inspectors	Howard Huie Michael Warren Daniel Kwok	Persons Contacted	Kevin Franklin , Manager of Security Programs Marla Blagg Jeff Lau, Chief Safety Officer Greg Leong, Supervisor of Operations Training

REFERENCE CRITERIA

1. Code of Federal Regulations, Title 49 Part 659.23 – System security plan: contents
2. CPUC General Order 164-D
3. BART System Safety Program Plan (SSPP) Rev. 9
4. BART System Security Plan (SSP)
5. BART Emergency Plan

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

Emergency Management Program

Interview the appropriate BART representatives involved in BART's Emergency Planning, Training, and Drill/Exercise Program, and review appropriate records to:

1. Randomly select five Station Agents and five Train Operators, and ensure they have completed and passed BART's Emergency Training Program as specified in sections 1104 and 1602 in the SSPP.
2. Verify a drill/exercise schedule has been created and followed.
3. Verify emergency responders and other outside agencies are invited to participate in BART's emergency planning as appropriate.
4. Determine if BART's Emergency Plan is annually reviewed by the Safety Department and is updated as necessary.
5. Determine when the last three drills/exercises were performed, within the last three years, and whether Post-Drill/Exercise Action Report were developed in a timely manner. Were there any corrective actions produced from the After Action Report? If so, were they tracked to completion?
6. Determine whether BART conducts periodic FLSSC meetings with external fire, police, and regulatory agencies.
7. Determine whether BART has created a Fire Department Training Schedule that has been developed and followed throughout the year, to provide local Fire

Departments familiarization with BART's stations, facilities, wayside, system and vehicle familiarization and resource training, and emergency procedures.

FINDINGS AND RECOMMENDATIONS

Activities:

1. Staff randomly selected 5 Station Agents and 5 Train Operators to review their recertification dates. Station Agents need to be recertified every 3 years. Train Operators need to be recertified every 2 years. From the Station Agents selected, 3 are within compliance, and 2 are currently being trained. From the Train Operators selected, all 5 were in compliance.
2. Staff verified that drills and exercises were created and performed for the years 2011, 2012, and 2013:
 - a. In 2011, 16 Safety and Security Drills were performed.
 - b. In 2012, 15 Safety and Security Drills were performed.
 - c. In 2013, 6 Safety and Security Drills were performed.
In 2013, 8 independent Security Drills were performed by BART Security.
All drills have at a minimum one pre-drill meeting with all pertinent response agencies.
3. The following agencies were invited and/or participated in Safety and Security Drills with BART: local fire departments and local police departments, FBI, TSA, Federal Air Marshal Service, Sheriffs, and the 93 Civil Support Team.
4. Staff verified the BART Emergency Manager reviews, and updates, if necessary, the Emergency Plan each year. The Emergency Manager conducts an Emergency Management Task Force meeting quarterly, but will meet more often as needed. The Emergency Plan is signed by Chief Safety Officer, General Manager, Assistant General Manager, Manager of Security Programs, and Chief of Police. The Emergency Manager sends out an annual email informing pertinent managers of any updates to the Emergency Plans. The last revision of BART's Emergency Plan was in 2012. Prior to that, the previous revision to the plan was in 2008.
5. BART's Safety department presented Staff with the following example of emergency drills that BART has participated in within the last 3 years, their corresponding After Action Report completion dates, and CAPs if there were any recommendations for corrective actions.
 - a. On August 21, 2013, Metropolitan Transportation Commission 2013 Fall Table Top Exercise was the performed.
The After Action Report was released on November 14, 2013.
No internal recommendations.
 - b. On April 2, 2013, W-Line Subway Emergency Response Drill (Train on fire) was performed.
The After Action Report was released on April 21, 2013.
The preliminary After Action Report had recommendations and the final After

Action Report that showed the recommendations have been closed out. It was noted to Staff that all After Action Reports are released twice: one preliminary, and one final. Final ARs are released only when all the recommendations are completed. If BART police has a recommendation, the Emergency Manager will track it for the police side. They will then give the Safety Manger an update once it has been completed.

- c. On April 22, 2012, Berkley Hills Tunnel Fire Training Exercise was performed. The After Action Report was released on April 23, 2012.
No internal recommendations.
 - d. On February 26, 2012, Trans-Bay Tube Fire Drill was performed. The After Action Report was released on March 1, 2012.
No internal recommendations.
 - e. On November 1, 2, 4, 14, 16, and 18, 2011, Contra Costa County Regional MCI Drill (Mass Casualty Incident with local hospitals) was performed. More than 350 First Responders and 549 volunteer victims participated in the drill. Some First Responders included were El Cerrito Fire Department, CCC Fire Protection District, Moraga Orinda Fire District, Richmond Fire Department, San Ramon Valley Fire District, East Contra Costa Fire Protection District, CCC Sheriff's Office, California Department of Forestry and Fire Protection SCU, Kensington Fire Department, America Medical Response, BayMedic, Cal Emergency Medical Services Authority, East Bay Regional Park District Fire Department, Concord Federal Fire Department.
The After Action Report was released on December 1, 2011.
No internal recommendations.
 - f. On May 8, 2011, Berkley Hills Tunnel Fire Training Exercise was performed. The After Action Report was released May 12, 2011.
No internal recommendations.
6. Staff reviewed the 2013, 2012, and 2011 quarterly Fire Liaison Committee (FLC) meeting minutes. The major participants in these meetings are San Francisco Fire Department, Oakland Fire Department, Alameda Fire Department, and BART Police Department. BART invites all local fire departments but they may not always attend. The following parties are on the FLC roster: Fremont FD, Hayward FD, San Jose FD, Oakland FD, Alameda FD, Concord Naval Weapons Station, Contra Costa County FD, Moraga/Orinda FD, Livermore/Pleasanton FD, San Francisco FD, Albany FD, Berkley FD, El Cerrito FD, Richmond FD, Milpitas FD, Central County FD, Colma FD, North County FD, Milbrae FD, San Bruno FD, South San Francisco FD, SF Airport FD.
 7. BART's Safety Department will meet with local agencies at the beginning of the year (during the quarterly FLC meeting), to negotiate when BART can host emergency drills will them and create training schedules. During the last quarter of the year, drills for the upcoming year are addressed and drafted. At the first meeting of the year, the drills are confirmed, but date and drill may be changed accordingly to individual agency needs.

Findings:

None.

Recommendations:

None.

2014 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT

Checklist No.	12	Element	Internal Safety Audits/Reviews
Date of Audit	January 31, 2014 OSA	Department(s)	System Safety Department
Auditors/ Inspectors	Jimmy Xia Robert Hansen Yan Solopov	Persons Contacted	Ni Lee, Senior Safety Engineer

REFERENCE CRITERIA

1. CPUC General Order 164-D
2. BART System Safety Program Plan (SSPP) Rev. 9
3. BART Internal Safety and Security Audit (ISSA) Schedule 2010-2012

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

Internal Safety Audits/Reviews

Interview the BART representatives involved in ISSAs, and review appropriate records to:

1. Determine if a three-year internal audit schedule was developed and submitted to CPUC.
2. Verify that all elements of the SSPP were evaluated within the past three years.
3. Verify that each audit lists the involved BART departments, the safety-related activities addressed, and the reference criteria for the audit.
4. Determine whether the ISSAs adequately address interdepartmental and interagency communication issues, and whether or not BART has a process for addressing and overcoming non-responsiveness of departments' non-responsiveness and failures to implement audit recommendations.
5. Determine how expertise for auditing specific functions is evaluated, and how personnel are assigned per the SSPP, Section 1203, to ensure ISSA quality. An example of a function is signal inspection.
6. Verify that audits have been properly documented and included references for documents and activities reviewed, criteria for evaluation, and notes to support findings and recommendations.
7. Verify that Annual Reports are accompanied by letters from the Director stating BART's compliance status with its SSPP and Corrective Action Plans for elements determined not to be in compliance.
8. Verify that Corrective Actions to address findings from audit reporting, as specified in the SSPP, Section 1206, were scheduled, tracked, and implemented.

FINDINGS AND RECOMMENDATIONS

Activities:

Staff interviewed BART's System Safety Engineer who is in charge of BART's Internal Safety and Security Audit (ISSA) Program and reviewed the following records and letters from 2010 to 2013:

1. BART's ISSA Program Annual Reports for 2010, 2011, and 2012.
 - a. A three-year internal audit schedule for each ISSA cycle was developed and submitted to CPUC as part of the annual ISSA reports by February 15th of every year as required by GO 164-D. The future schedule for the remainder of each three-year ISSA cycle is included in the back (Appendix B) of each annual ISSA report submitted to CPUC. The complete three-year ISSA cycle that is available for review for this audit is 2010-2012. Appendix B of the annual ISSA report for 2010 has the schedule and scope of internal audits for 2011 and 2012. Appendix B of the annual ISSA report for 2011 has the schedule and scope of internal audits for 2012. Appendix B of the annual ISSA report for 2012 has the schedule and scope of internal audits for the 2013-2015 cycle.
 - b. Staff verified that all elements of the SSPP were evaluated within the three year ISSA cycle from 2010 to 2012. Also, all SSP elements were evaluated in 2012.
 - c. Staff verified that the checklists for the ISS audits list the involved BART departments, the safety-related activities addressed, and the reference criteria for the audits.
 - d. BART has not encountered difficulty in addressing recommendations from ISSAs. Usually, departments address audit recommendations quickly after the corresponding audits. If there is an interdepartmental communication problem that causes a deficiency in the element being audited, it will be addressed. System safety will issue a recommendation if there is a deficiency caused by interdepartmental communication failure; then, there will be a CAP that results from the recommendation to resolve the deficiency.
 - e. BART tries to hire either experienced auditors or someone with rail transit operations experience to conduct ISSAs. When BART has experienced auditors, they can assign them to conduct the internal audit for any element. BART tries to rotate assignment of auditors to audit checklists to get a fresh perspective of each audit and ensure ISSA quality.
 - f. The ISSAs have been properly documented in the ISSA reports. The completed checklists in the internal audit reports include references for documents and activities reviewed, criteria for evaluation, and notes/observations to support findings and recommendations.
2. Letters from BART's General Manager regarding Certification of BART's Compliance with its SSPP and System Security Plan dated February 1, 2011, February 10, 2012, and February 1, 2013, respectively.
 - a. Annual Reports for the 2010-2012 cycle were accompanied by letters from the BART's General Manager stating BART's compliance status with its SSPP and SSP. Those letters serve as the cover letters to those ISSA reports that were submitted to CPUC. The statuses of the Corrective Action Plans from the internal audits performed in

every year are shown in Appendix A of the corresponding annual report.

3. The completed BART System Safety Corrective Action Plans for ISSA checklists 10-11, 11-01, and 11-20.
 - a. Corrective Actions that result from the internal audits are either within the audit reports if completed when the report is written or in follow-up CAP forms developed for the recommendations that have not been addressed when the report is written. Some recommendations from ISSAs are addressed quickly after the audits and their completion are reflected in the audit reports.
 - b. All of the CAPs from the 2010-2012 audit cycle have been completed and closed at the time of this review. All of BART's open CAPs are included in BART's internal quarterly corrective action status reports generated by system safety, which includes any open CAPs from ISSAs. BART tracks any open internal audit CAPs using these quarterly status reports. System safety sends these reports to the responsible person/department, department management, and upper management on a quarterly basis. These reports serve as reminders for updates of the statuses of corrective actions from the responsible parties, because they might have completed the actual physical work for the corrective actions but not the paper work.
 - c. Sometimes, the estimated date to complete a CAP can be exceeded, but the responsible party needs to have a valid reason for the delay. System safety lets the responsible parties set their own schedule for completing their CAPs, but system safety ensures that the schedule is reasonable and acts to expedite the implementation of the CAPs. Usually, the CAPs are implemented in a timely manner. If the CAPs are not completed according to the implementation schedule, BART will remind the responsible parties that they have open CAPs to respond to in a timely manner and the responsible parties have to provide the reasons of any delays in implementing the CAPs to system safety.

Findings:

None.

Recommendations:

None.

2014 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT

Checklist No.	13-A	Element	Rules Compliance: Observation and Enforcement
Date of Audit	January 29, 2014 LKS-14	Department(s)	Transportation Department Maintenance and Engineering Department
Auditors/ Inspectors	Donald Filippi	Persons Contacted	Roy Aguilera , Acting Chief Transportation Officer Tamar Allen, Chief Mechanical Officer Don Allen, Chief Engineer Jeff Lau, Chief Safety Officer
REFERENCE CRITERIA			
<ol style="list-style-type: none"> 1. CPUC General Order 164-D 2. CPUC General Order 172 3. BART System Safety Program Plan (SSPP) Rev. 9 4. BART Operations Rules and Procedures (OR&P) Manual 5. BART Operations Control Center Rules and Procedures Manual (OCC Manual) Rev. 21 6. BART Personal Electronic Device Usage Restriction Rules (PED Rules) 7. BART Management Procedure 13-10 8. BART PED Zero Tolerance Policy 			
ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION			
<p>Rules Compliance: Observation and Enforcement</p> <p>Review appropriate records from the three primary departments identified in the BART Operations Safety Compliance Program (OSCP)—Transportation, Maintenance and Engineering (M&E), and Rolling Stock and Shops (RS&S)—to:</p> <ol style="list-style-type: none"> 1. Verify that Operations supervisors are performing regular observations as part of Train Operator Evaluations Program, in accordance with the SSPP, Section 1304. 2. Verify that the Safety Department has performed at least one audit of the Transportation Department, including the Train Operator Evaluations program, in the past triennial audit cycle. 3. Verify that the OSCP is performing exercises and evaluations of personnel in the Transportation, M&E, and RS&S Departments, in accordance with SSPP, Section 1305 4. Verify that BART has conducted random evaluations regarding PED use as required by General Order 172, Sections 4.3.e, 4.5, and 6.2. 5. Verify that operations and maintenance employees are evaluated based on their 			

performance during unannounced observations to assess their compliance with safety rules, procedures, and/or practices.

6. Determine whether any accidents/incidents were determined to have resulted from inadequate operations procedures and verify appropriate CAPs were implemented in response.
7. Determine whether BART has developed and implemented a zero-tolerance policy and program regarding PED usage, as required by General Order 172, Section 5.
8. Verify that the Safety Department receives reports from the Operations and M&E Departments regarding rules compliance assessment and testing. Are issues of non-compliance identified from the rules compliance process, reported to the System Safety Department, and addressed in appropriate ways?

FINDINGS AND RECOMMENDATIONS

Activities:

1. Staff reviewed copies of Train Operator compliance checks for 2011, 2012, and 2013, performed by Operations Supervisors. Staff reviewed Train Operator evaluations checklists and summaries of Safety Compliance checks for the same years. Staff requested the System Safety Department's documentation regarding their internal safety audit on the Transportation Department, and review summaries of results for 2011, 2012, and 2013.
2. Staff verified that the System Safety Department performed at least one audit of the Transportation Department, including the Train Operator Evaluations program in the past triennial audit cycle.
3. Staff requested the OSCP for the Transportation, M&E, and RS&S Departments, as well as the Safety Monitors which ensures BART's compliance with General Order 172. Staff reviewed M&E's and RS&S's OSCP and BART's Zero Tolerance Policy on use of Personal Electronic Devices for related employees.
 - a. Both departments failed to comply with the requirements of their OSCP.
 - b. No evidence was provided that BART has monitored employees for GO 172 compliance.
 - c. BART's annual internal safety audit did not catch this discrepancy as required by the SSPP, Section 1305.
 - d. BART submitted satisfying documentation on March 20, 2014, that RS&S performed PED Rules compliance checks as required.
4. Staff requested copies of each department's compliance checks for GO 172. Staff reviewed the provided documentation from the Transportation, M&E, and RS&S Departments.
 - a. There were a number of evaluations conducted by the Operations Department, as well as the System Safety Department, that noted employee failures regarding T.O.M. 304d – Horn use while personnel wayside.
 - b. No evidence was provided to document that resolution of failed compliance checks were implemented.

- c. Evaluations were conducted and deficiencies were noted, but findings were not formally addressed through any traceable hazard resolution process.
5. Staff requested records regarding compliance to GO 172. BART produces a summary of Video Recorded Compliance Checks for 2013, performed by the Operations Department.
6. Staff requested observation documentation on operations and maintenance employees to determine compliance with operations rules, procedures, and practices.
7. Staff requested to review six closed Incident Reports to review probable causes and corrective action plans.
 - a. Staff reviewed closed Human Factor Incident Reports for each year.
 - b. No corrective actions consistent with the SSPP, Section 1007, were provided in response to any of the incidents.
8. Staff requested BART's Zero Tolerance Policy on use of Personal Electronic Devices.

Comments:

1. Information pertaining to a particular Train Operator's numerous evaluations and discussions with line managers were not maintained in one location, but rather in several files, on several different forms and checklists.
2. There seems to be very little interdepartmental communication with regards to employee evaluations. Staff noted that a few months prior to October 2014, Operations documented 10 failures in one testing event, all related to the use of horn by an operator when approaching men and equipment. Six months later, the System Safety Department documented five of the same failure types in a single testing event. However, BART could not provide documentation to show that both departments discussed these findings, or that they addressed them in a formal nature. No Corrective Action Plan for these deficiencies could be provided to staff, or an explanation of why the testing is not tracked with a formal resolution in mind.
3. BART submitted documentation regarding GO 172 PED Rules compliance checks performed by RS&S satisfying CPUC requirements on March 20, 2014. RS&S was removed from Finding 2 of this checklist upon receipt of the documentation.

Findings:

1. BART does not perform employee evaluations in compliance with the SSPP, Section 1305.
2. The Maintenance and Engineering Department has failed to comply with the requirements of their Operations Safety Compliance Program regarding GO 172.
3. BART has failed to provide a corrective action consistent with the SSPP, Section 1007, regarding any closed Human Factor Incident Reports.

Recommendations:

1. BART Maintenance and Engineering Department shall comply with the Employee Evaluation requirements outlined in the SSPP and OSCP.
2. BART Operations Department shall comply with the OSCP requirements to submit an

annual summary to the Safety Department by March 15 of each year.

3. See Checklist 10, Recommendation 2: “ BART shall issue a memorandum to the Safety Department reminding personnel of the SSPP’s requirements for CAPs, and BART will ensure that future CAPs generated through incident reports with all required information, including specified timelines for completion”

2014 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT

Checklist No.	13-B	Element	Rules Compliance: Operations Safety Compliance
Date of Audit	January 28, 2014 OCC	Department(s)	Transportation Department Maintenance and Engineering Department
Auditors/ Inspectors	Debbie Dziadzio Daniel Kwok	Persons Contacted	Fred Edwards , Administrative Manager, Operations Control Center Paul Liston, Assistant Chief Transportation Officer

REFERENCE CRITERIA

1. CPUC General Order 164-D
2. BART System Safety Program Plan (SSPP) Rev. 9
3. BART Operations Rules and Procedures (OR&P) Manual
4. BART Personal Electronic Device Usage Restriction Rules (PED Rules)
5. BART Wayside Safety Program
6. BART Track Safety Standards

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

Rules Compliance: Operations Safety Compliance

Interview BART representatives responsible for Operations Safety, perform random observations and operations inspections, and review appropriate records to determine whether:

1. Maintenance Workers:
 - a. Know and understand applicable wayside safety rules;
 - b. Comply with the PED Rules when performing any duties on or near railways;
 - c. Know and understand the rules and procedures for mainline operations.
2. Operators:
 - a. Are in compliance with the OR&P Manual;
 - 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 the Operations Control Center (OCC) during the same.
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 BART personnel and other agencies during the same.

Randomly select several controllers, operators, and maintenance personnel, and perform ride-along or on-site inspections to verify their compliance with applicable rules, that they have the proper safety equipment, that their radios are functioning, and that they are complying with the PED Rules.

FINDINGS AND RECOMMENDATIONS

Activities:

1. Staff reviewed the current Operating Bulletins, Speed Restrictions, Unusual Occurrence Reports (UORs), Simple Approval Logs, 6 Hour Reports, and Wayside Worker Orders at the Operations Control Center (OCC).
 - a. Staff interviewed several Train Controllers to assess their knowledge of the emergency code, emergency response coordination and contact information, and the location of the Operating Rule Book in OCC.
 - b. Staff was advised to turn sound off on phones and observed GO 172 while inside or near the OCC.
 - c. On Simple Approval Forms, prior to October 2013, lone workers were given permission to perform work.
 - d. BART Personnel informed Staff that Work Orders were issued when lone workers received permission to work.
 - e. Staff requested to see Work Orders issued for lone workers, but was advised that OCC keeps Work Orders for only three months, and then destroys them.
 - f. All reports reviewed contained information as outlined in the OCC Manual Rev. 21, Sections 204, 205, and 206.
2. Staff performed two ride-along inspections on trains running through work zones to observe OR&P compliance, and to ensure that Train Operators had functioning radios and were complying with BART's PED Rules.
 - a. Staff asked the Train Operators if they heard Automated Track Information System (ATIS) announcements, BART's automated system which makes repeated announcements regarding wayside personnel. The Train Operators admitted that they don't hear ATIS, and are made aware of wayside personnel when they hear other Train Operators and OCC talk about the locations of wayside personnel via radio.
 - b. Both Train Operators inspected had working radios, were in uniform, possessed 2 sets of train keys, a working flashlight, made the required station and transfer announcements, and complied with PED Rules.
3. Staff observed Car Cleaning Crews and Electricians were using all required safety equipment at the Daly City Yard Tower. Car Cleaning Crews and Electricians asked for

permission, via hand-held radios, to occupy or cross over various tracks to perform work. The Foreworker and a Foreworker Trainee granted permission to occupy tracks and applied protection through Work Orders.

4. All personnel observed at each location complied with PED Rules and the OR&P.

Comments:

1. There is no confirmation that Train Operators receive and understand ATIS announcements regarding wayside parties, indicating that the automated system is potentially ineffective as a means of providing additional protection to wayside workers.
2. Certain activities performed on Work Orders and Simple Approvals were inspections, therefore subject to BART's Track Safety Standards (TSS) requirements for retention of inspection records. According to the TSS, Table S7.1, Inspection Schedules and Records, on-foot inspections must be retained for at least one year. Furthermore, although Staff did not identify any requirements to retain wayside access records beyond one year, the CPUC would prefer that the records be retained for at least one triennial cycle, to allow for a full audit of the records. The Commission's General Order 175 requires Work Orders to be retained for at least one year.
3. Train Operators consistently do not hear ATIS announcements regarding wayside personnel. They are often made aware of wayside activity through other radio chatter.

Findings:

1. BART does not retain any Work Orders and Simple Approval documents for one year as required by the TSS, Table S7.1.

Recommendations:

1. Although "Simple Approval" has been discontinued by BART policy, BART shall retain whatever wayside access records it generates for the durations specified in applicable procedures.

2014 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT

Checklist No.	13-C	Element	Rules Compliance: Operator, Controller, and Maintenance Personnel Hours of Service
Date of Audit	January 31, 2014 LKS-14	Department(s)	Operations Department Maintenance and Engineering Department System Safety Department
Auditors/ Inspectors	Donald Filippi	Persons Contacted	Tera Hankins-Stokes , Manager of Transportation Operations Support and Review Tonya Holmes Joe Torrisi

REFERENCE CRITERIA

1. CPUC General Order 164-D
2. BART System Safety Program Plan (SSPP) Rev. 9
3. ATU Labor Agreement
4. AFSCME Labor Agreement

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

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

Select at least two safety-sensitive employees at random from each of the following classifications:

- Train Controller
- Power and Support Controller
- Train Operator
- Tower Foreworker
- Transit: Vehicle Mechanics
- Track Maintenance
- Signals Maintenance
- Revenue Vehicle Maintenance

Inspect the employees' time cards for a three-month period during the past 12 months to determine whether:

1. Shifts were in compliance with the requirements that safety-sensitive employees may 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:

Staff reviewed the timesheets of safety-sensitive employees whose job titles are listed as: Power Controllers, Foreworkers, Train Controllers, and Train Operators. All other classifications are not required to follow an hours of service limit and BART does not designate them as safety sensitive employees.

Staff reviewed hours of service records for approximately 45% of the Power Controllers, 40% of the Train Controllers, 7% of the Train Operators, and 8% of Foreworkers. Staff reviewed three random months for each employee, for each year of the Triennial Audit period. Staff noted the following for each craft:

Power Controllers: 100% of the Power Controllers records reviewed exceeded the hours of service limit noted in the Labor Agreement.

Train Controllers: Staff noted that 100% of the employee's records reviewed were compliant with the hours of service limit noted in the Labor Agreement.

Train Operators: Over 50% of the operators records that were reviewed exceeded the hours of service limits noted in the Labor Agreement. The excessive time ranged from 1 minute to multiple hours over the 12 hour service limit.

Foreworkers: 100% of the Foreworker's records reviewed exceeded the hours of service limit noted in the Labor Agreement.

BART does not have a documented Hours of Service Limit for Safety Sensitive Employee's. The Hours of Service Limit practiced by Bart is the Union Labor Agreement for the crafts listed above.

Comments:

The transportation industry has set a standard for Hours of Service Limits, these standards are practiced throughout the rail, airlines, shipping, and trucking industries.

Findings:

1. Train Operators, Power Controllers, and Foreworkers have violated the hours of service requirements set forth by BART's Labor Agreement, outlined in the supplemental document provided by the System Safety Department.

Recommendations:

1. BART shall enforce the hours of service requirements established in the BART Labor Agreement.

2014 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT

Checklist No.	13-D	Element	Rules Compliance: Contractor Safety Program
Date of Audit	February 4, 2014 LKS-18	Department(s)	Operations Department System Safety Department
Auditors/ Inspectors	Donald Filippi	Persons Contacted	Colby Barry Carin Shoemaker, Senior Operations Supervisor, Operations Liasons Mark Chan, Manager of Engineering Safety
REFERENCE CRITERIA			
<ol style="list-style-type: none"> 1. CPUC General Order 164-D 2. BART System Safety Program Plan (SSPP) Rev. 9 3. BART Operating Rules and Procedures Manual (OR&P) 4. BART Management Procedure 31 			
ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION			
<p>Rules Compliance: Contractor Safety Program</p> <p>Interview the BART representative responsible for the Contractor Safety Program and review BART's to determine whether:</p> <ol style="list-style-type: none"> 1. BART has developed and implemented a control document clearly establishing its responsibilities and requirements for the contractor safety program, including: <ol style="list-style-type: none"> a. Training and certification for contractors and their employees. b. The rules, regulations, and procedures applicable to contractors and their employees. 2. BART's procedures and practices clearly identify that BART is ultimately in charge on its system, and that contractors and their employees must comply with all established safety rules and procedures. 3. BART procedures require regular internal audits and inspections of construction sites to monitor compliance with its safety requirements. 4. BART procedures establish the range of activities for monitoring Contractors and their employees, and enforcing compliance with safety requirements through regular unscheduled and unannounced compliance checks, as well as by scheduled periodic audits and inspections. 5. The Safety Department has reviewed construction plans, performed site inspections, reviewed and approved contractor safety plans, and ensured contractors operate in compliance with BART OR&P Manual, all as specified in the 			

SSPP, Section 1803.

6. BART's monitoring and enforcement activities are properly recorded, distributed, and filed.
7. There is sufficient interagency coordination among various contractors regarding safety issues.

FINDINGS AND RECOMMENDATIONS

Activities:

Staff reviewed three projects: Contract 15PN-110, Contract 110-0091, and Contract 09AU-110. Staff reviewed the Project Overviews, including the Site Specific Work Plans (SSWPs), the Safety Monitor Daily Activity Reports, and the Track Allocations related to each project.

Staff noted that BART has outlined specific criteria regarding their Contractor Safety Program. The Contractor Safety Program is monitored by multiple personnel and all activities are documented, consistent with the SSPP. The contracts clearly outline the work to be performed, and the Safety Program monitors the work. The SSWPs are reviewed and signed off by all applicable parties, including the System Safety Department.

Comments:

Staff noted deficiencies with the BART Contractor Safety Program. Those deficiencies are noted on Checklist 16-B.

Findings:

None.

Recommendations:

None.

2014 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT

Checklist No.	13-E	Rules Compliance: Element Operating Rules and Procedures Manual and Operations Bulletin Revisions
Date of Audit	January 30, 2014 LKS-18	Department(s) System Safety Department Operations Department
Auditors/ Inspectors	Donald Filippi	Persons Contacted Jeff Lau, Chief Safety Officer Denis Ring, System Safety Engineer
REFERENCE CRITERIA		
<ol style="list-style-type: none"> 1. CPUC General Order 164-D 2. BART System Safety Program Plan (SSPP) Rev. 9 3. BART Operations Rules and Procedures (OR&P) Manual 		
ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION		
<p>Rules Compliance: Operating Rules and Maintenance Procedures Manual and Operations Bulletin Revisions</p> <p>Interview BART representative responsible for operations rules and procedures and review necessary documentation to determine whether:</p> <ol style="list-style-type: none"> 1. The OR&P Manual and all active Operating Bulletins are reviewed and revised if necessary on an annual basis. 2. The results of each annual review of the OR&P Manual and Operating Bulletins are documented in a memorandum to file, providing a summary of the results and the Chief Safety Officer's (CSO's) determination whether revisions are needed. 3. All Operating Bulletins were approved by the CSO with the concurrence of affected departments. 4. Operating Bulletins were issued in a timely manner and provided to affected personnel. 5. A record is maintained of all Operating Bulletins issued, and employees receiving the bulletins. 6. Active Operating Bulletins are posted in specified locations, and inactive bulletins are removed in a timely manner. 		
FINDINGS AND RECOMMENDATIONS		
<p><u>Activities:</u> Staff interviewed CSO to discuss the OR&P Manual and Operating Bulletins. The OR&P manual</p>		

is reviewed yearly by the Rules Committee that includes the CSO, the Chief Transportation Officer (CTO), and the Chief Engineer (CE). The committee includes all disciplines. Operating Bulletins are reviewed and revised yearly. All revisions are reviewed, approved, and signed by the CSO, CTO, and CE, then scanned to PDF and sent by email to all department heads for distribution.

1. The System Safety Department maintains a log and either cancels or renumbers and reissues an operating bulletin. Bulletins that are maintained for the next year are given a new number with that year being the first number followed by a dash (i.e. 13-xxx, 14-xxx). The deadline for issuing the new number system for the bulletins is January 1 each year.
2. At Daly City Yard Tower, staff observed BART's Operating Bulletin issuance procedure. All Train Operators are required to have a face-to-face with the Foreworker on duty to allow the Foreworker to assess that the Operator is fit for duty before going to their train. In the same area, all bulletins are available to Train Operators. A log is maintained by the Foreworker that requires Train Operators to sign when they have received a new bulletin. After a designated time, the Foreworker will print a list of names indicating which Train Operators have not picked up and signed for a new bulletin. This enables all Foreworkers to be on the lookout for such Train Operators.

Findings:

None.

Recommendations:

None.

2014 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT

Checklist No.	13-F	Element	Rules Compliance: Operations Control Center Manual Revisions
Date of Audit	January 30, 2014 OCC	Department(s)	System Safety Department Operations Department
Auditors/ Inspectors	Debbie Dziadzio	Persons Contacted	Fred Edwards, Administrative Manager of Operations Control Center
REFERENCE CRITERIA			
<ol style="list-style-type: none"> 1. CPUC General Order 164-D 2. BART System Safety Program Plan (SSPP) Rev. 9 3. BART Operations Control Center Rules and Procedures Manual (OCC Manual) Rev. 21 			
ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION			
<p>Rules Compliance: Operations Central Control Manual Revisions</p> <p>Interview BART representative responsible for operations rules and procedures and review necessary documentation to determine whether:</p> <ol style="list-style-type: none"> 1. The OCC Manual is reviewed and revised, as necessary, on an annual basis. 2. Revisions to the OCC Manual are made either through Operating Bulletins, or other written documents signed by the appropriate Department Managers. 			
FINDINGS AND RECOMMENDATIONS			
<p><u>Activities:</u></p> <p>Staff interviewed the Administrative Manager of OCC, and reviewed the Operating Bulletins Log notebooks, which are reviewed annually. Bulletins that are canceled are noted on the first page of each year’s log. The canceled bulletins are removed from the log book. Bulletins that are maintained for the next year are given a new number—the first two digits indicate the current year, followed by a hyphen and a unique three-digit identifier for each bulletin, i.e. 13-xxx, 14-xxx. New numbers for renewed bulletins are issued on January 1 each year.</p> <p>The OCC Manual Rev. 21, effective March 31, 2013, Rule #102 states “authorized changes to this manual shall be made promptly,” and “this manual shall be republished annually in January.” Staff found Rules #437 and 437B in the current version of the OCC Manual refer to Simple Approval. Neither the changes authorized by BART in October, 2013 prohibiting Simple Approval, nor GO 175 regarding Roadway Worker Protection effective November 7, 2013, have been noted or published in accordance with Rule #102.</p>			

The OCC Manual, Revision 22, was published on March 1, 2014, and incorporates all relevant operating bulletins.

Findings:

None.

Recommendations:

None.

2014 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT

Checklist No.	14-A	Element	Facilities and Equipment Inspections: Fire Emergency Systems
Date of Audit	January 30, 2014 OSA	Department(s)	System Safety Department Maintenance and Engineering Department
Auditors/ Inspectors	Jimmy Xia Robert Hansen Yan Solopov	Persons Contacted	Dean Giebelhausen, Section Manager

REFERENCE CRITERIA

1. CPUC General Order 164-D
2. California Code of Regulations Title 19, Division 1
3. BART System Safety Program Plan (SSPP) Rev. 9
4. BART Book 4, Mechanical Maintenance Procedures
5. BART Book 31, Electrical Maintenance Procedures

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

Facilities and Equipment Inspections: Fire Emergency Systems

Review BART's records of Preventative Maintenance (PM), testing, and unscheduled maintenance activities for two separate periods during the last three years, for at least two randomly selected separate reported areas for each of the following components:

1. Ventilation:
 - a. All ventilation systems were inspected at the correct frequency;
 - b. The required ventilation system inspections were properly documented, and noted defects were corrected in a timely manner.
2. Sprinkler System:
 - a. All sprinkler systems were inspected at the correct frequency;
 - b. The required sprinkler system inspections were properly documented, and noted defects were corrected in a timely manner.
3. Wet Standpipes:
 - a. All wet standpipes were inspected at the correct frequency;
 - b. The required standpipe inspections were properly documented and noted defects were corrected in a timely manner.
4. Under-Car Deluge
 - a. All under-car deluge systems were inspected at the correct frequency;
 - b. The required under-car deluge system inspections were properly documented and noted defects were corrected in a timely manner.

FINDINGS AND RECOMMENDATIONS

Activities:

Staff interviewed BART personnel responsible for inspection and maintenance of the Fire Emergency Systems and reviewed the following records of PM activities completed during the last three years for two randomly selected areas of the following components:

1. Ventilation
 - a. Line Fan MV-43 located at Civic Center Station:
 - i. Electrical Quarterly PM:

March 11, 2011	September 10, 2012
May 24, 2011	December 4, 2012
August 31, 2011	March 1, 2013
December 5, 2011	May 28, 2013
March 5, 2012	August 14, 2013
June 5, 2012	November 14, 2013
 - ii. Mechanical Annual PM:

May 17, 2011	May 15, 2013
May 1, 2012	
 - b. Line Fan KV 22:
 - i. Electrical Quarterly PM:

February 1, 2013	July 18, 2013
May 1, 2013	October 18, 2013
 - ii. Mechanical Annual PM:

March 28, 2011	May 15, 2013
March 29, 2012	
2. Sprinkler System
 - a. Sprinkler System Quarterly Inspection Forms for A60 Hayward Station:

February 21, 2012	February 26, 2013
May 3, 2012	May 2, 2013
August 9, 2012	August 13, 2013
November 14, 2012	November 12, 2013
 - b. Sprinkler System Quarterly Inspection Forms for C70 North Concord Station:

January 13, 2012	January 8, 2013
April 13, 2012	April 17, 2013
July 4, 2012	July 17, 2013
July 6, 2012	October 4, 2013
October 2, 2012	January 15, 2014
3. Wet Standpipes
 - a. Class I Standpipe Inspection Forms for Alcatraz Portal to R10 Ashby Station:
 - i. R1 Track:

March 2, 2011	March 12, 2013
September 6, 2011	September 4, 2013

- a. Both line fans MV-43 and KV-22 were inspected at the correct frequency.
 - b. The inspections of these two line fans were properly documented.
 - c. Defects discovered during inspections of MV-43 during the selected time frame were corrected in a timely manner. There were no defects noted for KV-22.
2. Sprinkler System
- a. The sprinkler systems at A60 Hayward Station and C70 North Concord Station were inspected at the correct frequency.
 - b. The inspections of these sprinkler systems were properly documented, using the Sprinkler System Quarterly Inspection Forms.
 - c. Defects discovered during the sprinkler system inspections at A60 Hayward Station were corrected in a timely manner. There were no defects noted for C70 North Concord Station.
3. Wet Standpipes
- a. The wet standpipes at the two selected zones were inspected at the correct frequency.
 - b. The inspections of the wet standpipes were properly documented, using the Class I Standpipes Inspection Form.
 - c. Records indicate that noted defects were corrected in a timely manner.
4. Under-Car Deluge System
- a. Under-Car Deluge System Inspections for M16 Embarcadero Station were performed at the correct frequency. Inspections for W40 Millbrae Station were performed at the correct frequency except for the January 2012 quarterly PM, for which documentation was not available.
 - b. Inspections of the under-car deluge systems were properly documented using the Under Car Deluge System PM Record Forms.
 - c. No discrepancies were found at either station, and no corrective actions were required.
 - d. A defect involving numerous missing nozzle caps on all tracks was indicated on the quarterly PMs for W40 Millbrae Station performed on the following dates:

April 20, 2012	July 25, 2013
October 9, 2012	October 17, 2013
January 30, 2012	January 17, 2014

 And also on the 5-Year PM performed on April 16, 2013. The discrepancies are noted on the PM Inspection Forms, and NNRs were generated accordingly. The completed NNRs for these defects indicate that the defects were corrected in a timely manner after discovery. This particular defect is recurring in nature because the nozzle caps are designed to fall off

Comments:

- 1. A BART inspector failed to put "OK" on the blank line next to item #8 Alarms and Supervisory Devices, sub-element #4 Isolation Valve on the BART Class I Standpipes inspection forms for the inspections performed for location Alcatraz Portal to R10 Ashby

Station for the R1 track on March 12, 2013, and the R2 track on March 13, 2013.

2. A BART Inspector failed to initial the "Zone E" line for the M1 track on the quarterly Under Car Deluge System PM Record forms for M16 Embarcadero Station on May 16, 2012, August 2, 2012, and November 27, 2012.
3. A BART inspector failed to put the NNR Form # on the 5-year Under Car Deluge PM check sheet for W40 Millbrae Station on April 16, 2013, from which NNR #4912 was generated.
4. The BART representatives agreed to staff's suggestion that they can remind the inspectors about completing the PM forms properly during the weekly safety meetings. The Under Car Deluge System PM Record form for the January 2012 Quarterly PM for W40 Millbrae Station was not found. Consequent to the audit, BART's Power Mechanical Section Manager provided the following information regarding this issue. After researching further and talking to the involved inspector, January of 2012 is when BART's computer database, Maximo, was rolled out a second and third time. Inspectors began using Maximo, but numerous shortcomings of the system reportedly made complete and accurate record-keeping difficult. All of the quarterly W40 Millbrae Station deluge system inspections were performed, and discrepancies repaired, before and after the January 2012 inspection. The January 2012 quarterly PM was probably performed, but BART has no verifying records. Despite problems encountered in the transitional phase, BART is moving forward with the computerized system, and changes to the Maximo system are expected to improve user compliance, efficiency, and accuracy.

Findings:

None.

Recommendations:

None.

2014 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT

Checklist No.	14-B	Element	Facilities and Equipment Inspections: Stations and Emergency Equipment
Date of Audit	February 6, 2014 LKS-18	Department(s)	System Safety Department Maintenance and Engineering Department
Auditors/ Inspectors	Thomas Govea John Madriaga Kevin McDonald	Persons Contacted	Reginald Lewis Jonathan Rossen, Manager of Employee and Patron Safety

REFERENCE CRITERIA

1. CPUC General Order 164-D
2. BART System Safety Program Plan (SSPP) Rev. 9

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

Facilities and Equipment Inspections: Stations and Emergency Equipment

Interview BART facilities and equipment inspectors, and review appropriate records to determine whether:

1. Passenger stations have been inspected at least once every 6 months, as required by the SSPP, Section 1402, for the past 3 years. Review inspection records for 5 randomly selected stations to verify that the stations were checked for the following potential and/or actual unsafe conditions:
 - a. Combustible, Flammable, and Hazardous Materials
 - b. Debris or Trash
 - c. Ventilation of Floor Scrubbers and Battery Rooms
 - d. Fire Hose Cabinet Damage
 - e. Discharged or Missing Fire Extinguishers
 - f. Trip and Fall Hazards
 - g. Defective Non-Skid Surfaces
 - h. Malfunctioning Emergency Exit Doors Panic Hardware and Alarm
 - i. Inadequate Lighting
 - j. Missing Light Covers
 - k. Malfunctioning Maintenance Phone Sets for Fire Department
 - l. Inadequate Annunciator Lamps Operation
 - m. Inoperable Elevator Phones
 - n. Malfunctioning Elevator Controls
 - o. Inoperable Keyed PA Phone
 - p. PABX Problems

- q. Potholes and Uneven Walking Surfaces
2. Inspections were properly documented, and discrepancies were corrected within 30 days, as required by the SSPP, Section 1404.
3. Potential hazards identified through scheduled inspections were tracked through the Hazard Management Process to resolution, and according to the requirements of the SSPP, Section 1502.

FINDINGS AND RECOMMENDATIONS

Activities:

On Thursday, February 6, 2014, Staff inspected BART Station facilities and equipment, and reviewed appropriate records for the following locations:

1. A10 Lake Merritt Station
 - a. Last inspection performed November 4, 2013
 - b. Records consisted of field inspection reports and emails.
 - i. Field inspection reports did not adequately describe current conditions of the station.
 - ii. Emails addressed findings from field inspection reports.
 - c. The SSPP, Section 1401 states "These inspections are primarily focused on the identification of Cal/OSHA-type violations, using standardized check sheets." However, no check sheets are being used.
 - d. A station inspection note from November 4, 2013, of potential unsafe conditions outlined in the SSPP, Section 1402, Regular Inspection and Testing. The following items were not identified on the inspection report:
 - i. Lighting is out on exit signs
 - ii. Lighting bulb out
 - iii. Lighting covers missing
 - iv. Elevator Phone Operation (elevator #29 is barricaded)
 - v. Elevator Control Operation (no notes of elevator #29 not in service)
2. A90 Fremont Station
 - a. Inspections were performed once in 2011 and once 2013, failing to comply with the SSPP, Section 1401, which requires inspections every 6 months
 - b. Inspections lacked proper documentation, including the Station Inspection Audit Checklist
 - c. Potential hazards were documented but not corrected within 30 Days, as required by the SSPP, Section 1404
 - d. Potential hazards were not tracked through resolution
 - i. Fire sprinkler control valve obstructed by boxes, noted June 3, 2011; No corrective action documented
 - ii. Expired fire extinguisher, noted October 31, 2012; No corrective action documented

3. L30 Dublin/Pleasanton Station
 - a. Only one inspection was performed in 2013, failing to comply with the SSPP, Section 1401, which requires inspections every 6 months
 - b. Potential hazards were documented but not corrected within 30 Days, as required by the SSPP, Section 1404
 - i. Expired fire extinguisher in room 102 noted April 6, 2011, November 17, 2011, and February 27, 2012; No corrective action documented
 - ii. Unlit exit sign over main door (TM zone) noted April 6, 2011; No corrective action documented
 - iii. Unlit exit signs over escalators P1 and P3, combustible trash and debris at entrance to TM building, and expired permit for elevator 99, noted February 27, 2012; No corrective action documented
 - iv. Expired elevator permit noted August 22, 2013; No corrective action documented
 - c. Exit sign over main door (TM Zone) is not lit
 - i. Discovered April 6, 2011
 - ii. No corrective action documented
 - d. Exit signs unlit over escalators P1 and P3, combustible trash and debris at entrance to TM Building, and Elevator #99 permit expired
 - i. Discovered February 27, 2012
 - ii. No corrective action taken
4. K30 MacArthur Station
 - a. No discrepancies noted
5. C80 Pittsburg/Bay Point Station
 - a. Inspections were not performed every six months as required by the SSPP, Section 1401
 - b. Last documented inspections were performed on June 28, 2013, and November 20, 2013
 - c. No documented inspections in 2011 or 2012
 - d. Inspections lacked proper documentation, including the Station Inspection Audit Checklist
 - e. Potential hazards were documented but not corrected within 30 Days, as required by the SSPP, Section 1404
 - i. Expired permit for Elevator #93 noted on November 20, 2013
 - ii. No documentation of corrective action
6. R50 El Cerrito Del Norte Station
 - a. No discrepancies noted
7. R60 Richmond Station
 - a. Only one inspection was performed in 2013, on July 30, failing to comply with the SSPP, Section 1401
 - b. Inspections lacked proper documentation, including the Station Inspection Audit Checklist

- c. Potential hazards were documented but not corrected within 30 days or at all, as required by the SSPP, Section 1404
- d. Potential hazards were not tracked through to resolution:
 - i. North parking lot tripping hazards in the form of potholes, reported April 3, 2014
 - ii. No corrective action documented
- 8. W30 San Bruno Station
 - a. No discrepancies noted
- 9. W40 Millbrae Station
 - a. Inspections were not performed every six months as required by the SSPP, Section 1401
 - b. Documented inspections were performed on October 18, 2011, November 29, 2011, October 5, 2012, and October 31, 2013
 - c. Potential hazards were documented but not corrected within 30 Days, as required by the SSPP, Section 1404
 - i. Expired fire extinguishers reported October 18, 2011 and October 5, 2012; No corrective actions documented
 - ii. Missing bullhorn reported October 5, 2012; No corrective actions documented
 - iii. Missing CPR mask reported October 5, 2012; No corrective actions documented
 - d. Potential hazards not tracked through resolution.

Staff also inspected the following areas to identify potential or actual unsafe conditions of Emergency Equipment and Designated Exits:

- 1. Subway Section W-33 Interlocking, Lines Y1, Y2 and W1, W2
 - a. W1 Fire Extinguisher expired March 2009
 - b. W2 Fire Extinguisher expired May 2012 MP 22.27
 - c. W2 Fire Extinguisher expired May 2012 MP 22.31
 - d. Door 180 between W1 and Y1 missing handle, not useable MP 22.25
- 2. Aerial Section R45 Interlocking, Lines R1, R2
- 3. Grade Section K23 Interlocking, Lines KX, C2, CX and C1
- 4. Subway Section A-05 Interlocking (The Oakland "Wye"), Line A-1 and A-2
 - a. A-2 0.39 Fire Extinguisher expired Sept 2011
 - b. C-1 0.10 Fire Extinguisher expired Sept 2011
 - c. C-1 0.16 Fire Extinguisher expired Sept 2011
 - d. C-1 0.21 Fire Extinguisher expired Sept 2011
 - e. A-2 0.26 Fire Extinguisher expired Sept 2011

Staff reviewed corrective actions generated from facility inspections and found the following inspections did not receive properly documented follow-up within the 30 days as required by the SSPP, Section 1404, Coordination with Hazard Management Process:

- 1. M10 Standpipe tripping hazard, discovered August 27, 2013
- 2. M40 Damaged light fixture cover, discovered October 18, 2013

3. M80 Expired elevator permit, discovered November 7, 2013
4. OHY Face shield need in truck bay, discovered October 9, 2013
5. W10 Overhead lights are burnt out, discovered October 17, 2013

Findings:

1. BART does not inspect its passenger stations at the required frequencies, fails to document inspections adequately by, for instance, completing Station Inspection Audit Checklists, and does not correct reported defects in a timely manner.
2. The inspection report for A10 Lake Merritt Station from November 4, 2013, does not comply with the SSPP Sections 1401 and 1402.
3. Corrective Actions generated through facility inspections did not receive proper follow-up as required by the SSPP, Section 1404.
4. Several fire extinguishers placed at subway wayside locations on the A-, C-, and W-lines were expired.

Recommendations:

1. BART shall ensure station and facilities inspections are performed and documented according to the SSPP, Section 1401, by using the "Station Inspection/Audit Checklist" and including the checklists in the inspection record documents.
2. BART shall ensure fire extinguisher inspections are conducted as required.

2014 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT

Checklist No.	14-C	Element	Facilities and Equipment Inspections: Non-Revenue Facilities
Date of Audit	February 4-5, 2014 OKS, LKS-18	Department(s)	System Safety Department Maintenance and Engineering Department
Auditors/ Inspectors	Michael Borer Jason Dixon	Persons Contacted	Reginald Lewis Jonathan Rossen, Manager of Employee and Patron Safety

REFERENCE CRITERIA

1. CPUC General Order 164-D
2. BART System Safety Program Plan (SSPP) Rev. 9

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

Facilities and Equipment Inspections: Non-Revenue Facilities

Interview BART facilities and equipment inspectors, and review appropriate records to determine whether:

1. Non-revenue facilities have inspected at least once every 6 months for the past 3 years, as required by the SSPP Section 1402. Randomly select and review two of each facility type to verify:
 - a. Train Control Rooms
 - b. Electrical Control Rooms
2. Administrative Facilities have been inspected at least once every 6 months for the past 3 years. Select two locations and review inspections to verify.
3. Inspections were properly documented, and discrepancies were corrected within 30 days, as required by the SSPP, Section 1404.
4. Potential hazards identified through scheduled inspections were tracked through the Hazard Management Process to resolution, and according to the requirements of the SSPP, Section 1502.

FINDINGS AND RECOMMENDATIONS

Activities:

Staff performed inspections of the Non-Revenue Mechanical Maintenance Facility and additional structures at the Oakland Shops on February 4, 2014, to verify compliance with the SSPP and General Order 164-D.

Staff noted the following during the inspection:

1. Exterior Electrical Outlet Covers
 - a. Defective cover at Northwest roll-up shop door—non-loaded spring
 - b. Missing cover at southwest wall of Maintenance Shop
 - c. Missing cover at northeast corner of Maintenance Shop
2. Conduit Covers:

Northwest junction box missing cover missing at northwest roll-up shop door
3. Shop Electrical Cords:

Electrical cord inside shop at northwest corner has end cut off with exposed wires. Co
4. Housekeeping
 - a. Southeast corner of shop contains hand tools that foul track at entrance of service bay
 - b. Northeast side of the Maintenance Facility adjacent to mainline has multiple tripping hazards, including corrugated plastic, cardboard sheets, broom heads, and plastic ducts
 - c. Oil Absorb-All is spilled over an area of approximately 2ft by 4ft on the floor in front of a Flammable Storage container.

Findings:

1. Staff noted several defects and discrepancies regarding the conditions of BART's non-revenue shop and yard in Oakland.

Recommendations:

1. BART personnel shall be knowledgeable in and comply with the SSPP, Section 1402.

2014 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT

Checklist No.	14-D	Element	Facilities and Equipment Inspections: Tunnels, Bridges, and Aerial Structures
Date of Audit	February 7, 2014 OSA	Department(s)	Structures Department System Safety Department
Auditors/ Inspectors	Robert Hansen Michael Warren Daniel Kwok	Persons Contacted	Mike Lingerfelt, Section Manager, Structures Inspection and Maintenance Way and Facilities Carlina Leong, Senior Safety Engineer

REFERENCE CRITERIA

1. CPUC General Order 164-D
2. BART System Safety Program Plan (SSPP) Rev. 9
3. Structures Inspection Manual, Rev. 2

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

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

Interview BART facilities and equipment inspectors, and review appropriate records to determine whether:

1. Structures inspections were performed.
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. The System Safety Department is aware of all safety hazards pertaining to civil structures.

FINDINGS AND RECOMMENDATIONS

Activities:

Staff learned from the attending BART personnel that four categories of inspections are performed for three types of structures on a 2-year cycle, pursuant to CPUC requirements. Inspections are performed on Subways/Tunnels, Bridges, and Aerials, which are inspected from grade as well as along the trackway. Of the four categories, all but the at-grade aerial inspections must be performed during blanket work-order hours because inspectors must foul the tracks.

Each type of inspection typically yields a number of reported defects. Defects are rated at the time of reporting as either: Priority 1, minor non-safety hazard; Priority 2, a potential hazard to monitor through future inspections; Priority 3, a safety-related hazard to be reviewed

immediately and possibly issue a Trouble Ticket to the responsible department; or Priority 9, a non-issue or resolved defect. Defects of each Priority are tracked across multiple inspection cycles and updated accordingly.

For each of the three types of structures, participating Staff randomly selected two segments and reviewed inspection records dating back to approximately 1999 on the Structures Department's DATASTREAM computerized record management database. Staff focused on Priority 3 and Priority 9 defects when selecting sample reports.

Staff noted that the Structures Department is the last within BART to adopt the newer Maximo database, which is intended to unify and centralize record management and tracking throughout the District. BART personnel explained that Maximo has been deployed in phases, and their department will adopt the software as soon as it is made available.

Subways and Tunnels:

R1005

Subway between Berkeley Station (R20) and North Berkeley Station (R30)

- MP 6.151: Plugged drop-inlet between tracks, water is accumulating in the invert.

Discovered February 2010

Trouble Ticket issued to Track Department February 2010

No updates during 2012 inspection

MP 6.028 R1: Blue Light lens is broken

Discovered April 2002, no data on work order

Observed as repaired April 2004

- MP 5.279 R2: Blue Light out

Discovered February 2000

No updates

- Numerous additional Blue Light outages.

BART personnel believe this section of subway is especially susceptible to moisture intrusion, causing problems for incandescent bulbs previously used for Blue Light stations.

LEDs are now used for tunnel lighting and are far more resilient.

Blue Light stations have been given more attention in recent years than when many of the defects were discovered, and are generally repaired more quickly now.

Communications Department is responsible for Blue Light station maintenance.

W1003

Subway between South San Francisco Station (W20) and San Bruno Station (W30)

- MP 20.515 W2: Door #158 does not open

Discovered May 2007

Observed during inspections in 2009, 2011, and 2013

Trouble Ticket issued March 2013

MP 20.724 W2: A 12 inch section of aluminum grate walkway over cable tray is missing, constituting a tripping hazard.

Discovered May 2007

Trouble Ticket issued May 2007

Observed as partially repaired March 2013 – repair was made using diamond plate instead of original aluminum grate, does not lie flush to existing walkway, is still a minor tripping hazard and is being monitored as Priority 2

- MP 21.080 W1: Heavy encrustation on walkway and leak in soffit (generated two defect reports)

Discovered May 2007

Trouble Ticket issued May 2007

Encrustation may be cleaned but leaks persist and result in new accumulation at subsequent inspections.

Bridges:

C5008

3-Span bridge over Shattuck Avenue in Oakland between MacArthur Station (K30) and Rockridge Station (C10)

- Fencing and razor wire at A46 abutment needs to be extended, is a potential point-of-entry for trespassers.

Discovered 2006, predates DATASTREAM records system, no record of request for repair is available

Observed 2008, Trouble Ticket issued to Grounds Department

Observed 2010

Observed 2012

- Human feces on concrete abutment slope

Discovered 2008, Trouble Ticket issued

Observed 2010, Interviewee recalls an external contractor was hired to clean-up

- Clothing and plastic bags stuffed into bridge expansion joint

Discovered 2010

- Minor spalling on A43 abutment observed

Very old issue, predates records

Observed at every inspection until Seismic Retrofit Project

Seismic Retrofit Project included reinforcing concrete poured around original abutment, could not observe in 2012

- Top Inspection (performed separately from ground-level inspection) found 3 broken concrete ties on C2 track

Discovered March 2009

Observed March 2011

Priority 2 defect, to be monitored throughout subsequent inspections

No Trouble Tickets issued

- Top Inspection found no defects on C1 track
Noted March 2009 and 2011

L5007

Single-span bridge near Castro Valley Station (L10)

- No control number stamps on Abutments A35 and A38
Discovered June 2001
Priority 2 defect, no Trouble Ticket issued
- A38 abutment shows minor to moderate soil erosion on slope to concrete face
Discovered June 1999
Priority 2 defect, no Trouble Ticket issued
- A35 abutment has large crack and delamination
Interviewee said photo suggests delamination possibly due to cold joint in construction
Discovered June 2011
Priority 2 defect, no Trouble Ticket issued
- A35 abutment L1 track keyway sounds hollow and has hairline fissures
Keyway is cutout of abutment to guide girder during shifting and expansion/contraction
Inspector tapped the concrete for sounds, hollow sound suggests possible delamination
Discovered June 2011
Priority 1 defect, no follow-up

Aerials:

A3005

Aerial section across 135 piers in San Leandro and Hayward

- Bee hives in multiple weep holes under girders
Discovered 2003, 2009, 2011, 2013
Trouble Tickets issued to Maintenance Department
No responses from Maintenance Department after completion
It is possible the defect was corrected and a new hive was created
Typical repair involves using a steel brush to destroy the hive
Primary safety concern is for bees stinging public
- Ivy growing on Piers 743, 769, and others, inhibits proper inspection of concrete
Observed in numerous inspections
Trouble Tickets issued to Grounds Department
No responses from Grounds Department
Ivy could have been removed, then regrown

C3009

Aerial section across 13 piers

- Pier 168 northside bearing seat shows signs of delamination and precursory spalling
Priority 3 defect
Discovered in 2002
Observed in 2004, 2006, 20082 and 2010
Trouble Ticket issued June 2010
No follow-up documentation is available
- Vegetation on cap of Pier 172
Priority 3 defect
- Trees in contact with girder G172-173
Priority 3 defect, Trouble Ticket issued to Grounds Department
Discovered 2008
Repaired at unknown date
Observed as repaired in 2010
- Broken wooden shunt board on C2 tracks at MP 15.25 (Top Inspection)
Discovered 2011
Priority 2 defect, no Trouble Ticket issued
Repaired by Train Control Department at unknown date
Observed as repaired 2013

Additional Notes:

- In recent years, inspections are reported on paper records and copied into DATASTREAM. The hard copies are kept within the department for two years, then archived in BART's document storage.
- Maximo, when implemented, will not import DATASTREAM's records automatically, leaving the Department's staff to copy data manually if any records are to be maintained. This most likely means the data will be lost, accessible only through the obsolete database and paper records.

Defects are identified and recorded with an appropriate level of detail.

Comments:

Despite the lack of feedback on Trouble Tickets, the Structures Department has an effective system for reporting and tracking defects until they are observed to be resolved during a two-year cycle inspection. The problem noted in this checklist's Finding addresses timeliness and inter-departmental communication, not record-keeping generally.

Staff discussed the Maximo record system with BART personnel and believe that, if properly developed, the new system could dramatically improve inter-departmental communication and resolve the issue of timely resolution.

Findings:

1. No formal process exists for feedback from external departments regarding Trouble Tickets, and verifying timely resolution of reported hazardous conditions is nearly impossible.

Recommendations:

1. BART should analyze its procedures for inter-departmental communications, and revise as needed to allow for proper tracking of hazard resolution by all affected parties.

2014 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT

Checklist No.	14-E	Element	Facilities and Equipment Inspections: GO 95 Right-of-Way Compliance
Date of Audit	February 3, 2014 Multiple Locations	Department(s)	System Safety Department Maintenance and Engineering Department Grounds, Way, and Facility Department Power Maintenance Department
Auditors/ Inspectors	Steve Espinal Jimmy Xia	Persons Contacted	Tim Cochrane Glen Eddy, Facilities Maintenance Supervisor

REFERENCE CRITERIA

1. CPUC General Order 95
2. CPUC General Order 164-D
3. Resolution ST-77, April 21, 2005
4. BART System Safety Program Plan (SSPP) Rev. 9
5. BART Book 31, Electrical Maintenance Procedures

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 each of the following areas:

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

Interview BART facilities and equipment inspectors, review appropriate records, and perform visual inspections and measurements to determine whether for each track section:

1. Right-of-Way inspection and maintenance standards and programs are compliant with General Order 95.
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 were submitted properly and approved by CPUC.

FINDINGS AND RECOMMENDATIONS

Activities:

Staff reviewed third rail maintenance records for 2011, 2012, and 2013, including inspections, inspection frequency, PM, and work orders.

- Coverboard Incident Logs for the entire system show the repair dates for coverboard defects from January 2011 through January 2014.
- Wayside Monthly PM records from January 2013 to January 2014.
- Coverboard inspections have been conducted on a quarterly basis. This is less frequent than the monthly inspections required by General Order 95, Section 79.6.
- Coverboard Incident Logs show many instances where defects found do not have a corresponding repair date. The following dates were noted:

July 30, 2012	March 12, 2013
October 20, 2012	March 17, 2013
January 1, 2013	June 26, 2013
January 14, 2013	
- BART's Electrical Section Manager stated that missing repair dates indicate the repair is not completed. BART personnel could not find the documents that show the defects found on the dates above have been repaired.

Comments:

Improvement in BART's documentation of work conducted is necessary.

Staffing levels should be reviewed.

Findings:

1. Coverboard inspections are conducted at a frequency lower than that required by GO 95, Section 79.6.
2. Coverboard defects noted on Coverboard Incident Logs are not effectively tracked and repaired.

Recommendations:

1. BART shall conduct monthly third rail inspections as required by GO 95, Section 79.6.
2. BART shall ensure that all coverboard defects noted on Coverboard Incident Logs are repaired and that all the repairs are properly documented in accordance with Book 31, Electrical Maintenance Procedures.

2014 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT

Checklist No.	14-F	Element	Facilities and Equipment Inspections: Train Control and Signal Facilities
Date of Audit	February 3, 2014 MET-G	Department(s)	Operations Department Maintenance and Engineering Department
Auditors/ Inspectors	Thomas Govea	Persons Contacted	Ed Poposo

REFERENCE CRITERIA

1. CPUC General Order 164-D
2. BART System Safety Program Plan (SSPP) Rev. 9
3. BART Book 20
4. BART Preventative Maintenance Database (access onsite)

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

Facilities and Equipment Inspections: Train Control and Signal Facilities

Interview BART's representative responsible for Automatic Train Protection (ATP) maintenance and Interlocking Plan maintenance, and randomly select four vital relay PM records from the past 12 months to review. Determine whether:

1. ATP Maintenance Program:
 - a. A standard operating procedure describing BART's comprehensive PM program for the ATP system is current, approved, and implemented.
 - b. The ATP system was inspected and tested at the frequencies specified in the SSPP, Section 1501, for the past 12 months.
 - c. The required PM activities were documented on standardized inspection report forms.
 - d. Defects and non-compliance noted on the inspection report forms were corrected and signed off in a timely manner.
 - e. All identified ATP system safety-related anomalies have been rectified.
2. Signal Systems and Power Switch Maintenance Program:
 - a. A standard operating procedure or other directive describing BART's PM program for interlocking plants is current, has been approved, and is being implemented.
 - b. At-grade interlocking plants have been inspected and tested at the specified frequency for the past 12 months. Review records for at least two at-grade interlockings.
 - c. Aerial interlocking plants have been inspected and tested at the specified

frequencies for the past 12 months. Review records for at least two aerial interlockings.

- d. Underground interlocking plants have been inspected and tested at the specified frequencies for the past 12 months. Review records for at least two interlockings in tunnels, subways, or the trans-bay tube.
- e. All required PM activities were documented on standardized inspection report forms.
- f. Potential hazards identified through scheduled inspections were tracked through to resolution.

FINDINGS AND RECOMMENDATIONS

Activities:

Staff interviewed BART's Section Manager of System Maintenance, Maintenance and Engineering Department, which is responsible for inspections and the maintenance of the District's Automatic Train Control System (ATCS) on the Maximo database. Staff reviewed PM records.

1. Train Control (TC) personnel day, swing, and night shift weekly schedule, January 27 through February 2, 2014
 - a. TC Day, Swing, and Night Shift Weekly Scheduler was implemented by BART Engineering Department starting in July, 2013
 - b. The new scheduler provides a weekly schedule for each shift of testing that is required, testing past due, totals numbers of PMs, total man hours of current PMs, and total man hours available
 - c. Statistics from the Scheduler for the week:
 - Total number of current PMs: 105
 - Total number of Past PMs: 73
 - Total number of PMs: 178This shows 58% completion on all required PMs for the week.
 - d. After further review of the weekly shift schedule, Staff determined:
 - The due date is not correct, and should be the start date of the PM
 - The Scheduler does not allow for 14 days from start date to completion
 - Does not reflect Maximo data:
 - Work Order#6790124 – Scheduler: January 6, 2014; Maximo: January 1, 2014
 - Work Order #6972722 – Scheduler: January 21, 2014; Maximo: January 29, 2014
 - Work Orders are not being closed out when work is completed
 - e. The PM Scheduler is not providing accurate information, partially due to the Due Date heading, which should instead be the Start Date, and that Work Orders are not being completed to allow Maximo to close out PM records. Its process is to generate a Work Order, provide the date work was completed, review the completed Work Order, and close.

- The required PM activities are not being fully documented on the standardized inspection database.
 - The process is not being completed in a timely manner to provide accurate data on a weekly PM schedule.
2. Identified ATCS safety-related anomalies, and 73 open items in the Unusual Occurrence Log (UOL):
- a. Work Orders are not being closed out when work is completed.
- Work Order #2712311 W33 False Occupancy , March 8, 2013: AC outage caused over-heating in Train Control Room, turned over to HVAC Mechanics Department, no updates provided to Train Control Department
 - Work Order #6498667 ODY Yard Down, December 9, 2013: Inverter down, replaced batteries, replaced fuse, completed in 3 hours. Work Order remains open despite actual work completion due to incomplete information on database, including materials used
 - Work Order #6968009 K30 run through switch January 6, 2014, 21:49: repair made within 2 hours, Maximo work order not completed to close ticket
 - Work Order #7088860 M15 Arching January 14, 2014, 04:51: grounded, no labor, work log, no narrative, undetermined status
 - Work Order #5738568 C80 TC Room Key restriction switch broken March 11, 2013: no replacement found, in progress
- b. Data provided on the UOL is not providing accurate information due to Work Orders not being completed to allow Maximo to close out trouble report records. Its process is to generate a Work Order, provide date work was completed, review to complete, then close.
- The required UOL trouble report activities are not being documented on standardized inspection reports.
 - Potential hazards identified are not tracked to current conditions due to documentation process in database, records are not completed in a timely manner. Staff reviewed 13 line items of the 74 open items, finding 8 with completed work, 3 with undetermined condition, and 2 in progress
3. Maximo data percentage of completion for PMs for each segment of testing December 2013:
- | | |
|--------------------------------|------|
| • Relay/Track Circuits | 93% |
| • Switch | 100% |
| • Switch | 98% |
| • Uninterruptible Power Supply | 100% |
| • Batteries Testing | 100% |

January 2014:

- | | | |
|--------------------------------|------|------------------------|
| • Train Control Room | 96% | |
| • Relay/Track Circuits | 95% | (19 of 20) |
| • Relay/Safety Y | 97% | |
| • Switch | 100% | |
| • Switch | 98% | |
| • Uninterruptible Power Supply | 96% | PG&E transformer down |
| • Batteries Testing | 96% | Inverter will not work |

Comments:

Grouping provided by inspection activity on Maximo database does not match the grouping of the SSPP, Section 1501, Train Control Inspection and Maintenance. Grouping should be considered to match the SSPP to better maintain and monitor the various frequencies required for each activity.

Findings:

1. Data in the PM Schedule and UOL is inaccurate, and Work Orders are not completed to allow Maximo to close out the PM records after actual work is done.
2. Work Order close out documentation indicates PM tests are not performed at the required frequencies.

Recommendations:

1. BART shall require that appropriate personnel receive proper training in using the Maximo database, and provide procedures for creating Work Order completion timelines and coordinating Work Order statuses across multiple departments, in order to provide accurate data for the TC Weekly PM Schedule/UOL Trouble Work Order spreadsheets.
2. BART shall perform testing to meet the required frequencies outlined in the SSPP, Section 1501, Train Control Inspection and Maintenance Program.

2014 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT

Checklist No.	14-G	Element	Facilities and Equipment Inspections: Communications Equipment
Date of Audit	February 4, 2014 LMA	Department(s)	Maintenance and Engineering Department
Auditors/ Inspectors	Thomas Govea	Persons Contacted	Steve Arisco Tony Williams
REFERENCE CRITERIA			
<ol style="list-style-type: none"> 1. CPUC General Order 164-D 2. BART System Safety Program Plan (SSPP) Rev. 9 3. BART Data Transmission System Manual 4. BART SCADA Preventative Maintenance Procedure 5. BART Book 42 6. BART Emergency Telephone Inspection Procedures 			
ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION			
<p>Facilities and Equipment Inspections: Communications Equipment</p> <p>Interview BART facilities and equipment inspectors, and review appropriate records, and perform the following:</p> <ol style="list-style-type: none"> 1. Select at least two activities from the Communication Equipment Inspections and Maintenance table in the SSPP, Section 1501, and verify all activities were performed with the required frequency. 2. Perform visual inspections and review records to determine whether the Data Transmission System (DTS) has been maintained as required, and that all preventative and corrective maintenance practices comply with the applicable reference criteria. 3. Perform visual inspections and review records to determine whether the Supervisory Control and Data Acquisition (SCADA) System has been maintained as required, and that all preventative and corrective maintenance practices comply with the applicable reference criteria. 			
FINDINGS AND RECOMMENDATIONS			
<p><u>Activities:</u></p> <p>Staff interviewed BART facilities Assistant Superintendent Systems Maintenance of Maintenance and Engineering Department responsible for inspection and maintenance records of BART's</p>			

communication equipment, and reviewed records to determine whether preventative and corrective maintenance practices are performed with the frequencies required by the SSPP, Section 1501.

1. The 30 year old DTS only provides Train Control Data for one section of the system: K23 Interlocking. The newer SCADA system has replaced DTS elsewhere on BART. DTS has been updated in-field with newer modems. The communication room has the original DTS equipment, with the exception of the original copper transmission lines—DTS now uses a fiber optic T-1Carrier on BART NET. The last section of DTS is scheduled to be transitioned to SCADA within the year. No PM Records are documented, BART just monitors DTS alarms.
2. SCADA monitors system alarms, electrification, station alarms, emergency telephones, etc. to exclude train control data. Inspection records were viewed for all of W30 San Bruno Station and A10 Lake Merritt Station.
SCADA System Fault Log: Work Order #2624625 W40 SCADA rack fault 12, 13, originated February 2013 to current date. The cause was the SCADA Display Interface in the Station Agent Booth at W20 Millbrae Station failed. Part was removed from the one of the two booths: one was used for training, parts on order with spare.
3. BART NET is the “Point-to-Point” network that provides all data transmission from the field to the Operation Control Center. BART NET transmits SCADA data, Train Control data from field Vital Processors, and K23 DTS “T-1 Carrier” data. T-1 Carrier transmission copper lines were replaced with BART NET. Inspection records were reviewed for W30 San Bruno Station
4. Emergency Telephone System:
 - a. Agent Station (courtesy phone) also used for public announcements, Station Communication. 90-day PM. Staff performed a field test of the R50 El Cerrito Del Norte Station agent call button.
 - b. Station Elevator gives 90 seconds for agent to answer before forwarding to the Operations Control Center, providing Elevator ID. 90-day PM. Staff inspected the A10 Lake Merritt Station elevator #29 and found it out-of-service.
 - c. Blue Light Emergency Phone, direct line to Operations Control Center. 90-day PM. Staff performed a field test of:
 - i. W33 Interlocking, ETS W357
 - ii. A10 Lake Merritt Station, ETS K-020
 - iii. A-05 Interlocking ETS K-018
5. Emergency Communication System, Mine Photos are found in the lower gallery (M1 Tk. Side) of the TransBay Tube and the Berkeley Hills Tunnel; 60-day PM
6. Trunk Radio underground system has recently been upgraded and annual maintenance is performed under contract by contractors. The above-ground Trunk Radio has no PM records, BART just monitors system alarms.

Comments:

The System Safety Department provided a document, excerpted below, indicating that the SSPP will be modified:

Subject: System Safety Program Plan Revision Items

This memo confirms that the following changes will be made to the System Safety Program Plan at the next revision (Revision 10), in response to the 2014 CPUC Triennial Safety Review, checklist #14-G.

Item 1:	Add BART.NET maintenance information to Chapter 15.
Item 2:	Change the frequency of Emergency Telephone inspection in Chapter 15 to quarterly.

Findings:

1. BART is not testing its DTS at the semiannual frequency required by the SSPP, Section 1501, instead monitoring its status by System Monitor through a log recorded hourly.
2. BART NET system testing procedures require a 90 day testing frequency. This requirement is not listed in the SSPP, Section 1501 Communication Testing Frequency Table.
3. The Emergency Telephone System testing procedures require a 90 day testing frequency. This is inconsistent with the SSPP, Section 1501.2, which requires testing once every 2 months.
4. Emergency Communication System testing procedures require a 60 day testing frequency. This is inconsistent with the SSPP, Section 1501.3 which requires quarterly testing.
5. The Trunk Radio System testing procedures require annual testing for the underground system only. This is inconsistent with the SSPP, Section 1501.1, which requires annual testing for both underground and above-ground systems.

Recommendations:

1. BART shall ensure that the SSPP and all PM procedures specify the same inspection and testing frequency requirements.

2014 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT

Checklist No.	14-H	Element	Facilities and Equipment Inspections: Measurement and Testing Instrumentation
Date of Audit	February 5, 2014 OKS, OHY	Department(s)	Maintenance and Engineering Department Rolling Stock and Shops: Oakland and Hayward
Auditors/ Inspectors	Thomas Govea	Persons Contacted	Luis Leon , Manager of Non-Revenue Maintenance Richard Severo

REFERENCE CRITERIA

1. CPUC General Order 164-D
2. BART System Safety Program Plan (SSPP) Rev. 9
3. NTSB Safety Advisory R-13-1 and R13-2, Use of Jumpers

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

Facilities and Equipment Inspections: Measurement and Testing Instrumentation

Interview responsible BART representatives from each department, review appropriate records, inspect equipment storage facilities, and inspect no fewer than eight 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 instrument.
3. Tools and instruments requiring calibration are addressed in departmental procedures.

FINDINGS AND RECOMMENDATIONS

Activities:

1. Oakland Shop
 - a. Staff interviewed the Supervisor from the non-revenue vehicle maintenance shop, requested to review appropriate records, and inspected equipment storage facilities measuring and testing instruments.
 - b. The Supervisor was not aware of any procedures in regards to control of test equipment.
 - c. BART personnel were not aware of any calibration history test records, and there is no schedule for calibration.

- d. Staff inspected equipment storage facilities measuring and testing instruments, torque wrenches, calipers, digital thread gauges, South Bend metal lathe with digital measurement readout and multi meters. No calibration date labels were affixed to test equipment.
 - e. Staff found calibration labels on:
 - i. Torque Tester BART #4032506, calibration due date July 30, 1989
 - ii. Torque Tester model 7065, calibration due date March 23, 1984
 - f. Staff reviewed the use of No Calibration Required stickers under Procedure Part D.2. No stickers are currently being used.
2. Hayward Yard
- a. Staff interviewed the Superintendent and the Manager from Quality and Reliability at the Hayward Maintenance Rolling Stock and Shop, reviewed the provided BART Book 429 Volume 3, Chapter 2, Section 2 Control of Test and Measurement Equipment, Rev. 01/14/2014
 - b. Staff reviewed appropriate records which showed 28 pieces of test equipment had failed and are located in the Quarantine Locker until replacement equipment arrives.
 - c. According to The Supplier of Quality System Evaluation Report, the last vendor audit was performed three years ago.
 - d. Measuring and testing instrument inspection was performed, and staff reviewed the use of No Calibration Required stickers.
 - e. Only one of several measuring and testing instruments inspected was found to be out of date: 8000A digital fluke, BTR-202, November 3, 2007, located in Section 7 of the Electrical Mechanical Department.
3. MET-G
- a. Staff interviewed the BART Superintendent and the Inspector from Quality Insurance of the System Maintenance and Engineering Department, reviewed BART Book 15, Chapter 17, Section 1 Calibration of Testing and Measurement Equipment, Rev. 02/21/1998.
 - b. Staff reviewed appropriate records, and inspected facilities equipment, and measuring and testing equipment.
 - i. Records show that BART is in the process of identifying what equipment is still in inventory and what is no longer available.
 - ii. During a field inspection of A10 Lake Merritt Station, staff identified test equipment out of compliance:
 - Test Equipment Fluke 97 50 MHz Scope Meter BTR-0238 #4040017, calibration due date is December 12, 2007
 - HP 33120A 15 MHz Arbitrary Waveform Generator CC647 #209344, calibration due date January 16, 1997.The Arbitrary Waveform Generator is not used to test train control systems, but for the use of the QA Department. Both test equipment was not on the calibration inventory, but will be recovered and returned to the cycle. All other test

- equipment noted in the field certification was up-to-date and on the inventory.
- iii. Supplier Quality System Evaluation Report staff was not being implemented under SOP Part G.2
 - iv. Staff reviewed the use of No Calibration Required stickers under Procedure Part D.2. no stickers are currently being used.
- c. BART personnel did not provide documentation in reference to NTSB Safety Advisory R-13-1 and R-13-2, Use of Jumpers.

Comments:

1. BART shall adhere to all applicable FTA Safety Advisories and NTSB Recommendations.

Findings:

1. The Oakland Non-Revenue Maintenance Shop does not consistently maintain accurate calibration date labels or No Calibration Required stickers on measurement and testing instruments.
2. Some measurement and testing equipment at each shop inspected is past due for calibration.

Recommendations:

1. BART shall review Oakland Shop control of Test and Measurement Equipment and develop procedures as necessary to ensure equipment is calibrated at the proper frequency.

2014 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT

Checklist No.	15-A	Element	Maintenance Audits and Inspections: Rail Vehicles
Date of Audit	January 28-29, 2014 February 4-5, 2014 Multiple Locations	Department(s)	Maintenance and Engineering Department Operations Hayward Yard Operations Richmond Yard Operations Concord Yard Oakland Shops Operations Daly City Yard
Auditors/ Inspectors	Michael Borer Jason Dixon John Madriaga Kevin McDonald Michael Warren	Persons Contacted	Richard Severo Bruce McDonald Mark Stowers Luis Leon, Manager of Non-Revenue Maintenance Paul Yan

REFERENCE CRITERIA

1. CPUC General Order 164-D
2. BART System Safety Program Plan (SSPP) Rev. 9
3. BART Book 50, C Car Preventative Maintenance Manual
4. BART Book 86, A/B Car Preventative Maintenance Manual

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

Maintenance Audits and Inspections: Rail Vehicles

1. Perform detailed inspections of BART's 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. Determine whether the cars are in compliance with the applicable references based on record review and inspections.

FINDINGS AND RECOMMENDATIONS

Activities:

On Tuesday, February 4, 2014, CPUC track inspectors conducted visual inspections of seven randomly selected hi-rail vehicles and examined hi-rail inspection records.

Of the seven hi-rail vehicles chosen, two had no operative back-up alarms, and one had no operative fire extinguisher (this was corrected at the time of CPUC's inspection). This does not present a negative trend. Upon examination of hi-rail vehicle inspection records, CPUC discovered that 95% of the hi-rail vehicle fleet has received inspections at the required frequency of every six months. Additionally, several randomly selected hi-rail vehicles had received Biennial Inspection of Terminals inspections at the required frequency of every 90 days.

Staff also conducted revenue vehicle inspections at the following locations and times, as prescribed in the SSPP, Chapter 15, Vehicle Preventative Maintenance inspections, and requested to verify that maintenance was being performed as required:

1. Richmond Mechanical Maintenance Facility, January 28, 2014
 - a. Unit #351 – The manual door release button cover in the Operator's cabin has a defective spring that prevents automatic return. BART personnel were notified of defect and corrective action was performed.
 - b. Unit #336 – The Operator's mirror was flipped backwards, preventing line-of-sight to the passenger compartment. BART personnel were notified of defect and corrective action was performed.
 - c. Unit #1854 – No defects noted.
 - d. PM Records were inspected and items noted during BART personnel inspection were listed in the "Summary/Detail" section of the inspection reports. Both defects noted corrective actions taken were shown on the list to provide accurate data of repair and release.
 - e. Items noted on prior sheet that were not in stock were not captured to confirm order to place. Example: on November 2, 2013, the windshield wiper knob for Unit #336 showed "not in stock," but a tracking request could not be provided by BART personnel to show if the item had been ordered or had been received.
2. Concord Mechanical Maintenance Facility, January 29, 2014
 - a. Unit #324 – No discrepancies noted.
 - b. Unit #1849 – No discrepancies noted.
 - c. Unit #361 – No discrepancies noted.
 - d. PM Records were requested for units that were inspected. BART personnel provided copies of defects noted on inspection reports, but could not produce an account of completion. Listed defects would show "COMPRELEASE," but would not provide information to determine whether items were repaired or released without repair.
3. Oakland Non-Revenue Mechanical Maintenance Facility, February 4, 2014
 - a. Unit #3656 License #1194217 – Defects noted:

- i. Left rear high-rail tie rod jam nut backed off
 - ii. Welding lead insulated with duct tape
 - iii. Torch hoses ruptured at torch connection
 - iv. First aid kit incomplete
 - b. Unit #3517 – Defects noted:
 - i. First aid kit incomplete
 - ii. Back up alarm inoperative
 - iii. Crane rope improperly stowed on case (drum)
4. Daly City Mechanical Maintenance Facility, February 5, 2014
- a. Unit #356 – The manual door release button cover in the Operator’s cabin has a defective spring that prevents automatic return. BART personnel were notified of the defect and corrective action was performed.
 - b. Unit #1850 – No discrepancies noted.
 - c. Unit #404 – The manual door release button cover in the Operator’s cabin has a defective spring that prevents automatic return. BART personnel were notified of the defect, and corrective action was performed.
 - d. PM records were requested for units that were inspected. BART personnel provided copies of defects noted on inspection but could not produce an account of completion. Listed defects would show “CLOSED,” but would not provide information to determine whether items were repaired or released without repair.

Comments:

BART personnel were advised that PM findings are not being reported in Maximo as they are completed, repaired, or released.

Staff met with BART personnel on February 13, 2014 to discuss plans of incorporating mechanical notes into the “FINDINGS/ACTIONS” box on inspection reports that would allow for repair or release tracking.

Findings:

- 1. Several defects were observed on vehicles #3656 and #3517 at Oakland Shop.
- 2. A crane rope for vehicle #3517 at Oakland Shop was improperly stowed, which could result in damage to the rope.

Recommendations:

- 1. BART shall note defects on drivers’ pre-check at Oakland Shops to include items present. Torches and welders shall be inspected prior to use, and items that present a danger to the operator shall be repaired before work commences.
- 2. Lifting ropes at Oakland Shops shall be stored properly to prevent rope breaks.

2014 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT

Checklist No.	15-B	Element	Maintenance Audits and Inspections: Traction Power System
Date of Audit	February 5-6, 2014 LKS-9, OKS	Department(s)	Operations Department Maintenance and Engineering Department
Auditors/ Inspectors	Steve Espinal Michael Warren Daniel Kwok	Persons Contacted	Tim Cochrane Mark Pfeiffer

REFERENCE CRITERIA

1. CPUC General Order 95
2. CPUC General Order 164-D
3. BART System Safety Program Plan (SSPP) Rev. 9
4. BART Stray Current Program documentation
5. BART Book 31, Bay Tube Cathodic Protection

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

Maintenance Audits and Inspections: Traction Power System

Select at least one section of the third rail traction power system from each of the following areas:

1. A/L Lines
2. C/R Lines
3. M/K Lines
4. W/Y Lines

For each section, review the appropriate documentation to determine whether:

1. The third rail is inspected and maintained in compliance with applicable standards.
2. Substations and gap-breakers are inspected and maintained in compliance with applicable standards.

Perform a visual inspection of one substation for each of the four areas to determine whether they are in compliance with BART standards, and are in a state of good repair. Perform a detailed inspection of substation components including but not limited to:

1. 1 kV DC Breaker
2. 1 kV DC Bus

Review designs, procedures, and inspection reports relating to BART's cathodic protection system.

Review BART's stray current program to determine whether:

1. BART is active in mitigating the effects of stray current on its own and surrounding structures and utilities.
2. BART has procedures in place to identify and correct hazards caused by stray current.
3. Any hazards identified have been satisfactorily addressed.

FINDINGS AND RECOMMENDATIONS

Activities:

Staff interviewed the Group Manager of Electrical and Mechanical Engineering regarding BART's Cathodic Protection Program and Stray Current Program. The Cathodic Protection Program includes 29 functioning anodes and one broken anode, which is in the process of being repaired. The broken anode was rendered non-functional one month prior by contact with equipment.

Staff requested written procedures regarding the Cathodic Protection System, and learned that BART has formalized procedures, but was unable to locate and provide documentation of the procedures. BART personnel verbally informed Staff that the goal of the system is to maintain approximately 160 Amps and a voltage drop of 500 mV from anode to ground. BART electricians have kept monthly records of system diagnostics, including the voltage of the rectifier and current through the anodes. BART has recently built a system which produces real-time measurements of the voltage and current.

The Stray Current Program includes track insulation, track bonding, cross-bonding track and thyristor (80 volts track to ground) grounding. CPUC has been working with BART and PG&E to monitor and advance work on mitigating stray current.

Staff reviewed documentation of the following:

1. Safety training, which is being conducted consistently and in a timely manner.
2. 1K Gap Breaker inspection records for K30 MacArthur Station. The semi-annual and annual circuit breaker and rectifier tests are being conducted on a timely basis. Staff reviewed the breaker inspection records for DC 1 through 12.

Staff performed field inspections at the following locations:

1. A2 Bayfair Station Traction Power Substation:
 - a. The traction power system was clean and functioning as designed
 - b. Communication system has exposed wires and a circuit cabinet which was open.
 - c. Communication system should be enclosed in a protective box.

2. 847 Elgin Street, Oakland:
 - a. LAA Gap Breaker
 - b. Is a backup gap breaker that was always racked until the breaker was needed
 - c. The housing was clean
3. C10 Rockridge Station Traction Power Substation
 - a. In good shape
 - b. High Voltage signage present
 - c. Fire extinguisher is current
4. R10 Ashby Station Traction Power Substation:
 - a. Fire extinguisher is current
 - b. No high voltage signage on door

Staff conducted inspections of the W/Y-Line, W33 interlocking, and the K23 interlocking including the CX pocket track.

Staff noted the following PM procedures have not been conducted according to their respective prescribed frequencies:

<u>Maintenance Procedure:</u>	<u>Documented Frequency:</u>	<u>Actual Frequency:</u>
FPE/GE inspections	Weekly	Monthly
FPE 34.5 KV AC Bus	Annual	3-5 Years
GE Battery and Charger	Quarterly	Semi-Annual
GE 1 KV DC Bus	Annual	3-5 Years
Ventilation Inspection	Monthly	Quarterly

Staff reviewed a Parsons-Brinkerhoff report on cathodic protection throughout the BART system from December, 1994. BART's Cathodic Protection System and associated inspections program is fully functional; however, Staff determined through interviews of BART personnel that there are few detailed procedures regarding Section 2.6 of this report, making a comprehensive audit difficult. Furthermore, BART personnel discussed Cathodic Protection System inspection and testing record keeping with Staff and agreed that a centrally-located database would make both internal and external audits easier.

Comments:

1. Electrical maintenance staff count has been held steady for many years. At its height, approximately 75 electrical maintenance staff were employed. After expanding the system by 15 platforms with associated circuits and substations, there are now only 69 employed. Staffing levels should be reviewed.
2. BART personnel have informed Staff that the coverboards that were observed as broken at M10 West Oakland Station and the maintenance facility at 601 8th Street in Oakland

have been repaired.

2. BART should consider establishing a centralized database for tracking inspections and maintenance of the cathodic protection system.

Findings:

1. BART lacks detailed written Operation and Maintenance procedures for the Cathodic Protection System, the Ultrasonic Testing Program, and Seismic Analysis, based on the 1994 Parsons Brinkerhoff report.
2. The Maintenance and Engineering Department has not performed PM at the proper frequencies: monthly weekly FPE/GE inspections, rather than the required weekly inspections; FPE 34.5 KV AC BUS maintenance every 3-5 years, rather than the required annual maintenance; semi-annual GE Battery & Charger maintenance, rather than the required quarterly maintenance; GE 1KV DC BUS maintenance every 3-5 years, rather than the required annual maintenance; and quarterly ventilation inspections, rather than the required monthly inspections.
3. Broken coverboards were found at the M10 West Oakland Station platform and at the maintenance facility at 601 8th St. in Oakland.
4. The A2 Substation at A50 Bay Fair Station had exposed communication wires and an open circuit cabinet door.

Recommendations:

1. BART shall develop written procedures, operation standards, and maintenance standards for the Cathodic Protection System, including requirements for inspection frequency, rectifier voltage range, current range, system design, and specifications. The program shall also include the metal to ground voltage drop goals and associated rationale. Procedures shall also include ultrasound testing frequency, nondestructive and destructive testing methods, repairs, training, calibration, etc.
2. BART Engineering shall issue and follow procedures that accurately reflect the frequency of the inspections and PM being conducted for all procedures, including monthly inspections of the third rail system and associated components, as required by General Order 95, section 79.6.
3. BART shall repair the broken coverboards discovered during this review.
4. BART shall enclose the exposed communication wiring at the A50 Bay Fair Station A2 Substation.

2014 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT

Checklist No.	15-C	Element	Maintenance Audits and Inspections: Train Control and Signal Systems Maintenance
Date of Audit	January 28-31, 2014 February 5, 2014 Multiple Locations	Department(s)	Operations Department Maintenance and Engineering Department
Auditors/ Inspectors	Thomas Govea Michael Warren	Persons Contacted	Ed Poposo
REFERENCE CRITERIA			
<ol style="list-style-type: none"> 1. CPUC General Order 127 2. CPUC General Order 164-D 3. BART System Safety Program Plan (SSPP) Rev. 9 4. BART Book 20, Train Control Maintenance Procedures 5. BART Track Safety Standards (TSS) 6. BART Wayside Safety Program 7. BART Maintenance Management Information System (access onsite) 			
ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION			
<p>Maintenance Audits and Inspections: Train Control and Signal Systems Maintenance</p> <ol style="list-style-type: none"> 1. Review and evaluate the compliance of BART's train control and signal inspection maintenance programs and standards 2. Perform detailed inspections of the signal system and Automatic Train Protection (ATP) system components to determine whether or not they are in compliance with applicable reference criteria. Select at least one track section at random from each of the following areas to inspect: <ol style="list-style-type: none"> 1. A- and L-Lines 2. C- and R-Lines 3. M- and K-Lines 4. W- and Y-Lines 			
FINDINGS AND RECOMMENDATIONS			
<p><u>Activities:</u> Staff reviewed BART's train control and signal inspection maintenance programs and standards, TSS Table S7.1, the SSPP, and Book 20 as reference for evaluating compliance during the field</p>			

inspection. Staff performed detailed inspections of the train control system and Automatic Train Control System (ATCS) components to determine whether or not they are in compliance with applicable reference criteria at the following locations:

1. **W/Y-Line:** W33 Interlocking, Switches 235 (W2) and 333 (Y1), and W34 Train Control Room
 - a. Switch 235 W2, mainline rail missing C-bond at joint bar, temporary shunt cord in location but not fastened to rail, BART personnel fastened a new shunt cord to rail during inspection.
 - b. Numerous hardware failures of GEOLoc vital processor in W34 Train Control Room log book—6 entries from November 17, 2013 to January 24, 2014.
 - c. W34 Train Control Room Cabinet W34 R1 termination T3 A and B missing arrestors, and cabinet W34 R1 A termination T7 A and B missing arrestors. BART personnel installed missing arrestors during inspection.
2. **R-Line:** R45 Interlocking, Switches 127, 227, 123, and 223, and R50 Train Control Room
 - a. The normal switch point of Switch 227 did not fit properly against the stock rail in the closed position as specified in the TSS, Table S7.1. Switches 127, 227, 123, and 223 were taken out of service, repaired, and returned to service after 24 hours.
3. **K-Line:** K-23 Interlocking, Switches 143, 225, and 341, and K-30 Train Control Room
 - a. Switch 225 wayside control case was not secured as required by General Order 127, Section 3.12. A lock was provided by BART personnel during the inspection.
 - b. K-30 Train Control Room is undergoing a transition from relay to vital logic processors. The Cabinet D1 System is in operation, but as-built plans from March 22, 2006 are not accurate to the field wiring.
 - i. Drawing #SA01040-6400, page 42 does not show wiring for row 49-52.
 - ii. Drawing #SA0140-6400, page 24 shows wires terminated in row 49-52.
 - iii. Wire tags for row 49-52 do not reflect the correct point of termination.
 - iv. R-16-G wiring changes on page 11 VHLC I/O Drawing #SA0140-6400 are not all terminated as shown in pencil on as-built plans.
4. **A-Line:** A-05 Interlocking (Oakland Wye), Switches 153 and 287, and A05 Train Control Room
 - a. Test Equipment Fluke 97, 50 MHz Scope Meter BTR-0238 #4040017 calibration is past its due date of December 12, 2007
 - b. HP 33120A, 15 MHz Arbitrary Waveform Generator CC647 #2090344 calibration is past its due date of January 16, 1997

Comments:

1. Discrepancies resolved at the time of inspection are not listed as findings.
2. Out-of-date testing equipment finding is recorded on Checklist 14-H Equipment Maintenance Program: Measurement and Testing Equipment.

Findings:

1. As-built plans for the K30 Train Control Room, Cabinet D1 are inaccurate.
2. Some equipment at A05 Train Control Room is out-of-date on calibration.

Recommendations:

1. BART shall revise the as-built plans for the K-30 Train Control Room, Cabinet D1 for accuracy.
2. BART shall routinely calibrate all equipment according to manufacturer specifications and BART procedures.

2014 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT

Checklist No.	15-D	Element	Maintenance Audits and Inspections: Tracks and Turnouts
Date of Audit	January 28-31, 2014 Multiple Locations	Department(s)	Operations Department Maintenance and Engineering Department
Auditors/ Inspectors	John Madriaga Kevin McDonald	Persons Contacted	Tracy Johnson Duncan Lawson

REFERENCE CRITERIA

1. CPUC General Order 164-D
2. BART System Safety Program Plan (SSPP) Rev. 9
3. BART Track Standards Manual
4. BART Track Safety Standards (TSS)
5. BART Annual Track and Train Control Joint-Switch, Turnout Interlocking Inspection Form
6. BART Maintenance Management Information System (access onsite)

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

Maintenance Audits and Inspections: Tracks and Turnouts

Review BART's records of PM, schedule and unscheduled maintenance activities for two separate 6 month periods in the past 3 years:

1. Track Inspection:
 - a. Randomly select at least two separate track inspection reported areas 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.
 - 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.
 - c. Review BART 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. Randomly select at least two separate turnout inspection reported areas 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.

Perform detailed inspections of mainline tracks to determine whether or not they are in compliance with applicable reference criteria. Select at least one track section at random from each of the following areas to inspect, including at least one at-grade section, one underground section, and one aerial section:

1. A- and L-Lines
2. C/R-Lines
3. M/K Line
4. W/Y Lines

FINDINGS AND RECOMMENDATIONS

Activities:

On Tuesday, January 28, 2014, during non-revenue hours, CPUC track inspectors performed a walking visual inspection of the M-Line beginning at M16 Embarcadero Station, including the M17 and M55 interlockings. Detailed measurements were taken of tangent track, switches, turnouts, and frogs.

1. While visually inspecting Switch 123, Staff observed the BART section manager for track maintenance foul the mainline track and used a cellular phone to take a picture of a crack in the frog point at switch 123.
2. Staff immediately asked the section manager to cease, and reminded him of CPUC's prohibition of personal electronic device usage under General Order 172, Section 3.1.c.
3. The Acting Superintendent of Way and Facilities apparently misunderstood the rule and believed using a cellular phone's camera function was allowable.
4. Staff informed the section manager that only dedicated cameras, not cellular phones, are usable when fouling the trackway.

On Friday, January 31, 2014, CPUC track inspectors examined BART internal rail defect reports.

1. BART records show that there was one complete internal rail defect inspection in 2012, and one in 2013. Under BART's TSS, Section S7.1, there must be two internal rail defect inspections per year.
2. Numerous internal rail defects were noted but not corrected:
 - a. Defective weld of 10% at MP 9.04, reported August 6, 2013, no date for completion of

- corrective action noted
- b. Compound fissure of 30% at MP 4.22, reported December 5, 2012, no date for completion of corrective action noted
 - c. Detail fracture of 30% at MP 11.60, reported December 9, 2012, no date for completion of corrective action noted
 - d. Detail fracture of 30% at MP 0.53, reported January 7, 2013, no date for completion of corrective action noted

On Friday, January 31, 2014, CPUC track inspectors examined Geometry Car inspection records.

1. Geometry Car inspections from January 2011 through January 2014 were not performed at the proper frequency of twice per year, as specified in BART TSS section S7.1.
2. Only one Geometry Car inspection was performed in 2012, and no inspections were performed in 2013
3. BART Wayside Staff communicated that a contractor had performed a geometry car inspection in the last quarter of 2013, but no documentation was available to confirm
4. No documentation was available indicating that exceptions (defects) reported on Geometry Car inspection reports were ever corrected.

Comments:

The fact that two BART employees, including the Acting Superintendent of Way and Facilities, had misunderstood General Order 172 indicates a potentially widespread misunderstanding of the General Order throughout BART.

Findings:

1. Internal rail defect inspections were not performed two times per year, as required by the TSS, Section S7.1.
2. Corrective actions for rail defects are not properly tracked and documented through completion.
3. Geometry Car track inspections were not performed two times per year, as required by TSS, Section S7.1.
4. Corrective actions generated through Geometry Car track inspection reports were not properly tracked and documented through completion.

Recommendations:

1. BART shall conduct internal rail defect inspections and Geometry Car track inspections on their mainline track at the frequencies specified in the TSS, Section S7.1.
2. BART shall implement a systematic program to track and document corrective actions for all internal rail defects and Geometry Car track inspections.

2014 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT

Checklist No.	16-A	Element	Training and Certification Programs: Operators, Controllers, and Foreworkers
Date of Audit	January 31, 2014 LKS-2, LMA	Department(s)	Operations Central Control Operations Department Training Department
Auditors/ Inspectors	Donald Filippi Michael Borer	Persons Contacted	Fred Edwards , Administrative Manager of Operations Control Center Greg Leong

REFERENCE CRITERIA

1. CPUC General Order 164-D
2. Cal/OSHA Safety Orders
3. BART System Safety Program Plan (SSPP) Rev. 9
4. BART Employee Certification Plan

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

Training and Certification Programs: Operators, Controllers, and Foreworkers

Select at least six (6) employees at random in each of the following classifications:

- Train Operator
- Train Controller
- Foreworker

Review training, certification, and recertification records of the selected employees to determine whether:

1. All personnel successfully completed initial training programs, and any discrepancies were addressed and resolved.
2. All personnel have been retrained and recertified at the correct frequency and are currently certified to perform their duties according to the Employee Certification Plan.

FINDINGS AND RECOMMENDATIONS

Activities:

Staff reviewed three years of training records for Operators, Controllers, and Foreworkers. Staff noted that all of the training records were consistent with BART's Training Program outlined in the SSPP.

Foreworkers Training Records for 2011, 2012, and 2013: Staff reviewed approximately 11% of the Foreworkers training records. Staff noted that 100% of the records reviewed met BART's training requirements.

Controllers Training Records for 2011, 2012, and 2013: Staff reviewed approximately 32% of the Controllers training records. Staff noted that 100% of the records reviewed met the BART training requirements.

Operators Training Records for 2011, 2012, and 2013: Staff reviewed approximately 5% of the Operators training records. Staff noted that 100% of the records reviewed met the BART training requirements.

Comments:

BART is the ONLY rail agency in the State of California that does not require its Safety Sensitive Employees to undergo a physical evaluation prior to Certification/Recertification. Title 49 CFR Part 240 requires all Commuter and Freight Railroads to have their Safety Sensitive Employees undergo a physical examination prior to Certification/Recertification. General Order 143-B requires in Section 12.02 that operators of light rail vehicles and streetcars be subject to a physical examination in accordance with Class B licensing requirements. Additionally, the CFR also mandates that such employees immediately inform the agency and agency/employee physician if they are taking any banned medication.

GO 143-B does not specifically apply to BART and there is no finding related to this checklist, but Staff does make a recommendation to BART that it begin to develop processes and procedures compliant with GO 143-B to reduce the probability of future accidents and bring it into alignment with the other rail transit agencies in California (See also: end of Section 5 of the triennial report).

2014 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT

Checklist No.	16-B	Element	Training and Certification Programs: Employees and Contractors
Date of Audit	January 31, 2014 February 4, 7, 2014 Multiple Locations	Department(s)	Operations Department Training Department
Auditors/ Inspectors	Donald Filippi John Madriaga Kevin McDonald Michael Borer Jason Dixon Thomas Govea	Persons Contacted	Michael Smith Tracy Johnson Karen Arhontes

REFERENCE CRITERIA

1. CPUC General Order 164-D
2. Cal/OSHA Safety Orders
3. BART System Safety Program Plan (SSPP) Rev. 9
4. BART Employee Certification Plan

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

Training and Certification Programs: Employees and Contractors

Interview BART representative(s) responsible for Maintenance Personnel and Signal Maintenance Personnel training and certification programs, and review records for at least 6 active employees and 6 active contractors to determine whether:

1. Employees and contractors have completed the initial training program, refresher, and remedial training as necessary.
2. Employees and contractors have been certified, and recertified at the required frequency, and currently meets all criteria for proper performance of his or her duties according to the Employee Certification Plan.

FINDINGS AND RECOMMENDATIONS

Activities:

Staff interviewed BART representatives responsible for Maintenance Personnel and Signal Maintenance Personnel Technical Division certification programs, consisting of 7 to 8 classes, to assess whether they follow the three-year requirements specified in SSPP, Section 1602.

- MUX System Cert Class
- GRS ATP Track Circuit Certification Class
- GRS VPI Hardware Certification Class
- GRS VPI Software Certification Class
- VHLC Interlocking Certification Class
- SOFX ATCS Certification Class
- Switch Machine Certification Class
- Alstrom Switch GM4000A Certification Class, or
BART Switch Machine Certification Class

Staff also reviewed the Wayside Training program to assess whether it complies with the 24 month requirements specified in the SSPP, Section 1604.

Staff randomly selected 4 of the 72 active Train Control (TC) Electronic Tech employees, including one new hire, along with one Train Control Foreworker, and one Section Manager for the TC System, to verify compliance with the training requirements.

- Employee #0556900
 - Failed WTTC023T Wayside Safety for TC Recertification on October 28, 2008
 - Passed WTTC023T Wayside Safety for TC Recertification on December 9, 2008
 - Passed WTTC023T Wayside Safety Recertification on October 26, 2011
 - No testing documented in 2013
- Employee #055166
 - Passed WTSAF001T Wayside Safety Recertification on January 4, 2010
 - Passed WTSAF001T Wayside Safety Recertification on December 27, 2012
- Employee #057802
 - Failed WTTC0230T Wayside Safety Recertification on October 28, 2008
 - Passed WTTC023T Wayside Safety Recertification on December 23, 2008
 - Failed WTSAF001T Wayside Safety Recertification on October 23, 2011
 - Passed WTSAF001T Wayside Safety Recertification on January 16, 2012
- Employee #057323
 - Passed WTTC023T Wayside Safety Recertification on October 31, 2007
 - Passed WTSAF001T Wayside Safety Recertification on October 25, 2010
 - WTSAF001T Wayside Safety Recertification on October 22, 2013
- Train Control Foreworker #057363
 - Passed WTTC023T Wayside Safety Recertification on January 1, 2007
 - Passed WTSAF001T Wayside Safety Recertification on October 28, 2010
 - No other certification on file
- Section Manager System Maintenance #050207
 - Passed WTTC023T Wayside Safety for TC on June 21, 2004
 - No other certification on file from November 6, 1989, to February 7, 2014

Staff requested training records for shop personnel based on job classification to determine whether BART personnel have been receiving training as required in the SSPP. BART provided Staff with the requested training requirements and transcripts from BART's Pathlore Training Program. Training records were requested for BART mechanical personnel at their assigned maintenance shops. Staff performed on-site employee training record reviews at the following five maintenance facilities:

January 28, 2014, 09:00: Hayward Mechanical Maintenance Facility

- Employee #041678 – MA 825 Transit Vehicle Electronic Technician
 - SSOSHA08 HEARING CONSERVATION: missing 2011, 2012, and 2013
- Employee #060423 – MA830 Transit Vehicle Mechanic
 - SSOSHA08 HEARING CONSERVATION: missing 2011, 2012, and 2013
- BART Injury and Illness Prevention Program (IIPP), Addendum A-08 HEARING CONSERVATION PROGRAM, 2.0 PURPOSE requires all employees listed in Hayward Shop to receive annual testing per 5.0 TRAINING.

January 28, 2014, 16:00: Richmond Mechanical Maintenance Facility

- Employee #056772 – MA825 Transit Vehicle Electronic Technician
 - SSOSHA08 HEARING CONSERVATION: missing 2011, 2012, and 2013
- Employee #055898 – MA830 Transit Vehicle Mechanic
 - SSOSHA08 HEARING CONSERVATION: missing 2011, 2012, and 2013
 - SSOSHA18 RESPIRATORY PROTECTION: missing 2011
- Employee #061501 – MA830 Transit Vehicle Mechanic
 - SSOSHA08 HEARING CONSERVATION: missing 2013
- Employee #061380 – MA 830 Transit Vehicle Mechanic
 - SSOSHA08 HEARING CONSERVATION: missing 2013
- Employee #056790 – MA835 Utility Worker
 - SSOSHA08 HEARING CONSERVATION missing 2013
 - STREG001T FORKLIFT RECERTIFICATION missing 2010
 - SSOSHA21 BLOODBORNE PATHOGENS missing 2011 and 2012
 - SSOSHA18 RESPIRATORY PROTECTION missing 2011
- BART IIPP, Addendum A-08 HEARING CONSERVATION PROGRAM, 2.0 PURPOSE requires all employees listed in Richmond Shop to have annual testing per 5.0 TRAINING.

January 29, 2014, 09:30: Concord Mechanical Maintenance Facility

- Employee #060955 – MA825 Transit Vehicle Electronic Technician
 - SSOSHA08 HEARING CONSERVATION missing 2012 and 2013
- Employee #056992 – MA825 Transit Vehicle Electronic Technician
 - SSOSHA08 HEARING CONSERVATION missing 2010, 2011, 2012, 2013
- Employee #057451 – MA830 Transit Vehicle Mechanic
 - SSOSHA08 HEARING CONSERVATION missing 2010, 2011, 2012, and 2013
 - SSOSHA18 RESPIRATORY PROTECTION missing 2011
 - STREG001T FORKLIFT RECERTIFICATION missing 2010, 2011, and 2012
- Employee #056174 – MA830 Transit Vehicle Mechanic
 - SSOSHA08 HEARING CONSERVATION missing 2010, 2011, 2012, and 2013
 - SSOSHA18 RESPIRATORY PROTECTION missing 2011
- Employee #049257 – MA835 Utility Worker
 - SSOSHA08 HEARING CONSERVATION missing 2010, 2011, 2012, and 2013
 - SSOSHA18 RESPIRATORY PROTECTION missing 2011
- Additional Document Requested:
FORKLIFT OPERATOR SAFETY AND CERTIFICATION #STREG001C/#SREG001T
 - Staff observed Richmond Shop personnel operating a forklift without a secured seatbelt.
 - This is a violation of Chapter C, Line #1, page 4 of the training guide.
 - BART personnel were also notified that Personal Protective Equipment requirements are absent from Chapter B, Line #1, page 3, but required by the SSPP.
 - BART personnel made revision to training guide, adding subsection C. Safety Glasses/Goggles to Personal Protective Equipment requirements in current revision, dated January 31, 2014.

February 4, 2014, 09:00: Oakland Non-Revenue Mechanical Maintenance Facility

- Employee #0802871 – Non-Revenue Vehicle Maintenance
- Employee #060692 – Non-Revenue Vehicle Maintenance
 - SSOSHA08 HEARING CONSERVATION missing 2011, 2012, 2013
 - SSOSHA03A CLASS A/B DRIVERS missing 2011, 2012, and 2013

Note: BART IIPP, Addendum A-03 DRIVER/VEHICLE SAFETY PROGRAM, 5.0 TRAINING requires Class A and B drivers to also complete SSOSHA03A.
- Employee #033134 – Non-Revenue Vehicle Maintenance
 - SSOSHA08 HEARING CONSERVATION missing 2010, 2011, 2012, and 2013
 - STREG001T FORKLIFT RECERTIFICATION missing 2010, 2011, 2012, and 2013
- Employee #058291 – Non-Revenue Vehicle Maintenance
 - SSOSHA08 HEARING CONSERVATION missing 2011, 2012, and 2013
 - STREG001T FORKLIFT RECERTIFICATION missing 2011, 2012, and 2013

February 5, 2014, 09:00: Daly City Mechanical Maintenance Facility

- Employee #033803 – MA825 Transit Vehicle Electronic Technician
 - SSOSHA08 HEARING CONSERVATION missing 2010, 2011, 2012, and 2013
- Employee #056817 – MA825 Transit Vehicle Electronic Technician
- Employee #056300 – MA830 Transit Vehicle Mechanic
- Employee #048368 – MA830 Transit Vehicle Mechanic
 - SSOSHA08 HEARING CONSERVATION missing 2010, 2011, 2012, and 2013
 - SSOSHA18 RESPIRATORY PROTECTION missing 2011
 - STREG001T FORKLIFT RECERTIFICATION missing 2010
- Employee #057530 – MA830 Transit Vehicle Mechanic
 - SSOSHA08 HEARING CONSERVATION missing 2010, 2011, 2012, and 2013
 - SSOSHA18 RESPIRATORY PROTECTION missing 2011
- Employee #054144 – MA830 Transit Vehicle Mechanic
 - SSOSHA08 HEARING CONSERVATION missing 2010, 2011, 2012, 2013
 - SSOSHA18 RESPIRATORY PROTECTION missing 2011
- Employee #060424 – 000035 Quality Team Leader
 - SSOSHA08 HEARING CONSERVATION missing 2010, 2011, 2012, and 2013
- BART IIPP, Addendum A-08 HEARING CONSERVATION PROGRAM, 2.0 PURPOSE, requires all employees listed in Daly City Shop to receive annual testing per 5.0 TRAINING.

On Friday, January 31, 2014, staff examined training and certification records for six randomly selected employees, including three on-rail equipment operators and three track foreworkers:

- Employee #056924 – Last received Wayside Safety Training on August 23, 2011
- Employee #057876 – Last received Wayside Safety Training on July 28, 2011
- Employee #058124 – Last received Wayside Safety Training on July 14, 2011
- Employee #057099 – Last received Wayside Safety Training on July 15, 2011
- Employee #058477 – Last received Wayside Safety Training on December 16, 2011

Note that the SSPP, Section 1604 requires roadway worker protection training every 24 months.

Staff reviewed the following projects, including the project overviews and Site Specific Work Plans (SSWPs), the Safety Monitor Daily Activity Reports, and relevant Track Allocations:

- Contract 15PN-110
- Contract 110-0091
- Contract 09AU-110

Comments:

1. BART has failed to provide Contractor training records, including Roadway Worker Protection, Lock-Out/Tag-Out Protection, OR&P Training, Aerial Structure/Fall Protection Training, First Aid Training, Cal/OSHA-required training, High Voltage/Third Rail Training, and Power Tools/Equipment Training.

Findings:

1. Training schedules for the selected employees did not comply with the frequency requirements specified in the SSPP.
2. BART is not complying with the IIPP and SSPP by failing to train its maintenance personnel in SSOSHA03A, SSOSHA08, SSOSHA18, SSOSHA21, and STREG001T courses.
3. BART has failed to provide training/retraining records for Contractors working on the projects reviewed, as required by the SSPP, Chapter 16.
4. BART has failed to provide Wayside Safety Training to on-rail equipment operators and track foreworkers every 24 months, as required in the SSPP, Section 1604.
5. BART has failed to provide training records for the Safety Monitors used to provide protection for Contractors related to the projects reviewed, as required by the OR&P Manual and the SSPP, Chapter 16.
6. BART has failed to provide Track Allocations for project 15PN-110. Staff could not verify that the project met all of BART's safety requirements.
7. BART's Resident Engineer failed to meet the guidelines listed in BART's SSPP, Section 1605, by signing off on each project despite them not meeting the outlined requirements listed.

Recommendations:

1. BART shall revise the three-year recertification program to comply with the 24 month recertification requirements in the SSPP, and require that all employees receive wayside training regardless of position.
2. BART shall review the IIPP and SSPP for training requirements, and audit employee records to ensure training intervals are as required.
3. BART shall ensure that all Contractors are trained according to BART policy, including any training and retraining specified in SSWPs.
4. BART should develop procedures to ensure that all training records related to Contractors and Contractor Projects are kept for a minimum of four years.
5. BART's Resident Engineer shall ensure that all project guidelines have been met prior to approving any work, consistent with BART policy.

2014 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT

Checklist No.	17	Element	Configuration Management and Control
Date of Audit	January 28, 2014 LKS-2	Department(s)	System Safety Department
Auditors/ Inspectors	Joey Bigornia Noel Takahara Michael Warren	Persons Contacted	Kirk Marshall, Manager Niko Wilson, Administrative Support Officer Mark Chan, Manager of Engineering Safety
REFERENCE CRITERIA			
<ol style="list-style-type: none"> 1. CPUC General Order 164-D 2. BART System Safety Program Plan (SSPP) Rev. 9 3. BART Engineering Change Order (BECO) Form 			
ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION			
<p>Configuration Management and Control</p> <ol style="list-style-type: none"> 1. Randomly select two recent BART system modifications or changes during the last year to ensure configuration management documentation was properly updated to include at minimum: <ol style="list-style-type: none"> a. Engineering design peer review; b. Design and Analysis Review by the System Safety Department; c. Design and Analysis Review by CPUC if required; 2. Randomly select a Project Concept submitted to the System Safety Department and verify that: <ol style="list-style-type: none"> a. BECO Forms were used; b. BECO Forms were circulated to the Project Engineer; c. The System Safety Department performed a review, analysis, and approval of the Modification and Change Request Forms for the project; d. The modification or change was reviewed and approved by BART's Director or Deputy Director of Operations and Maintenance; e. The modification or change was circulated to the proper departments prior to implementation; f. All necessary parties or contract employees within or outside the agency were properly notified of the modification or change. 			
FINDINGS AND RECOMMENDATIONS			

Activities:

Staff interview the BART Manager responsible for Configuration Management & Control and found the following:

Major BART publications (e.g. Blue Prints, Maintenance Manuals, Design Documents, etc.) are kept by the Configuration Management (CM) Department, assigned document numbers, and are reviewed as a formal process, before any changes are made. BART Publication Book Number Assignment Table/ List identified all documents (approximately 436 in total) and the current ones which require revision updates by the CM Department. The CM Department can also receive and maintain new documents such as drawings as they are developed. Documents not maintained by the CM department are administered by each respective BART department. The CM Department also maintains BECO Weekly Reports and Monthly Reports to track the status of all BECO Forms from initial request to final close-out approval. BECO Forms are required for any change/revision to a CM Department maintained document. The CM Department receives approximately 3 to 8 BECOs on a daily basis, the majority of which are requests for engineering drawing revisions.

1. BECO #V0008948:
 - Update drawing #017361 Air Compressor Motor
 - Received 12/11/13
 - Due Date 1/10/14
 - BECO #EM001887
 - Revision of Contract 08CS-120, Sheet CT001, Barrier Improvement Drawings
 - Received December 3, 2013
 - Due Date December 30, 2013
 - a. The DRAFTING BECO TRACKING checklist coversheets for both projects show Engineering Design Review was performed.
 - b. The BECO Form 0771 for both Projects shows the BECO Originator sent the BECO to Safety Department (on line #10) for further review. The Safety Department upon receipt of BECO will determine if they are required to perform additional analysis for complex projects. If the BECO does not require extensive review such as a replacement of a blue-print drawing, the Manager of Engineering Safety will acknowledge to the BECO Originator via an email. If the BECO is a large project, the Manager of Engineering Safety is required to provide a formal signature on the BECO Project document acceptance page.
 - c. Neither of the BECO Forms reviewed required CPUC Design and Analysis Review.
2. Staff reviewed the Project Plan for Traction Power Substation Equipment Installation–ACO, KOW 15EK-110 dated February 20, 2012. The Project Plan:
 - a. BECO was used to generate the Project
 - b. BECO was used to generate the Project

- c. System Safety Department was sent copy of Project Plan for review, comments, and a formal signature from the Manager of Engineering Safety was necessary.
- d. BART's Director approval is required for the projects' capital expenses
- e. The Plan modifications have been circulated within BART's Departments (e.g. Power and Mechanical Maintenance Section Manager) since the Major Milestones are: Contract Development due date March 16, 2012, Contract Award January 29, 2012, Portable Substations on-line August 5, 2013, and Commissioning of Substation Equipment January 22 through March 11, 14.

For additional Project Concepts, refer to Checklist #8 Safety Certification.

Findings:

None.

Recommendations:

None.

2014 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT

Checklist No.	18	Element	Local, State, and Federal Requirements: Employee Safety Program
Date of Audit	January 30, 2014 LKS-18	Department(s)	Operations Department System Safety Department
Auditors/ Inspectors	Steve Espinal Michael Warren Daniel Kwok	Persons Contacted	Jonathan Rossen, Manager of Employee and Patron Safety Reginald Lewis

REFERENCE CRITERIA

1. CPUC General Order 164-D
2. Cal/OSHA Safety Orders
3. BART System Safety Program Plan (SSPP) Rev. 9
4. BART District Management Procedure – Injury and Illness Prevention Program

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

Local, State, and Federal Requirements: Employee Safety Program

Interview personnel and review appropriate records to determine whether:

1. BART has had any problems complying with local, state, or federal requirements. Review documentation of any such problems and assess how the issue was handled and resolved.
2. BART regularly holds Joint Union/Management Safety Committee (JUMSC) Meetings, and the Chief Safety Officer serves as the committee chair.
3. The JUMSC appropriately responds to employees' complaints regarding safety problems.
4. The JUMSC appoints subcommittees for special task assignments.
5. BART Management forms other Safety Committees when appropriate to address safety in specific work areas, special operation problems, or employee behavior and morale.
6. An appropriate procedure and reporting form is being implemented, and is distributed to all employees to effectively report safety hazards in the work place.
7. Employees are aware of the Employee Safety Program and comfortable utilizing it.
8. Appropriate corrective actions regarding employee safety have either been satisfactorily completed or are being actively tracked and documented.

Randomly select at least two employees from each of the following departments, and review each employee's safety program records to determine whether they have received

appropriate safety training with respect to their classification:

1. Maintenance and Engineering: Way and Facilities;
2. Maintenance and Engineering: Systems Maintenance;
3. Maintenance and Engineering: Power and Mechanical Maintenance;
4. Non-Revenue Vehicle Maintenance;
5. System Safety;
6. Rolling Stock and Shops.

FINDINGS AND RECOMMENDATIONS

Activities:

1. Staff reviewed BART's State and Federal Safety Rules Compliance and JUMSC by-laws. BART trains or communicates all employees in the Injury and Illness Prevention Plan through the JUMSC procedures. For example, the following safety issues have been reported:

<u>Issue:</u>	<u>Report Date:</u>	<u>Closed Date:</u>
Tower radios do not reach Trains	September 19, 2011	November 16, 2011
Emergency door will not open	February 14, 2011	March 7, 2011
Electrical panel latch missing	October 27, 2011	November 10, 2011
Lights out in upper parking lot	March 15, 2011	May 10, 2011
Light covers in blow pit are cracked	February 13, 2012	April 3, 2012

2. BART conducts JUMSC Meetings on a regular basis. The JUMSC meeting is scheduled for the first Wednesday of every month.
3. BART's JUMSC team receives safety concerns from BART employees and JUMSC committee management representatives. The JUMSC team investigates and directs repairs or corrective actions in response to employee concerns. The JUMSC corrective actions are documented and monitored through closure.
4. The JUMSC team is constantly working on special task assignments.
5. JUMSC addresses safety issues and no mention of morale is made.
6. BART provides Safety Notices to the employees. Employees are free to generate safety notices for JUMSC investigation.
7. Based on the safety concerns raised, BART employees are apparently informed of the program.
8. Based on the closure rate of safety issues discussed by the JUMSC, the issues are being addressed in a timely fashion.
9. Staff randomly selected the following departments and verified staff from each has received appropriate safety training:
 - a. Maintenance and Engineering: Way and Facilities
 - b. Maintenance and Engineering: Systems Maintenance

- c. Maintenance and Engineering: Power and Mechanical Maintenance
- d. Non-Revenue Vehicle Maintenance
- e. System Safety
- f. Rolling Stock and Shops

Comments:

1. Staff submitted a request for information after performing the on-site review. No response was received from BART.

Findings:

None.

Recommendations:

None.

2014 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT

Checklist No.	19	Element	Hazardous Materials Program
Date of Audit	February 5, 2014 LKS-18	Department(s)	Operations Department Environmental Department
Auditors/ Inspectors	Jimmy Xia Yan Solopov	Persons Contacted	Jonathan Rossen, Manager of Employee and Patron Safety Gary Jensen, Principal Engineer

REFERENCE CRITERIA

1. CPUC General Order 164-D
2. Cal/OSHA General Order Title 8
3. BART System Safety Program Plan (SSPP) Rev. 9
4. BART Hazardous Communications Program documentation
5. BART District Management Procedure – Injury and Illness Prevention Program
6. BART Material Safety Data Sheets (MSDSs)

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

Hazardous Materials Program

1. Select at random at least six BART employees responsible for handling hazardous materials, and verify that they have received specific training for reporting requirements, product release or spill, and spill incident response and clean-up.
2. Verify that hazardous materials discharge/spill reports for incidents in the past 12 months have been prepared and filed properly.
3. Verify that all MSDSs are available to all personnel who handle hazardous materials.

FINDINGS AND RECOMMENDATIONS

Activities:

Staff interviewed BART representatives and reviewed BART's Hazardous Materials Program documentation, including the following:

1. BART issues two types of training related to hazardous material handling for BART employees who work with hazardous materials every year, which are described below:
 - a. A general training video for all BART employees who work with hazardous materials every year that is put on by the maintenance shops. This video is 20 minutes in length, and mainly covers spill response procedures for front line users.

All BART employees are required to view this annually, with the exception of those subject to the second type of training, described below.

- b. A class entitled 'Hazardous Waste Management' conducted by a consultant, the Industrial Safety & Hazmat Training Group. This is an 8-hour long (one day) training class specifically for BART employees responsible for handling hazardous materials that is conducted every year. This training covers reporting requirements, product release or spill, and spill incident response and clean-up, which includes all the information from the general training mentioned above. BART selects several employees each year to receive this training, usually around three per shop. The selected employees may vary by year. Employees are issued a certificate upon successful completion of the class.

The Certificates of Completion for the Hazardous Waste Management training class conducted by the Industrial Safety & Hazmat Training Group for six randomly selected BART employees for training they completed in 2012 and 2013 with the following training and expiration dates.

- a. Employee A
Completed training: May 24, 2012; Expiration date: May 24, 2013
Completed training: June 27, 2013; Expiration date: June 27, 2014
- b. Employee B
Completed training: May 24, 2012; Expiration date: May 24, 2013
Completed training: June 27, 2013; Expiration date: June 27, 2014
- c. Employee C
Completed training: May 23, 2012; Expiration date: May 23, 2013
Completed training: June 26, 2013; Expiration date: June 26, 2014
- d. Employee D
Completed training: May 24, 2012; Expiration date: May 24, 2013
Completed training: June 27, 2013; Expiration date: June 27, 2014
- e. Employee E
Completed training: May 24, 2012; Expiration date: May 24, 2013
Completed training: June 26, 2013; Expiration date: June 26, 2014
- f. Employee F
Completed training: May 24, 2012; Expiration date: May 24, 2013
Completed Training: June 27, 2013; Expiration date: June 27, 2014

All six BART employees have successfully completed the annual Hazardous Waste Management training in the past two years, as could be seen from their issued certificates. As such, all six selected employees are currently compliant with the requirement to receive this training annually, and are current with the training, because their current training certificates are valid through latter June of 2014. However, each of the employees received retraining in 2013 approximately one month

late.

2. BART did not have any hazardous materials discharge/spill incidents that were reportable within the past 12 months. As such, no reports of such incidents have been prepared and filed during the past 12 months. If BART ever encounters such an incident, they will proceed in reporting and resolving the issue accordingly. BART's Unusual Occurrence Report form, which is a general form used for all incidents, would be utilized in these cases.
3. MSDS for BTC 401 Heavy Duty Cleaner printed out from Web BART
 - a. All of BART's MSDSs are available to all personnel who handle hazardous materials in a variety of ways, as follows:
 - i. All MSDSs are available online on BART's internal intranet site called Web BART. BART's facilities where maintenance employees work have computer terminals/kiosks that are connected to Web BART, thereby allowing them to access MSDSs at any time. Web BART has the most up to date version of MSDSs, which are typically provided to BART by manufacturers of the corresponding chemicals. This is the most widely used means for accessing MSDSs.
 - ii. Some shops have hard copies of MSDSs available to some extent, i.e. binders/booklets.
 - iii. BART has a number of CDROMs containing MSDSs. These have largely been replaced by the online method of viewing MSDSs. However, they are still available to employees upon request.
 - b. It is quite rare for BART to get new chemicals. Before a new chemical is purchased, system safety has to review and approve the MSDS for that chemical. If system safety approves the MSDS, the purchase of the new chemical will be permitted and they will add the new MSDS into the electronic inventory of MSDSs on Web BART.
 - c. BART's Principal Engineer responsible for BART's Hazardous Materials Program has claimed that he typically won't allow BART to purchase carcinogenic materials.
 - d. BART maintains current MSDSs at all times. On average, BART adds one or two new chemicals every year as needed.

Findings:

1. Each of the employees inspected received Hazardous Waste Management training in 2013 approximately one month later than the 2012 training expiration dates.

Recommendations:

1. BART shall take action to ensure employees responsible for handling hazardous waste receive annual Hazardous Waste Management training before the expiration dates noted on their training certificates for the previous training sessions.

2014 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT

Checklist No.	20	Element	Drug and Alcohol Program
Date of Audit	January 30, 2014 LKS-20	Department(s)	Operations Department System Safety Department
Auditors/ Inspectors	Steve Espinal Michael Warren	Persons Contacted	David Wong

REFERENCE CRITERIA

1. Code of Federal Regulations, Title 49 Part 655 – Prevention of Alcohol Misuse and Prohibited Use in Transit Operations
2. CPUC General Order 164-D
3. BART System Safety Program Plan (SSPP) Rev. 9
4. BART Operations Rules and Procedures (OR&P) Manual
5. BART Corporate Drug and Alcohol Policy
6. BART Book 349, Substance Abuse Program

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

Drug and Alcohol Program

Interview BART representatives and review appropriate records prepared in the past 12 months to:

1. Verify that the number of employees in safety-sensitive positions who tested non-negative or refused to take the test was reported accurately.
2. Verify that the Substance Abuse Program meets current FTA requirements.
3. Verify that BART has a policy for managing the use of over-the-counter drugs.
4. Select at random at least two safety-sensitive employees who tested non-negative for drugs or alcohol in the past year. Determine whether:
 - a. The employee was evaluated and released to duty by a Substance Abuse Professional;
 - b. The employee was administered a return-to-duty test with verified negative results;
 - c. Follow-up testing was performed as directed by the Substance Abuse Professional according to required follow-up testing frequencies in the reference documents after the employee returned to duty.
5. Verify that consequences for repeat offenders were carried out as required in the reference.

FINDINGS AND RECOMMENDATIONS

Activities:

1. Staff reviewed BART employees who tested positive for drug and alcohol. BART's testing includes current staff as well as applicants. BART randomly tests 25% of its safety-sensitive employees each year, totaling approximately 400 drug and alcohol tests annually.
2. BART drug and alcohol testing policies are current with the FTA's requirements.
3. BART's Drug and Alcohol Program, Section 3.0 deals with over-the-counter drugs. BART also deals with over-the-counter medications in the OR&P, Section 1309, and the Substance Abuse Policy, Section C1.4.1.
4. Two employee's records were reviewed who tested non-negative.
 - a. The employees were evaluated and released by a Substance Abuse Professional
 - b. Staff verified BART's employees who registered a positive drug test submitted to a return to service drug test as well as follow-up testing for a minimum of six (6) tests in the first year, and additional testing.
 - c. Staff verified that repeat offenders are given second chances, but a third positive test results in termination of the employee.
5. BART substance abuse training records of Supervisors were reviewed.

Findings:

None.

Recommendations:

None.

2014 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT

Checklist No.	21	Element	Procurement Process
Date of Audit	February 7, 2014 OHY	Department(s)	Operations Department System Safety Department Rolling Stock and Shops
Auditors/ Inspectors	Howard Huie Michael Warren Daniel Kwok	Persons Contacted	Martin Atkinson, Manager of Quality, Reliability, and Process Development
REFERENCE CRITERIA			
<ol style="list-style-type: none"> 1. CPUC General Order 164-D 2. BART System Safety Program Plan (SSPP) Rev. 9 3. BART Procurement Quality Assurance Procedures 			
ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION			
<p>Procurement Process</p> <p>Interview BART representatives and review appropriate documentation to:</p> <ol style="list-style-type: none"> 1. Verify that BART personnel are following the Procurement Quality Assurance Procedures, and ensure safety issues and concerns are addressed in the procurement process. 2. Determine that adequate procedures and controls are in place to preclude the introduction of defective or deficient equipment into the BART System. 3. Determine that adequate procedures are in place to deal safely with defective or deficient equipment in the event such equipment is introduced into the BART System. 			
FINDINGS AND RECOMMENDATIONS			
<p><u>Activities:</u></p> <p>Staff interviewed BART representatives in charge of Procurement Quality Assurance, and reviewed the following records and documentation:</p> <ol style="list-style-type: none"> 1. Once an article arrives on-site, the Store Keeper looks for obvious damage of the article before acceptance of the package. The package is then accepted in Maximo, BART's inventory management system. Maximo creates a Quality Report (QR), and transfers it into BART Vehicle Configuration Management (CM) System proprietary hybrid workflow system. Staff reviewed the following Quality Assurance (QA) documentation to 			

verify that BART personnel are following BART Rolling Stock and Shops Procedures:

- a. QR 11-0056, inspected January 6, 2011
- b. QR 11-0634, inspected March 4, 2011
- c. QR 12-0272, inspected February 6, 2012
- d. QR 12-0472, inspected February 27, 2012
- e. QR 13-0596, inspected March 13, 2013
- f. QR 13-1821, inspected July 24, 2013

The QR tells the QA inspector what to inspect and to what specifications. Inspectors will do their due diligence depending on the item. Some items may require reviewing drawings while others require only visual inspection against an existing part number. Depending on the item, all or some will be inspected, and all or some inspected items may be accepted or rejected. Once the item is accepted, the store keeper is notified and the item goes to inventory. If the item is a special-order item, it will be delivered directly to the requesting department. If an item is rejected by the inspectors, the item goes into Vehicle System Engineering Pending. The Engineering Manager will assign an engineer to review for deficiencies and will confirm or overwrite the rejection. All overwritten and accepted items go to the Store Keeper. If the item is rejected by both the inspectors and the engineers, the item is put in a holding area and the order goes into an assignment queue for the original ordering Procurement personnel. Procurement personnel will then need to resolve the discrepancy with the vendor. If the part is to be shipped back, Procurement personnel will coordinate with the vendor and the Store Keeper to do so.

2. Staff reviewed the following QA documentation to verify that BART personnel are following BART Rolling Stock and Shops Procedures:

- a. MRB 11-030, created February 24, 2011
- b. MRB 11-057, created March 9, 2011
- c. MRB 12-025, created January 23, 2012
- d. MRB 12-210, created May 24, 2012
- e. MRB 13-048, created February 8, 2013
- f. MRB 13-118, created March 29, 2013

There is a Material Review Board (MRB) module in the CM System. The MRB will track all damaged items that need any special attention

3. Upon discovery of a defective item in inventory, QA inspects other items from that shipment. Defective items are then put through the MRB rejected materials process described above.

Comments:

All critical materials have been entered into CM System and are on record for the past three years. Nothing is erased or deleted out of the system. All items from three and a half years are active, and nothing has been archived. Moving forward, BART will set up a policy to archive some of the old items to reduce the size of the database for efficiency.

Findings:

None.

Recommendations:

None.