2010
TRIENNIAL ON-SITE
SAFETY REVIEW OF
BAY AREA RAPID TRANSIT DISTRICT

RAIL TRANSIT SAFETY SECTION
RAIL TRANSIT AND CROSSINGS BRANCH
CONSUMER PROTECTION AND SAFETY DIVISION
CALIFORNIA PUBLIC UTILITIES COMMISSION
505 VAN NESS AVENUE
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Final Report

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Consumer Protection and Safety Division

2010 TRIENNIAL ON-SITE SAFETY REVIEW
BAY AREA RAPID TRANSIT DISTRICT

ACKNOWLEDGEMENT

The California Public Utilities Commission's Rail Transit Safety Section (RTSS) conducted this system safety program review. Staff members directly responsible for conducting safety review and inspection activities are:

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TABLE OF CONTENTS

Page

1. EXECUTIVE SUMMARY 1

2. INTRODUCTION 2

3. BACKGROUND 3

    BART Rail System Description 3

    BART 2006 Triennial Review Recommendations Status 4

4. SAFETY REVIEW PROCEDURE 5

5. FINDINGS AND RECOMMENDATIONS 6

APPENDICES

A. Abbreviation and Acronym List 13

B. BART 2010 Triennial Safety Review Checklist Index 14

C. BART 2010 Triennial Safety Review Recommendations List 15

D. BART 2010 Triennial Safety Review Checklists 16

1. EXECUTIVE SUMMARY

The California Public Utilities Commission's (Commission) Consumer Protection and Safety Division (CPSD), Rail Transit Safety Section staff (Staff), conducted an on-site system safety program review of the Bay Area Rapid Transit District (BART) in May 2010.

The on-site review was preceded by an opening conference with BART personnel on May 10, 2010. Staff conducted the 2010 BART on-site safety review from May 10 through May 21, 2010. The review focused on verifying the effective implementation of the System Safety Program Plan (SSPP).

Staff held a post-review conference with BART personnel on June 1, 2010. Staff provided BART personnel with a synopsis of the preliminary review findings and preliminary recommendations for corrective actions.

The review results indicate that BART has a comprehensive system safety program and has effectively implemented its SSPP. However, staff noted exceptions during the review. These exceptions are described in the Findings and Recommendations sections of each checklist. Staff made 8 recommendations for corrective actions as described in the 32 checklists. These are distributed among the following departments: Transportation, Maintenance and Engineering, and System Safety.

The Introduction and Background Sections of this report are presented in Section 2 and 3 respectively. The Background Section contains a description of the BART rail system and a status of the corrective actions resulting from the 2006 on-site safety review recommendations. Section 4 describes the review procedure. The review findings and recommendations are listed in Section 5. The 2010 BART Triennial Safety Review Acronyms List is found in Appendix A, Checklist Index in Appendix B, Recommendations List in Appendix C and Review Checklists in Appendix D.

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) 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 a review of each rail transit agency's system safety program at a minimum of once every three years. The purpose of the triennial review is to verify compliance and evaluate the effectiveness of each rail transit agency's System Safety Program Plan (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 safety review of BART in August 2006.

Staff advised BART General Manager by a letter dated on January 27, 2010 of the scheduling of the Commission's safety review on May 10-21, 2010. The letter included 32 checklists that served as the basis for the review. Six of the 32 checklists outlined inspection of track, operation, signals, electric power systems, and vehicles. The remaining 26 checklists focused on the verification of the effective implementation of the SSPP.

Staff conducted an opening conference on May 10, 2010 with BART General Manager, Assistant General Manager of Operations, Executive Manager of Transit System Compliance, and BART Chief Officers.

Staff conducted the on-site safety inspections and records review during May 10-21, 2020. At the conclusion of each review activity, staff provided BART personnel a verbal summary of the preliminary findings and discussed preliminary recommendations for corrective actions.

On June 1, 2010, staff conducted a post-review exit meeting with BART's executive and department managers. Staff provided the attendees a synopsis of the non-compliant findings from the 32 checklists and discussed the need for corrective actions where applicable.

3. BACKGROUND

The Bay Area Rapid Transit District (BART) began operation on September 11, 1972 with 28 miles of track in Alameda County, servicing from Oakland to Fremont. The second segment opened on January 29, 1973, with 12 miles of track extending the service from Fremont to Richmond. The third segment opened on May 21, 1973, with 17 additional miles of track marking the opening of the Concord Line. On November 5, 1973, service began between Montgomery Street Station in downtown San Francisco and Daly City Station, adding another 7.5 miles of track to the system. Transbay service began on September 16, 1974, bringing the full 71.5 miles of track into service. On May 27, 1976, the Embarcadero Station officially opened for revenue service, bringing the total station count to 34. The Embarcadero Station added no additional track miles.

Additional Extensions

The extension to North Concord/Martinez Station opened on December 16, 1995, adding 2.25 miles of track north of the Station. On February 24, 1996, Colma Station opened for revenue service, adding 1.6 miles of track south of the Daly City Station. The Pittsburg/Bay Point Station was the next to be opened for revenue service on December 7, 1996, completing a 7.8-mile segment of the Pittsburg/Antioch Extension from the Concord Station. The Dublin/Pleasanton extension opening followed on May 10, 1997, adding 14 miles of track and two stations to the system. The San Francisco Airport extension opened on June 22, 2003 adding four stations and 8.7 miles of track. Currently, the system operates five lines on 104 miles of track with 43 stations.

The BART system operates five lines. These are:

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

Current Extensions in planning/construction

Warm Springs Extension

The Warm Springs Extension Project will add 5.4 miles of track, extending BART's railway system from the Fremont Station to the Warm Springs Station in South Fremont. Staff has reviewed and the Commission has approved the Safety and Security Certification Plan for this project in its Resolution ST-80.

Santa Clara Valley Transportation Authority/Silicon Valley Rapid Transit Project

The Santa Clara Valley Transportation Authority/Silicon Valley Rapid Transit Project (VTA/SVRT Project) is a 16.3-mile extension beginning at the Warm Springs BART Station in South Fremont, extending along the Union Pacific Railroad line to Milpitas and then continues on to 28th and Santa Clara Streets in San Jose. The extension will then proceed underground through Downtown San Jose to the Diridon Caltrain Station. The BART extension will then turn north under the Caltrain line and terminate at the Santa Clara Station. Staff has reviewed and the Commission has approved the Safety and Security Certification Plan for this project in its Resolution ST-83.

Status of the 2006 BART Triennial Review Recommendations

Staff performed the previous triennial on-site safety review in August 2006. Staff made twelve recommendations for corrective actions out of the thirty-three checklists. Results of the Year 2006 review demonstrated that BART was in compliance with its SSPP.

CPUC Commission Resolution ST-87 adopted staff's final report and ordered BART to develop appropriate corrective action plan and implementation schedule to respond to the issued recommendations. Resolution ST-87 also ordered BART to submit quarterly status reports tracking the implementation of these corrective actions through full completion.

BART developed and submitted a corrective action plan and an implementation schedule to fulfill each of the twelve recommendations. On January 19, 2010, BART submitted its final 2006 CPUC Safety Audit Quarterly Status Report completing its last corrective action in compliance with Commission Resolution ST-87.

4. SAFETY REVIEW PROCEDURE

Staff conducted the 2010 safety review in accordance with Rail Transit Safety Section Procedure RTSS-4, *Procedure for Performing Triennial Safety Audits of Rail Transit Systems*. Staff developed thirty-two (32) checklists to cover various aspects of system safety responsibilities, based on Commission and FTA requirements, BART SSPP, safety-related BART documents, and the knowledge of Staff of BART operations. A list of the 32 checklists is contained in Appendix B.

Each checklist identified safety-related elements and characteristics that were either inspected or reviewed by staff. The completed checklists include the findings of Staff and recommendations corresponding to non-compliant findings with the SSPP of BART, its procedures, and/or Commission regulations. The methods used to perform the review included:

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

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

5. FINDINGS AND RECOMMENDATIONS

The triennial on-site safety review shows that the BART rail system has a comprehensive SSPP and has been effectively implementing that plan. Review findings identify areas where changes should be made to further improve the SSPP. The review results are derived from activities observed, documents reviewed, issues discussed with management, and field inspections. Overall, the review result confirms that BART is in compliance with its SSPP. The review identified eight (8) recommendations from the 32 checklists. Following are the findings and recommendations for each checklist:

1. **Executive Management Involvement and Commitment to Safety**

   No findings of non-compliance; no recommendations.

2. **Hazard Management and Safety Data Acquisition Analysis**

   No findings of non-compliance; no recommendations.

3. **Safety and Security Certification Plan (WSX, eBART Platform Transfer, L20 West Dublin Station, SVRT, Earthquake Reconstruction, Vehicle Procurement)**

   No findings of non-compliance; no recommendations.

4. **Accident Reporting and Investigation**

   No findings of non-compliance; no recommendations.

5. **Emergency Response Management, Planning, and Training**

   No findings of non-compliance; no recommendations.

6. **Internal Safety and Security Audit Program**

   No findings of non-compliance; no recommendations.

7. **Operating Rules and Procedures Manual and Operating Bulletins Review**

   No findings of non-compliance; no recommendations.

8. **Operation Safety Compliance Program Inspection – CPUC Operations Inspector**

   Several on duty BART train operators were observed by a CPUC inspector not to be in possession of all the required safety equipment and operating documentation in violation of Section 1100 of the BART Operation Rules and Procedures Manual.

   Recommendation:

   BART should take appropriate measures to verify adherence of its train operators with all BART Operations Rules and Procedures Manual elements and develop the controls necessary to alert management when full compliance is not achieved. (OR&P 1000)

9. **Train Operator, Line Supervisor, and Central Control Supervisor Training and Recertification**

   No findings of non-compliance; no recommendations.

10. **Hours of Service**

    No findings of non-compliance; no recommendations.

11. **Bridges/Aerial Structures**

    No findings of non-compliance; no recommendations.

12. <u>Track, Switch, and Turnout Inspection - CPUC Track Inspector</u>

A BART hi-rail vehicle operator was observed by a CPUC inspector listening to the vehicle radio while obtaining permission to occupy track in violation of Section 1331 of the BART Operating Rules and Procedures Manual.

Recommendation:

BART should take appropriate measures to verify adherence of its wayside workers with all BART Operations Rules and Procedures Manual and Wayside Safety Program elements and develop the controls necessary to alert management when full compliance is not achieved. (OR&P 1000)

13. <u>Heavy Rail Vehicle Inspection - CPUC Equipment Inspector</u>

No findings of non-compliance; no recommendations.

14. <u>Traction Power Substation Inspection (Electrical Substation and Gap breaker) - CPUC Electrical Generation Inspector</u>

No findings of non-compliance; no recommendations.

15. <u>Signal Communication Inspection - CPUC Signal Inspector</u>

A BART maintenance crew did not fill out the Simple Form 1589 on May 16 and 17, 2010 prior to performing work on the wayside.

Recommendation:

BART should take appropriate measures to verify adherence of its wayside workers with all BART Operations Rules and Procedures Manual and Wayside Safety Program elements and develop the controls necessary to alert management when full compliance is not achieved. (Form 1589)

(Identical Recommendation as Checklist #12)

16. <u>GO 95 Right of Way Inspection (Fencing, Warning Signs, Structures, Vegetation, Cover board) - CPUC USRB Utilities Engineer</u>

No findings of non-compliance; no recommendations.

17. <u>Track and Turnout Maintenance Review</u>

Some track maintenance documentation was missing relevant information and others requiring verification were not approved in the appropriate time in violation of the BART Maintenance Program requirements.

Recommendation:

BART should clarify its Track Maintenance Program processes ensuring that all program forms are comprehensively completed and appropriately signed off and all noted defects are clearly identified and tracked to timely completion. (SSPP Chapter 15)

18. <u>Track Maintenance Training and Certification</u>

No findings of non-compliance; no recommendations.

19. <u>Heavy Rail Vehicle Preventative Maintenance</u>

No findings of non-compliance; no recommendations.

20. <u>Secondary Vehicle Train Control Equipment Maintenance and Test</u>

No findings of non-compliance; no recommendations.

21. <u>Non Revenue Vehicle Maintenance</u>

Some vehicle maintenance documentation was missing relevant information and others showed that several vehicles surpassed the required inspection frequencies in violation of the BART Maintenance Program requirements.

Recommendation:

BART should develop the controls necessary to alert management when the Non-Revenue Vehicle Maintenance Program requirements are not carried out per the required frequencies and documentation guidelines. (SSPP Chapter 15)

22. <u>Traction Power Substation Inspection (Electrical Substation and Gapbreaker) Review</u>

No findings of non-compliance; no recommendations.

23. <u>GO 95 Right of Way Maintenance (Fencing, Warning Signs, Structures, Vegetation, Cover board) Review</u>

No findings of non-compliance; no recommendations.

24. <u>Train Control and Communication Equipment Maintenance Review</u>

Several vital relay Work Orders were not closed out in violation of the BART Vital Relays Preventative Maintenance Procedures.

Recommendation

BART should develop the controls necessary to alert management when vital relay work orders are not closed out in a timely manner as required by the BART Vital Relays Preventative Maintenance Procedure. (Book 20)

25. <u>Drug and Alcohol Testing and Worker Fit for Duty</u>

No findings of non-compliance; no recommendations.

26. <u>Fire Emergency Systems (Ventilation, Sprinkler System, Wet Stand Pipe, Under-Car Deluge)</u>

No findings of non-compliance; no recommendations.

27. <u>Electrical Maintenance Training and Certification</u>

Two of the employees selected from the Power and Mechanical Maintenance employees selected did not meet the certification requirements (Section 3.4.1 of the BART Employee Certification Plan).

Recommendation:

BART should take appropriate actions to ensure that all electricians and foreworkers meet their training and certification requirements. (BART Employee Certification Plan)

28. <u>Configuration Management and System Modification</u>

The Capital Investment Committee (CIC), as stated in System Safety Program Plan, Revision 8, dated February 1, 2008, Chapter 17, Configuration

Management, under 1702 Process for Change, no longer exists.

Recommendation:

BART should identify and remove programs and committees which are no longer applicable from its SSPP in its next revision. (SSPP 1702)

29. <u>Employee Safety - Injury and Illness Prevention Program</u>

Two of the employees selected from the Maintenance and Engineering Department did not meet the safety training requirements appropriate to their classification in violation of the BART Injury and Illness Prevention Program Plan.

Recommendation:

BART should take necessary actions to ensure all its Maintenance and Engineering employees receive their required safety training as appropriate to their classification. (BART Injury and Illness Prevention Program Plan)

30. <u>Contractor Safety Preparation and Coordination</u>

No findings of non-compliance; no recommendations.

31. <u>Hazardous Materials Management Program</u>

The Environmental Management System (EMS), a set of processes to analyze, control, and reduce environmental impacts, has been put on "Hold" since 2006 and has not been implemented in accordance to the SSPP, Revision 8, dated February 1, 2008, Chapter 5.

Recommendation:

BART should identify and remove programs and committees which are no longer applicable from its SSPP in its next revision. (SSPP 1702)

(Identical Recommendation as Checklist #28)

32. <u>Procurement</u>

No findings of non-compliance; no recommendations.

APPENDICES

A. Abbreviation and Acronym List

B. BART 2010 Triennial Safety Review Checklist Index

C. BART 2010 Triennial Safety Review Recommendations List

D. BART 2010 Triennial Safety Review Checklists

APPENDIX A

ABBREVIATION and ACRONYM LIST

Abbreviation / Acronym	Description
ATC	Automatic Train Control
BART	Bay Area Rapid Transit District
BPD	BART Police Department
CAP	Corrective Action Plan
CFR	Code of Federal Regulations
Commission	California Public Utilities Commission
CPSD	Consumer Protection and Safety Division
CPUC	California Public Utilities Commission
FTA	Federal Transit Administration
GO	General Order
HOS	Hours of Service
IIPP	Injury and Illness Prevention Program
ISSA	Internal Safety and Security Audit
OCC	Operations Control Center
PHA	Preliminary Hazard Analysis
PM	Preventive Maintenance
RTCB	Rail Transit and Crossing Branch
RTSS	Rail Transit Safety Section
SAP	Substance Abuse Professional
SCRC	Safety Certification Review Committee
SCP	Safety Certification Plan
SCVR	Safety Certification Verification Report
SSP	System Security Plan
SSPP	System Safety Program Plan
Staff	Consumer Protection and Safety Division personnel

APPENDIX B
2010 BART TRIENNIAL SAFETY REVIEW CHECKLIST INDEX

Checklist No.	Element / Characteristic	Checklist No.	Element / Characteristic
1	Executive Management Involvement and Commitment to Safety	17	Track and Turnout Maintenance Review
2	Hazard Management and Safety Data Acquisition Analysis	18	Track Maintenance Training and Certification
3	Safety and Security Certification	19	Heavy Rail Vehicle Preventative Maintenance
4	Accident Reporting and Investigation	20	Secondary Vehicle Train Control Equipment Maintenance and Test
5	Emergency Response Management, Planning, and Training	21	Non Revenue Vehicle Maintenance
6	Internal Safety Audit Program	22	Traction Power Substation Maintenance Review
7	Operations Safety Compliance Program Review	23	GO 95 Right of Way Maintenance Review
8	Operation Safety Compliance Program Inspection – CPUC Operations Inspector	24	Train Control (Wayside) Equipment Maintenance and Tests
9	Train Operator, Line Supervisor, and Central Control Supervisor Training and Recertification	25	Drug and Alcohol Testing and Worker Fit for Duty
10	Hours of Service	26	Fire Emergency Systems
11	Bridges/Aerial Structures	27	Electrical Maintenance Training and Certification
12	Track, Switch, and Turnout Inspection - CPUC Track Inspector	28	Configuration Management and System Changes
13	Heavy Rail Vehicle Inspection - CPUC Equipment Inspector	29	Employee Safety - Injury and Illness Prevention Program
14	Traction Power Substation Inspection	30	Contractor Safety Preparation and Coordination
15	Signal Communication Inspection - CPUC Signal Inspector	31	Hazardous Materials Management Program
16	GO 95 Right of Way Inspection	32	Procurement

APPENDIX C

2010 BART TRIENNIAL SAFETY REVIEW RECOMMENDATIONS LIST

No.	Recommendation	Checklist No.
1	BART should take appropriate measures to verify adherence of its train operators with all BART Operations Rules and Procedures Manual elements and develop the controls necessary to alert management when full compliance is not achieved. (OR&P 1000)	8
2	BART should take appropriate measures to verify adherence of its wayside workers with all BART Operations Rules and Procedures Manual and Wayside Safety Program elements and develop the controls necessary to alert management when full compliance is not achieved. (OR&P/Form 1589)	12, 15
3	BART should clarify its Track Maintenance Program processes ensuring that all program forms are comprehensively completed and appropriately signed off and all noted defects are clearly identified and tracked to timely completion. (SSPP Chapter 15)	17
4	BART should develop the controls necessary to alert management when the Non-Revenue Vehicle Maintenance Program requirements are not carried out per the required frequencies and documentation guidelines. (SSPP Chapter 15)	21
5	BART should develop the controls necessary to alert management when vital relay work orders are not closed out in a timely manner as required by the BART Vital Relays Preventative Maintenance Procedure. (Book 20)	24
6	BART should take appropriate actions to ensure that all electricians and foreworkers meet their training and certification requirements. (BART Employee Certification Plan)	27
7	BART should identify and remove programs and committees which are no longer applicable from its SSPP in its next revision. (SSPP)	28, 31
8	BART should take necessary actions to ensure all its Maintenance and Engineering employees receive their required safety training as appropriate to their classification. (BART Injury and Illness Prevention Program)	29

APPENDIX D

2010 BART TRIENNIAL SAFETY REVIEW CHECKLISTS

2010 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR BAY AREA RAPID TRANSIT DISTRICT

Checklist No.	**1**	Subject	Executive Management Involvement and Commitment to Safety
Date of Review	**May 10, 2010**	Department(s)	Executive Managers (Operations and Transit System Compliance) System Safety
Reviewers/ Inspectors	**Georgetta Gregory Anton Garabetian**	Person(s) Contacted	**Dorothy Dugger (General Manager) Paul Oversier (Assistant General Manager of Operations) Len Hardy (Chief Safety Officer) Thomas Parker (Transit System Compliance)**

REFERENCE CRITERIA

1. General Order 164-D: Section 3.2 Rules a, b, d, e; Section 3.5
2. System Safety Program Plan Revision No. 8, Dated February 1, 2008: Chapters 1-5

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

Executive Management Involvement and Commitment to Safety

Conduct the necessary interviews of executive management as necessary to evaluate the scope of Management involvement, coordination, and communication for improving the System Safety Program Plan. Specific commitments of review should include the following tasks:

1. Determine the source, frequency, and depth of safety information provided to the General Manager
2. Determine the methods and incentives included in the management performance system to facilitate a system safety culture within the organization.
3. Determine the involvement of management in accident/hazardous condition investigations and corrective actions.
4. Determine the level where key safety and security decisions are made and the involvement of the management team in these decisions.
5. Determine the level and depth of Management review and follow-up on corrective actions, including those initiated by accidents, hazardous conditions, internal audits, and triennial audits.

RESULTS/COMMENTS

Activities:

Staff interviewed BART General Manager, Operations Manager, Transit System Compliance Manager, and Chief Safety Officer to determine BART management involvement, coordination, and communication to improve System Safety and Security Programs.

Findings:

1. The General Manager receives the following information regarding safety and security

issues:

a. Quarterly reports on incidents statistics
b. Corrective Action Plans (CAPs) reports
c. These reports, alongside the incident trends are presented quarterly to the BART Board.

2. The Assistant General Manager of Operations holds weekly meetings with BART executive managers including attendance from the Chief Safety Officer to discuss the following issues:
   a. Safety and security
   b. Threat and vulnerability assessments
   c. Accidents and hazard condition investigations
   d. Corrective actions
3. BART management promotes safety through analysis of "what could have happened" in incidents which occur at BART and other rail transit agencies. This is BART's approach to a safety culture with informal and subtle safety promotion recognition instead of using monetary incentives.

Recommendation:

None

2010 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR BAY AREA RAPID TRANSIT DISTRICT

Checklist No.	**2**	Subject	Hazard Management and Safety Data Acquisition Analysis
Date of Review	**May 14, 2010**	Department(s)	System Safety
Reviewers/ Inspectors	**Rupa Shitole**	Person(s) Contacted	**David Sanborn (Manager, Environmental, Health and Safety)** **Jeffrey Lau (Manager of Operations Safety)**

REFERENCE CRITERIA

1. General Order 164-D: Section 3.2 Rules f, i
2. System Safety Program Plan Revision No. 8, Dated February 1, 2008: Chapters 6 and 9

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

Hazard Management and Safety Data Acquisition Analysis

Interview the BART representative and review appropriate records to determine whether or not:

1. BART has an acceptable process for managing hazards to its system which is coordinated with other important activities such as accident/incident investigation and safety data collection and analysis.
2. The above process was followed to identify, categorize, and bring hazards down to acceptable levels of risk (provide specific examples).
    a. Hazard analysis and reports are completed and performed on a periodic basis
    b. Hazards identification notification should include but are not limited to
        - Equipment failure
        - Rule and procedure violations
        - Unauthorized entry into the right of way
3. BART has a documented process for the collection and analysis of unsafe trends due to external uncontrollable factors that may impact the system's operations
4. The process was followed for identifying safety issues and resulted in recommendations that were implemented

RESULTS/COMMENTS

Activities:

Staff interviewed BART representatives from System Safety in charge of Hazard Management and Safety Data Acquisition & Analysis. BART staff provided the following information on managing hazards, collecting and analyzing safety data:

Staff requested and reviewed the following documents and records:

1. Safety Notice Running Log dated April 2010
2. BART Safety Notice (Form No. 0836) records

3. Quarterly Operations Safety Statistics Worksheet for fourth quarter of calendar year 2009.
4. Quarterly Safety Statistics Data from year 2000 to 2010.
5. Quarterly Safety Statistics Reports dated April 29, 2008, July 25, 2008, October 22, 2008, January 29, 2009, March, 31, 2009, July 21, 2009, October 29, 2009, and January 20, 2010.
6. Accident-Injury Reports for year 2009 from Civic Center Station – CCS/M40 folder.
7. Accident-Injury Reports for year 2009 from Coliseum Station – COS/A30 folder.
8. UOR #080 for year 2009 that was related to an Object vs. Train incident on 8/07/09.
9. UOR #037 for year 2010 that related to Person vs. Train incident on 4/14/10.

Findings:

1. Hazard analysis and reports are created by System Safety on the Operation side and by Engineering Department for new projects and system modifications.
2. BART Safety Statistics Reports are issued quarterly that show collected data in graphic format. The data is presented in three sections:
    a. Patron Safety Statistics
    b. Employee Safety Statistics
    c. Operations Safety Statistics
3. Data presented in the BART Safety Statistics Report is received from the following sources:
    a. Employee Injury and Illness Reports
    b. Patron Accident Reports
    c. Rules and Procedure Violations
    d. Unusual Occurrence Reports (UORs)
    e. BART Safety Notices (BSNs) (Form No. 0836)
4. System Safety notifies CPUC of hazards considered as “unacceptable” according to the Hazard Resolution Matrix of the SSPP, Chapter 6.

Recommendation:

None

2010 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR BAY AREA RAPID TRANSIT DISTRICT

Checklist No.	**3**	Subject	Safety and Security Certification
Date of Review	**May 11, 2010**	Department(s)	System Safety
Reviewers/ Inspectors	**Jimmy Xia**	Person(s) Contacted	**Mark Chan (Manager of Engineering Safety)** **Mark Dana (System Safety Senior Engineer)** **Joshua Teo (System Safety Engineer)**

REFERENCE CRITERIA

1. General Order 164-C: Section 7-8
2. General Order 164-D: Section 3.2 Rule h; Section 11
3. System Safety Program Plan Revision No. 8, Dated February 1, 2008: Chapters 7-8
4. Safety Certification Plan for Warm Springs Extension Project (WSX) Revision No. 0, Dated August 30, 2005
5. Safety Certification Plan for L20 West Dublin/Pleasanton Station Revision No. 0, Dated January 4, 2007
6. Safety Certification Plan for Earthquake Safety Project Revision No. 0, Dated September 1, 2005
7. Safety Certification Plan for Central Contra Costa County Crossover Project (CCCCCP) Revision No. 0, Dated March 27, 2009
8. BART Facilities Standards

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

Safety and Security Certification

Interview the BART representative in charge of the Safety Certification Program and review the BART Safety Certification conformance criteria and any other supporting documents for current or planned projects to determine whether or not:

1. The Safety Certification Program is in conformance with the General Order 164-D
2. Effective communications and liaison with CPUC staff throughout the life of the project
3. All identified hazards have been eliminated or controlled as required under the Safety Certification Plans
4. Submittal elements for Safety Certified projects were identified for the Safety Certification Verification Report and submitted to the CPUC in a timely manner
5. The BART Facilities Standards is sufficient for design specifications

RESULTS/COMMENTS

Activities:

Staff interviewed the BART representatives in charge of the Safety Certification Program and reviewed the BART Safety Certification conformance criteria and other supporting documents as mentioned below for the following four projects.

1. Warms Springs Extension Project (WSX):
    a. Safety and Security Review Committee Meeting minutes, sign-in sheets, and

agendas for the following dates:

i. 10/22/09

ii. 1/21/10

iii. 3/25/10

b. BART's Preliminary Hazard Assessment Report dated June 2005.

c. WSX BART Facilities Standards Conformance Checklist Final Design for Certifiable Element A – Guideway

2. L20 West Dublin/Pleasanton Station Project:

a. Safety and Security Review Committee Meeting minutes, sign-in sheets, and agendas for the following dates:

i. 11/16/09

ii. 1/25/10

iii. 3/22/10

b. BART's Certificate of Conformance for Hazard Analysis for the West Dublin Station signed between 6/13/08 and 8/4/08.

c. Preliminary Hazard Analysis (PHA) Report dated 5/21/08.

d. Two letters dated 6/9/08 and 6/10/08 from Shimmick Construction Co., Inc., to BART stating that Shimmick confirmed all the identified hazards from the PHA are resolved from the design standpoint.

3. Earthquake Safety Program (ESP) Project:

a. BART contract matrix, dated 5/5/10 that shows the project progress for twenty contracts. Five of the twenty contracts are now complete.

b. Rockridge station records

i. Signed Certificates of Conformance for certifiable factor #1 dated 4/15/09

ii. Signed Certificates of Conformance for certifiable factors #2 and #3 dated 1/26/10

iii. BART's letter to the CPUC dated 2/17/10 requesting approval for safety certification of the Rockridge Station portion of the ESP

iv. CPUC's letter dated 3/9/10 approving the safety certification of the Rockridge Station portion of the ESP.

4. Central Contra Costa County Crossover Project (CCCCCP):

a. Safety and Security Review committee meeting minutes, sign-in sheets, and agendas for three meetings

b. CPUC's State Safety Oversight Plan (SSOP), revision 0 dated 7/15/09.

<u>Findings:</u>

1. The Safety Certification Program for the WSX, L20, and ESP projects is in conformance with the General Order (GO) 164-C. The Safety Certification Program for the CCCCCP is in conformance with GO 164-D.

2. BART maintains effective communications with CPUC staff throughout the lifecycle of the WSX, L20, and CCCCCP projects by inviting the CPUC to the WSX Safety/Security Certification Program Committee Meetings, the L20 Safety and Security Review Committee Certification Program Tracking Meetings, and the Safety Certification Meetings for the CCCCCP by email.

3. Preliminary Hazard Assessments
    a. General Engineering Consultant (GEC) was responsible for the Preliminary Hazard Assessment report of the Warms Springs Extension Project (WSX) and had verified in design that all identified hazards have been eliminated or controlled as required under the SC Plan.
    b. Shimmick Construction Co., Inc. was responsible for the Preliminary Hazard Assessment report for the L20 West Dublin/Pleasanton Station Project and had verified in design that all identified hazards have been eliminated or controlled as required under the SC Plan.
    c. BART has assigned engineers for the PHA report and Hazard Analysis Review Committee meetings/workshops for the Earthquake Safety Program (ESP) Project. All the contractors confirmed that all the identified hazards from the PHA's have been eliminated or controlled as required under the SC Plan for this project.
4. All four projects are based off of the BART Facilities Standards (BFS) version 1.2 dated 7/1/04. BART completed the latest revision of the BFS version 2.1, dated 10/2/09. The standards apply to all the projects as mentioned in this checklist.

<u>Recommendations</u>

None

2010 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR BAY AREA RAPID TRANSIT DISTRICT

Checklist No.	**4**	Subject	Accident Reporting and Investigation
Date of Review	**May 12, 2010**	Department(s)	System Safety
Reviewers/ Inspectors	**Vincent Kwong**	Person(s) Contacted	**Jeffrey Lau (Manager of Operations Safety)**

REFERENCE CRITERIA

1. General Order 164-C: Section 5
2. General Order 164-D: Section 3.2 Rule j; Section 7-9
3. System Safety Program Plan Revision No. 8, Dated February 1, 2008: Chapter 10

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

Accident Reporting and Investigation

Interview BART representatives directly involved in accident reporting and review appropriate documentation since 2006 to determine whether or not:

1. Operations Unusual Occurrence Reports are routinely evaluated, significant safety concerns identified, and follow up investigations conducted.
2. Monthly corrective action status reports are updated and submitted to the CPUC
3. Both BART Safety and BART Police are present to investigate accidents on site.

Interview BART representatives and review at least four reportable accident reports submitted to the CPUC since 2006 to determine whether or not:

1. All accidents meeting the requirements of General Order 164-C or General Order 164-D were reported to the CPUC within the required time
2. The accident investigation activities and reports were in accordance with the reference criteria
3. The most probable cause was identified and supported by findings.
4. Recommendations from BART System Safety for corrective actions are reviewed by the responsible persons and implemented into corrective action plans in a timely manner.
5. Corrective action plans are submitted to CPUC for approval and tracked until completion.

RESULTS/COMMENTS

Activities:

Staff interviewed the BART Manager of Operations Safety and reviewed the following records for Unusual Occurrence Reports, BART Police Department Reports, and notification data pertaining to both General Order 164-C as well as General Order 164-D:

1. Staff selected and reviewed 3 sample Unusual Occurrence Reports for each year from January 2006 to May 2010. In the following reviewed incidents, all those which met the CPUC accident reporting threshold as defined by General Order 164-C and General Order 164-D were reported as required.
    a. 2006 – 12/27/06; 8/18/06; 1/17/06

b. 2007 – 1/6/07; 10/28/07; 10/29/07
c. 2008 – 12/29/08; 7/22/08; 4/5/08
d. 2009 – 7/16/09 (reported to CPUC); 1/19/09; 4/23/09
e. 2010 – 3/17/10; 3/20/10; 5/5/10 (reported to CPUC)

2. Staff selected and reviewed all Form Vs from January 2006 to April 2010. These were submitted monthly to CPUC containing all tracked open and closed corrective action plans.
3. Staff selected the following six reported accidents and inquired whether the BART Police Department was involved as part of the investigation.
    a. 12.1.06 BART A05 Interlocking Derailment - BART PD Case #0612-0074
    b. 12/16/07 BART Daly City Yard Collision - BART PD was not involved
    c. 6.5.07 BART M17 Embarcadero and Montgomery Stations – Fire – BART PD was involved
    d. 8.16.08 BART Civic Center Station – Suicide - BART PD Report #0808-1907
    e. 7.16.09 BART L20 Collision Contractor - BART Police Report #0907-1762
    f. 12.20.09 BART Bay Fair Station – Injury - BPD #0912-209
4. Staff selected and reviewed all reportable incidents from 2006 to 2010 to verify if they were reported within 4 hours of occurrence per General Order 164-C for incidents prior to May 3, 2007 and 2 hours of occurrence per General Order 164-D thereafter.
5. Staff selected and reviewed the following six accident investigation reports which were investigated on the CPUC's behalf:
    a. 8/22/06 – Fatality at Union City Station
    b. 12/1/06 – A05 Interlocking Derailment
    c. 3/31/07 – Balboa Park Station Wayside Fire
    d. 6/5/07 – M17 Embarcadero and Montgomery Stations Fire
    e. 5/10/08 – Hayward Yard Fire
    f. 8/07/09 – Concord Collision Debris

<u>Findings:</u>

1. The BART Police Department is dispatched by the Operations Central Control as necessary to investigate all reported accidents on the BART system.
2. The following incidents were reported to CPUC past the required 2 hour notification under General Order 164-D, Section 7.1:
    a. 6/5/07 – M17 Embarcadero and Montgomery Stations Fire
    b. 9/1/08 – Circuit Breaker Failure at ASH Substation
    c. 11/27/08 – A85 Hi Rail Vehicle Derailment
    d. 1/1/09 – Fruitvale Shooting Fatality
    e. 1/31/09 – Circuit Breaker Tripping at RRI Substation
    f. 8/7/09 – Debris Collision MP 16.02 on C2 Line
    g. 11/1/09 – Union City Station Collision
    h. 3/6/10 – Spruce Ave Auxiliary Substation SSF Fire

    It should be noted that most of these incidents are minor and were reported within three hours and at most within one day due to delayed damage estimates. BART System Safety recognizes this issue and will develop its program to meet the two hour reporting requirement.
3. Accident investigation reports prepared during Yr 2006 to 2010 were found to be in accordance with the requirements of the reference criteria and contained the necessary

identified probable causes, recommendations, and corrective actions. <u>Recommendation:</u> None

2010 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR BAY AREA RAPID TRANSIT DISTRICT

Checklist No.	**5**	Subject	Emergency Response Management, Planning, and Training
Date of Review	**May 20, 2010**	Department(s)	System Safety
Reviewers/ Inspectors	**Erik Juul**	Person(s) Contacted	**Ni Lee (Safety Specialist)**

REFERENCE CRITERIA

1. General Order 164-D: Section 3.2 Rule k
2. System Safety Program Plan Revision No. 8, Dated February 1, 2008: Chapter 11
3. Emergency Plan, Dated May 2008
4. 49 CFR Part 659, Section 659.23

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

Emergency Response Management, Planning, and Training

Interview BART representative responsible for Emergency Response Management, Planning, and Training program and review records and documentation for the last three years to determine whether or not:

1. The Emergency Plan is reviewed and revised as necessary by the Safety Department on an annual basis. All revisions will be approved by the Chief Safety Officer, the BART Police Chief, the AGM for Operations, and the General Manager.
2. Regularly scheduled meetings are conducted with appropriate external agencies (local, state, and federal agencies) to coordinate emergency response planning
3. Mutual aid agreements or memorandum of understandings are established with external agencies
4. Emergency drills that included tabletop and practical exercises were planned and carried out with the involvement of appropriate external agencies
5. Training is made available to all relevant emergency response agencies in the areas where BART operates.
6. All drills were performed regularly and any deficiencies or participant critiques were documented, scheduled and tracked to completion.
7. Emergency planning addresses both accidental emergencies as well as security related emergencies.
8. The SSPP describes or references how BART documents the results of its emergency preparedness evolutions (i.e. briefings, after action report recommendation/findings and corrective actions
9. Communications systems are tested for interoperability with appropriate emergency response agencies

RESULTS/COMMENTS

Activities:

Staff interviewed the BART representative responsible for Emergency Response Management,

Planning, and Training Program. Staff also reviewed the following records from 2007 to 2010:

1. Emergency Plan
2. Memorandum of Understandings
3. Drill Schedule for 2008, 2009, and 2010
4. After Action Reports

Findings:

1. The Emergency Plan was reviewed on the following dates:
    a. 1/16/07
    b. 12/26/07 – The Emergency Plan was updated in 2008 with approval from the Chief Safety Officer, the BART Police Chief, the Assistant General Manager for Operations, and the General Manager
    c. 2/13/09
    d. 2/4/10
2. Regularly scheduled meetings were conducted with appropriate external agencies (local, state, and federal agencies) to coordinate emergency response planning. BART held quarterly Rapid Transit Fire Liaison meetings from 2007 to 2010 with representatives of the fire departments.
3. A Memorandum of Understanding dated October 2007 between BART and the San Francisco Metropolitan Transportation Authority (SFMTA) coordinates ventilation fan activation and train movement at joint use stations (Embarcadero, Montgomery Street, Powell Street, and Civic Center).
4. Emergency drills that included tabletop and practical exercises were planned and carried out with the involvement of appropriate external agencies. The following are records of planned and performed drills at BART:
    a. 2008 – 15 drills performed
    b. 2009 – 4 drills performed
    c. 2010 – 6 drills planned
5. Training is available to all relevant emergency response agencies in the areas where BART operates. BART System Safety has encouraged the fire departments to participate in the emergency drills. BART System Safety accommodates any familiarization and drill request from the fire departments
6. BART performs drills regularly and any deficiencies or participant critiques were documented, scheduled and tracked to completion. Two fire exercises, on September 21, 2008 and February 28, 2010, which resulted in deficiencies were documented, scheduled and tracked to completion.
7. The After Action Report includes a description of the observations and identification of the weaknesses noted during the exercise. System Safety will evaluate After Action Report recommendations and implement corrective actions, where practical.
8. Communications systems are tested for interoperability with appropriate emergency response agencies. On the second Thursday of every month, BART System Safety conducts a Trans Bay Tube communications check with Oakland Fire Department and San Francisco Fire Department. Staff reviewed the documentation of these checks.

Recommendation:

None

2010 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR BAY AREA RAPID TRANSIT DISTRICT

Checklist No.	**6**	Subject	Internal Safety and Security Audit Program
Date of Review	**May 13, 2010**	Department(s)	System Safety
Reviewers/ Inspectors	**Steven Espinal**	Person(s) Contacted	**Jeffrey Lau (Manager of Operations Safety)**

REFERENCE CRITERIA

1. General Order 164-D: Section 3.2 Rule l, Section 4, Section 5
2. System Safety Program Plan Revision No. 8, Dated February 1, 2008: Chapter 12
3. System Security Plan, Dated February 2009
4. 49 CFR Part 659, Section 659.23

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

Internal Safety and Security Audit Program

Interview the BART representative in charge of the Internal Safety and Security Audit (ISSA) Program and review the audit reports for year 2007-2009 and determine whether or not:

1. All of the required safety and security program elements were covered within a three year audit cycle and in compliance with the SSPP and SSP. The audits were evaluated by qualified auditors who are independent from the first line of supervision responsible for performance of the activity being audited.
2. The ISSA reports were prepared with the General Manager's certification and submitted to the CPUC by February 15th of each year and corrective action plan recommendations were prepared, tracked and implemented in a timely manner.
3. Invitations were provided to CPUC for scheduled internal safety audits. Any changes to the schedule set for the year was also transmitted to the CPUC.
4. The findings, recommendations, and CAPs from the ISSA are evaluated and directed to the appropriate responsible persons with CAPs tracked until completion.

RESULTS/COMMENTS

Activities:

Staff interviewed BART's Manager of Operations Safety who oversees the Internal Safety and Security Audit Program. Staff also reviewed the following records and letters from 2007 to 2009:

1. Annual Internal Safety Audit Reports for 2008, 2009, and 2010.
2. CPUC Certification of BART's Compliance with System Safety Program Plan and System Security Program Plan
3. Letter of Approval from CPUC (G. Gregory) dated 2/1/2010

Finding:

1. BART has covered all the required elements and met the schedule for an Internal Safety Audit Program as required by GO164-D.

2. At the time of this review, there are four open corrective action plan items found in the 2009 Annual Internal Safety Audit Report that remain in an open status and are on schedule for closure in July 2010.

Recommendation:

None

2010 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR BAY AREA RAPID TRANSIT DISTRICT

Checklist No.	**7**	Subject	Operating Rules and Procedures Manual and Operating Bulletins Review
Date of Review	**May 10, 2010**	Department(s)	System Safety
Reviewers/ Inspectors	**Donald Filippi**	Person(s) Contacted	**Jeff Lau (Manager of Operations Safety)**

REFERENCE CRITERIA

1. General Order 164-D: Section 3.2 Rule m
2. System Safety Program Plan Revision No. 8, Dated February 1, 2008: Chapter 13
3. Operations Rules & Procedures Manual Revision No. 6.2, Dated January 2008
4. Train Operator Ride Check Program Report

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

Operating Rules and Procedures Manual and Operating Bulletins Review

Interview BART's representative responsible for Operation Rules and Procedures and review records and documentation for the last three years to determine whether or not:

1. Revisions or changes to the Operations Rules and Procedures Manual are performed systematically and distributed to the relevant personnel
2. Bulletins are issued in a timely manner and provided to train operators as necessary with adequate information for them to carry out their responsibilities safely and securely
3. Any submitted unusual occurrence reports regarding operations are reviewed and approved by the responsible person and addressed with the appropriate departments.
4. Any discrepancies and corrective actions were mitigated and tracked in a timely manner until completion
5. Bulletins and operating rules have been distributed to staff during the past 12 months and the process has been tracked.

RESULTS/COMMENTS

Activities:

Staff interviewed the BART representative responsible for Operation Rules and Procedures and reviewed the following records for the last three years:

1. Operations Rules and Procedures Manual
2. Operations Bulletins and Sign For's
3. Unusual Occurrence Reports

Findings:

No exceptions were noted.

Recommendations:

None

2010 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR BAY AREA RAPID TRANSIT DISTRICT

Checklist No.	**8**	Subject	Operation Safety Compliance Program Inspection
Date of Review	**May 10, 2010**	Department(s)	System Safety and Transportation – Rail Operations and Operations Central Control
Reviewers/ Inspectors	**Donald Filippi**	Person(s) Contacted	**Paul Liston (Transportation Supervisor)** **Ni Lee (Safety Specialist)**

REFERENCE CRITERIA

1. General Order 164-D: Section 3.2 Rules m
2. System Safety Program Plan Revision No. 8, Dated February 1, 2008: Chapter 13
3. Operations Rules & Procedures Manual Revision No. 6.2, Dated January 2008
4. Management Procedure 84, Operations Safety Compliance Program
5. Train Operator Safety/Performance Form
6. Train Operator Ride Check Program Report
7. Control Center Rules and Procedures Manual, Revision 17, dated April 1, 2009.
8. Transportation OSC Plan

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

Operation Safety Compliance Program Review

Interview BART's representative responsible for Operations Safety, observe/inspect operations, and review documentation as necessary to determine whether or not:

1. The Safety Compliance Program meets the requirements under the referenced criteria
2. An Operations Safety Compliance Program Record Form was completed for each check and maintained in accordance with the plan. Any compliance issues are identified, addressed, and resolved in a timely manner
3. Maintenance of Way - Wayside Workers
    a. Coordinate at OCC to locate and observe access authority provisions and procedures for wayside workers to determine whether or not they follow according to the documents under the reference criteria
    b. Interview at least one BART wayside workers to evaluate their knowledge and understanding of BART's Operating Rules and Procedures relative to mainline operations
4. Revenue Operations – Train Operators (Fremont Station)
    a. Perform an inspection of one departing BART train operators operating revenue vehicles to determine if they have all of the required safety items.
    b. Perform a "check ride" and observe, the operations of at least two BART trains in revenue service on the mainline to determine if:
        i. Each BART train operator performs in compliance with the OR&P and updated bulletins.
        ii. Each BART train operator possesses the required on-board safety equipment.
    c. Observe two coupling procedures to determine whether or not they follow operating rules and procedures

d. Interview at least two BART train operators to evaluate their knowledge and understanding of BART's Operating Rules and Procedures relative to mainline operations

5. Operations Central Control – Train Controller
    a. Applicable reports, logs or records are properly prepared, maintained, and available upon request for review
    b. Duties are performed in accordance with the OR&P, Controller Manual including all Bulletins, General Notices and Special instructions.
    c. BART Train Controllers are knowledgeable in dealing and coordinating with other agencies during incidents, accidents, and emergency response situations.

RESULTS/COMMENTS

Activities:

Staff performed the following activities with BART personnel to verify the compliance with BART's Operation Safety Compliance Program.

1. Interviewed BART employees and supervisors to determine if BART procedures were being followed during day-to-day operations.
2. Performed check rides with train operators to observe the performance and adherence to rules.
3. Interviewed various BART employees to determine their knowledge with BART operating rules and procedures.
4. Observed the daily functions at the Central Control Center to determine if employees were meeting BART's rules, policies, and guidelines.
5. Observed the coupling of a train at Fremont Station and interviewed BART personnel regarding agency rules and procedures at the terminal.

Findings:

1. Operations Rules and Procedures 1102 require that Personnel shall have a copy of the Operations Rules and Procedures immediately available at times while on duty. A BART on duty train operator was found without the required safety equipment.
2. Operations Rules and Procedures 1105 require BART personnel to maintain their copy of the Operations rules and Procedures in current status by inserting revisions when issued. Several on duty BART train operators did not have current materials inside their rulebooks.
3. BART employees from the Way and Facilities Department as well as the Transportation Department were not aware of elements found in the Operations Rules and Procedures Manual, Sections 5501 (f), 5606 (d), and 6200.
4. BART representatives stated that hand signals will be included in future recertification training courses.

Recommendation:

BART should take appropriate measures to verify adherence of its train operators with all BART Operations Rules and Procedures Manual elements and develop the controls necessary to alert management when full compliance is not achieved. (OR&P 1000)

2010 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR BAY AREA RAPID TRANSIT DISTRICT

Checklist No.	**9**	Subject	Train Operator, Line Supervisor, and Central Control Supervisor Training and Recertification
Date of Review	**May 12, 2010**	Department(s)	Operations Central Control and Operations Training
Reviewers/ Inspectors	**Colleen Sullivan** **Donald Filippi**	Person(s) Contacted	**Carlina Leong (Senior Safety Engineer)** **Greg Leong (Supervisor of Operations Training)** **Anthony Robinson (Training Supervisor)**

REFERENCE CRITERIA

1. General Order 164-D: Section 3.2 Rules p; Section 13.03
2. System Safety Program Plan Revision No. 8, Dated February 1, 2008: Chapter 16
3. BART Employee Certification Plan

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

Train Operator, Line Supervisor, and Central Control Supervisor Training and Recertification

Interview BART representative in charge of the Train Operator and Controller Certification Program to determine whether or not:

1. BART complied with the requirements of the certification program according to the reference criteria
2. The training program has been reviewed and modified as necessary to meet training and recertification requirements

Randomly select at least six BART employees in each of the following classifications:

- Train Operator
- Train Controller
- Line Supervisor
- Yard Supervisor

Review the training and recertification records for the employees above in the past three years to determine if:

1. The initial training program was completed successfully and any discrepancies were addressed and resolved
2. The person has been recertified at the correct frequency and currently meets the criteria to perform his/her duties

RESULTS/COMMENTS

Activities:

Staff interviewed BART training personnel on policies and procedures related to training and the BART Certification Plan. Staff also selected and reviewed twenty train operators, six train controllers, and nine line and yard supervisors.

Findings:

1. The following train operators were not recertified in the two year period specified in the Certification Plan, Section 1.1.6.3 – Recertification. Section 1.1.6.9 – Failure to Qualify for Certification and Recertification also states that once an employee fails to pass recertification after 30 days of the designated recertification date, the employee will not be granted certification and cannot be assigned to duty.
    a. Train Operator # 057716 – Recertification
    b. Train Operator # 058135 – Recertification
    c. Train Operator #057946 – Recertification
    d. Train Operator #050715 – Recertification
2. The following Yard Supervisors were not recertified in the two-year period specified in the Certification Plan, Section 1.1.6.3 – Recertification. Section 1.1.6.9 – Failure to Qualify for Certification and Recertification also states that once an employee fails to pass recertification after 30 days of the designated recertification date, will not be granted certification and cannot be assigned to duty.
    a. Yard Supervisor # 057057 – Recertification
    b. Yard Supervisor # 053982 – Recertification
    c. Yard Supervisor #001399 – Recertification
    d. Yard Supervisor #057805 – Recertification
3. As of 2009, Transportation has improved the certification schedule for all train operators by removing them from active duty once their certification has expired. On April 13, 2010, the Transportation department showed records of 100% compliance with the certification requirements and has issued changes to allow for a six month grace period for training. The recertification process now requires train operators returning to duty to report to training before being allowed to operate on a train as stated in the Recertification Guidelines dated April 2010. This came out of an agreement between the Union and BART Transportation Department.

Recommendations:

None

2010 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR BAY AREA RAPID TRANSIT DISTRICT

Checklist No.	**10**	Subject	Hours of Service
Date of Review	**May 10, 2010**	Department(s)	Transportation
Reviewers/ Inspectors	**Colleen Sullivan**	Person(s) Contacted	**Paul Liston (Manager, Rail Operations)** **Ni Lee (Safety Specialist)** **Tonya Holmes (Manager of Time Accounting and Administration Department)**

REFERENCE CRITERIA

1. General Order 164-D: Section 3.2 Rules p; Section 3.5
2. System Safety Program Plan Revision No. 8, Dated February 1, 2008: Chapters 13, 18
3. Operations Control Center Rules and Procedures Manual, Revision 17, dated April 1, 2009
4. BART Agreement with Division 1555 Amalgamated Transit Union (ATU) Labor Agreement
5. BART Agreement with AFSME

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

Hours of Service

Randomly select a minimum of one employee from each of the following safety sensitive job classifications:

- Train Operators
- Foreworkers
- Train Controllers
- Power and Support Controllers
- Communication Specialists
- Managers and Supervisors

Review the payroll records, "time on duty" records, and/or other pertinent documentation for a three month period in the past two years to determine whether or not selected employees exceeded the "hours of service" limitations set in the reference criteria.

RESULTS/COMMENTS

Activities:

Staff selected and reviewed the "time-on-duty" records for the following safety sensitive job classifications and their respective periods:

1. One Train Operator – four month period between 2008 to 2010
2. One Train Operator – eleven month period between 2008 to 2010
3. Two Foreworkers – eleven month period between 2008 to 2010
4. One Train Controller – eleven month period between 2008 to 2010

5. One Power and Support Controller – eleven month period between 2008 to 2010

Findings:

1. "Time on duty" records for one Train Operator from October 4, 2009 to February 11, 2010 did not show any discrepancy.
2. "Time on duty" records for one Train Operator from February 3, 2009 to January 8, 2010 did not show any discrepancy.
3. "Time on duty" records for one Foreworker from February 2, 2009 to January 9, 2010 did not show any discrepancy.
4. "Time on duty" records for one Foreworker from February 2, 2009 to January 10, 2010 did not show any discrepancy.
5. "Time on duty" records for one Foreworker from February 2, 2009 to January 11, 2010 did not show any discrepancy.
6. "Time on duty" records for one Train Controller from February 4, 2009 to January 7, 2010 did not show any discrepancy.
7. "Time on duty" records for one Power Support Controller from February 2, 2009 to January 10, 2010 did not show any discrepancy.
8. "Time on duty" records for one Manager from February 2, 2009 to January 20, 2010 did not show any discrepancy.
9. "Time on duty" records for one Supervisor from March 4, 2009 to October 6, 2009 did not show any discrepancy.
10. Staff did not review "time on duty" records for Communication Specialists and Managers and Supervisors because they are not safety sensitive employees.

Recommendations:

None

2010 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR BAY AREA RAPID TRANSIT DISTRICT

Checklist No.	**11**	Subject	Bridges/Aerial Structures
Date of Review	**May 11, 2010**	Department(s)	Structures Inspection Department
Reviewers/ Inspectors	**Jimmy Xia**	Person(s) Contacted	**Siew-Chin Yeong (Assistant Superintendent of the Structures and Buildings Sections)** **Mike Lingerfelt (Structures Inspector Foreworker)** **Mark Dana (System Safety Senior Engineer)**

REFERENCE CRITERIA

1. General Order 164-D: Section 3.2 Rules n, o; Section 3.3
2. System Safety Program Plan Revision No. 8, Dated February 1, 2008: Chapter 15
3. Structures Inspection Manual Revision No. 2, Dated 2005

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

Bridges/Aerial Inspections and Reports

Interview BART representatives to determine whether or not:

1. The structures inspection program meets the requirements of the reference criteria
2. The Structures Inspection Manual is reviewed and revised as necessary to effectively address the conditions in the system

Randomly select two inspection reports in the last three years for each of the following lines:

- A Line
- C Line
- L Line
- M Line
- R Line

Review the inspection reports and any other pertinent documents to determine whether or not:

1. The frequency of inspections is met as required in the structures inspection schedule
2. Any findings or discrepancies are reported and directed to the appropriate responsible persons and mitigated in a timely manner.

RESULTS/COMMENTS

Activities:

Staff interviewed the BART representatives regarding BART's Structures Inspection Program and the revision process of its Structures Inspection Manual.

1. The BART's Structures Inspection Department inspects all the structures of the entire BART system once every two years.
2. BART responds to deficiencies according to a priority code system ranging from 1 being the minor to 4 requiring immediate attention and 9 which means a condition has been repaired.
3. The manual is currently still under review by BART and will be updated for the upcoming

2010 revision. BART will incorporate the code changes, union rule changes, new structures, and new components it needs to inspect into the next revision of the manual.

Staff selected and reviewed the inspection reports and other pertinent documents for the following site locations with the corresponding date on the BART system:

1. Location STR-A3001T on the A Line
    a. 2/6/07
    b. 2/25/09
2. Location STR-C5010 on the C Line
    a. 6/10/08
    b. 3/7/10
3. Location STR-L3001on the L Line
    a. 8/20/07
    b. 7/14/09
4. Location STR-M5001 on the M Line
    a. 11/6/06
    b. 11/5/08
    c. 2/3/10
5. Location STR-R3005 on the R Line
    a. 1/17/07
    b. 6/4/08
    c. 4/20/09

<u>Findings</u>

1. Staff determined that the structures inspection program meets the requirements of the reference criteria and undergoes review and revision as necessary to effectively address the conditions of the system.
2. The frequency of inspections indicated on reviewed records meet the two year required structures inspection schedule.
3. Trouble tickets found during inspections are closed out in a timely manner.

<u>Recommendations:</u>

None

2010 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR BAY AREA RAPID TRANSIT DISTRICT

Checklist No.	**12**	Subject	Track, Switch, and Turnout Inspection - CPUC Track Inspector
Date of Review	**May 10,11,12,13,**	Department(s)	Maintenance and Engineering
Reviewers/ Inspectors	**John Madriaga**	Person(s) Contacted	Doug Hunter-Track Section Manager Jeffery Lau- Manager of Safety Operations

REFERENCE CRITERIA

1. General Order 164-D: Section 3.2 Rules n, o; Section 3.3
2. System Safety Program Plan Revision No. 8, Dated February 1, 2008: Chapter 15
3. Track Standards Manual, Dated June 1, 2007
4. Annual Track and Train Control Joint-Switch, Turnout and Interlocking Inspection Form
5. DataStream
6. BART Switch Machine Preventative Maintenance – Location and Frequency

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

Track, Switch, and Turnout Inspection - CPUC Track Inspector

1. Review and evaluate the adequacy of BART's track inspection maintenance programs and standards.
2. Randomly select at least two sections of the mainline track, one switch, one crossover, and one turnout on the mainline from three lines: R, L, or M.
3. Perform visual and dimensional inspection/measurements to determine whether or not all track components are in compliance with the applicable reference criteria.

RESULTS/COMMENTS

Activities:

Staff inspected and observed BART personnel performing operation, maintenance, and test activities for the following equipment and locations:

1. M-Line Inspection of Track, Switches, Crossovers, and Turnouts
    a. Milepost 16.22 to 1.85 – 26 switches
    b. Visual and dimensional inspection at M55 Interlocking at Milepost 10.57 – Gates A and B
    c. Visual and dimensional inspection at M17 Interlocking at Milepost 7.47 – Gates A and B
2. L-Line Inspection of Track, Switches, Crossovers, and Turnouts
    a. Milepost 11.47 to 22.00 – 17 switches
    b. Visual and dimensional inspection at Milepost 11.93 – Gates C, D, E, and F
3. R-Line Inspection of Track, Switches, Crossovers, and Turnouts
    a. Milepost 12.57 to 3.40 and from Milepost 3.40 to 12.57 – 8 switches
    b. Visual and dimensional inspection at SW 227, SW 127, SW 123, and SW223

Findings:

1. The track inspection procedures, frequency, inspection methods, are in compliance with the reference criteria under Track Standards Section S7.and DataStream.
2. Staff witnessed a BART hi rail vehicle operator listening to the radio while obtaining permission to occupy track in violation of the Operating Rules and Procedures, Section 1331.

Recommendation:

BART should take appropriate measures to verify adherence of its wayside workers with all BART Operations Rules and Procedures Manual and Wayside Safety Program elements and develop the controls necessary to alert management when full compliance is not achieved. (OR&P 1331)

2010 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR BAY AREA RAPID TRANSIT DISTRICT

Checklist No.	**13**	Subject	Heavy Rail Vehicle Inspection - CPUC Equipment Inspector
Date of Review	**May 10, 2010**	Department(s)	Rolling Stock and Shops (Concord and Richmond Shops)
Reviewers/ Inspectors	**Michael Borer**	Person(s) Contacted	**Joel Koford (Concord Shop Manager)** **Mike Turner (Assistant Superintendent)**

REFERENCE CRITERIA

1. General Order 164-D: Section 3.2 Rules n, o; Section 3.3; Section 3.5
2. System Safety Program Plan Revision No. 8, Dated February 1, 2008: Chapters 14-15
3. Book 42: Automatic Train Control Maintenance Procedures
4. Book 50: C Car Maintenance Procedures, Volume 14
5. Book 86: A2/B2 Car Maintenance Procedures, Volume 14
6. Book 16: Rolling Stock and Shops Department Procedures, Section 1, Procedures 24

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

Heavy Rail Vehicle Inspection - CPUC Equipment Inspector

Randomly select at least two B cars, one A cars, and two C car held at each of the following shops:

1. Concord Yard Shop
2. Richmond Yard Shop

Perform a detailed inspection including but not limited to the following prior to release of the vehicle to determine if BART heavy rail vehicles are properly and adequately maintained according to the referenced criteria:

1. Axle/Truck/Wheel
2. Visual inspection of the following:
    a. Passenger cab
    b. Operator cab
    c. Door operation
    d. Safety appliances
3. Traction motors
4. Train Control Hardware
5. Brake system
6. Coupler assemblies
7. Collector shoes

RESULTS/COMMENTS
<u>Activities:</u> Staff selected and inspected BART personnel performing preventative and unscheduled maintenance of the following vehicles at their respective locations: 1. Concord Shop a. C Car 0317 b. A/B Car 1584 c. C Car 0382 d. C2 Car 2523 2. Richmond Shop a. A/B Car 1729 b. C Car 0414 c. C2 Car 2549 d. A/B Car 1557 e. A/B Car 1233 Staff also observed and followed up on items found during inspection recorded on the Maintenance Discrepancy and Correction Sheet. <u>Findings:</u> 1. All maintenance activities were performed in accordance with the requirements. <u>Recommendation:</u> None

2010 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR BAY AREA RAPID TRANSIT DISTRICT

Checklist No.	**14**	Subject	Traction Power Substation Inspection (Electrical Substation and Gapbreaker) - CPUC Electrical Generation Inspector
Date of Review	**May 11-13, 2010**	Department(s)	Maintenance and Engineering – Power and Mechanical Maintenance
Reviewers/ Inspectors	**Steve Espinal**	Person(s) Contacted	**Randy Clark (Superintendant of Electrical Maintenance)** **Eduardo Cheves (Electrical Section Manager)** **Leslie L. Lagdamen (Electrical Section Manager)** **Vitaly Lusherovich (Section Manager)** **Len Hardy (Chief Safety Officer)**

REFERENCE CRITERIA

1. General Order 164-D: Section 3.2 Rules n, o; Section 3.3
2. System Safety Program Plan Revision No. 8, Dated February 1, 2008: Chapter 14
3. Book 31, Power and Way Electrical Maintenance Procedures
4. Book 36, Electrification Plans

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

Traction Power Substation Inspection (Electrical Substation and Gapbreaker) - CPUC Electrical Generation Inspector

1. Review and evaluate the compliance of BART's power substation and gapbreaker maintenance programs and standards.
2. Randomly select at least one station(s) on the mainline from each of the following:
   a. R Line
   b. M Line

   Observe and/or perform detailed inspections of the components including but not limited to the following to determine whether or not BART is in compliance with the applicable reference criteria.
   a. 1 kV DC Breaker
   b. 1 kV DC Bus

RESULTS/COMMENTS

Activities:

Staff inspected and observed BART personnel performing operation, maintenance, and test activities for the following equipment and locations:

1. North Berkeley Station - RNB
2. Powell Station - MPS

Findings:

1. BART currently utilizes similar circuit breaker equipment with six different manufacturers.
2. Staff found the equipment to be well maintained both at the substation and on the breakers.
3. BART personnel performed their inspection and maintenance per procedures on disassembling, measuring volts, lubrication, and repair.

Recommendation:

None

2010 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR BAY AREA RAPID TRANSIT DISTRICT

Checklist No.	**15**	Subject	Signal Communication, Train Control – CPUC Signal Inspector
Date of Review	**May 16-19, 2010**	Departments	Maintenance and Engineering Systems Maintenance
Reviewers/ Inspectors	**Thomas Govea**	Persons Contacted	**Felix Martin (Assist. Supervisor M/E Department)** **Ken Yup (Section Manager)** **Jim Scullion (Section Manager Communication)** **Henry Lee (Foreman)** **Jeffery Lau (Manager of Safety Operations)**

REFERENCE CRITERIA

1. General Order 164-D: Section 3.2 Rules n, o; Section 3.3
2. General Order 127
3. System Safety Program Plan Revision No. 8, Dated February 1, 2008: Chapter 15
4. DataStream
5. Book 20, Train Control Maintenance Procedures
6. BART Operating Rules and Procedures (OR&P)
7. BART Wayside Safety Program July 2009

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

Signal Communication Inspection-CPUC Signal Inspector

1. Review and evaluate the compliance of BART's train control and signal inspection maintenance programs and standards.
2. Randomly select at least two sections of the mainline from each of the following:
   a. R Line
   b. A Line
   c. M Line

   Perform detailed inspections of surface and subway mainline train control and signal systems and components to determine whether or not they are in compliance with the applicable reference criteria.

RESULTS/COMMENTS

Activities:

Staff inspected and observed BART personnel performing operation, maintenance, and test activities for the following equipment and locations:

1. Train Control Room

a. Millbrae Room 25-1, Milepost 24.18 – Interlocking Controls
b. Lake Merritt Room A-10, Milepost 0.57 – Interlocking Controls
c. MacArthur Room K30 – Interlocking Controls

2. Platform Cover board Antennae
   a. MacArthur Station C Line – Track 3, Milepost 2.22
   b. South Hayward A Line – Track 2, Milepost 16.75
   c. Fruitvale A Line – Track 2, Milepost 3.32A
   d. Embarcadero M Line – Track 1, Milepost 7.35
   e. Civic Center M Line – Track 2, Milepost 8.64
   f. Berkeley R Line – Track 2, Milepost 5.16
3. Switch Points, #1 Switch Rod, Cover boards, and Gate Signs
   a. Line W – W39 Interlocking
   b. Line W – W45 Interlocking
   c. Line A – A15 Interlocking
   d. Line K – K35 Interlocking
   e. Line M – M03 Interlocking
4. Wayside Blue Light, Emergency Telephone, Vertical Fire Phone, and Mine Phone
   a. Line W – ETS Blue Light Stations
   b. Millbrae Train Control Room ETS 2036
   c. Line M – Transbay Tube Gallery Blue Light Phone, Mine Phone, Yellow Fire Phone Jack

Findings:

1. At Lake Merritt Train Control Room A-10 in ATO cabinet 1, non working exposed wires were disconnected. BART has identified the wires to be non vital to the system and has fastened them upon CPUC request.
2. Switch Point Inspection
   a. Line A – A15, SW 223 M-2 - Failed ¼" obstruction test / adjusted, corrected
   b. Line K – K15, SW 261 C-2 - Failed 1/8" obstruction test / adjusted, corrected
   c. Line K, K15, SW 167 C-1 - Failed 1/8" obstruction test / adjusted, corrected
   d. Indication Signal 2.32R1/C1 K35 Interlocking Staff witnessed a heavy dirt film over lens. BART has responded that the identified signal interlocking is non vital and will be cleaned or removed.
3. BART employee used improper hand signals for approaching train by motioning hand on side extending over head to proceed forward. OR&P Section V, 5605A requires hand raised and lowered vertically in the direction of the vehicle operator. BART has implemented this into their tail-gate safety meetings and will be auditing the practice amongst the departments.
4. Wayside vegetation with thorny weeds has grown to waist height in and around switch machines at M03. BART is also aware of the vegetation growth and has in place a dedicated program to mitigate the vegetation growth throughout the system.
5. BART maintenance crew did not fill out the Simple Form 1589 on May 16 and 17, 2010 prior to performing work as required in BART's Wayside Safety Program, page 42 - the person in charge shall have this form, completed, in his/hers possession while on wayside.
6. The "No Refuge Zone" sign located at Daly City Yard does not match the color that is represented in the OR&P Section V, 5800 P. BART is implementing a process to redesign and replace various signs throughout the system. A prototype for the sign

indicated in this finding was made available as of 6/28/10.

Recommendation:

BART should take appropriate measures to verify adherence of its wayside workers with all BART Operations Rules and Procedures Manual and Wayside Safety Program elements and develop the controls necessary to alert management when full compliance is not achieved. (Form 1589)

(Identical Recommendation as Checklist #12)

2010 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR BAY AREA RAPID TRANSIT DISTRICT

Checklist No.	**16**	Subject	GO 95 Right of Way Inspection (Fencing, Warning Signs, Barrier, Vegetation, Cover board) - CPUC USRB Utilities Engineer
Date of Review	**May 14, 2010**	Department(s)	
Reviewers/ Inspectors	**Colleen Sullivan** **Steven Espinal**	Person(s) Contacted	**Donald Emmons (Assistant Superintendent Way and Facilities Division Buildings, Grounds, Track and Structures)** **Glen Eddy (Facilities Maintenance Supervisor – Grounds Way and Facilities)** **Clifton Black (Section Manager Power and Mechanical Maintenance)**

REFERENCE CRITERIA

1. General Order 164-D: Section 3.2 Rules n, o; Section 3.3
2. General Order 95: Rule 79
3. Resolution ST-77, April 21, 2005
4. Track Maintenance Standards, Dated June 1, 2007
5. System Safety Program Plan Revision No. 8, Dated February 1, 2008: Chapter 14
6. Book 31, Electrical Maintenance Procedures, Chapter 1, Section 17, Wayside Monthly PM
7. Maintenance & Engineering, Way & Facilities Division - Grounds Department, Scheduled Right of Way Fence Inspection Program, December 1, 2008

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

GO 95 Right of Way Inspection (Fencing, Warning Signs, Structures, Vegetation, Cover board) - CPUC USRB Utilities Engineer

1. Review and evaluate the compliance of BART's GO 95 Right of Way maintenance programs and standards.
2. Randomly select at least three sections of the mainline track and two sections of yard track from each of the following:
   a. R Line
   b. L Line
   c. M Line

   Perform visual and dimensional inspection/measurements to determine whether or not all right of way components are in compliance with the applicable reference criteria.

RESULTS/COMMENTS

Activities:

Staff inspected and observed BART personnel performing maintenance and test activities for the following equipment and locations:

1. Mainline cover boards, fencing, vegetation, and warning signs
    a. Three sections of the R Line
    b. Three sections of the L Line
    c. Three sections of the M Line
    d. Three sections of the C Line
2. Yard cover boards, fencing, vegetation, and warning signs
    a. Two sections of the R Line
    b. Two sections of the L Line
    c. Two sections of the M Line
    d. Two sections of the C Line

Findings:

1. The following locations had missing or broken cover boards:
    a. M Line on Track 1 north of Daly City Station platform at M87A -150
    b. R Line south of the Richmond Station is missing a 20 foot section of cover boards due to installation of new equipment
    c. C Line in the city of Concord at milepost 18.00 is missing a 15 foot section of cover boards. The cover boards in this area were scheduled for replacement which was completed as of 6/23/10. The section of missing cover boards was noted in BART maintenance records from 4/14/10.
2. BART is implementing a cover board modification program which adds a third cover board bracket based in the center thereby strengthening the cover board. BART has started with the A Line and is planning to implement this throughout the entire system.

Recommendations:

None

2010 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR BAY AREA RAPID TRANSIT DISTRICT

Checklist No.	**17**	Subject	Track and Turnout Maintenance Review
Date of Review	**May 10, 2010**	Department(s)	Maintenance and Engineering Way and Facilities Maintenance
Reviewers/ Inspectors	**Rupa Shitole** **Arun Mehta**	Person(s) Contacted	**Donald Emmons (Assistant Superintendent)** **Carlina Leong (Senior Safety Engineer)**

REFERENCE CRITERIA

1. General Order 164-D: Section 3.2 Rules n, o; Section 3.3
2. System Safety Program Plan Revision No. 8, Dated February 1, 2008: Chapter 15
3. Track Standards Manual, Dated June 1, 2007
4. Annual Track and Train Control Joint-Switch, Turnout and Interlocking Inspection Form

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

Track and Turnout Maintenance Review

Review BART's records of preventative maintenance, scheduled and unscheduled maintenance activities for two separate periods during the last three years for the following components:

1. Track Inspection
    a. Randomly select at least two separate track inspection reported areas to determine whether or not:
        i. All mainline tracks, yard leads, and transfer tracks were inspected at the correct frequency
        ii. The required inspections were properly documented and noted defects were corrected in a timely manner
    b. Randomly select at least two separate recorded geometry car inspection reports to determine whether or not:
        i. All mainline tracks, yard leads, and transfer tracks were inspected at the correct frequency
        ii. The required inspections were properly documented and noted defects were corrected in a timely manner
    c. Review BART internal rail defect reports to determine whether or not:
        i. All mainline tracks were inspected by a device capable of detecting internal flaws in the running rails at the correct frequency
        ii. The required inspections were properly documented and noted defects were corrected in a timely manner
2. Turnout Inspection
    a. Randomly select at least two separate recorded turnout inspection reported areas to determine whether or not:
        i. All mainline tracks and yard turnouts were inspected at the correct frequency
        ii. The required inspections were properly documented and noted defects

were corrected in a timely manner
RESULTS/COMMENTS

Activities:

Staff interviewed the BART representative in-charge of Track and Turnout Maintenance Program consisting in excess of fifty track maintenance workers and seven track inspectors for all shifts.

Staff selected and reviewed the following preventative maintenance components for two periods during the last three years:

1. Track Inspection
    a. 2008
        i. Form T001 – 5/2/08
        ii. Form T001 – 5/16/08
        iii. Form T001 – 5/22/08
        iv. Form T001 – 5/23/08
    b. 2009
        i. Form T001 – 3/3/09
        ii. Form T001 – 3/19/09
        iii. Form T001 – 3/24/09
        iv. Form T002 – 3/24/09
        v. Form T001 – 3/25/09
        vi. Form T002 – 3/25/09
        vii. Track Inspection Reports – 4/12/09, 4/22/09, and 4/23/09
        viii. Form T001 – 4/30/09
    c. 2010
        i. Form T001 – 1/24/10
        ii. Form T001 – 5/02/10
        iii. Form T002 – 5/02/10
2. Geometry Car Inspection
    a. Report No. 20060811 – November 2006 for M and W lines.
    b. Report No. 20080407 dated April 2008 for A-Line.
    c. Report No. 090419 dated April 2009 for A-Line.
    d. Report No. 100324 dated March 2010 for M, W, and Y Lines.
3. Internal Rail Defect Inspections
    a. Herzog Ultrasonic Rail Testing Report dated October 2008 for M-Line.
    b. Herzog Ultrasonic Rail Testing Report dated November 2009.
4. Turnout Inspection
    a. K-Line inspection reports dated 5/7/09 and 6/25/09.
    b. M-Line inspection reports dated 5/7/09, 9/16/09, 10/13/09 and 11/12/09.
    c. Daly City Yard inspection reports dated 9/10/09 and 9/17/09.
    d. Richmond Yard inspection reports dated 7/30/09 and 8/6/09.
    e. Concord Yard inspection reports dated 7/8/09 and 7/23/09
    f. Hayward Yard inspection reports dated 5/28/09 and 7/2/09.
    g. Track Turnout Measurement Report Form No. 1307 Dated 5/02/10 for #10 Turnout Interlocking R45 Gate B Switch #127.

Findings:

1. Tracks are inspected by various methods including: (1) On Foot, (2) Hi-Rail, (3) On-Train, (4) Ultrasonic Testing, and (5) Geometry Car. The frequency of track and turnout includes weekly, monthly, quarterly, bi-annually and annually depending upon the method and degree of track usage
2. Staff found the following forms, reports, work orders, and repairs to have inaccurate information and errors:
    a. Track Inspections conducted on 5/23/08 showed several items which needed to be immediately repaired such as "Loose Bolts." These were shown as "Tightened bolts" in the "Remedial Action" column of the Form T001. Some deferred maintenance items did not have a corresponding repair action in the "Remedial Action" column. BART explained that these are captured during the scheduling of future maintenance work.
    b. Track Inspections conducted on 3/25/09 for M-Line at Milepost 13.10 to 17.07 on Hi-Rail, revealed 4 defects. One of them was repaired and the others were shown as "mitigated".
    c. Track Inspections conducted on 4/12/09, 4/22/09 and 4/23/09 revealed several defects. Some defects such as "Loose Bolts" were shown as "Repaired" in the "Remedial Action" column. Other defects such as "Pads need shimmed, Impaired Rail Pads", and "Broken Pads" were shown as "Mitigated" in the "Remedial Action" column.
    d. Track Inspection conducted on 4/30/09 night "On Train" and during non-revenue hours on early morning of 5/1/09 on "Hi-Rail" revealed on Form T001a defect of "Vegetation Hitting trains" on track A-2 MP 21.5-21.7. This defect was shown as "Mitigated" in the "Remedial Action" column. Further review of the work orders showed that vegetation was cut and removed on 10/30/09.
    e. Track Inspections conducted on 1/24/10 revealed several defects such as "Loose Bolts Broken Pads". These were shown as "Mitigated" in the "Remedial Action" column.
    f. Track Inspections conducted on 5/02/10 on the R-Line R1 Track MP 5-41-5.57 revealed several defects such as "Tighten Gage in Pandrol Pads", "Corroded Pads", and "Rail Grind the entire Curve". This Track Repair Report was marked as "COMPLETE 5/5/10" by somebody without a name or I.D. Further review of the work orders showed that Pandrol Pads and Corroded Pads were repaired on 5/5/10.
    g. Track Inspection report dated 12/07/09 had one defect noted that had signatures missing from both the Section Manager and the inspector.
    h. The Internal Rail/Broken Rail Report dated 12/07/09 also had missing signature from Section Manager.
3. The term "Mitigated," used in the Remedial Action column does not mean that a defect has been corrected in its entirety. It indicates that the problem has been addressed with a temporary solution and is awaiting another process or work order to fully correct the defect.
4. All measurement fields were filled in and all conditions checklists were marked in the Track Turnout Measurement Report Form No. 1307 Dated 5/02/10 for #10 Turnout Interlocking R45 Gate B Switch 127. There were no defects noted.

Recommendations:

BART should clarify its Track Maintenance Program processes ensuring that all program forms are comprehensively completed and appropriately signed off and all noted defects are clearly identified and tracked to timely completion. (SSPP Chapter 15)

2010 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR BAY AREA RAPID TRANSIT DISTRICT

Checklist No.	**18**	Subject	Track Maintenance Training and Certification
Date of Review	**May 12, 2010**	Department(s)	Maintenance and Engineering – Way and Facilities and Maintenance Training
Reviewers/ Inspectors	**Jimmy Xia** **John Madriaga**	Person(s) Contacted	**Richard Leonard (Way & Facilities Division Superintendent)** **Michael Smith (Maintenance Training Supervisor)** **Joseph Torrisi (Maintenance Support Division Manager)** **Ni Lee (Safety Specialist)**

REFERENCE CRITERIA

1. General Order 164-D: Section 3.2 Rules n, o; Section 3.3
2. System Safety Program Plan Revision No. 8, Dated February 1, 2008: Chapter 16
3. Track Standards Manual, Dated June 1, 2007
4. Annual Track and Train Control Joint-Switch, Turnout and Interlocking Inspection Form

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

Track Maintenance Training and Certification

Interview the BART representative in charge of the Track Maintenance Training Program to determine whether or not:

1. The training program standards and course implementation are reviewed and modified as necessary to meet the requirements of the reference criteria.

Randomly select the names of at least three persons in each of the following classifications:

a. Track Worker
b. Track Equipment Operator

Review the training and certification records for the last three years to determine whether or not:

1. The employee has received the required training to perform his/her duties
2. Documents are on-file to show that the employee is qualified to perform his/her duties
3. The employee has been re-certified at the required frequency

RESULTS/COMMENTS

Activities:

Staff interviewed the BART representatives in charge of the Track Maintenance Training Program regarding BART's revision process of its training program standards and course implementation.

Staff randomly selected three employees from both the Track Worker and Track Equipment

Operator classifications and reviewed the following training records for the previous, current, and next certification:

1. Wayside Safety Practices
2. Trackway Safety Certification
3. OR&P Manual & Map Certification Test
4. OR&P Manual On-Rail Certification

Findings:

1. BART has the following three training classes for its track maintainers:
    a. A 32-hour Trackway Safety Certification training
    b. An 80-hour long on-rail certification training
    c. A 4-hour Operations Rules and Procedures (OR&P) and BART system map training
2. BART's Track Workers receive training and certification every three years plus or minus 90 days. A passing score of 85% is required for completion.
3. BART reviews and modifies its track maintenance training program standards and course implementation as necessary to meet the requirements of the reference criteria. BART will update the training materials whenever the OR&P manual gets updated. It reviews and updates the OR&P manual as necessary due to the frequency of acquiring new equipments.
4. All six randomly selected employees show a timely completion of the required training and certification necessary to perform their duties.

Recommendations:

None

2010 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR BAY AREA RAPID TRANSIT DISTRICT

Checklist No.	**19**	Subject	Heavy Rail Vehicle Preventative Maintenance
Date of Review	**May 12, 2010**	Department(s)	Rolling Stock & Shops (Richmond Yard)
Reviewers/ Inspectors	**Vincent Kwong** **Michael Borer**	Person(s) Contacted	**Mike Turner (Assistant Superintendent)**

REFERENCE CRITERIA

1. General Order 164-D: Section 3.2 Rules n, o; Section 3.3; Section 3.5
2. System Safety Program Plan Revision No. 8, Dated February 1, 2008: Chapters 15
3. Book 50: C Car Maintenance Procedures, Volume 14
4. Book 86: A2/B2 Car Maintenance Procedures, Volume 14
5. Book 16: Rolling Stock and Shops Department Procedures, Section 1, Procedures 24

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

Heavy Rail Vehicle Preventative Maintenance (Richmond Yard)

Randomly select a minimum of one A car, one B car, and one C car from the Richmond Shop to review the completed Preventative Maintenance (PM) records associated with each car selected over the last two years to determine whether or not:

1. The vehicles were inspected during preventative maintenance at the required frequencies as specified in the referenced criteria
2. The records were properly documented with the necessary review and approval
3. Noted defects were corrected in a timely manner

RESULTS/COMMENTS

Activities:

Staff interviewed the Assistant Superintendent of the Richmond Yard Rolling Stock and Shops and reviewed the following documents contained in the preventative maintenance and unscheduled maintenance records for vehicles:

1. Shopped Vehicle Unscheduled Check Sheet
2. Maintenance Discrepancy/Correction Sheets
3. Part Tags
4. Maintenance Directives
5. Mod Implementation – Change Documents

Staff selected and reviewed only preventative maintenance records for the following cars and type for the time period between June 2008 through May 2010:

1. B Car 1726
2. C Car 0370

3. C2 Car 2558

Staff selected and reviewed both preventative maintenance and unscheduled maintenance records for the following cars and type for the time period between June 2008 through May 2010:

4. A Car 1227
5. A Car 1244
6. C Car 0351

Findings:

1. Unscheduled maintenance occurs when discrepancies are reported anywhere on the system and requires the vehicle to be brought into the shops for inspection and necessary repairs.
2. Maximum preventative maintenance thresholds are set at every 650 hours for C cars and 850 hours for A and B cars.

Recommendations:

None

2010 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR BAY AREA RAPID TRANSIT DISTRICT

Checklist No.	**20**	Subject	Secondary Vehicle Train Control Equipment Maintenance and Test
Date of Review	**May 13, 2010**	Department(s)	Rolling Stock and Shops (Hayward Shop)
Reviewers/ Inspectors	**Michael Borer**	Person(s) Contacted	**Steven Steele (Shop Superintendent and Supervisor)**

REFERENCE CRITERIA

1. General Order 164-D: Section 3.2 Rules n, o; Section 3.3
2. System Safety Program Plan Revision No. 8, Dated February 1, 2008: Chapter 15
3. Book 42: Automatic Train Control Maintenance Procedures

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

Secondary Vehicle Train Control Equipment Maintenance and Test

Interview BART representative in charge of Vehicle Train Control to determine whether or not:

1. The program standards and procedures are reviewed and modified as necessary to meet the requirements of the reference criteria

Randomly select a minimum of five repaired equipment to review the completed maintenance records associated with each car selected over the last three years to determine whether or not:

1. The vehicles are were inspected at the required frequencies as specified in the referenced criteria
2. The records were properly documented with the necessary review and approval
3. Noted defects were corrected in a timely manner

RESULTS/COMMENTS

Activities:

Staff interviewed the Hayward Shop Superintendent and Shop Supervisor and randomly selected seven repairs and maintenance records for proper testing, documentation, and completion of repair in a timely manner.

Findings:

1. All standards and procedures were reviewed and meet or exceeded requirements.
2. All testing, documentation, and repairs meet or exceeded requirements.

Recommendations:

None

2010 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR BAY AREA RAPID TRANSIT DISTRICT

Checklist No.	**21**	Subject	Non Revenue Vehicle Maintenance
Date of Review	**May 10, 2010**	Department(s)	Maintenance and Engineering – Non Revenue Vehicle Maintenance (Oakland Shop)
Reviewers/ Inspectors	**Michael Borer**	Person(s) Contacted	**John Ford (Manager of Non-Revenue Vehicle Maintenance)**

REFERENCE CRITERIA

1. General Order 164-D: Section 3.2 Rules n, o; Section 3.3
2. System Safety Program Plan Revision No. 8, Dated February 1, 2008: Chapter 15

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

Non Revenue Vehicle Maintenance (Oakland Shop)

Randomly select a minimum of six hi rail maintenance vehicles from the Oakland Shop to review the completed Preventative Maintenance (PM) and unscheduled maintenance records associated with each car selected over the last three years to determine whether or not:

1. The vehicles were inspected during preventative maintenance at the required frequencies as specified in the referenced criteria
2. The records were properly documented with the necessary review and approval
3. Noted defects were corrected in a timely manner
4. Any necessary adjustments or modifications to the rail system are tracked and monitored for performance and safety

RESULTS/COMMENTS

Activities:

Staff interviewed the Manager of Non-Revenue Vehicle Maintenance and selected and reviewed the following hi rail maintenance vehicles records:

1. Truck # 3656 Flatbed welder
2. Truck # 3624 Crew cab
3. Truck # 3599 F700
4. Truck #3574 F700
5. Speed swing # 3643
6. Speed swing # 3560

Findings:

1. Vehicle trucks are regulated under the Department of Transportation (DOT) and must have a 90 day periodic inspection when operating under the Biennial Inspection of Terminals (BIT) program.
2. Speed swings fall under an hour based or annual inspection that is determined by BART's maintenance program.

3. Multiple tickets show past due inspections as required by either DOT or the BART maintenance program as follows:
    a. Truck # 3624 Crew cab – BIT inspections that were required every 90 days showed ticket # 08-0003022 with 49 days overdue.
    b. Truck # 3599 F700 – BIT inspections that were required every 90 days showed ticket # 09-0001169 with 50 days overdue.
    c. Truck #3574 F700 – BIT inspections that were required every 90 days showed ticket # 08-0003022 with 72 days overdue.
4. There are inconsistencies with documentation in the non-vehicle maintenance program such as missing preventative maintenance, missing entries, and mismatched information between reports found in BART's information program database and physical paperwork as follows:
    a. Speed swing # 3643 - This speed swing was missing multiple preventative maintenances
    b. Speed swing # 3560 - This speed swing was not maintained since 6/23/06

Recommendation:

BART should develop the controls necessary to alert management when the Non-Revenue Vehicle Maintenance Program requirements are not carried out per the required frequencies and documentation guidelines. (SSPP Chapter 15)

2010 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR BAY AREA RAPID TRANSIT DISTRICT

Checklist No.	**22**	Subject	Traction Power Substation Maintenance Review
Date of Review	**May 11, 2010**	Department(s)	Maintenance and Engineering – Power and Mechanical Maintenance
Reviewers/ Inspectors	**Vincent Kwong** **Steve Espinal**	Person(s) Contacted	**Randy Clark (Superintendent)** **Len Hardy (Chief Safety Officer)**

REFERENCE CRITERIA

1. General Order 164-D: Section 3.2 Rules n, o; Section 3.3
2. System Safety Program Plan Revision No. 8, Dated February 1, 2008: Chapter 14
3. Book 31, Power and Way Electrical Maintenance Procedures
4. Book 36, Electrification Plans

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

Traction Power Substation Maintenance Review

Review BART's records of preventative maintenance, scheduled and unscheduled maintenance activities for two separate periods during the last three years for the following components:

1. Substation
    a. Randomly select at least four substations from the system to determine whether or not:
        i. All required inspections were performed at the required frequency
        ii. The required inspections were properly documented and noted defects were corrected in a timely manner
2. Gap Breaker
    a. Randomly select at least four gap breakers from the system to determine whether or not:
        i. All required inspections were performed at the correct frequency
        ii. The required inspections were properly documented and noted defects were corrected in a timely manner

RESULTS/COMMENTS

Activities:

Staff interviewed the superintendent of the Power and Mechanical Department and reviewed the following documents contained in the substation records as well as the gap breaker records:

- Monthly Traction Power Facility Inspection
- A/C 34.5 kV Cable/Bus IR and Visual PM
- A/C 1 kV Cable/Bus IR and Visual PM
- Aux Equip Panels/ATS IR and Visual PM
- 35 KV Circuit Breakers FPE Type PM
- 35 KV Circuit Breakers CPC Semi Annual

- Rectifier Annual Inspection
- Substation GO1A PM
- Substation Relay PM
- 1 kV DC GE Circuit Breaker Maintenance Check
- Substation Battery Maintenance Record Semi Annual
- Station Alarms Checks
- Medium Voltage Vacuum Circuit Breaker Test

1. BART has 6 different types of circuit breakers with various loads but utilize one general procedure to address them all.
2. Staff selected the following 4 substations and reviewed records for January 2007 to June 2007 as well as July 2009 to December 2009.
    a. MPS
    b. AFV
    c. RYE
    d. RNB
3. Staff selected the following 4 gap breaker substations and reviewed records for January 2007 to June 2007 as well as July 2009 to December 2009.
    a. CPH
    b. CXH
    c. LXA
    d. AXA

<u>Findings:</u>

1. At substation RYE, the 1 kV DC GE Circuit Breaker Maintenance Check forms in the following were not completed and followed up according to procedures contained in Book 31, Power and Way Electrical Maintenance Procedures, Chapter 1, Section 5, Item I – Semi Annual P.M.:
    a. 4/7/07 DC-5 Semi Annual – Operations Counter measurement not recorded
2. At gap breaker substation CPH, the 1 kV DC GE Circuit Breaker Maintenance Check forms in the following were not completed and followed up according to procedures contained in Book 31, Power and Way Electrical Maintenance Procedures, Chapter 1, Section 5, Item I – Semi Annual P.M.:
    a. 1/2/07 DC-1 Annual – Contact Resistance measured at 19 micro-Ohms
    b. 1/2/07 DC-2 Annual – Contact Resistance measured at 16 micro-Ohms
    c. 1/3/07 DC-4 Annual – Contact Resistance measurement not found
    d. 7/3/09 DC-1 Semi Annual – Contact Resistance measured above 14 micro-Ohms
    e. 7/3/09 DC-4 Semi Annual – Contact Resistance measurement not recorded
3. At gap breaker substation CPH, the Monthly Traction Power Facility Inspection forms and Routine Weekly Gap Breaker and Substation Inspection forms in the following were used interchangeably during inspections:
    a. 3/2/07 – Monthly Traction Power Facility Inspection
    b. 5/1/07 – Monthly Traction Power Facility Inspection
    c. 5/1/09 – Routine Weekly Gap Breaker
    d. 5/31/09 – Monthly Traction Power Facility Inspection
    e. 7/2/09 – Routine Weekly Gap Breaker
    f. 8/1/09 – Monthly Traction Power Facility Inspection

g. 9/1/09 – Routine Weekly Gap Breaker

4. At gap breaker substation CXH, the 1 kV DC GE Circuit Breaker Maintenance Check forms in the following were not completed and followed up according to procedures contained in Book 31, Power and Way Electrical Maintenance Procedures, Chapter 1, Section 5, Item I – Semi Annual P.M.:
    a. 2/2/07 DC-2 – There is no indication which maintenance was performed of the Semi Annual, Annual, or Emergency. Contact Resistance measured at 19 micro-Ohms
    b. 2/5/07 DC-1 Annual – Contact Resistance measured at 22 micro-Ohms
    c. 2/5/07 DC-2 – There is no indication which maintenance was performed of the Semi Annual, Annual, or Emergency. Contact Resistance measured at 16 micro-Ohms
5. Due to the various models and specifications of gap breakers on the BART system, the Contact Resistance limits vary as well. The measurement procedure has been changed to address this.
6. Although Monthly Traction Power Facility Inspections were completed and recorded on different forms, the superintendent has instructed the use of a single form for performing inspections.

Recommendations:

None

2010 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR BAY AREA RAPID TRANSIT DISTRICT

Checklist No.	**23**	Subject	GO 95 Right of Way Maintenance Review
Date of Review	**May 12, 19, and 21, 2010**	Department(s)	Maintenance and Engineering – Grounds Department
Reviewers/ Inspectors	**Colleen Sullivan**	Person(s) Contacted	**Glen Eddy (Facilities Maintenance Supervisor – Grounds Way and Facilities)** **Donald Emmons (Assistant Superintendent Way and Facilities Division Buildings, Grounds, Track, and Structures)** **Clifton Black (Section Manager Power and Mechanical Maintenance)** **Carlina Leong (Senior Safety Engineer)**

REFERENCE CRITERIA

1. General Order 164-D: Section 3.2 Rules n, o; Section 3.3
2. General Order 95: Rule 79
3. Resolution ST-77, April 21, 2005
4. CPUC 2006 BART Triennial Safety Audit, Recommendation 1 (Checklist 4)
5. System Safety Program Plan Revision No. 8, Dated February 1, 2008: Chapter 14
6. Track Maintenance Manual, Dated June 1, 2007
7. Book 31, Electrical Maintenance Procedures, Chapter 1, Section 17, Wayside Monthly PM
8. Maintenance & Engineering, Way & Facilities Division - Grounds Department, Scheduled Right of Way Fence Inspection Program, December 1, 2008

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

GO 95 Right of Way Maintenance Review

Review BART's records of preventative maintenance, scheduled and unscheduled maintenance activities for two separate periods during the last three years for the following components:

1. Fencing
    a. Randomly select at least two separate recorded right of way inspection areas to determine whether or not:
        i. Segments of fencing were inspected at the correct frequency
        ii. The required inspections were properly documented and noted defects were corrected in a timely manner
2. Warning Signs/Label
    a. Randomly select at least two separate recorded right of way inspection areas to determine whether or not:
        i. All warning signs were inspected at the correct frequency
        ii. The required inspections were properly documented and noted defects were corrected in a timely manner

b. Review progress for the 3rd Rail Labeling program implemented during wayside preventative maintenance

3. Vegetation
    a. Randomly select at least four separate recorded right of way inspection areas to determine whether or not:
        i. Sites containing vegetation were inspected at the correct frequency
        ii. The required inspections were properly documented and noted discrepancies were corrected in a timely manner
        iii. A plan has been implemented to mitigate and control the growth of vegetation throughout the system
4. Cover board
    a. Randomly select at least two separate recorded right of way inspection areas to determine whether or not:
        i. All cover boards were inspected at the correct frequency
        ii. The required inspections were properly documented and noted defects were corrected in a timely manner

RESULTS/COMMENTS

Activities:

Staff reviewed the following documents between the associated time periods for frequency and timely correction of any deficiencies:

1. Right-of-Way Barrier Inspection Report – May 2007 to April 2010
    a. C Line
    b. R Line
2. Warning Signs/Label Inspection Report – January 2007 to January 2010
    a. R Line
    b. L Line
3. Vegetation Inspection Report – February 2007 to March 2010
    a. C Line
    b. R Line
    c. M Line
    d. L Line
4. Cover Board Report Forms – May 2007 to January 2010
    a. C Line
    b. L Line

Findings:

1. Segments of fencing were inspected at the correct frequency and the required documents were corrected in a timely manner.
2. Warning signs were inspected at the correct frequency. In addition, the required inspections were properly documented and noted defects were corrected in a timely manner.
3. Sites containing vegetation were inspected at the correct frequency. The required inspections were properly documented and noted discrepancies were corrected in a timely manner. A plan has been implemented to mitigate and control the growth of vegetation throughout the system. BART is using vegetation retardants to slow the growth rates of vegetation throughout its entire system. This has greatly reduced the

growth rates of various types of vegetation.

4. Cover boards were inspected at the correct frequency. In addition, the required inspections were properly documented and noted defects were corrected in a timely manner.
5. BART is implementing a cover board modification to its program. This modification adds a third cover board bracket based in the center thereby strengthening the cover board. BART started with the A Line and is planning to implement this throughout the entire system. BART staff estimates that 60-75% of cover board incidents will be reduced when this cover board modification is in place.
6. BART hosts track allocation meetings where various BART departments and outside contractors have ascertained that schedules do not conflict and work conditions are safe for employees, contractors, and subcontractors. They are also ensuring that there will be adequate passenger safety when work is being planned.

Recommendations:

None

2010 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR BAY AREA RAPID TRANSIT DISTRICT

Checklist No.	**24**	Subject	Train Control and Communication Equipment Maintenance Review
Date of Review	**May 17, 2010 & May 20, 2010**	Department(s)	Maintenance and Engineering: 1) Systems Maintenance 2) Way and Facilities
Reviewers/ Inspectors	**Jimmy Xia** **Thomas Govea**	Person(s) Contacted	**Felix Marten (Assistant Superintendant, Maintenance & Engineering Department)** **Dan Stevenson (Section Manager)** **Edward Pomposo (Section Manager)** **Tony Williams (Section Manager)** **Randy Radford (Section Manager)** **Ni Lee (Safety Specialist)**

REFERENCE CRITERIA

1. General Order 164-D: Section 3.2 Rules n, o; Section 3.3
2. System Safety Program Plan Revision No. 8, Dated February 1, 2008: Chapter 15
3. Book 20, Procedure 019 – Train Control Equipment Room Preventative Maintenance Procedure
4. Book 20, Procedure 014 – Vital Relays Preventative Maintenance Procedure
5. SORS Preventative Maintenance Procedures
6. BART Periodic Maintenance Procedures for Station Emergency Phones
7. Preventative Maintenance Procedures for Vertical Yellow Fire Phones, Mine Phones, Blue light Stations, and Yellow Phones
8. DataStream
9. BART Switch Machine Preventative Maintenance – Location and Frequency

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

Train Control and Communication Equipment Maintenance Review

Review BART's records of preventative maintenance, scheduled and unscheduled maintenance activities for two separate periods during the last three years for the following components:

1. Station Multiplexer (MUX)
    a. Randomly select at least two stations and review their inspection reports to determine whether or not:
        i. All MUX components were inspected at the correct frequency
        ii. The required inspections were properly documented and noted defects were corrected in a timely manner
2. SORS
    a. Randomly select at least two stations and review their inspection reports to determine whether or not:
        i. All SORS components were inspected at the correct frequency
        ii. The required inspections were properly documented and noted defects were corrected in a timely manner

3. Vital Relays
    a. Randomly select at least two stations and review their inspection reports to determine whether or not:
        i. All vital relays components were inspected at the correct frequency
        ii. The required inspections were properly documented and noted defects were corrected in a timely manner
4. Switch
    a. Randomly select at least two switch machines to determine whether or not:
        i. All switches were inspected at the correct frequency
        ii. The required inspections were properly documented and noted defects were corrected in a timely manner
5. Emergency Telephones
    a. Randomly select at least one station and three wayside locations and review their inspection reports to determine whether or not:
        i. All equipments were inspected at the correct frequency
        ii. The required inspections were properly documented and noted defects were corrected in a timely manner

RESULTS/COMMENTS

Activities:
Staff interviewed BART personnel and selected and reviewed the following records of preventative maintenance (PM) and scheduled and unscheduled maintenance activities that were completed in the last three years for the following.

1. Station Multiplexer (MUX)
    a. 24th St. Mission Station
        i. Quarterly Inspection Reports for October 2007 to April 2010
        ii. PM completion reports for 8/1/08, 4/14/09, 10/21/09, and 4/27/10
    b. Walnut Creek Station
        i. Quarterly Inspection Reports for December 2007 to March 2010
        ii. PM completion reports for 9/25/08, 12/17/08, 6/18/09, 9/14/09, 12/12/09, and 3/21/10
2. Sequential Occupancy Release System (SORS)
    a. Downtown Berkeley Station (R20)
        i. Work Order Summary
        ii. Non Revenue Tests / Revenue Tests inspection reports for 1/15/08, 4/20/08, 5/7/08, 6/2008, 7/2008, 8/26/08, 9/16/08, 1/23/09, 7/30/09, 8/11/09, 9/26/09, 11/26/09, 1/2010, and 3/11/10
    b. San Leandro Station (A40)
        i. Work Order Summary
        ii. Non Revenue Tests / Revenue Tests inspection reports for 1/29/08, 5/29/08, 9/8/08, 2/17/09, 5/6/09, 9/9/09, 11/16/09, 1/5/10, 3/8/10, and 4/22/10
3. Vital Relays
    a. Montgomery St. Station (M20)
        i. Test History Data sheets and PM completion reports for the 2/15/07 and 3/2/09 inspections
    b. Dublin/Pleasanton Station (L30)
        i. Test History Data sheets and PM completion reports for the 10/4/06, 10/5/06, 10/7/06, 10/18/06, 9/28/08, 9/29/08, and 9/30/08 inspections
4. Switch Machines

a. Switch machine #131 at A05 interlocking
    i. Eight PM completion reports
b. Switch machine #129 at M87 interlocking
    i. Nine PM completion reports from 5/1/09 to early May 2010
c. All Switches
    i. Work Order Summaries for April 2010 and May 2010

5. Emergency Telephones
    a. 19th St. Oakland Station (K20)
        i. Work Order Summaries for the station emergency phones and vertical yellow fire phones
        ii. BART Station Communications 90 Day PM reports for 4/3/08, 4/1/09, and 3/27/10
        iii. BART Vertical Yellow Fire Phone 90 Day PM reports for 10/1/07, 4/3/08, 4/1/09, and 3/27/10
    b. Equipment No. COMM-A1-ETS (Emergency Telephone Station) on the A Line
        i. Work Order Summary
        ii. BART Communications Section Wayside Inspection 90 Day PM reports for 1/31/09 and 4/28/10
    c. Equipment No. COMM-C1-ETS-BHT (Berkeley Hills Tunnel) on the C Line
        i. Work Order Summary for this equipment
        ii. BART Communications Section Wayside Inspection 90 Day PM reports for 2/3/09 and 4/30/10
    d. Equipment No. COMM-L2-ETS on the L Line
        i. Work Order Summary for this equipment
        ii. BART Communications Section Wayside Inspection 90 Day PM reports for 3/31/09 and 4/2/10

<u>Findings:</u>

1. Station Multiplexer (MUX)
    a. 24th St. Mission Station
        i. All MUX components were inspected at the required quarterly frequency and passed their tests with no defects.
        ii. The PM completion reports for the inspections that were closed on 8/1/08 and 4/14/09 do not have the PM data sheets for train control room inspection attached to them which violates BART's SSPP, Chapter 15, requiring that equipment found to be in a failed or out of tolerance condition are recorded and tracked by the responsible maintenance department.
    b. Walnut Creek Station
        i. MUX components in this station were inspected at the required quarterly frequency with PM completion reports including inspections and data sheets properly documented.
        ii. The testers did not write "Yes" or "No" under the column labeled "Pass (Yes/No)" in the boxes corresponding to each MUX system on the PM data sheets for the power supply tests for the inspections that were completed on 12/17/08, 6/18/09, and 3/21/10.
        iii. A PM task with the work order #10-0002879 for a MUX cable with a due date of 4/30/10 was still open.
        iv. As of 6/2/10, PM task work order #10-0002879 was completed.
2. Sequential Occupancy Release System (SORS)

a. Downtown Berkeley Station (R20)
    i. Components were inspected at the correct frequency and records properly documented.
b. San Leandro Station (A40)
    i. Components were inspected at the correct frequency and records properly documented
    ii. Missing SORS documentation in the station was reported in the "Comments" sections on the Non Revenue Tests / Revenue Tests inspection reports for both the 3/8/10 and 4/22/10 inspections. On 5/18/10, a new documentation was reported to replace.
    iii. All the other noted defects found during inspections of the SORS components in this station were corrected in a timely manner.

3. Vital Relays
    a. Montgomery St. Station (M20) and Dublin/Pleasanton Station (L30)
        i. Inspections and PMs were completed at the correct frequency and properly documented.
        ii. All the vital relays in this station passed their tests and no defects were found.
    b. Some PM tasks for the vital relays due on 3/13/10 in the L10 station are still open.
    c. The PM tasks for the vital relays in cabinet 11 and cabinet 12 in the C55 interlock due on 4/3/10 are still open. They have the work order numbers ranging from #10-0001972 to #10-0001978.
4. Switch Machines
    a. Switch Machine #131 and #129
        i. Inspections and PMs were completed at the correct frequency and properly documented.
        ii. No discrepancies were found.
    b. A PM task for a switch machine with the work order #10-0002824 due on 4/30/10 remains open.
    c. As of 5/24/10, PM task for switch machine with work order #10-0002824 was completed.
    d. The PM tasks for five switch machines #115, 215, 217, 219, and 317 in the Y05 interlock near the SFO are overdue and still open as shown in the Work Order Summary for all the PM tasks for April 2010.
    e. As of 5/24/10, PM tasks for five switch machines #115, 215, 217, 219, and 317 have been completed.
5. Emergency Telephones
    a. 19th St. Oakland Station (K20) and Equipment No. COMM-A1-ETS (Emergency Telephone Station) on the A Line
        i. Inspections and PMs were completed at the correct frequency and properly documented.
        ii. No discrepancies were found and noted defects were corrected in a timely manner.
    b. Equipment No. COMM-C1-ETS-BHT (Berkeley Hills Tunnel) on the C Line
        i. Inspections and PMs were completed at the correct frequency and properly documented.
        ii. There are two trouble tickets noted on the Communications PM Trouble Ticket Report for the 4/30/10 inspection (#10-0003352 and #10-0002452). These two trouble tickets are in the open items list to be tracked to completion in a timely manner as shown in DataStream. A

BART representative stated that these two trouble tickets are recent and that BART will try to finish fixing these problems by the next inspection cycle.

c. Equipment No. COMM-L2-ETS on the L Line
    i. Inspections and PMs were completed at the correct frequency and properly documented.
    ii. The required inspections were properly documented on the BART Communications Section Wayside Inspection – Subway PM 90 Day reports.

6. BART inspects high use switch machines every 10 days (three inspections/month), which is more frequent than the required monthly frequency for high use switch machines as mentioned in BART's SSPP Chapter 15. Every PM task for a high use switch machine has a 10-day window to complete. This is the standard for the time frame to complete the PM tasks for high use switches that is implemented in the DataStream program. The DataStream program generates three scheduled PM completion dates for each month for high use switches (i.e. inspections are scheduled once every 10 days).
7. BART's existing DataStream software doesn't give inspectors flags when PM tasks are due, but a near future software update will replace the existing DataStream software and give reminders of overdue PM tasks including those which are carried over from previous time periods.

<u>Recommendation:</u>

BART should develop the controls necessary to alert management when vital relay work orders are not closed out in a timely manner as required by the BART Vital Relays Preventative Maintenance Procedure. (Book 20)

2010 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR BAY AREA RAPID TRANSIT DISTRICT

Checklist No.	**25**	Subject	Drug and Alcohol Testing and Worker Fit for Duty
Date of Review	**May 11, 2010**	Department(s)	Human Resources – Employee Services
Reviewers/ Inspectors	**Erik Juul**	Person(s) Contacted	**Margaret Saget (Principal Employee Services Representative)**

REFERENCE CRITERIA

1. General Order 164-D: Section 3.2 Rules t
2. System Safety Program Plan Revision No. 8, Dated February 1, 2008: Chapter 20
3. Operations Rules and Procedures Manual Revision No. 6.2, Dated January 2008
4. Human Resources Reference

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

Drug and Alcohol Testing

Interview the BART representative and review appropriate records in the last three years to determine whether or not:

1. The BART Substance Abuse Program meets current FTA guidelines
2. Results from the FTA Audit are satisfactory with any discrepancies having been addressed and corrective actions put in place to track until completion
3. The BART Substance Abuse Program includes contracted employees who also work in safety sensitive positions
4. The employees in safety sensitive positions were tested during the past three years for the following tests:
    a. Pre-employment
    b. Reasonable suspicion
    c. Post-Accident
    d. Random
    e. Return to Work
    f. Follow-up
5. The outcome of the tests is in compliance with BART policy and other regulatory requirements

Randomly select at least ten BART employees in safety sensitive positions who were tested positive for either drugs or alcohol or refused to be tested during the last three years and determine whether or not:

1. The employee was evaluated and released to duty by a Substance Abuse Professional (SAP)
2. The employee was administered a return to duty test with verified negative results
3. Follow-up testing was performed as directed by the SAP according to the required follow-up testing frequencies of the reference criteria after the employee has returned to duty

4. Consequences for repeat offenders were carried out as required by the reference criteria
5. Random testing of safety sensitive employees is performed as detailed in the BART Substance Abuse Program

Randomly select three employees from two different safety sensitive classifications and review records to determine whether or not: BART employees selected are given physicals including sight exams with results meeting the minimal requirements

RESULTS/COMMENTS

Activities:
Staff interviewed the BART Principal Employee Services Representative in charge of the BART Substance Abuse Program and reviewed the following drug and alcohol records as well as fit for duty from 2007 to 2010:

1. Pre-employment files.
2. Reasonable suspicion.
3. Post Accident.
4. Random tests.
5. Return to Work
6. Follow-up.

Staff also selected the following BART employees in safety sensitive positions who tested positive for either drugs or alcohol or refused to be tested during the last three years.

1. Four mechanics
2. Two track workers
3. One train operator

Findings:

1. On August 15, 2006, the Drug and Alcohol Program Manager of the Federal Transit Administration (FTA) provided a letter to the BART General Manager containing the following information:
    a. FTA found BART to currently be in compliance with the federally mandated Drug and Alcohol Testing Program.
    b. The FTA also confirmed that the FTA Audit results of BART were satisfactory.
2. BART does not have any contracted employees performing safety sensitive work.
3. The following safety sensitive classifications were reviewed and indicate that BART is in compliance with the minimal requirements for fit for duty:
    a. Three employees from two different safety sensitive classifications received physicals including sight exams.
    b. Three train operators received physicals including sight exams
    c. Three BART police officers received physicals including sight exams
4. The drug and alcohol procedures, test results, and follow up actions are in compliance with BART policy and other regulatory requirements.

Recommendations:
None

2010 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR BAY AREA RAPID TRANSIT DISTRICT

Checklist No.	**26**	Subject	Fire Emergency Systems
Date of Review	**May 12, 2010**	Department(s)	Maintenance and Engineering Power/Mechanical Maintenance
Reviewers/ Inspectors	**Steven Espinal**	Person(s) Contacted	**Dean Gielbelhausen (Section Manager)**

REFERENCE CRITERIA

1. General Order 164-D: Section 3.2 Rules n, o; Section 3.3
2. System Safety Program Plan Revision No. 8, Dated February 1, 2008: Chapters 14-15
3. Book 31, Electrical Maintenance Procedures
4. Book 4, Mechanical Maintenance Procedures, Volumes I and IX
5. California Code of Regulations Title 19

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

Fire Emergency Systems

Review BART's records of preventative maintenance, testing, and unscheduled maintenance activities for two separate periods during the last three years for the following components:

1. Ventilation
    a. Randomly select at least two separate reported areas to determine whether or not:
        i. All ventilation systems were inspected correct frequency
        ii. The required inspections were properly documented and noted defects were corrected in a timely manner
2. Sprinkler System
    a. Randomly select at least two separate reported areas to determine whether or not:
        i. All sprinkler systems were inspected at the correct frequency
        ii. The required inspections were properly documented and noted defects were corrected in a timely manner
3. Wet Stand Pipe
    a. Randomly select at least two separate reported areas to determine whether or not:
        i. All wet stand pipes were inspected at the correct frequency
        ii. The required inspections were properly documented and noted defects were corrected in a timely manner
4. Under-Car Deluge
    a. Randomly select at least two separate reported areas to determine whether or not:
        i. All under-car deluge systems were inspected at the correct frequency
        ii. The required inspections were properly documented and noted defects were corrected in a timely manner

RESULTS/COMMENTS
<u>Activities:</u> Staff interviewed the Section Manager for Fire Emergency Stations and reviewed the inspection records from 2008 to 2010 for the following stations: 1. Embarcadero Station 2. Berkeley Station 3. Trans Bay Tube Tunnel 4. Berkeley Hills Tunnel <u>Findings:</u> No exceptions were noted. <u>Recommendations:</u> None

2010 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR BAY AREA RAPID TRANSIT DISTRICT

Checklist No.	**27**	Subject	Electrical Maintenance Training and Certification
Date of Review	**May 11, 2010**	Department(s)	Maintenance and Engineering – Power and Mechanical Maintenance
Reviewers/ Inspectors	**Rupa Shitole** **Arun Mehta**	Person(s) Contacted	**Joseph Torrisi (Division Manager, Maintenance Support)** **Michael Smith (Supervisor, Maintenance Training)**

REFERENCE CRITERIA

1. General Order 164-D: Section 3.2 Rules n, o; Section 3.3
2. System Safety Program Plan Revision No. 8, Dated February 1, 2008: Chapters 15-16
3. BART Employee Certification Plan
4. Pathlore Training Database

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

Electrical Maintenance Training and Certification

Interview the BART representative in charge of the Electrical Maintenance Training Program to determine whether or not:

1. The program standards and implementation technique is reviewed and modified as necessary to meet the requirements of the reference criteria.

Randomly select the names of at least three persons in each of the following classifications:

1. Electrician
2. Electrical Foreworkers

Review the training and certification records for the last three years to determine whether or not:

1. The employee has received the required training to perform his/her duties
2. Documents are on-file to show that the employee is qualified to perform his/her duties
3. The employee has been re-certified at the required frequency

RESULTS/COMMENTS
<u>Activities:</u> Staff interviewed BART representatives and reviewed documents from the Maintenance and Engineering Department regarding training and certification processes including the following programs: 1. Electrical Safe Clearance Certification (ESC) 2. Berkeley Hills Tunnel (BHT) 3. 480v Emergency Transfer (ETP) 4. Wayside Staff also reviewed the following documents which were in accordance with the reference criteria: 1. Electrical PUC Certification Status as of 5/11/10 for all electricians and foreworkers 2. BART's Employee Certification Plan dated January 2005 3. Job description and Duty description for "Electrician" Job Title ID 1954. 4. 2010 Instructor Guides for the following: a. Electrical Safety Clearance (ESC) b. Berkeley Hills Tunnel (BHT). Staff selected the following persons identified by their ID numbers and reviewed the their training records: 1. Electrical Foreworkers a. #056497 b. #052862 c. #055723 2. Electricians a. #056788 b. #060682 c. #057389 d. #057389 <u>Findings:</u> 1. BART requires mandatory training and retraining certification programs for the electrician workforce including one day training on Injury and Illness Prevention Program and General Safety for new employees. 2. BART maintains a two or three year cycle for its training re-certifications depending upon the course. 3. Staff found all the training plans, procedures and practices to be in order. 4. According to the Pathlore database and Section 3.4.1 of its Employee Certification Plan, the following electrical foreworkers and electricians are out of compliance for periods ranging from two to eight months. a. Employee #056788 received the following training and exceeded the required three-year cycle by over eight months. i. Trained in BHT on 5/11/06 ii. Retrained in BHT on 3/1/10 iii. Trained in ESC on 5/12/06

iv. Retrained in ESC on 3/1/10

b. Employee #052862 received BHT training on the following dates and exceeded the required three-year cycle by over five months.

i. Trained on 4/27/06

ii. Retrained on 10/1/09

Recommendation:

BART should take appropriate actions to ensure that all electricians and foreworkers meet their training and certification requirements (BART Employee Certification Plan).

2010 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR BAY AREA RAPID TRANSIT DISTRICT

Checklist No.	**28**	Subject	Configuration Management and System Modification
Date of Review	**May 10, 2010**	Department(s)	System Safety
Reviewers/ Inspectors	**Anton Garabetian**	Person(s) Contacted	**Mark Chan, Principal Engineer**

REFERENCE CRITERIA

1. General Order 164-D: Section 3.2, Rule g
2. System Safety Program Plan Revision No. 8, Dated February 1, 2008: Chapters 8 and 17

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

Configuration Management and System Modification

Interview BART staff and review appropriate records to determine whether or not:

1. BART has a documented system modification review and approval process with specifics of sign-off requirements and exception capability.
2. The review and approval process of proposed changes to BART's system was properly documented (examples: Vehicle Automatic Train Control, MUX Stations, etc.).
3. Configuration changes to the rail system including those which are not in the Safety Certification Process with CPUC (e.g. revenue vehicles, passenger stations & facilities) were submitted, reviewed, and approved, implemented and documented in accordance with the reference criteria.
4. BART is actively addressing all the safety related issues stemming from the proposed changes to the system.

RESULTS/COMMENTS

Activities:

Staff interviewed BART Safety Engineer and reviewed the applicable records and documentation:

Findings:

1. BART has a documented system modification review and approval process with specifics of sign-off requirements and exception capability.
    a. For small scale projects or procuring parts, BART personnel use BART Engineering Change Order (BECO) Procedure.
    b. For large scale projects, such as Vehicle Automation Train Control (VATC), BART personnel use the Signature Review Process.
2. The following projects meet the BART procedures and have been documented in an appropriate manner:

a. Fixture Caps
    i. BECO documents and drawings
    ii. The project drawing revision is dated September 9, 2008
b. Vehicle Automatic Train Control
    i. BART properly documented the review and approval process of proposed changes
    ii. The Safety Department has approved the VATC project modification changes on April 21, 2009.
c. Multiplexer (MUX) Project
    i. BART properly documented the review and approval process of proposed changes
    ii. Safety Department is in the approval process of the MUX project.

3. BART submitted, reviewed, approved, implemented and documented configuration changes to the rail system, including those which are not in the Safety Certification Process with CPUC (e.g. revenue vehicles, passenger stations & facilities), in accordance with the reference criteria.
4. According to BART personnel, the Capital Investment Committee (CIC), as stated in SSPP Chapter 17, Configuration Management, under 1702 Process for Change, does not exist.
5. BART is actively addressing all the safety related issues stemming from the proposed changes to the system.

Recommendation:

BART should identify and remove programs and committees which are no longer applicable from its SSPP in its next revision. (SSPP 1702)

2010 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR BAY AREA RAPID TRANSIT DISTRICT

Checklist No.	**29**	Subject	Employee Safety - Injury and Illness Prevention Program
Date of Review	**May 13 & 20, 2010**	Department(s)	System Safety
Reviewers/ Inspectors	**Erik Juul**	Person(s) Contacted	**David L. Sanborn (Manager of Employee/Patron Safety)**

REFERENCE CRITERIA

1. General Order 164-D: Section 3.2 Rules r
2. System Safety Program Plan Revision No. 8, Dated February 1, 2008: Chapter 16
3. Injury and Illness Prevention Program

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

Employee Safety - Injury and Illness Prevention Program

Interview the BART representative in charge of the Employee Safety Program to determine whether or not:

1. An appropriate procedure and reporting form is available for employees to effectively report safety hazards in the work place
2. Employees are aware of this program and are comfortable utilizing it
3. Appropriate corrective action plans and schedule are developed and tracked to completion to address all reported hazards
4. Safety Committee meetings have addressed safety issues which have been closed out in a timely manner

Randomly select at least two employees from each of the following departments:

- Maintenance and Engineering: Way and Facilities
- Maintenance and Engineering: Systems Maintenance
- Maintenance and Engineering: Power and Mechanical Maintenance
- Non-Revenue Vehicle Maintenance
- System Safety
- Rolling Stock and Shops

Review employee safety program records to determine whether or not each employee has received the appropriate safety training in respect to their classification

RESULTS/COMMENTS

Activities:

Staff interviewed the BART Manager in charge of the BART Injury and Illness Prevention Program and reviewed records from 2007 to 2010:

Staff selected and reviewed safety program records from each of the following departments to determine whether or not each employee has received the appropriate safety training in 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:

1. The BART Injury and Illness Prevention Program procedure is available to employees. New hires are given copies of the procedure and the reporting form. An appropriate procedure and reporting form is available for employees to effectively report safety hazards in the work place.
2. System Safety accepts employee safety notices which track the progression of a complaint including the investigation and a closing letter to the complainant. Employees are aware of this program and are comfortable utilizing it.
3. Appropriate corrective action plans and schedule are developed and tracked to completion to address all reported hazards. These corrective action plans and schedules are stored on the safety notice running log.
4. Safety Committee meetings have addressed safety issues which have been closed out in a timely manner. These safety issues and close outs are documented in the Safety Committee meeting minutes prepared by the BART Manager of Employee/Patron Safety.
5. An employee ID # 060183 in Maintenance and Engineering: Systems Maintenance has not received the appropriate safety training in respect to their classification.
6. An employee ID # 056369, in Maintenance and Engineering: Power and Mechanical Maintenance has not received the appropriate safety training in respect to their classification.

Recommendation:

BART should take necessary actions to ensure all its Maintenance and Engineering employees receive their required safety training as appropriate to their classification. (BART Injury and Illness Prevention Program)

2010 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR BAY AREA RAPID TRANSIT DISTRICT

Checklist No.	**30**	Subject	Contractor Safety Preparation and Coordination
Date of Review	**May 12, 2010**	Department(s)	System Safety
Reviewers/ Inspectors	**Jimmy Xia**	Person(s) Contacted	**Mark Chan (Manager of Engineering Safety)** **Tom Morris (Resident Engineer in charge)**

REFERENCE CRITERIA

1. General Order 164-D: Section 3.2 Rule r
2. System Safety Program Plan Revision No. 8, Dated February 1, 2008: Chapter 16
3. Operations Rules and Procedures Manual No. 6.2, Dated January 2008
4. Management Procedure 31

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

Contractor Safety Preparation and Coordination

Interview the BART representative in charge of the Contractor Safety Program to determine whether or not:

1. The training program standards, course implementation, and compliance to the rules and procedures are reviewed and modified as necessary to meet the requirements of the reference criteria.
2. Agreements and contracts outline enough details to ensure that contractors understand the importance of safety preparation at BART

Randomly select two projects BART has outsourced to contractors and review the safety work plan, and training and certification records as necessary to determine whether or not:

1. Contracted employees have received the all the required training to safely perform his/her duties
2. Contractor safety procedures and policies clearly demonstrate that the contractors are responsible to comply with BART's safety rules and procedures.

RESULTS/COMMENTS

Activities:

Staff interviewed BART's Manager of Engineering Safety and Resident Engineer (RE) in charge of the Contractor Safety Program regarding the review and revision of the program standards and safety requirements in agreements and contracts.

Staff selected the following two projects BART and reviewed the safety work plans and training and certification records as mentioned below.

1. Central Contra Costa County Crossover Project (CCCCCP):

a) The 4-hour OR&P training material for the contractor employees

b) Track Safety Plan

c) A letter from Shimmick, BART's contractor for this project, to BART, dated 5/6/10, stating that Shimmick provided the 4-hour OR&P training to all the contractor employees.

d) The contractor's Site Specific Health and Safety Plan for this project, dated 9/24/09, which BART approved on 10/1/09.

e) A list, dated 5/7/10, of the contractor employees who passed the 4-hour annual OR&P training class. It has the headings: Sticker No., Date, Name, and Company.

f) Interim Operating Plan (IOP) #C001 for the installation of No. 10 crossover at C45 interlocking for the CCCCCP, which covers 3/26/10 – 3/29/10 which was approved by BART.

2. L20 West Dublin/Pleasanton Station Project:

   a) Site Specific Health and Safety Plan for the West Dublin station prepared by Shimmick Construction for BART, dated 10/30/06.

   b) SSWP for the West Dublin station prepared by Shimmick Construction, dated 7/31/09, to reconfigure the safety fence and work on constructing the station and was approved by BART on 8/3/09.

3. New Hire BART Orientation Training

4. BART Facilities Standards Revision 2.1

   a) Section 01 35 14 – Operating System Interface dated 10/01/09

   b) Section 01 35 24 – Construction Safety

5. Wayside Training Module Description for Contractor Superintendent dated 5/13/08

<u>Findings:</u>

1. BART has a Contractor Safety Training in place to ensure that all on-site contractor personnel are properly trained before starting work.
2. BART will modify the OR&P, training program standards, training course implementations, and other references available to support wayside work and access.
3. BART contracts approximately 80 safety monitors assigned to projects to ensure that contractors do not interfere with BART operations and are implementing their System Safety Work Plans in a safe manner.

<u>Recommendations:</u>

None

2010 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR BAY AREA RAPID TRANSIT DISTRICT

Checklist No.	**31**	Subject	Hazardous Materials Management Program
Date of Review	**May 11, 2010**	Department(s)	System Safety
Reviewers/ Inspectors	**Rupa Shitole** **Arun Mehta**	Person(s) Contacted	**David Sanborn (Manager, Environmental Health and Safety)** **Gary Jensen (Principal Engineer)**

REFERENCE CRITERIA

1. General Order 164-D: Section 3.2 Rules s
2. System Safety Program Plan Revision No. 8, Dated February 1, 2008: Chapters 19

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

Hazardous Materials Management Program

Interview the BART representative and review appropriate records in the last three years to determine whether or not:

1. The hazardous material and environmental management programs comply with the Federal, State and Local regulatory requirements
2. The Uniform Hazardous Waste Manifest System is in compliance to the reference criteria for each of BART's offsite disposal of generated hazardous waste
3. The Hazardous Materials Business Plan is accessible and has been reviewed and updated accordingly
4. BART employees who handle hazardous materials have received specific training regarding reporting requirements, inventory control storage, product release or spill, and the response and cleanup of spill incidents.
5. All emergency accessible equipment for handling hazardous materials is available and inspected routinely.
6. All noted discrepancies have been addressed and corrected in a timely manner

RESULTS/COMMENTS

Activities:

Staff interviewed BART representatives in charge of the Hazardous Material Management Program. Staff reviewed the following documents:

1. Spill Prevention Control and Countermeasures (SPCC) Plan that comply with all applicable Federal, State and Local requirements. SPCC plan consists of the following sections:
    a. SPCC Introduction
    b. Certification Statement signed and dated 7/18/05
    c. SPCC Requirements Table
    d. Hazardous Materials Business Plan dated 05/02/02. Each facility has a different

plan and all managers have access to these plans.

2. 22 California Code Regulation (CCR) Chapter 4.5 requirements for Hazardous Waste dated 5/11/05
3. 22CCR 66273 requirements for Universal Waste Management dated 5/11/05
4. Hazard Communication (Chemicals) Program dated March 15, 2007
5. Emergency Action Program dated March 15, 2007
6. List of Environmental, Health and Safety Programs/Topics dated May 11, 2010.
7. Environmental Management System (EMS) Progress Report dated March 9, 2006.
8. EMS team meeting power point presentation dated October 21, 2008.

Staff selected and reviewed the following records:

1. Uniform Hazardous Waste Manifest Form for Richmond Shop, Manifest Tracking Number 002511281FLE, signed and dated 9/15/09. Siemens Water Technologies Corp. issued Certificate of Treatment and Waste Management for Manifest Tracking Number 002511281FLE.
2. Uniform Hazardous Waste Manifest Form for Richmond Shop, Manifest Tracking Number 002513594FLE signed and dated 1/5/10. Siemens Water Technologies Corp. issued Certificate of Treatment and Waste Management for Manifest Tracking Number 002513594FLE.
3. Uniform Hazardous Waste Manifest Form for Daly City Shop, Manifest Tracking Number 002513685FLE, signed and dated 12/29/09.
4. Hazardous Waste Generator Reporting Form signed and dated 2/9/09 with Hazardous Materials Inventory (2009 CUPA Packet) for Richmond Shop.
5. Hazardous Waste Generator Reporting Form signed and dated 2/25/10 with Hazardous Materials Inventory (2010 CUPA Packet) for Richmond Shop.
6. Hazardous Waste Generator Reporting Form signed and dated 2/24/10 with Hazardous Materials Inventory (2010 CUPA Packet) for Willow Pass Road at Hwy 4.
7. Hazardous Materials Business Plan/Hazardous Materials Inventory for Hayward Substation for year 2010 submitted to Hayward Fire Department as an annual requirement under Federal Law and/or Emergency Planning and Community Right-to-Know Act (EPCRA).
8. Certificates of Completion for successful completion of Hazardous Waste Management/Shipping training conducted by the Industrial Safety and Hazmat Training Group on April 8, 2010 at Hayward for all 15 BART employees who handle hazardous waste material. The expiration date for this training is April 8, 2011. This is an 8 hour course taken annually.
9. BART Weekly Hazardous Waste Generator Inspection Form for Richmond Shop dated 1/8/10, 1/15/10, 1/22/10, 2/19/10, 2/26/10, 3/5/10, 3/12/10, 3/26/10, 4/2/10, 4/9/10, 4/16/10, 4/23/10, 4/30/10 and 5/2/10. All noted discrepancies were addressed and corrected in a timely manner. This form inspects the Hazardous waste, Universal waste, and the Emergency supplies. Spill kits are available at each facility.

<u>Findings:</u>

1. Staff found BART's Hazardous Materials Management Program to be in order.
2. The Environmental Management System EMS is a set of management processes and procedures that allow an organization to analyze control and reduce environmental impact of its activities and operate with greater efficiency and control. Since 2006, the EMS Program has been put on "Hold" for past 3 years and not conducted accordingly to the System Safety Program Plan, Revision 8, dated February 1, 2008, Chapter 5.

Recommendation: BART should identify and remove programs and committees which are no longer applicable from its SSPP in its next revision. (SSPP 1702) (Identical Recommendation as Checklist #28)

2010 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR BAY AREA RAPID TRANSIT DISTRICT

Checklist No.	**32**	Subject	Procurement and Quality Assurance
Date of Review	**May 12, 2010**	Department(s)	Quality Assurance and Logistics
Reviewers/ Inspectors	**Rupa Shitole** **Arun Mehta**	Person(s) Contacted	**Sandy Miniz (Senior Quality Assurance Eng.)** **Gary Mascarenas (Senior Lead)** **Ni Lee (Safety Specialist)**

REFERENCE CRITERIA

1. General Order 164-D: Section 3.2 Rules u
2. System Safety Program Plan Revision No. 8, Dated February 1, 2008: Chapter 21

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

Procurement and Quality Assurance

Interview the BART representative and review appropriate records in the last three years to determine whether or not:

1. Adequate procedures and controls are in place to preclude the introduction of defective or deficient equipment into the system
2. Safety procedures exist to mitigate safety hazards or defective or deficient equipment in the event these are introduced into the system
3. Proper documentation is maintained to record tests and mitigation controls for defective or deficient equipment.

RESULTS/COMMENTS

Activities:

Staff interviewed BART representatives from the Quality Assurance (QA) and Logistics Departments at Hayward Shop. BART staff provided information on the following procedures:

1. New part(s) purchasing procedure
2. First article inspection procedure
3. Rejection procedure of an article
4. Electronic Repair Shop checks for electronic parts
5. Secondary Repair Shop checks for repairable materials/articles that are tagged using different color coding.
6. Storage space for inventory items, rejected items, hold items, testing items, etc.

Staff also interviewed the QA inspectors, who are responsible for inspecting new and repaired material received in accordance to the material and/or drawing specifications.

Staff selected and reviewed the following procedures as well as some pertaining records:

1. Rolling Stock and Shops, Quality Assurance Manual, Chapter 6 Procedure 2 (Revision Date 3/16/09)

2. Rolling Stock and Shops, Quality Assurance Manual, Chapter 6 Procedure 6 (Date Issued 5/31/07)
3. Quality Assurance/Receiving Exception Report
4. Certificate of Material Conformance

Findings:

1. BART Quality Assurance procedures are followed and adequate for the program.
2. First Article Inspection Report for Material No.1745A (Locking Strip, Side Door Glass Seal)
    a. Approved and signed on 1/22/10
    b. BART ordered a quantity of 10 and inspected the parts according to the customer approved drawing. 1 of the 10 was rejected and did not meet the customer approved drawing.
    c. Acceptance Report for P.O. Number 146661, Stock Number 19-11-80833 dated 2/3/10 was signed and approved by an inspector as well as an engineer on 2/5/10.
3. Quality Assurance/ Receiving Exception Report #01311 dated 4/1/10. P.O. # 146575 (Tie Rod Assembly) or BART Stock# 193573103
    a. BART ordered a quantity of 50 and rejected 50 after an inspection because the parts were not assembled according to the customer approved drawing.
    b. Engineering Department concurred and signed on 4/1/10.
    c. Material/Management and Procurement Department concurred and signed on 4/7/10.
4. Certificate of Material Conformance for Part #011557 by a Quality Technician from Portland Forge dated 12/4/09.
    d. Flame Metals Processing Corporation Certification for Part #011557 dated 1/19/10.
    e. Part Submission Warrant and Final Inspection Report by Inspector from Columbia Gear Corporation for Part #011557 (Gear, High Speed Gear Unit) signed and dated 4/13/10.
5. Quality Assurance/ Receiving Exception Report #00887dated 1/11/08. P.O. # 137851 (Panel Floor) or BART Stock# 181160110.
    f. BART ordered a quantity of 10 and rejected 10 after conducting a destructive testing by an outside vendor (reviewed the Metallurgy Test Form dated 10/17/07) because the part numbers were not stamped on panels and were not according to the customer approved drawing.
    g. Engineering Department concurred and signed on 1/11/08.
    h. Material/Management and Procurement Department concurred and signed on 1/11/08.

Recommendations:

None