TRIENNIAL ON-SITE SAFETY AUDIT OF BAY AREA RAPID TRANSIT

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PREPARED BY:

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2003 ON-SITE SAFETY AUDIT OF

BAY AREA RAPID TRANSIT DISTRICT'S

RAIL TRANSIT SAFETY PROGRAM

ACKNOWLEDGEMENT

The California Public Utilities Commission's Rail Transit Safety Section staff, with the assistance of staff from the Railroad Safety Branch and the Utility Safety Section, conducted this system safety program audit and the safety inspections. Staff members directly responsible for conducting audit and inspection activities include:

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1. EXECUTIVE SUMMARY

The California Public Utilities Commission's (Commission) Consumer Protection and Safety Division, Rail Transit Safety Section Staff (staff) performed an on-site audit of the Bay Area Rapid Transit District's (BART) safety program in October 2003.

Generally, the audit found that BART has a comprehensive System Safety Program Plan and is effectively carrying out that plan. Staff made 22 recommendations on the 36 checklists (areas examined). The most serious area of concern is management follow-through. While the BART managers interviewed appear to be genuinely interested in carrying out the safety program, there are disturbing instances of incomplete, partial or delayed compliance, possibly tied to limited resources. Staff auditors found safety inspections being performed less often than required (checklists 24, 28, 29, 31), corrective action plans not being implemented promptly (checklist 9), employees not receiving required refresher course training when required (checklist 12, 35), and security items/repairs identified by BART Police not being promptly attended to (checklist 16). Staff does not believe these items constitutes an imminent safety hazard, but they could have long term safety impacts if allowed to continue.

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Acronyms List

Acronym	Meaning
AIP	Accident Investigation Procedure
APTA	American Public Transportation Association
ATC	Automatic Train Control
ATO	Automatic Train Operation
ATP	Automatic Train Protection
BART	Bay Area Rapid Transit
CFR	Code of Federal Regulations
CPUC	California Public Utilities Commission
DISCAL/OSHA	Department of Industrial Safety – California Occupational Safety and Health Act
FRA	Federal Railroad Administration
FTA	Federal Transportation Administration
GM	General Manager
GO	General Order
ISA	Internal Safety Audit
MOW	Maintenance of Way
NTSB	National Transportation Safety Board
OCC	Operations Control Center
OES	Office of Emergency Services
PM	Preventative Maintenance
PMP	Project Management Plan
SORS	Sequential Operating Release System
SSPP	System Safety Program Plan
STAFF	CPUC's Rail Transit Safety Section Staff
T/O	Train Operator

2. INTRODUCTION

The Federal Transit Administration's (FTA) Rule, 49 CFR Part 659, State Safety Oversight of Rail Fixed Guideways, requires that State safety oversight agencies perform a review of each rail transit agency's system safety program at least once every three years. The Commission, in turn, has incorporated that requirement into GO 164-C. The purpose of these reviews or audits is to evaluate the effectiveness of the rail transit agencies' system safety programs and to assess the level of compliance with GO 164-C and other Commission safety requirements.

The Commission's GO 164-C, Rules and Regulations Governing State Safety Oversight of Rail Fixed Guideway Systems, was developed and adopted to satisfy the FTA's requirement for a rail transit safety program standard. The GO includes the Commission's minimum requirements for rail transit agency system safety program plans (SSPP).

Staff of the California Public Utilities Commission's Consumer Protection and Safety Division performed the third triennial, on-site safety audit of BART beginning October 2 through October 10, 2003. As a precursor to the audit, staff sent a letter to BART's General Manager, in early May 2003, advising him that the triennial audit would be scheduled for early October 2003. A second letter was sent in early September setting the dates of the audit. Enclosed with the letter were 36 checklists that served as the basis for the audit. The 36 checklists included four inspections for track, signals, electric power systems, and vehicles.

On October 1, 2003, staff conducted a pre-audit meeting with BART's senior management team. Staff began the on-site safety audit and records review the next day (October 2) and completed it on October 10, 2003. At the conclusion of each audit activity, staff provided the BART representative with a summary of the preliminary findings and discussed any recommendations for corrective actions.

On October 10, 2003, staff conducted a post-audit exit meeting with BART's General Manager and included the Chief of Police, Deputy Director, and Chief Safety Officer. Attendees were given a verbal synopsis of the findings from the 36 checklists and discussed the need for corrective actions. Staff also answered questions about the findings and explained that a preliminary draft audit report would be prepared for BART's review and comments.

3. BACKGROUND

System Description

BART began regular passenger service in September, 1972. With BART's recent expansion into SFO, the system has approximately 119 miles of double track and nearly 700 transit cars. BART provides Bay Area mobility by serving over 300,000 passengers daily, or 90 million passengers annually. This fully automated, high speed, urban mass transportation system provides over 1 billion passenger miles per year and has total operating expenses of over $350 million.

BART serves passengers in four counties with 43 stations. These are:

- Alameda (19)
- Contra Costa (10)
- San Francisco (8)
- San Mateo (6)

There are five BART routes: Daly City-Richmond, Fremont-Richmond, SFO-Dublin/Pleasanton, Daly City-Fremont, and Millbrae-Pittsburg/BayPoint. These routes are comprised of approximately 63 miles of at-grade right-of-way, and are fully grade separated from roadway operations. In addition there are 27 miles of aerial structure, 25 miles of underground construction, and four miles of underwater tube linking Oakland to San Francisco.

2000 Audit

The staff's previous audit of BART's System Safety Program was performed in October 2000. The 2000 audit resulted in forty-six (46) recommendations (See Appendix B) on forty

(40) checklists (See Appendix A). The majority of the recommendations focused on preventive maintenance inspections and training/recertification programs. BART developed a corrective action plan to implement the recommendations, and the corrective actions were completed prior to the 2003 audit.

The 2003 audit indicated that BART made significant progress between the 2000 and 2003 audit in the areas of inspection, documentation and training. However, it also identified these as areas where additional improvements could be made to further improve BART's safety program.

4. AUDIT PROCEDURE

The audit was conducted in accordance with the Commission's procedure RTSS-4, Procedure for Performing Triennial Safety Audits of Rail Transit Systems. A set of 36 audit checklists covering various departments with system safety responsibilities was prepared in advance of the on-site audit. A list of the 36 checklists is included as Appendix D. Each checklist identified the elements and characteristics that were audited, the results of the audit, and recommendations for improvement, where applicable. The methods used during the audit included:

- Discussions with BART management
- Reviews of procedures and records
- Observations of operations and maintenance activities
- Interviews with rank and file employees
- Inspections and measurements of equipment and infrastructure
- Follow-up to the 2000 BART Triennial Audit

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

5. FINDINGS AND RECOMMENDATIONS

The 2003 Triennial Audit of BART confirmed through the activities observed, the documents reviewed, the management discussions and the items inspected that BART is in compliance with their System Safety Program. This audit identified 22 corrective actions on 36 checklists:

One (1) recommendation for the General Manager,

Five (5) recommendations for the System Safety,

Five (5) recommendations for Operations and Training,

Six (6) recommendations for the Maintenance and Engineering Way and Facilities,

Four (4) recommendations for the Maintenance and Engineering Power/Mechanical, and

One (1) recommendation for the Police Department and Facilities Maintenance.

The 36 checklists are listed in Appendix D, the recommendations are listed in Appendix E, and the complete checklists are in Appendix F.

General Manager:

The General Manager (GM) has the overall management responsibility for all of the BART Departments. This includes the authority and responsibility for System Safety.

Findings – Conforming Conditions:

1. The GM was interviewed to determine the scope of management involvement, coordination, and communication to satisfy the commitments and recommendations for improving and implementing the System Safety Program Plan. The GM has many resources and tools available to track system safety. These include:
    - Monthly reports on district-wide performance parameters
    - A quarterly performance report
    - The annual budget process
    - Annual meeting between the Chief Safety Officer and the GM

2. Management through a formal process tracks major accidents and hazardous conditions and keeps the GM informed on these accidents.

Findings – Non-Conforming Conditions:

1. Maintenance and Engineering did not develop corrective action plans to address five Internal Safety Audit checklists after repeated notices from the System Safety Department. (See checklist 9).
2. Resolution ST-51 ordered BART to implement Recommendation 2 from checklist 36, "BART should develop and implement the plan and schedule to eliminate the training backlog as soon as possible." A training backlog continues to exist in safety sensitive categories. (See checklist 35).

Recommendations.

1. BART upper management needs to ensure that safety failures identified by the System Safety Department are promptly resolved.

Human Resources:

The Human Resources Department is responsible for employee recruitment, and the administration and enforcement of BART's Drug and Alcohol Policy for all employees at BART.

Findings – Conforming Conditions:

1. BART has a successful Drug and Alcohol Testing Program and its Substance Abuse program exceeds Federal requirements.

Findings – Non-Conforming Conditions:

None

Recommendations:

None

System Safety Department:

System Safety is responsible for the implementation of BART's System Safety Program Plan (SSPP) policies. It interfaces and communicates with all departments to develop, review and implement policies related to the SSPP. It is responsible for the annual internal safety audits, accident investigations, hazardous materials, emergency response preparedness and other safety related issues.

Findings – Confirming Conditions:

1. Accident and Unacceptable Hazardous Conditions procedures and investigations were very good.
2. BART's Operating Rules and Procedures Manual and Operating Bulletins are maintained and distributed appropriately.
3. BART's Employee Assistance Program is well developed, a draft Injury and Illness Prevention Program is in the approval process.
4. A Safety Committee tracks corrective actions and informs upper management of progress.
5. BART has a comprehensive Internal Safety Audit program.
6. Inter-departmental Communication programs are adequate.
7. The Oakland Airport Connector Safety Certification Plan meets system safety requirements.
8. BART has a developed Hazardous Materials Management Program.
9. BART collects and analyzes safety related data in a way that complies with its SSPP.
10. BART has an active Emergency Response and Training Program and holds frequent drills throughout its system.

Findings – Non –Conforming Conditions:

1. During accident investigations, required update/status reports to the PUC were not filed and corrective action plans were not always submitted to the PUC as required. (See checklist 6).
2. Maintenance and Engineering did not develop corrective action plans to address five Internal Safety Audit checklists. (See checklist 9).
3. The current SSPP does not adequately address the safety certification requirements of GO 164-C, adopted February 27, 2003. (See checklist 11).
4. No controls currently exist to ensure new hires and transferees receive the necessary environmental and safety training. (See checklist 12).

Recommendations:

2. BART should ensure that if the investigation takes longer than 60 days to complete, the interim status reports are submitted to the CPUC every 30 days as required by G. O. 164-C, Section 6.3 (e).
3. BART should ensure that if a corrective action plan with an accompanying implementation schedule is prepared as a separate document, it is submitted to the CPUC to comply with the requirements of G. O. 164-C, Section 6.3 (e).
4. BART should ensure that the audited departments develop the required corrective action plans and schedules that are responsive to the audit findings to address the recommendations in accordance with SSPP and Management Procedure No. 60 and transmit them to the System Safety Department in a timely manner.
5. BART should update the current System Safety Program Plan to describe the Safety Certification Plan process to implement the requirements of the

   General Order No. 164-C.
6. Develop and implement a method that ensures that new hires and transferees receive the necessary environmental and safety training in a timely manner.

Operations Training and Development:

The Operations and Training and Development Department conducts certification and technical skills training classes to non-supervisory employees, safety training to employees and contractors and provides supplemental orientation to incumbent employees.

Findings – Conforming Conditions:

1. BART has a well developed training program for train controller, power/support controller, central manager trainees, and forepersons.
2. BART has an in-depth initial training and certification program for track control technician certification.

Findings – Non –Conforming Conditions:

1. Several train operators and foreworkers are past due for required recertification training. (See checklist 17).
2. A significant number of track control technicians are past due for required recertification training. (See checklist 35).
3. The Training Department is responsible for notifying the responsible manager about any past due certification status but the Training Department does not always have up to date information of the status of the employee (transfer, retired, promotion, classification change, etc.) from HR and the responsible departments. (see checklist 17).
4. The Training Department uses a revised draft version of the employee certification plan, however, this revised version is not an approved document. Section H of the employee certification plan dated December 1986 requires any modification to be forwarded to the CPUC for review and comment prior to implementation. (see checklist 17 and 35).
5. BART did not have file copies of the course Instructor's Guides for the track control technician training. Course training materials do not always comply with the Technical Training Handbook. (See checklist 35).

Recommendations

7. BART should develop and implement a plan and schedule to eliminate the training backlog.

8. BART should ensure that all safety sensitive employees receive the necessary training and testing and are recertified before their certification lapses. BART should develop a procedure that establishes and implements effective communication among the training department, human resources department and other responsible departments so that the employee training certification/recertification program is effectively implemented in a timely manner.

9. BART should ensure that any employee, whose certification has lapsed, is not assigned to the position that requires the certification.

10. BART should update, as soon as possible, the existing employee certification plan dated December 1986 to reflect current training practices, documentation requirements, inter-departmental coordination, etc., and forward this updated plan to the CPUC for review and comment prior to implementation.

11. BART should increase the Training Department's oversight of Employee Development Specialists to ensure:

    a) An up to date file copy of all training materials and instructor guides is maintained,

    b) All courses have an Instructor Guide, and the guides are in compliance with the Technical Training Handbook,

    c) All courses have an up to date Lesson Plan

Maintenance and Engineering Way and Facilities Maintenance:

Facility Management and Engineering maintains the physical plant, track and wayside equipment.

Findings – Conforming Conditions

1. The track inspection revealed no defects or problems
2. Inspected Switch Gear and Gap Breakers were in compliance with GO 95.
3. Inspected switches and signals were in good working order.
4. A review of track inspection records found inspections were preformed as required and defects corrected in a timely manner.
5. A review of turnout inspection records found inspections were preformed as required and defects corrected in a timely manner.
6. BART's procedure for updating and control of the Track Safety Standards Maintenance Manual met all requirements.
7. A review of inspection and repair records for train control equipment showed all inspections were completed as required and noted defects corrected in a timely manner.

Findings – Non –Conforming Conditions:

1. Inspectors of the electrical power system identified several instances where required warning signs were not present or were obscured. (See checklist 2).
2. Inspectors of the electrical power system identified instances where third rail cover boards were missing. (See checklist 2).
3. Fences at the Fremont Substation did not meet the GO 95 height requirements. (See checklist 2).
4. BART did not perform inspections of fence barriers on highways. (See checklist 24).
5. BART did not complete all Right-of-Way Fence inspections, documentation was incomplete on some inspection forms, and in some cases there was no indication whether deficiencies noted during inspections were corrected. (See checklist 24).
6. BART did not inspect the Right-of-Way Fences on the San Francisco Airport/Milbrae extension. (See checklist 24).

Recommendations

12. All BART stations and substations should be inspected to ensure that the signage is in compliance with GO 95, Rule 79.5. If the signage is not in compliance a corrective action plan needs to be developed and implemented.

13. All third rail guards should be inspected and repairs made to the guards as necessary to be in compliance with GO 95, Rule 79.2.

14. All of BART's fencing should be inspected to determine if it is in compliance with GO95, Rule 79.4B, or a variance approved by the CPUC. If the fencing is not in compliance, a corrective action plan needs to be developed and implemented. BART should begin inspections of barriers, and document those inspections.

15. BART should inspect and document all items identified for scheduled Right-of-Way fence inspections.

16. BART should correct all deficiencies found during Right-of-way fence inspections, and document them on the proper forms.

17. BART should revise the monthly inspection records to include those areas pertaining to the San Francisco airport extension and begin inspecting those fences immediately.

Maintenance and Engineering Power/Mechanical Maintenance:

Power and Mechanical Maintenance is responsible for traction power, electrical facilities elevator and escalator and mechanical maintenance.

Findings – Conforming Conditions

1. The mechanical portion of preventive maintenance inspections for ventilation fans were completed as required and noted defects corrected in a timely manner.
2. Vital relay inspections were completed as required and noted defects corrected in a timely manner.
3. Wet pipe sprinkler system and line pump inspections and testing were performed at the required intervals and good records were maintained.

4. Under-car deluge system inspections were performed at the required intervals and noted defects were corrected in a timely manner.
5. Gap breaker inspections were performed at the required intervals and noted defects were corrected in a timely manner.

Findings – Non –Conforming Conditions:

1. The electrical portion of preventive maintenance inspections for ventilation fans were completed approximately 70 percent of the time and the inspection intervals have been lengthened from monthly to quarterly. There was no documentation to show whether some of the defects noted in inspections had been repaired. (See checklist 28).
2. Monthly third rail maintenance inspections are being completed approximately 75 percent of the time. Annual inspection records showed approximately 85 percent complete in 2002, but inspections are on track for 100 percent compliance in 2003. The documentation of third rail inspections needs improvement, especially in noting and tracking deficiencies found in inspections. (See checklist 29).
3. The Power and Way Electrical maintenance Procedure book is out of date and does not reflect current practice. (See checklist 29).
4. Scheduled fire alarm and sprinkler system inspections were completed less than one third of the time during the first six months of 2003. (See checklist 31).

Recommendations:

18. BART should ensure that the electrical portion of the line ventilation fans' preventive maintenance program is performed at the required frequencies and repairs for noted discrepancies are properly documented.

19. BART should ensure that the monthly and annual third rail inspections are performed for the entire system; the noted discrepancies are tracked and corrected in a timely manner, and properly documented to show clear closures of the repairs of all deficiencies.

20. BART should update, as soon as possible, the existing Power & Way Electrical Maintenance Procedure Book 31, Chapter 1, Section 17 dated 11/18/82 to reflect current inspection practices, documentation requirements, inter-departmental coordination, etc.

21. BART should ensure that fire alarm and sprinkler system inspections are performed at the required intervals and the noted discrepancies are tracked and corrected in a timely manner.

Rolling Stock and Shops:

Rolling Stock and Shops Department maintains the revenue vehicle fleet and is responsible for the movement of revenue vehicles within the areas and on yard leads.

Findings – Conforming Conditions

1. Vehicle inspections revealed no safety problems
2. A review of the Vehicle Restoration project found no discrepancies in the change control procedures or in configuration management.
3. A review of calibration and testing equipment found no discrepancies.
4. The Preventive Maintenance Inspections were preformed according to the schedule with no backlog. Records were complete, all identified items were corrected and and no exceptions found.
5. BART has a mature and effective quality assurance program for transit vehicles, no discrepancies were found in the records reviewed.

Findings – Non –Conforming Conditions:

None

Recommendations:

None

Transportation:

The Transportation Department organizationally is under the Operations umbrella that includes: Transportation and System Service, Rolling Stock and Shops, Operations Training

and Development, Maintenance and Engineering and Operations Liaisons. This includes the monitoring of the Hours of Service.

Findings – Non –Conforming Conditions:

1. While generally in compliance with the hours of service rules, auditors found one instance where a safety sensitive employee began work with less than the required time off. (See checklist 18).

Recommendations:

None

Police Department:

The BART Police Department is an agency that provides the full range of law enforcement services and is a participating member of the California mutual aid pact. In addition, this department tracks the type of crime activity on BART and develops strategies to deter criminal activities.

Findings – Conforming Conditions:

1. BART's Security program is comprehensive, including terrorist threat assessments, station inspections/audits, crime data collection and analysis, and emergency preparedness training. Recent training has focused on responding to weapons of mass destruction.

Findings – Non –Conforming Conditions:

1. The Police Department has, at times, been unable to obtain timely maintenance for safety and security related problems, such as lighting. (See checklist 16).

Recommendations

22. Develop a procedure for the BART Police Department and Facilitates Maintenance that communicates, tracks, and follows-up on items identified by the Police Department as impacting passenger and employee safety or security. Ensure the procedure is implemented so that priority safety and security items are promptly corrected.

APPENDIX A
BART 2000 TRIENNIAL AUDIT INDEX OF CHECKLISTS

Checklist	Title
1	Internal Safety Audit Program
2	Safety Department Responsibilities – Part 1
3	Reporting and Investigating Accidents and Unacceptable Hazardous Conditions
4	Safety Certification – San Francisco Airport Extension Project
5	Hazardous Materials Management Program
6	Drug and Alcohol Testing Program
7	Safety Department Responsibilities – Part 2
8	Fence Inspection
9	Emergency Ventilation Fans
10	Third Rail Maintenance
11	Station Fire Alarms and Sprinkler Systems
12	Wet Pipe Sprinkler Systems and Line Pumps
13	Under-Car Deluge System
14	Substations, Gap Breakers & Wayside Equipment
15	Non-Revenue On-Rail Vehicle Maintenance
16	Station Emergency Telephone Maintenance
17	Train Control Equipment Inspection and Tests
18	SORS (Sequential Operating Release System) Preventive Maintenance
19	Vital Relays (Wayside) Maintenance
20	Switch Machine Inspection and Maintenance
21	Joint Inspection of Switches Records
22	Turnout Inspection and Joint Inspection off Switches Performance
23	Security
24	Transit Vehicle Maintenance
25	Quality Assurance – Transit Vehicles
26	Calibration of Measuring and Testing Equipment
27	Special Inspection Requirements Following Derailments and Switch Run Through
28	Track Inspection Records
29	Turnout Inspection Records
30	Training and Certification of Train Controllers and Power Support Controllers
31	Operations Control Center (OCC) Activities
32	Hours of Service
33	Train Operator Performance
34	Tower Foreworker Performance
35	Training and Certification of Train Operators, Station Agents, and Tower Foreworkers
36	Training and Certification of Train Control Technicians

Checklist	Title
37	Training and Certification of Transit Vehicle Mechanics, Electricians, and Electronic Technicians
38	Training and Certification of Safety Monitors and Contractors
39	Local Control Operators Training and Performance
40	On-Rail Equipment Operator Performance, Training, and Certification

APPENDIX B

BART 2000 TRIENNIAL AUDIT RECOMMENDATIONS LIST

No.	*Recommendations*	Checklists No.
1	Short term: The CPUC staff representative for BART should immediately be brought into the on-going investigation, analysis, and resolution process for the hazards associated with motor vehicle intrusions into the DPX right of way.	3
2	Long term: BART Safety should prepare an appropriate procedure for investigating hazardous conditions to assure that BART policy regarding partnering with the CPUC is fully implemented by providing the Commission designated representative every opportunity to fully participate in all phases of investigations of this kind.	3
3	BART should develop a process or procedure to ensure that every manager and supervisor attends the required Substance Abuse Program Training.	6
4	BART should review and re-issue the BART System Safety Program Plan.	7
5	BART should re-examine the frequency of shop and station inspections or perform inspections as required.	7
6	BART should develop a procedure to ensure that all defects in fences noted on the Monthly Conditions Reports are corrected in a timely manner.	8
7	BART should ensure that maintenance inspections for ventilation fans and associated dampers are performed at the required intervals, the inspections are properly documented, and noted discrepancies are corrected in a timely manner. In addition, controls should be put in place to ensure that management will be alerted when maintenance inspections are not performed at the required intervals, the inspections are not properly documented, or noted discrepancies are not corrected in a timely manner.	9
8	BART should develop a procedure for a monthly check and status report to ensure that the monthly vital equipment tests, required by the OCC Rules and Procedures Manual #382, are performed and documented. This procedure should ensure that there is coordination between the Power & Mechanical Maintenance Department and the Power / Support Controller in BART OCC to perform the required tests. The status report should also confirm that all associated checklist forms have been completely filled out, properly signed, and filed by the Power & Support Controller performing the test.	9
9	The Power & Mechanical Maintenance Department should schedule and perform the required operational tests, at the required frequencies, of all devices associated with the Trans Bay Tube and the Berkeley Hills Tunnel ventilation systems. Track the proper documentation and ensure that noted discrepancies were corrected in a timely manner.	9
10	BART should ensure that maintenance inspections for third rail are performed at the required intervals, the inspections are properly documented, and noted discrepancies are corrected in a timely manner. In addition, controls should be put in place to ensure that management will be alerted when maintenance inspections are not performed at the required intervals, the inspections are not properly documented, or noted discrepancies are not corrected in a timely manner.	10
11	BART should ensure that the maintenance inspections forms are delivered to the Oakland Shops office in a timely manner.	10
12	BART should identify what current procedure requires the preventative maintenance inspection of station fire alarms and fire sprinkler systems. If no such procedure exists, BART shall develop such a procedure as soon as possible.	11
13	BART should ensure that maintenance inspections of station fire alarms and fire	11

No.	*Recommendations*	Checklists No.
	sprinkler systems are performed at the required intervals. In addition, controls should be put in place to ensure that management will be alerted when maintenance inspections are not performed at the required intervals.	
14	BART should finalize the procedure that reflects the new maintenance intervals for inspecting sump pumps.	12
15	BART should ensure that maintenance inspections of sump pumps are performed at the required intervals. In addition, controls should be put in place to ensure that management will be alerted when maintenance inspections are not performed at the required intervals.	12
16	BART should finalize the revision to the under-car deluge system procedure to reflect the elimination of the monthly inspection and to reflect the implementation of the semi-annual inspections. Before changing the procedure, BART should verify the requirements of Title 19 Sub-Chapter 5, California Administrative Code NFPA 25.	13
17	BART should ensure that maintenance inspections of the under-car deluge system are performed at the required intervals. Controls should be put in place to ensure that management will be alerted when maintenance inspections are not performed at the required intervals.	13
18	BART should schedule and perform the required maintenance inspections of the 34.5 KV wayside equipment transition boxes. BART should ensure that these maintenance inspections are performed at the required intervals, the inspections are properly documented, and noted discrepancies are corrected in a timely manner. In addition, controls should be put in place to ensure that management will be alerted when maintenance inspections are not performed at the required intervals, the inspections are not properly documented, or noted discrepancies are not corrected in a timely manner.	14
19	BART should develop comprehensive and clear maintenance procedures that identify the frequency and criteria for inspections, certification, re-certification, red-tagging, and condemning of non-revenue on-rail vehicles and on-rail mechanisms. The procedures should ensure that the inspections are documented and noted discrepancies are corrected in a timely manner.	15
20	BART should ensure that maintenance inspections of Station Emergency Telephones are performed at the required intervals, the inspections are properly documented, and noted discrepancies are corrected in a timely manner. Complete the quarterly inspection report for Civic Center Station on a priority basis. Ensure that the Foreworker and the Section Manager are accurately verifying the completeness and proper filing of the inspection reports. In addition, controls should be put in place to ensure that management will be alerted when maintenance inspections are not performed at the required intervals, the inspections are not properly documented, or noted discrepancies are not corrected in a timely manner.	16
21	BART should implement a procedure for storing and tracking trouble tickets so that they can be accessed in a timely manner.	16
22	BART should review the Datastream Software for all of the maintenance activities in the Systems Maintenance Department. Take appropriate corrective action as determined by the review.	17
23	BART should review the vital relay inspection and maintenance program to determine if the problem is limited to documentation or if it is an actual failure to perform the required maintenance activities at the required frequency. Take appropriate corrective action as determined by the review.	19
24	BART should complete the inspection of the vital relay for Lafayette Station (C30) on a priority basis.	19

No.	*Recommendations*	Checklists No.
25	BART Engineering should review the matter of remanufactured vital relays to determine exactly what quality control testing by BART needs to be done on these relays. Then, BART should prepare a procedure describing those quality control requirements.	19
26	BART should review the switch machine inspection and maintenance program to determine if the problem is limited to documentation or if it is an actual failure to perform the required maintenance activities at the required frequency. Take appropriate corrective action as determined by the review.	20
27	BART should ensure that switch machines maintenance inspections are performed at the required intervals, the inspections are properly documented, and noted discrepancies are corrected in a timely manner. In addition, controls should be put in place to ensure that management will be alerted when maintenance inspections are not performed at the required intervals, the inspections are not properly documented, or noted discrepancies are not corrected in a timely manner.	20
28	See Checklist #17regarding the Datastream Software.	20
29	BART should review all Annual Track and Train Control Departments' Joint Switch, Turnout, and Interlocking Inspection Forms submitted for the year 2000. Complete the inspections that are found to be incomplete.	21
30	BART should conduct inspections of all turnouts to check for loose and missing anchors.	22
31	BART Police shall prepare a plan and a schedule to conduct the annual inspection of stations for all of the four BART police zones.	23
32	BART Police should develop a methodology to verify and document that District Emergency Exits are being checked every month.	23
33	BART should develop a methodology to ensure that the following items are documented: (1) the name of the Safety Department person who was notified of the derailment or switch run-through, and authorized repairs be made and (2) the date the authorization was given.	27
34	To ensure that the current level of instructional quality is maintained, BART should formalize the activities and procedures that would maintain the integration of the training and certification programs of the OCC and Hayward Training Center. The focus of that relationship should be to promote the common and compatible interpretation, meaning and application of BART operating rules and procedures for both of the training and certification programs. In order to document the considerable knowledge and experience of the OCC instructors and help ensure continuity as personnel or other organizational changes take place, BART should: a) More formally document the OCC training and certification programs and plans; b) Use previous BART OCC training and certification programs as a model for the task; c) Consider the formal approach and formats being employed and developed by the Hayward Training Center, to promote system integration with OCC and; Use the greater formalization as baselines for the training and certification programs when instructors and managers are reviewing and evaluating training or when making modifications to the training programs.	30
35	BART should develop and implement a procedure for a monthly check and status report to ensure that the monthly vital equipment tests, required by the OCC Rules and Procedures Manual #382, are performed and documented. This procedure should ensure that there is coordination between the Power & Mechanical Maintenance Department and the Power / Support Controller in BART OCC to perform the required tests. The status report should also confirm that all	31

No.	*Recommendations*	Checklists No.
	associated checklist forms have been completely filled out, properly signed, and filed by the Power & Support Controller performing the test.	
36	BART should periodically review and evaluate the adequacy and effectiveness of its "ride check" program to ensure that the train operators are knowledgeable about and performing their duties in compliance with BART rules and procedures. Those reviews and evaluations should also include, but not be limited to, identifying any shortcomings in training, supervision or administration, which may require modification to ensure safe train operator performance.	33
37	BART should review and evaluate its approach to addressing the corrective actions required by the Commission following the 1997 BART Triennial Safety Audit. Based on the findings of that review and evaluation, BART should again develop a plan and schedule to conduct a comprehensive review of tower operations at all four yards. That review should include, but not be limited to, an examination of all the findings included in this checklist. The evaluation and corrective actions, resulting from that review, should also consider the effects of training and supervision on tower foreworker's compliance with BART rules and procedures.	34
38	BART should establish appropriate processes and procedures for reviewing, revising, authorizing, and implementing the various employee classification-specific manuals within the Operations Department.	34
39	BART should review and evaluate its approach to addressing the corrective actions required by the Commission following the 1997 BART Triennial Safety Audit. Based on the findings of that review and evaluation, BART should again develop a plan and schedule to conduct a comprehensive review of training, certification and re-certification records for all Tower Foreworkers and all Station Agents.	35
40	That review above should include, but not be limited to, an examination of all the findings included in this checklist. The evaluation and corrective actions resulting from that review should consider training and supervisory responsibilities for overseeing and ensuring rules and procedures compliance by tower foreworkers. Controls should be put place to ensure that management will be alerted when the re-certification of Tower Foreworkers and Station Agents have not been completed and documented in a timely manner.	35
41	BART should examine the program and resources allocated to the training and certification of train control technicians and shall prepare a plan and schedule that will ensure that the Train Control Technicians can be trained, certified, re-trained, and re-certified in all of the required technical areas.	36
42	BART should develop and implement the plan and schedule to eliminate the training backlog as soon as possible.	36
43	BART should examine the needs, develop a plan and schedule and take the steps necessary to ensure that there are adequate resources to develop and implement the new training modules for the up-coming train control system technological changes.	36
44	BART should coordinate and ensure that all Electricians are re-certified every three years.	37
45	Controls should be put place to ensure that senior management will alerted when the re-certification of Electricians have not been completed and documented in a timely manner.	37
46	A formal relationship should be developed between BART Shops and the Hayward Training Center to ensure common and compatible interpretation, meaning and application of BART operating rules and procedures for both departments training and certification programs. Specifically, this would include:	39

No.	*Recommendations*	Checklists No.
	a) The BART Shops Local Control training and certification programs and plans should be more formally documented. To promote BART system integration, the formal approach and formats being employed and further developed by the Hayward Training Center should be considered as models in carrying out this task. Doing so would serve to document the considerable knowledge and experience of the Shop instructors and help ensure continuity of the program as personnel or other organizational changes take place. Greater formalization would also establish baselines for the training and certification programs, which could be used by the instructors and managers when reviewing and evaluating the programs. Those baselines could also serve as references when making additions or other modifications to the programs. b) BART should provide the BART Shops with appropriate copies of the most current BART Employee Certification Plan. BART Shops should review that document and ensure the Local Control operations training and certification program is in compliance with those requirements. c) BART should develop and implement a means to alert the department in advance of the expiration date of each effected employee's training and certification to ensure that the employee's certification status is current. The department should also be immediately notified in the event that any employee's certification has expired.	

APPENDIX C

PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

Rail Safety and Carriers Division — RESOLUTION ST-51
Rail Engineering Safety Branch — Date: December 21, 2000

Rail Transit Safety Section

R E S O L U T I O N

RESOLUTION ST-51. GRANTING APPROVAL OF A FINAL REPORT OF AN ON-SITE SAFETY AUDIT OF THE BAY AREA RAPID TRANSIT DISTRICT PERFORMED BY THE RAIL TRANSIT SAFETY SECTION OF THE RAIL SAFETY AND CARRIERS DIVISION

SUMMARY

This resolution grants the request of the Rail Safety and Carriers Division for Commission approval of the Rail Transit Safety Section's final audit report entitled, Triennial On-Site Safety Audit of the Bay Area Rapid Transit District, dated December 5, 2000.

BACKGROUND

Both Commission General Order No. 164-B, "Rules and Regulations Governing State Safety Oversight of Rail Fixed Guideway Systems" and Federal Transit Administration (FTA) Final Rule 49 CFR, Part 659, "State Safety Oversight of Rail Fixed Guideway Systems" require the Commission, as the designated state safety oversight agency for California, to conduct an on-site safety audit of each transit agency operating a rail fixed guideway system at least once every three years. Following the completion of each audit, the Commission is required to issue a report containing its findings and recommendations. This report must also, at a minimum, include an analysis of the efficacy of the transit agency's system

safety program plan and a determination of whether or not the plan needs to be updated.

DISCUSSION

Staff of the Rail Transit Safety Section conducted an on-site, safety audit of the Bay Area Rapid Transit District (BART) rail transit system during the period from October 2 to October 6, 2000. The methods used to conduct the audit included:

- Discussions with BART management
- Reviews of procedures and records
- Observations of operations and maintenance activities
- Interviews with rank and file employees
- Inspections and measurements of equipment and infrastructure
- Follow-up to the 1997 BART Triennial Audit

The audit concentrated on requirements that affect the safety of operations and are known or believed to be important to minimizing safety hazards and preventing accidents. A full description of the audit, including the procedure, findings, recommendations and conclusions is contained in the final audit report which is included with this resolution as Appendix A. The audit findings are recorded directly on the forty checklists that are included as a part of the final audit report. Based upon these recorded findings, forty-six (46) recommendations to effect improvements in BART's system safety program are presented in the final audit report. BART has agreed to prepare a set of project plans and schedules to implement all forty-six (46) recommendations.

The results of the audit show that BART is effectively implementing its System Safety Program Plan. BART's management demonstrated that they have a clear understanding of the policies and procedures important to safety, and BART staff, by their actions as well as words, demonstrated that they are effectively carrying out these safety related policies and procedures. As part of its on-going process, BART is reviewing and will be updating its System Safety Program Plan.

PROTESTS

BART has been advised of the contents of this resolution and the attached final audit report, and no protests or objections have been received. Accordingly, pursuant to Public Utilities Code Section 311(g)(2), the otherwise applicable 30-day period for public review and comment is being waived.

THEREFORE, IT IS ORDERED that:

The Rail Safety and Carriers Division's request for Commission approval of the Rail Transit Safety Section's report entitled, Triennial On-Site Safety Audit of the Bay Area Rapid Transit District, dated December 5, 2000 is granted.

BART shall submit to the Commission for its approval a set of project plans and milestone schedules for implementing all forty-six (46) recommendations contained in the final audit report by January 21, 2001. The plans and schedules shall:

- Contain step-by-step descriptions of the tasks required to complete each recommendation.
- Establish milestone target dates for when each step in each task will be started and completed.
- Identify the person assigned responsibility for implementing the plan and schedule for each recommendation.

On or before February 21, 2001, BART shall begin implementing its project plans and shall provide the Commission with quarterly written status reports until all forty-six (46) recommendations are fully implemented. The status reports shall include project plan and schedule updates that show the work completed and the work remaining for each of the forty-six (46) recommendations.

The BART System Safety Department shall monitor the work performed to assure it is fully responsive to the recommendations, and it shall so verify by signing off on each of the quarterly status reports.

This resolution is effective today.

I certify that the foregoing resolution was duly introduced, passed, and adopted by the Commission at its regularly scheduled meeting on December 21, 2000. The following Commissioners voted favorably thereon:

_____

_ WESLEY M. FRANKLIN
Executive Director

APPENDIX D

BART 2003 TRIENNIAL AUDIT
INDEX OF CHECKLISTS

Checklist #	Element/Characteristic	Checklist #	Element/Characteristic
1	Track Inspection	19	Configuration Management Car Restoration Project
2	GO95, GO128 Inspection	20	Calibration of Measuring & Testing Equipment
3	Signal Inspection	21	Track Inspection Records
4	Vehicle Inspection	22	Turnout Inspection Records
5	Authority & Responsibility for System Safety Program	23	Updating and Control of Track Maintenance Standards Manual
6	Reporting and Investigating Accidents and Investigation procedures	24	Exclusive ROW Fence inspection Records
7	Review Operating Rules & Procedures Manual and Operating Bulletins	25	Transit Vehicle Maintenance
8	Review Employee Safety Program	26	Quality Assurance – Transit Vehicles
9	Internal Safety Audit Program	27	Train Control Equipment Inspection & Tests
10	Inter-departmental Safety Audit Program	28	Emergency Ventilation Fans
11	Safety Certification – Oakland Airport Connection	29	Third Rail Maintenance
12	Hazardous Materials Management Program	30	Vital Relays
13	Data Acquisition Analysis	31	Fire Alarms & Sprinkler Systems
14	Emergency Response Planning & Training	32	Wet Pipe Sprinkler Systems & Line Pumps
15	Drug and Alcohol Testing Program	33	Under-Car Deluge System
16	Security Program BART Police & Security Audits	34	Gap Breakers & Wayside Equipment
17	Train Operator, Line Supervisor, and Central Control Supervisor Training & Recertification	35	Signal Maintenance Training & Certification
18	Hours of Service Train Operators, Train Controllers and Supervisors	36	Contractor Safety Coordination

APPENDIX E

BART 2003 TRIENNIAL AUDIT RECOMMENDATIONS LIST

No.	Recommendations	Checklists No.
1	BART upper management needs to ensure that safety failures identified by the System Safety Department are promptly resolved.	5
2	BART should ensure that if the investigation takes longer than 60 days to complete, the interim status reports are submitted to the CPUC every 30 days as required by G. O. 164-C, Section 6.3 (e).	6
3	BART should ensure that if a corrective action plan with an accompanying implementation schedule is prepared as a separate document, it is submitted to the CPUC to comply with the requirements of G. O. 164-C, Section 6.3 (e).	6
4	BART should ensure that the audited departments develop the required corrective action plans and schedules that are responsive to the audit findings to address the recommendations in accordance with SSPP and Management Procedure No. 60 and transmit them to the System Safety Department in a timely manner.	9
5	BART should update the current System Safety Program Plan to describe the Safety Certification Plan process to implement the requirements of the General Order No. 164-C.	11
6	Develop and implement a method that ensures that new hires and transferees receive the necessary environmental and safety training in a timely manner.	12
7	BART should develop and implement a plan and schedule to eliminate the training backlog.	35
8	BART should ensure that all safety sensitive employees receive the necessary training and testing and are recertified before their certification lapses. BART should develop a procedure that establishes and implements effective communication among the training department, human resources department and other responsible departments so that the employee training certification/recertification program is effectively implemented in a timely manner.	35
9	BART should ensure that any employee, whose certification has lapsed, is not assigned to the position that requires the certification.	35
10	BART should update, as soon as possible, the existing employee certification plan dated December 1986 to reflect current training practices, documentation requirements, inter-departmental	17

No.	Recommendations	Checklists No.
	coordination, etc., and forward this updated plan to the CPUC for review and comment prior to implementation.	
11	BART should increase the Training Department's oversight of Employee Development Specialists to ensure: a) An up to date file copy of all training materials and instructor guides is maintained, b) All courses have an Instructor Guide, and the guides are in compliance with the Technical Training Handbook, c) All courses have an up to date Lesson Plan	35
12	All BART stations and substations should be inspected to ensure that the signage is in compliance with GO 95, Rule 79.5. If the signage is not in compliance a corrective action plan needs to be developed and implemented.	2
13	All third rail guards should be inspected and repairs made to the guards as necessary to be in compliance with GO 95, Rule 79.2.	2
14	All of BART's fencing should be inspected to determine if it is in compliance with GO95, Rule 79.4B, or a variance approved by the CPUC. If the fencing is not in compliance, a corrective action plan needs to be developed and implemented. BART should begin inspections of barriers, and document those inspections.	2
15	BART should inspect and document all items identified for scheduled Right-of-Way fence inspections.	24
16	BART should correct all deficiencies found during Right-of-way fence inspections, and document them on the proper forms.	24
17	BART should revise the monthly inspection records to include those areas pertaining to the San Francisco airport extension and begin inspecting those fences immediately.	24
18	BART should ensure that the electrical portion of the line ventilation fans' preventive maintenance program is performed at the required frequencies and repairs for noted discrepancies are properly documented.	28
19	BART should ensure that the monthly and annual third rail inspections are performed for the entire system; the noted discrepancies are tracked and corrected in a timely manner, and properly documented to show clear closures of the repairs of all deficiencies.	29
20	BART should update, as soon as possible, the existing Power & Way Electrical Maintenance Procedure Book 31, Chapter 1, Section 17 dated 11/18/82 to reflect current inspection practices,	29

No.	Recommendations	Checklists No.
	documentation requirements, inter-departmental coordination, etc.	
21	BART should ensure that fire alarm and sprinkler system inspections are performed at the required intervals and the noted discrepancies are tracked and corrected in a timely manner.	31
22	Develop a procedure for the BART Police Department and Facilitates Maintenance that communicates, tracks, and follows-up on items identified by the Police Department as impacting passenger and employee safety or security. Ensure the procedure is implemented so that priority safety and security items are promptly corrected.	16

ATTACHMENT A

APPENDIX F

BART 2003 TRIENNIAL AUDIT

CHECKLISTS
(1 THROUGH 36)

2003 CPUC SYSTEM SAFETY & SECURITY AUDIT CHECKLIST FOR BAY AREA RAPID TRANSIT			
Checklist No.	**1**	Element	**10, 11 – Track Inspection/ Signal Inspection**
Date of Audit	**9/24/03**	Department	Maintenance and Engineering Way and Facilities Maintenance
Auditors/ Inspectors	Tim Pendleton Bill Mealor	Persons Contacted	Manual S. Quaresma, John Berlin, Tony Deleon, Don Smith and Gary Babler

REFERENCE CRITERIA

Track Standards Manual, 6/1/95

CHARACTERISTICS AND METHOD OF VERIFICATION

Utilizing the services of a CPUC-FRA certified track inspector from the Commission's Railroad Safety Branch.

Perform detailed visual and dimensional inspections/measurements of 2 sections of mainline track, 4 switches, 4 crossovers and 4 turnouts to determine whether or not the selected components are in compliance with the CODE of Federal Regulation maintenance standards.

ACTIVITIES

The activities for the track inspections included:

1. Three crossovers were inspected to determine if the track was maintained properly.
2. One crossing frog was checked.

FINDINGS

1. There were no defective track conditions noted.
2. There was very little wear on the track inspected.

3. The track was constructed of high quality materials.
4. The Bart track inspector had knowledge of his track and components.

COMMENTS

1. The inspection criteria were modified to accommodate a detailed inspection of the BART track in the Pittsburg area.
2. We suggested that BART start a program for testing their point detector rod. This test requires that BART maintenance float the lock rods so the lock dog can go through the rod to verify that the point detector is working as required.

RECOMMENDATIONS

None

2003 CPUC SYSTEM SAFETY & SECURITY AUDIT CHECKLIST FOR BAY AREA RAPID TRANSIT			
Checklist No.	**2**	Element	**10, 11 – GO 95 Inspection**
Date of Audit	**9/29/03**	Department	Maintenance and Engineering Way and Facilities Maintenance
Auditors/ Inspectors	Paul Penny & Mahendra Patel	Persons Contacted	Jim Dunn, Richard Leonard and Randy Clark

REFERENCE CRITERIA

CPUC GO 95, GO 128

CHARACTERISTICS AND METHOD OF VERIFICATION

CPUC Inspector will select separate sections of third rail and inspect for compliance with the applicable criteria.

ACTIVITIES

We performed the following:

1. Inspected Switch Gear at the 12th Street BART Station.
2. Inspected Gap Breaker at the 12th Street BART Station
3. Observed track at various places on the BART Line to determine if they are in compliance with GO95.
4. Visual inspection of Fremont Substation adjacent at the Fremont BART Station.
5. Observed train driver loading platform near Fremont.
6. Visual inspection of Hayward BART Station.
7. Visual inspection of the Colma BART Station.
8. Visual inspection of the Dublin/Pleasanton BART Station.
9. Visual inspection of the San Leandro BART Station.

FINDINGS

1. The Switch Gear inspected at the 12th Street BART Station is in compliance with GO 95.
2. The Gap Breaker at the 12th Street BART Station is in compliance with GO 95.
3. At approximately MP 7.5 going to Fremont a guard on the third rail was missing. This is not in compliance with Rule 79.2. (GO 95).
4. At the Fremont substation adjacent to the BART Station, two gates at the substation do not have warning signs. This is not in compliance with Rule 79.5 (GO 95), requiring danger signs at gates and at intervals of not more than 500 feet along each enclosing the right-of-ways.
5. The fencing surrounding Fremont Substation adjacent to the BART Station does not appear to be 7ft. in height. This is not in compliance with 79.4 (GO 95).
6. The Hayward BART Station is in compliance with GO 95.
7. At approximately MP2.5 going north to Oakland, a cover for the third rail is missing. This is not in compliance with Rule 79.2. (GO 95).
8. At the Colma BART Station a danger sign is covered by an antenna along platform 2 near the up escalator. This is not in compliance with Rule 79.5 (GO 95),
9. At the Dublin/Pleasanton BART Station, all warning signs on the third rail covering at the station are obstructed by the antennas. This is not in compliance with Rule 79.5 (GO 95),
10. The San Leandro BART Station is in compliance with GO 95.

COMMENTS

None

RECOMMENDATIONS

1. All BART stations and substations should be inspected to ensure that the signage is in compliance with GO 95, Rule 79.5. If the signage is not in compliance a corrective action plan needs to be developed and implemented to ensure compliance. (#12)
2. All of BART's fencing should be inspected to determine if it is in compliance with GO95, Rule 79.4B, or a variance approved by the CPUC. If the fencing is not in compliance a corrective action plan needs to be developed and implemented to ensure compliance. (#14)

3. All third rail guards should be inspected and repairs made to the guards as necessary to be in compliance with GO 95, Rule 79.2. (#13)

2003 CPUC SYSTEM SAFETY & SECURITY AUDIT CHECKLIST FOR BAY AREA RAPID TRANSIT			
Checklist No.	**3**	Element	**10, 11 – Signal Inspection**
Date of Audit	**9/24/03**	Department	Maintenance and Engineering Systems Maintenance
Auditors/ Inspectors	Tim Pendleton Bill Mealor	Persons Contacted	Manual S. Quaresma, John Berlin, Tony Deleon, Don Smith and Gary Babler

REFERENCE CRITERIA

Rule Book

CHARACTERISTICS AND METHOD OF VERIFICATION

Utilizing the expertise of a FRA certified signal inspector from the Commission's Rail Safety Section, select a sample of Signals and inspect them to determine if they are in compliance with the applicable criteria.

ACTIVITIES

All of the inspection activities were conducted in the Pittsburg area.

1. Five switches were checked:
   a) SW223
   b) SW227
   c) SW127
   d) SW123
   e) SW129

2. The signals at the switches were checked to determine if they were in compliance with the Rule Book.

FINDINGS

1. The switches inspected were in good working order.
2. The signals that were inspected were considered to be in good working order.

COMMENTS

None

RECOMMENDATIONS

None

2003 CPUC SYSTEM SAFETY & SECURITY AUDIT CHECKLIST FOR BAY AREA RAPID TRANSIT			
Checklist No.	**4**	Element	**10, 11 – Vehicle Inspection**
Date of Audit	**9/23/03**	Department	Rolling Stock and Shops
Auditors/ Inspectors	Randy McCaul	Persons Contacted	Bill McCoy

REFERENCE CRITERIA

Book 42, 50, 86

CHARACTERISTICS AND METHOD OF VERIFICATION

CPUC Inspector will select four random cars, one of these being a "B" car and perform a detailed inspection to determine if BART is properly and adequately maintaining the vehicles.

ACTIVITIES

I performed the following:

1. Took a tour of the shop to determine how the operation functions.
2. Inspected the underside of an "A" car and a "B" car to determine the operational readiness of these vehicles.
3. Reviewed the maintenance schedules for these vehicles to determine if they are being maintained on a regular basis per the operational procedures.
4. Discussed what work is being done on these cars with the workmen doing the actual work.
5. Compared the work being done by the workmen to the maintenance records.

FINDINGS

1. The records are accurate and detailed.

2. The records are easy to understand and in good order.
3. The procedure manuals are well laid out for the inspectors and workmen to use.
4. The vehicles are well maintained.
5. The work completed by the workmen matches the work on the maintenance records/work sheets.
6. There was some deferred maintenance but none of it was safety related.

COMMENTS

1. The criteria used in this inspection are the same that are used on freight/passenger inspection of Class I railroad records and inspection programs.
2. The deferred maintenance items should be monitored to make sure they continue not to be safety related.
3. The program that is in place at this time is working sufficiently.

RECOMMENDATIONS

None

2003 CPUC SYSTEM SAFETY & SECURITY AUDIT CHECKLIST FOR BAY AREA RAPID TRANSIT			
Checklist No.	**5**	Element	**1 – 6 Authority and Responsibility for System Safety Program**
Date of Audit	**10/10/03**	Department	General Manager
Auditors/ Inspectors	Robert Strauss and Dennis Reed	Persons Contacted	Thomas Margo, Paul Oversier, Len Hardy

REFERENCE CRITERIA

System Safety Program Plan, 10/8/02

CHARACTERISTICS AND METHOD OF VERIFICATION

Interview BART's General Manager, Chief Safety Officer, Chief Transportation Officer, Chief Engineer, Chief Mechanical Officer, Human Resources Manager, Manager of Operating Budget and Chief of Police as a group and/or individually to evaluate the scope of Management involvement, coordination, and communication to satisfy the commitments and recommendations of the CPUC's Triennial Audit 2000 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 and security 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.

ACTIVITIES

1. Interviewed BART's General Manager with the Chief Safety Officer, Chief Transportation Officer, Chief Engineer, Chief Mechanical Officer, Human Resources Manager, Manager of Operating Budget and Chief of Police present. The various managers assisted the General Manager as appropriate.

FINDINGS

1. The General Manager receives a monthly report on district-wide performance parameters. There is also a quarterly performance report for the BART Board. Safety provided a copy of a Safety Statistics Report for the 2nd Quarter April-June 2003 and a Quarterly Service Performance Review Fourth quarter FY03 April-June 2003. The first report provided statistics on a number of performance measures. It included bar graphs that compared the year to date with previous years. The second report provided graphs of performance targets and actual rates during the last four quarters.
2. During the Annual Budget process, Department heads meet with the General Manager in a detailed review of resource allocation. Goals and objectives of each unit are examined. Safety is reviewed as part of this process. The General Manager stated that safety is the highest priority.
3. BART does not give bonuses. The General Manager stated safety is infused in the culture by his concern for safety.
4. Once a year the Chief Safety Officer meets with the General Manager to review the overall safety program.
5. The Operations Department has a weekly meeting of managers, including Operations Safety Manager. These meetings provide a forum for safety discussions.
6. General Manager is kept informed on accidents. For major accidents, the General Manager is paged. Major accidents or hazardous conditions are tracked by management through a formal process.
7. Audit (CPUC and Internal) Recommendations are tracked by the Safety Department. The General Manager is kept informed. Once a year the General Manager meets with the safety department to review each recommendation, the corrective action plan, the quarterly reports, and the responsible person.
8. Maintenance and Engineering did not develop corrective action plans to address five Internal Safety Audit checklists after repeated notices from System Safety. (See checklist 9).
9. Resolution ST-51 ordered BART to implement Recommendation 2 from checklist 36, "BART should develop and implement the plan and schedule to eliminate the training

backlog as soon as possible." A training backlog continues to exist in safety sensitive categories. (See checklist 35).

COMMENTS

1. BART's safety culture could be enhanced by including specific safety goals in the senior manager's performance criteria.
2. Communication on safety related issues should be enhanced. Several of the audit recommendations relate to a lack of resources or attention to safety implementation. For example, the audit revealed inspections that were not performed according to schedule, employees in safety sensitive positions that had not received the required recertification, and prior audit recommendations that had not been corrected in a timely fashion. Improved communication to upper management should result in additional attention and resources being made available to ensure that day to day safety implementation is completed.

RECOMMENDATIONS

1. BART upper management needs to ensure that safety failures identified by the Safety Department are promptly resolved. (#1)

2003 CPUC SYSTEM SAFETY & SECURITY AUDIT CHECKLIST FOR BAY AREA RAPID TRANSIT			
Checklist No.	**6**	Element	**7, 8 – Reporting and Investigation Accidents and Investigation procedures**
Date of Audit	**10/02/03**	Department	System Safety
Auditors/ Inspectors	Mahendra Patel	Persons Contacted	Kenneth A. Cook, Operations Safety Manager Carl H. Smith, Senior Operations Safety Specialist

REFERENCE CRITERIA

Management Procedure 48, 3/6/01

Management Procedure 81, 2/13/02

CHARACTERISTICS AND METHOD OF VERIFICATION

Select at least two accidents involving an injury or fatality reportable to the CPUC during the past 12 months and determine:

1. If the accident was reported to the CPUC representative by telephone within 4-hours, and by written report within 30-days from the last day of the month during which the accidents occurred.
2. If the incident investigated was in compliance with accident investigation procedures and CPUC approved written procedure?
3. If an investigation report was prepared that identified:
   a) Each item covered by the investigation.
   b) The investigation findings of the most probable cause Underlying contributing causes
4. If a corrective action plan was prepared that addressed the identified causes, and that the corrective action plan minimized the incident from recurring.
5) If a schedule for implementing the corrective action plan was prepared and has been completed or is being monitored on an on-going basis

ACTIVITIES

I performed the following:

1. Discussed Management Procedures No. 48, effective date 03/06/01 (District Accident Investigation Procedure) and No. 81, effective date 02/13/02 (Investigating Unacceptable Hazardous Conditions).
2. Reviewed file copies of accident reports for the past 12 months.
3. Selected four accidents: West Oakland Station, 10/16/02; R2 track at milepost 12.0 Richmond and El Cerrito/Del Norte, 02/03/03; Hayward Yard, 02/23/03; and Daily City Station, 04/07/03 and one unacceptable hazardous condition: BART car uncoupled between San Leandro and Bayfair, 12/02/02 and reviewed these for completeness of investigation requirements.
4. Discussed the findings and recommendations with BART representatives and obtained their concurrence.

FINDINGS

1. Immediately reportable accidents were reported to the CPUC representative within 4-hours and Form T's and V's were submitted to the CPUC at the end of the month as required by G. O. 164-C.
2. Incident investigation for each of the selected incidents was in compliance with the accident investigation procedure and investigating unacceptable hazardous conditions procedure.
3. Investigation report for the each of the selected incidents identified each item covered by the investigation including the most probable cause and any underlying contributing causes as applicable.
4. Corrective action plan was determined to be not needed for West Oakland Station, 10/16/02; R2 track at milepost 12.0 Richmond and El Cerrito/Del Norte, and Daily City Station, 04/07/03 accidents.
5. Final accident investigation report for Hayward Yard, 02/23/03 accident was transmitted to the CPUC representative with a cover letter dated 09/19/03, however, the preparation for the corrective action plan including the implementation schedule is in progress for this accident. This is beyond the 60 days requirement of G. O. 164-C, Section 6.3 (e). Furthermore, interim status reports were not submitted to the CPUC every 30 days as required by G. O. 164-C, Section 6.3 (e).
6. Final investigation report for unacceptable hazardous condition, BART car uncoupled between San Leandro and Bayfair, 12/02/02, was completed on 06/23/03. Once again, interim status reports were not submitted to the CPUC every 30 days. Furthermore, a corrective action plan including implementation schedule has been developed to address the recommendations contained in this final report, however, it is not submitted to the CPUC as required by the G. O. 164-C.

COMMENTS

None

RECOMMENDATIONS

1. BART should ensure that if the investigation takes longer than 60 days to complete, the interim status reports are submitted to the CPUC every 30 days as required by G. O. 164-C, Section 6.3 (e). (#2)
2. BART should ensure that if a corrective action plan with an accompanying implementation schedule is prepared as a separate document, it is submitted to the CPUC to comply with the requirements of G. O. 164-C, Section 6.3 (e). (#3)

2003 CPUC SYSTEM SAFETY & SECURITY AUDIT CHECKLIST FOR BAY AREA RAPID TRANSIT			
Checklist No.	**7**	Element	**12 – Review Operating Rules and Procedures Manual and Operating Bulletins.**
Date of Audit	**10/08/03**	Department	System Safety
Auditors/ Inspectors	Mahendra Patel	Persons Contacted	Kenneth A. Cook, Operations Safety Manager

REFERENCE CRITERIA

Management Procedure 34, 10/1/98

CHARACTERISTICS AND METHOD OF VERIFICATION

Determine the following:

1. Are Operating Rules, Procedures and Bulletins updated on a regular basis?
2. How are these distributed to staff?
3. Review samples of bulletins and operating rules that have been distributed during the past 18 months and track the process.

ACTIVITIES

I performed the following:

1. Interviewed Operations Safety Manager to determine how Management Procedure No. 34 (MP-34), Operations Rules and Procedures Manual, Supplementary Operations Manuals and Operating Bulletins, is implemented.
2. Reviewed the binder containing operating bulletins and operating rules that have been distributed during the past 18 months and selected Operating Bulletin No. 02-04, 02-05, 03-03, and 03-31 as samples to track the process.
3. Discussed the findings and comments with BART representative and obtained his concurrence.

FINDINGS

1. Operations Rules and Procedures Manual (commonly referred to throughout BART district as the "Orange Book") was last revised as revision 5 dated May 1, 2002 and

was distributed to executive managers, department managers and CPUC. System safety department maintains a matrix of the distribution.

2. Human resources department distributes the Orange Book to new employees at the time of hiring.
3. Department managers notify the system safety department about the receipt of the required number of copies of the Orange Book. They are responsible to distribute it to their employees.
4. Revision 5 of the Orange Book was reviewed on February 21, 2002 and April 21, 2003 to satisfy the annual review requirement of MP-34 and it was determined that no revision was needed.
5. Operating Bulletins are also reviewed annually as per the requirement of MP-34 and renumbered and reissued as appropriate.
6. System safety department maintains BART operating bulletin status. There are 32 operating bulletins in 2003 that include 4 cancelled bulletins, 7 new issues and 21 reissues.
7. System safety department also maintains a summary of active operating bulletins that is generally distributed every six months but at least once a year.
8. Affected department manager signs the operating bulletin signifying the concurrence before it is approved by the chief safety officer and distributed.
9. System safety department utilizes an extensive electronic distribution list for operating bulletins in addition to the hard copy distribution.
10. Revision 5 of the Orange Book does not include San Francisco Airport Extension System, however, it is covered in operating bulletin no. 03-31which was issued on 06/20/03.
11. MP-34 contains outdated requirements, such as, recording with pen and ink changes in the individual manual, record keeping by Technical Resources, Publications and Graphics Department, etc.

COMMENTS

I suggested to include San Francisco Airport Extension and other operating bulletins as appropriate in the future revision of the Orange Book and to revise the existing Management Procedure No. 34, dated 10/01/98 to reflect the current working practices and organizational changes.

RECOMMENDATIONS

None

2003 CPUC SYSTEM SAFETY & SECURITY AUDIT CHECKLIST FOR BAY AREA RAPID TRANSIT

Checklist No.	**8**	Element	**19 – Review Employee Safety Program**
Date of Audit	**10/09/03**	Department	System Safety
Auditors/ Inspectors	Mahendra Patel	Persons Contacted	David L. Sanborn, Manager, Employee/Patron Safety Joe Torrisi Mike Caesare

REFERENCE CRITERIA

Management Procedure 61, 8/13/80

CHARACTERISTICS AND METHOD OF VERIFICATION

Interview operations management and at least two safety committee employee representatives and also review the employee safety program records to determine if:

1. An appropriate procedure and reporting form has been developed and periodically distributed to all employees to effectively report safety hazards in the work place.
2. All employee identified safety hazards during the past 18 months have been addressed by a Safety Committee that developed and implemented corrective action plans.
3. These corrective action are being tracked or have been implemented.
4. Periodic Safety Committee meetings have been held during the past 18 months to facilitate the implementation of this corrective action.

ACTIVITIES

I performed the following:

1. Interviewed Manager, Employee/Patron Safety, who is also a chairperson of safety committee and two safety committee representatives to determine how Management Procedure No. 61 (MP-61), Employee Safety Program is implemented.
2. Reviewed employee safety program records of past 18 months that included Joint Union/Management Safety Committee meeting minutes; various reporting forms, such as Train Operator Observation form, Accident-Injury Report, Incident Report, Unusual Occurrence Report, BART Safety Notice, etc.; Safety Committee membership roster; safety committee meeting schedule; project information record;

issues being currently worked spreadsheet; and Injury and Illness Prevention Program (IIPP) Draft # 4.

3. Discussed the findings and comments with BART representatives and obtained their concurrence.

FINDINGS

1. Programs and policies contained in IIPP are utilized to implement Employee/Patron Safety Programs. Presently, this IIPP is in a draft form (draft # 4) and is being reviewed for approval. Once the IIPP is approved, it will supersede the Management Procedure No. 61.
2. BART Safety Notice Form # 0836 and BART Safety Notice Procedure have been developed for employees to report any potential or observed safety hazards in the work place. Employee/patron also report potential safety hazard by letters, e-mail and phone calls. The safety department also collects pertinent data from accident-injury reports, incident reports, unusual occurrence reports, claims, and train operator observation forms.
3. Safety committee meetings are held on first Wednesday of every month. The agenda generally includes approval of previous month meeting minutes, unresolved issues from past meetings, on going safety related issues, review of BART Safety Notices status, safety awareness sub-committee report, quarterly statistical report, and new safety related issues.
4. Corrective action plans including implementation are discussed and tracked in the monthly safety committee meetings. In addition, quarterly report also tracks the corrective action plans. Safety committee meeting minutes and quarterly reports are distributed to executive staff, department managers, union offices, system safety staff and all members of the safety committee members.
5. Safety department also tracks the status and resolution of safety issues by means of project information record and issues being currently worked spreadsheet.
6. BART has launched the employee suggestion program in December of 2002. This program is intended to encourage employees to become involved in making suggestions for safety improvements on the job and provides some form of recognitions and awards for ideas that actually get implemented.

COMMENTS

I suggested that BART should approve the Injury and Illness Prevention Program (IIPP) as soon as possible and that the Employee/Patron Safety Division should provide periodic progress report to the CPUC representative on the approval status of this IIPP.

RECOMMENDATIONS

None

2003 CPUC SYSTEM SAFETY & SECURITY AUDIT CHECKLIST FOR BAY AREA RAPID TRANSIT			
Checklist No.	**9**	Element	**9, 16 – Internal Safety Audit Program**
Date of Audit	**10/09/03**	Department	System Safety
Auditors/ Inspectors	Mahendra Patel	Persons Contacted	Len Hardy, Chief Safety Officer Kenneth A. Cook, Operations Safety Manager

REFERENCE CRITERIA

Management Procedure 60, 1/28/98

CHARACTERISTICS AND METHOD OF VERIFICATION

Determine the Following:

1. Planned and Internal Safety Audits have been scheduled and performed.
2. All of the required elements from the APTA Guidelines have been included in the scope of audit activities.
3. The APTA Guidelines (10 - 24 elements) have been covered during the three-year period from the last triennial audit.
4. Has the internal audit process been performed and submitted to the CPUC before audits start.
5. Internal Safety audits have been properly documented and submitted to the CPUC on an annual basis.
6. Corrective actions

ACTIVITIES

I performed the following:

1. Interviewed BART representatives to determine how Management Procedure No. 60 (MP-60), Internal Safety Audit Program, is implemented.
2. Reviewed 2001 and 2002 Annual Internal Safety Audit reports.
4. Discussed the findings, comments, and recommendations with BART representatives and obtained their concurrence.

FINDINGS

1. Management Procedure No. 60 dated 01/28/98 does not include the Security element and the requirement of the auditors being independent from the first line of supervision responsible for performance of the activity being audited.
2. BART Internal Safety Audit (ISA) three- year cycle covers the year 2001, 2002, and 2003. BART representatives stated that the CPUC representative is informed about the audit schedule in the beginning of the audit cycle. Meetings are held to discuss and prepare audit schedule and the CPUC representative is invited to these meetings. The subsequent annual ISA report includes the three-year audit schedule as appendices. They also stated that any changes to the schedule are communicated to the CPUC representative either by phone or by e-mail.
3. All of the required elements from the APTA Guidelines (10 - 24 elements) have been included in the scope of audit activities and covered during the three-year period from the last triennial audit.
4. The ISA annual reports for the year 2001 and 2002 were prepared and submitted to the CPUC by February 15, 2002 and February 15, 2003 respectively as required by General Order No. 164-C. The reports contain the checklists used by BART to conduct their Internal Safety Audit, summary of the items that were scheduled for audit, and appendix showing the scope and schedule of internal audit for the balance of the three-year period. The individual checklists identify the department audited, contact person(s) interviewed, results of the audit, findings, and recommendations, if any.
5. The 2001 annual ISA report also contained the corrective action plans with implementation schedules for the associated recommendations.
6. Review of the 2002 annual ISA report revealed that the Maintenance & Engineering Department (Power Mechanical Dept.) has not developed corrective action plans to address the recommendations provided in checklists 02-09, 02-10, 02-11, 02-12 & 02-14. The audit for these checklists was completed during the time span from 05/16/02 to 05/21/02. System safety stated that they have contacted the affected department regarding the status of the corrective action plan via e-mails and phone calls but they still have not received the corrective action plans. System safety also stated that this is tracked by the quarterly safety report, which is distributed, to upper management, all departments, unions, etc. in accordance with the distribution list for this report. Section 906 of the SSPP and Section VIII of the Management Procedure No. 60 require the audited department to develop the corrective action plans and schedules that are responsive to the audit findings.

COMMENTS

I suggested that BART should update the existing Management Procedure No. 60, dated 01/28/98 to include the Security element, the requirement of the auditors being independent from the first line of supervision responsible for performance of the activity being audited, and to reflect the current working practices and organizational changes.

RECOMMENDATIONS

BART should ensure that the audited departments develop the required corrective action plans and schedules that are responsive to the audit findings to address the recommendations in accordance with SSPP and Management Procedure No. 60 and transmit them to the System Safety Department in a timely manner. (#4)

2003 CPUC SYSTEM SAFETY & SECURITY AUDIT CHECKLIST FOR BAY AREA RAPID TRANSIT			
Checklist No.	**10**	Element	**17 -- Inter-departmental Safety Audit Program**
Date of Audit	**10/09/03**	Department	System Safety
Auditors/ Inspectors	Raed Dwairi	Persons Contacted	Len Hardy – Chief Safety Officer, System Safety.

REFERENCE CRITERIA

APTA Guidelines Element 17 – Section 3
General Order 164 - C

CHARACTERISTICS AND METHOD OF VERIFICATION

Interview the BART representative in charge of the Internal Safety Audit Process and review the internal safety audit requirements as well as those audit reports and other records to determine if:

1. The inter-departmental and interagency communications process and requirements are clearly defined and explained in detail;
2. Inter-departmental and interagency communications are an element of BART's internal safety audit program;
3. Any deviations from the approved procedure, identified during an internal safety audit or by any other means are brought to the attention of the general management and;
4. BART's monitors, reports and acts to correct any deviation from its communications policies with emergency responders and other affected agencies.

ACTIVITIES

1. I interviewed the Chief Safety Officer at BART and reviewed Internal Safety Audit reports prepared during the last two years.

FINDINGS

1. The interdepartmental and interagency communication and coordination process is covered in detail in BART's System Safety Program Plan Revision No. 5 dated October 8, 2002.
2. The above process is also one of the elements covered through the internal safety audit program at BART.
3. Deviations from approved district policies and management procedures are brought to the attention of upper management through the System Safety Department. This was done in the internal audits conducted in 2001 and 2002. In addition, upper management was informed that 4 CAPS were not submitted in a timely manner by the Power Mechanical/Engineering Department.
4. BART has established effective emergency response procedures and plans with all other affected outside agencies (this is covered in detail in Checklist #14)

COMMENTS

None

RECOMMENDATIONS

None

2003 CPUC SYSTEM SAFETY & SECURITY AUDIT CHECKLIST FOR BAY AREA RAPID TRANSIT			
Checklist No.	**11**	Element	**2, 6, 15, 17 – Safety and Security Certification Plan (Oakland Airport Connection)**
Date of Audit	**10/03/03**	Department	System Safety
Auditors/ Inspectors	Mahendra Patel Dennis Reed	Persons Contacted	Len Hardy, Chief Safety Officer Mark T. Chan, Principal Engineer

REFERENCE CRITERIA

Safety and Security Certification Plan (Oakland Airport Connector), June, 2003

General Order 164-C, California Public Utilities Commission, February 2003

System Safety Program Plan, Bay Area Rapid Transit (BART), October 2002

CHARACTERISTICS AND METHOD OF VERIFICATION

Interview management and review documentation to determine if:

1. The SC Plan addresses safety certification management, including organizational authority and responsibilities.
2. The SC Plan addresses the controls used to maintain effective communications and liaison with Staff throughout the life of the project.
3. The SC Plan identifies the process used to verify and document conformance with safety and security requirements during design, construction testing, and operational readiness.

Use the Safety and Security Certification Plan for the OAC as a sample prepared according to General Order 164-C.

ACTIVITIES

We performed the following:

1. Interviewed BART representatives to determine how Safety Certification Plan requirements described in Section 7 of the General Order No. 164-C are incorporated in the Safety and Security Certification Plan for the Oakland Airport Connector Project.
2. Reviewed Safety and Security Certification Plan (SC Plan) for the Oakland Airport Connector Project, Revision 0, June 2003.

3. Discussed the findings, comments, and recommendations with BART representatives and obtained their concurrence.

FINDINGS

1. The Oakland Airport Connector Project is a design, build and operate project. Presently, the project is in the preliminary engineering phase. The current plan is to put together contracts documents and then the project would be on hold due to budgetary constraints.
2. The SC Plan basically follows the practices and procedures described in the FTA Handbook for Transit Safety and Security Certification, final report, November 2002.
3. Section 3 of the SC Plan addresses safety certification management, including organizational authority and responsibilities.
4. Section 2 of the SC Plan identifies the certification process and procedures used to verify and document conformance with safety and security requirements during design, construction testing, and operational readiness.
5. The last paragraph of Section 7.2 of the SC Plan addresses the issue of providing periodic status reports including copies of completed certificates of conformance to the CPUC Staff for review and acceptance throughout the lifecycle of the project. However, the SC Plan does not address provisions to facilitate the CPUC Staff participation to the fullest extent possible in all aspects of the Safety Certification process, such as, attending Safety and Security Review Committee meetings, participating in the safety certification audits, witnessing the integrated tests, etc.
6. Reference to BART System Safety Program Plan (SSPP) should be Revision 5, dated October 8, 2002 instead of Revision 4, dated December 2, 1996.
7. Chapter 15 of the current BART SSPP dated 10/8/02 addresses system modification review/approval process, however, this does not address the Safety Certification Plan requirements stipulated in the General Order No. 164-C, which became effective on February 27, 2003.

COMMENTS

We suggested that BART should describe the controls used to address provisions to facilitate the CPUC Staff participation to the fullest extent possible in all aspects of the Safety Certification process in the future revision of the Safety and Security Certification Plan (SC Plan) for the Oakland Airport Connector Project.

RECOMMENDATIONS

BART should update the current System Safety Program Plan to describe the Safety Certification Plan process to implement the requirements of the General Order No. 164-C. (#5)

2003 CPUC SYSTEM SAFETY & SECURITY AUDIT CHECKLIST FOR BAY AREA RAPID TRANSIT			
Checklist No.	**12**	Element	**20, 23 -- Hazardous Materials Management Program**
Date of Audit	**October 8, 2003**	Department	System Safety
Auditors/ Inspectors	Raed Dwairi	Persons Contacted	Janie L. Layton – Manager, Environmental Compliance David L. Sanborn – Manager, Employee/ Patron Safety Gary G. Jenson – Principal Engineer Jonathan Rossen – District Industrial Hygienist

REFERENCE CRITERIA

Management Procedure 60, 1/28/98

CHARACTERISTICS AND METHOD OF VERIFICATION

Interview management to determine if hazardous materials are being handled properly. In addition review procedures and record checks, to determine:

1. What the procurement process is for items like insecticides, herbicides, chemicals, and solvents used on BART. Property.
2. The Material Safety Data Sheet (MSDS) for each hazardous material is on file with the System Safety Department
3. The approved MSDS's have been entered into the Material Safety Data Sheet System
4. Personnel who handle hazardous materials have received specific training regarding reporting requirements, inventory control and storage, product release or spill, and the response and cleanup of spill incidents
5. Hazardous materials discharge/spill reports for incidents that occurred during the past three years have been prepared and are on file

All Material Safety Data Sheets are available to all personnel who work with hazardous materials

ACTIVITIES

I performed the following tasks:

1. Interviewed BART personnel in charge of the Hazardous Materials Management Program.
2. Reviewed Chemical Evaluation Forms, MSDS, Weekly Safety Reminders, Employee Safety Training Matrix, Employee/Patron Safety Polices, and a draft #4 of the Hazard Communication Program (addendum B-01 of the Injury and Illness Prevention Program).
3. Discussed the CIMAGE computer program used by the department and received a demo on its actual use.

FINDINGS

1. Chemical Evaluation Forms are used as a first step in the procurement process of hazardous materials at BART. These forms are shared between the requesting department, Procurement, and System Safety Departments. The requesting department identifies its need and the product info that meets its need on the Chemical Evaluation Form and submits it to the District Industrial Hygienist for further evaluation. If the request is approved and the product is accepted for use at BART facilities, then System Safety identifies the safety instructions that must be followed by the potential users (ventilation considerations, protective equipment, etc.) and further updates its MSDS data on the procured product. If the request is denied and the product rejected for use at BART facilities then System Safety identifies the reason for such action.
2. All MSDS are on file with the System Safety Department. These are electronically stored and regularly updated. All departments have the ability to retrieve and use the stored data.
3. Records indicate that BART has a training program and a training matrix that identifies the required training topics (reporting/investigation, electrical safety, hearing conservation, etc.), appropriate training plans, required frequencies and duration, and affected employees.
4. The hazardous materials program is paperwork intensive and started relying on a computerized database that should be maintained and fully utilized in the storage, retrieval, and dissemination of program data.
5. Records indicate that BART had no hazardous materials spills in the past three years.
6. No controls currently exist to ensure that new hires and transferees receive the necessary environmental & safety training.

COMMENTS

None

RECOMMENDATIONS

Develop and implement a method that ensures that new hires and transferees receive the necessary environmental and safety training in a timely manner. (#6).

2003 CPUC SYSTEM SAFETY & SECURITY AUDIT CHECKLIST FOR BAY AREA RAPID TRANSIT

Checklist No.	**13**	Element	**16 – Data Acquisition Analysis**
Date of Audit	**10/03/03**	Department	System Safety
Auditors/ Inspectors	Mahendra Patel	Persons Contacted	Kenneth A. Cook, Operations Safety Manager David L. Sanborn, Manager, Employee/Patron Safe

REFERENCE CRITERIA

APTA Guidelines Element 16
General Order 164-C – Section 3

CHARACTERISTICS AND METHOD OF VERIFICATION

Interview BART representative in charge of safety data acquisition and analysis; review the safety data acquisition and analysis program requirements as well as records and reports to determine if:

1. The data collected includes, at minimum, information concerning BART rail transit accidents and incidents, employee performance failures, equipment failures, software failures, procedural deficiencies, external factors, environmental factors, fatalities, injuries, property damage and environmental damage;
2. Safety data is supplied by and collected from all departments including risk management;
3. Safety data that is collected is analyzed and incorporated into BART's hazard identification and resolution process and;
4. The safety data collected and the resulting analyses are made available to all BART departments for use in planning their safety related activities.

ACTIVITIES

I performed the following:

1. Interviewed BART representatives to determine how Safety Data Acquisition and Analysis is implemented to monitor safety performance of the BART District's operations.
2. Reviewed safety data acquisition and analysis records and reports that included Quarterly Safety Statistics reports of last twelve months (four reports from June 2002 to June 2003); Operations Summary Report for September 2003, Patron

Accident/Injury Summary Reports for August 2003 and September 2003, Engineering & Operations Committee Quarterly Performance Review Report for April – June 2003, and historical data for various incidents, such as, station platform and concourse incidents, station stair incidents, station escalator incidents, vehicle boarding & alighting incidents, vehicle on-board incidents, OSHA recordable injuries & illness, etc.

3. Discussed the findings and comments with BART representatives and obtained their concurrence.

FINDINGS

1. The System Safety Department collects pertinent safety data from all departments including risk management. Any potential or observed safety hazards are reported on various forms, such as, accident-injury reports, incident reports, unusual occurrence reports, BART Safety Notices, claims, etc. In addition, employee/patron also report potential safety hazards by letters, e-mail and phone calls.
2. The data collected includes, information concerning accidents and incidents for station operations (platforms, concourses, stairs, escalators, parking lots, elevators, etc.) and train operations (vehicle boarding & alighting, unscheduled door openings, gap falls, on-board incidents, etc.), rule violations (safety rules, signals, clearance/protection, operating procedures, etc.), potential hazardous equipment failures, OSHA recordable injuries and illnesses, and operations safety (collision, derailment, switch run-through, smoke/fire, trespassers on Right Of Way, etc.).
3. The System Safety Department analyzes the safety data that is collected in a weekly meeting to identify safety-related trends, investigate specific areas of concern, and provide recommendations for corrective actions as applicable to the affected department management.
4. The System Safety Department prepares a quarterly safety statistics report presenting the data in graphic format and compares the data to show overall historical performance to determine safety-related trends. The data is presented for patron safety statistics, employee safety statistics, and operations safety statistics. This quarterly safety statistics report is distributed to executive staff, department managers, and union offices for information and use.
5. BART does not have a formal Management Procedure describing the process, mechanism, responsibilities, etc. for activities, such as, collection, maintenance and distribution related to safety data acquisition and analysis.

COMMENTS

None

RECOMMENDATIONS

None

2003 CPUC SYSTEM SAFETY & SECURITY AUDIT CHECKLIST FOR BAY AREA RAPID TRANSIT			
Checklist No.	**14**	Element	**14, 17 – Emergency Response Planning and Training**
Date of Audit	**10/08/03**	Department	System Safety
Auditors/ Inspectors	Raed Dwairi	Persons Contacted	Ken Cook – Manager, System Safety

REFERENCE CRITERIA

BART Emergency Plan, 11/02

CHARACTERISTICS AND METHOD OF VERIFICATION

Interview the Safety Manager/Chief and review available records and documentation for the past year to determine if:

1. BART has held periodic Fire Life Safety meetings with police and fire departments in the applicable BART jurisdictions.
2. Emergency drills that included tabletop and practical exercises were planned and performed with all external agencies in the last three years.
3. Drills were evaluated and any recommendations found were incorporated into the Emergency Response agency Familiarization Program. What were the corrective actions and were they implemented.

ACTIVITIES

1. I interviewed BART representatives in charge of the emergency response program at the district and reviewed applicable documentation prepared during the last 12 months.

FINDINGS

1. BART held quarterly Fire Life Safety meetings from 4/14/00 to 8/12/03. The binder included agendas and minutes for all meetings. These included agencies from all BART jurisdictions.

2. BART executes three planned emergency response drills in the Trans bay Tube every year and one multi-causality every other year.
3. BART executed three Trans Bay Tube drills in 2003 on the following dates:
    a) Drill No. 1 on 2/23/03
    b) Drill No. 2 on 7/13/03
    c) Drill No. 3 on 9/7/03
4. The four emergency drills conducted for the year 2003 were as follows:
    a) Drill No. 1 @ the South San Francisco Station on 1/25/03
    b) Drill No. 2 @ the North Berkeley Station on 3/30/03 (Tabletop exercise conducted on 3/24/03)
    c) Drill No. 3 @ the Orinda Station on 6/24/03 (this was funded by the FTA).
    d) Drill No. 4 @ the Bay Fair Station to be conducted on 10/26/03 and Tabletop on 10/24/03
5. Three Trans Bay Tube drills were conducted last year as follows:
    a) Drill No. 1 on 2/24/02
    b) Drill No. 2 on 4/21/02
    c) Drill No. 3 on 6/16/02
6. A multi agency exercise (earthquake) was conducted on 10/16/02
7. BART conducted the following drills at the Berkeley Hills Tunnel:
    a) Drill No. 1 on 8/26/01
    b) Drill No. 2 on 11/4/01
    c) Drill No. 3 on 12/2/01
8. All drills were properly evaluated on After Action Reports that included appropriate corrective actions for the all recommendations (such as the evaluation of number of available cell phone lines and the degree of their coverage which was completed in May 2003).

COMMENTS

None

RECOMMENDATIONS

None

2003 CPUC SYSTEM SAFETY & SECURITY AUDIT CHECKLIST FOR BAY AREA RAPID TRANSIT			
Checklist No.	**15**	Element	**21 – Drug and Alcohol Testing Program**
Date of Audit	**10/06/03**	Department	Administration Human Resources/Employee Services
Auditors/ Inspectors	Dennis Reed	Persons Contacted	Barbara George

REFERENCE CRITERIA

BART Substance Abuse Program 2000

CHARACTERISTICS AND METHOD OF VERIFICATION

Determine the following:

1. Does the program meet current FTA guidelines?
2. The total number of employees in safety sensitive positions who tested positive or refused to take a test for drugs or alcohol during the past 3 years for:
   a) Pre-employment/Pre-Duty
   b) Reasonable Cause
   c) Post-Accident
   d) Random
   e) Return to Work
   f) Follow-up.

For each employee who tested positive (or refused to take a test) review the required records and determine the outcome and if it is in compliance with BART policy and other regulatory requirements.

3. If new supervisors are being trained according to BART procedure.

ACTIVITIES

I performed the following:

1. Discussed the Drug and Alcohol Policy with Barbara George and reviewed training documentation to determine if it meets current FTA guidelines.
2. Determined the total number of employees in safety sensitive positions who tested positive or refused to take a test for drugs or alcohol during the past 3 years.
3. Reviewed employee records to determine employees who tested positive or refused to take a test and determine if the outcomes are in compliance with BART policy and other regulatory requirements.
4. Reviewed training documentation and training schedules to determine if new BART supervisors are being trained according to BART procedure.

FINDINGS

1. The current training manual is in compliance with FTA guidelines, and all employees are being trained to these guidelines.
2. The total number of employees that tested positive during the past 3 years are:
    a) Pre-employment/Pre-Duty (3)
    b) Reasonable Cause (1)
    c) Post-Accident (2)
    d) Random (19)
    e) Return to Work (0)
    f) Follow-up. (8)
3. Those who tested positive during the pre-employment phase of the hiring were not hired and that was consistent with BART hiring policies. The files for the three pre-employment prospective confirmed that they were not hired.
4. There are approximately 1600 safety sensitive positions at BART and 750 – 775 random tests are conducted on a yearly basis. During the past three years 19 employees tested positive while random testing. According to BART policy these employees are required to complete a treatment plan that is developed by a substance abuse professional (SAP) before they are allowed to return to work. Four of the positive random files were reviewed and all information was recorded properly.
5. All supervisors are required to receive training on the substance abuse program. The training list was reviewed and it was confirmed that the supervisors are receiving the substance abuse training according to BART procedures.

COMMENTS

1. During the past 6 – 7 years the number of random employees testing positive has dropped from approximately 2.0% to 0.5%.
2. BART's Substance Abuse Program exceeds the federal requirements.

RECOMMENDATIONS

None

2003 CPUC SYSTEM SAFETY & SECURITY AUDIT CHECKLIST FOR BAY AREA RAPID TRANSIT			
Checklist No.	**16**	Element	**24 -- Security Program BART Police and Security Audits**
Date of Audit	**10/09/03**	Department	BART Police Department
Auditors/ Inspectors	Dennis Reed	Persons Contacted	Clark Lynch

REFERENCE CRITERIA

System Security Program Plan, 1/1/98

CHARACTERISTICS AND METHOD OF VERIFICATION

Through a combination of interviews with the assigned staff as well as by procedure reviews and record checks, for the past three years, determine if:

1. Annual inspections, of all BART stations have been conducted and areas of concern have been documented and addressed.

2. The BART Police crime analyst has produced monthly crime reports and these reports have been distributed to all department command staff. Has there been a shift in the types of crime activities either downward or upward?

3. Security audits have been conducted in the last three years to identify potential terrorist targets and improvements have been implemented.

ACTIVITIES

I performed the following:

1. Reviewed documentation for the past three years to confirm that these inspections are being done annually.
2. Discussed how issues identified in the annual and other inspections are being resolved.

3. Reviewed monthly and weekly crime reports and discussed trends from these reports.

   Discussed the distribution of crime reports to staff and how this information is used.

4. Discussed security audits done during the past three and its impact on security changes for BART.

FINDINGS

1. During the last quarter of the year the four BART zone commanders are required to do an annual inspection of the stations within their zones to identify and initiate corrections for problematic physical conditions and report the findings to the overall Commander who reports his/her findings to executive management. The documentation reviewed confirmed that these inspections are being done during the last quarter on an annual basis. The past three inspections were conducted in the following months:

   a) October 9, 2000

   b) November 6, 2001

   c) October 11, 2002

   These inspections are in addition to the normal beat officer's and sergeant's patrol activities which result in the preparation of beat condition reports to initiate corrective action for physical problems at the stations, parking lots and other district facilities.

2. At times it has been difficult for the Police Department to get maintenance problems fixed in a timely fashion at the stations. In some situations this can create a safety and security hazard. Lighting is an example of the type of problem that impacts the safety and security of patrons and employees. Recently, there have been meetings between the Facilities Maintenance Department and the Police Department to work on these types of issues.

3. The weekly and monthly crime statistics clearly identify the types of crimes and where they are being committed throughout the BART system. This provides the necessary information for the BART Police Commanders so they can direct resources to where they are needed. In addition this data facilitates the identification of trends for crimes like auto theft, auto burglary, and crimes against persons. This information is utilized by the Police Department and management for planning safety and security measures at the various BART stations.

4. BART's overall security has improved during the past three years. This is the result of threat assessments conducted by BART both internally, and through outside sources like the security audit done by Booz Allen Hamilton for the FTA after 911. As a result of this type of analysis improved security measures have been implemented in those areas that were identified as potential targets. In addition, emergency preparedness training exercises has been conducted at several of the BART stations for handling Weapons of Mass Destruction (WMD) threats.

COMMENTS

None

RECOMMENDATIONS

Develop a procedure for the BART Police Department and Facilitates Maintenance that communicates, tracks, and follows-up on items identified by the Police Department as impacting passenger and employee safety or security. Ensure the procedure is implemented so that priority safety and security items are promptly corrected. (#22)

2003 CPUC SYSTEM SAFETY & SECURITY AUDIT CHECKLIST FOR BAY AREA RAPID TRANSIT

Checklist No.	**17**	Element	**13, 16 – Train Operator, Line Supervisor, and Central Control Supervisor Training and Recertification**
Date of Audit	**10/06/03**	Department	Operations Training and Development Transportation
Auditors/ Inspectors	Mahendra Patel	Persons Contacted	John L. McPartland, Safety Specialist Roy Aguilera, Training Supervisor Operations Control Center Randall E. Roderick, Manager Operations Control Center Paul V. Liston, Operations Supervisor Operations Support & Review – Rail Operations Kathleen Gilbert, Group Manager Operations Support and Review Transportation Calvin V. Coleman, Department Manager Operations Training & Development Center

REFERENCE CRITERIA

BART Employee Certification Plan, 1986

CHARACTERISTICS AND METHOD OF VERIFICATION

Randomly select the names of at least four persons each in the classification of (1) train operator and (2) Central Control Supervisor, (3) Line Supervisor and (4) yard Supervisor and review their training and recertification records for the past 3-years to determine whether or not:

1. The person has completed the initial training program.
2. The person has been recertified at the correct frequency
3. The person currently meets the criteria to operate a vehicle.
4. The course content was appropriate and testing adequate to meet training and recertification requirements.

ACTIVITIES

I performed the following:

1. Discussed Bay Area Rapid Transit District Employee Certification Plan Revised December 1986.
2. Selected and reviewed four (out of seventeen) train controllers training and recertification records.
3. Selected and reviewed two (out of eight) power/support controllers training and recertification records.
4. Selected and reviewed two (out of six) central managers training and recertification records.
5. Discussed training and recertification of operation supervisors and senior operation supervisors.
6. Selected and reviewed five (out of three hundred and ninety eight) train operators training and recertification records.
7. Selected and reviewed six (out of fifty five) foreworkers training and recertification records.
8. Discussed the findings and recommendations with BART representatives and obtained their concurrence.

FINDINGS

1. Train controller training program consists of 6-weeks classroom course and a final exam. This is followed by 23-weeks console training with On- the-Job Instructor (OJI) and 1-week checkout with the Training Supervisor. OJI administers quizzes and examinations. A passing score of 85% for each exam is required for successful completion of the training program. A recertification is required every two years. The records reviewed for the train controllers showed that the initial trainings and recertifications have been satisfactorily completed as required by the train control certification program.
2. Power/support controller training program consists of 4-weeks classroom course and a final exam. A passing score of 85% is required for successful completion of the training program. This is followed by 6-weeks console training to demonstrate the ability to handle power support functions with minimal assistance. A recertification is required every two years. The records reviewed for the power/support controllers showed that the initial trainings and recertifications have been satisfactorily completed as required by the power/support certification program.
3. Central manger trainees are required to have current certification for the position of train controller and power/support controller. The trainee is assigned to a central manager OJI for 2-weeks on each shift for familiarization training. OJI uses the manager training certification checklist. The trainee is required to complete one checklist for each shift with minimal assistance from the OJI to successfully complete

this course. Central managers are required to complete train controller recertification every two years and power/support recertification every three years. The records reviewed for the central managers showed that the initial trainings and recertifications have been satisfactorily completed as required by the central manager certification program.

4. Operations Supervisor and Group Manager stated that there are no Line Supervisor and Yard Supervisor positions. However there are Operations Supervisors and Senior Operations Supervisor positions. Each transportation supervisor is provided with a transportation supervisor's manual. I reviewed a spreadsheet that listed the training record for various topics, such as, incident command, automated fare control, drug testing procedure and certification, wye operation, Daily City Yard operation, etc.
5. Operations training department manager stated that there are two classifications for foreworkers: (1) senior/principal foreworker (foreworker 3) and (2) operations foreworker (foreworker 2). Training requirements are same for both classifications. The train operator and foreworker training program includes basic certification training program and on the job training under supervision. Basic training programs include various technical training programs, operations rules & procedures manual, safety regulations, etc. On the job training programs are structured to evaluate specific skills and functions pertinent to the job classifications. Testing and performance evaluations are integral parts of the training programs. Recertification is required every two years.
6. Operations training department maintains electronic records to track the certification status. Exams and hard copies, etc. are maintained for the last recertification only. However, several file records selected for review did not contain the exams, but the manager stated that these could be retrieved from other files.
7. Review of electronic certification status report showing course code, employee #, name and certification due date for train operators and foreworkers showed that quiet a few employees are past due from few months to few years. The manager stated that the training department notifies the responsible department manager about the past due status, and schedules re-certification classes (slots). There is a bidding process to enroll in these slots. However, the training department doest not always have up to date knowledge of the status of the employee (transfer, retired, promotion, classification change, etc.) from HR and the responsible departments.
8. The training department uses a revised draft version of the employee certification plan, however, this revised version is not an approved document. Section H of the employee certification plan dated December 1986 requires any modification to be forwarded to the CPUC for review and comment prior to implementation.

COMMENTS

None

RECOMMENDATIONS

BART should update, as soon as possible, the existing employee certification plan dated December 1986 to reflect current training practices, documentation requirements, inter-departmental coordination, etc. and forward this updated plan to the CPUC for review and comment prior to implementation. (#10)

2003 CPUC SYSTEM SAFETY & SECURITY AUDIT CHECKLIST FOR BAY AREA RAPID TRANSIT			
Checklist No.	**18**	Element	**9, 13, 19 – Hours of Service Train Operators, Train Controllers and Supervisors**
Date of Audit	**October 6, 2003**	Department	Transportation
Auditors/ Inspectors	Michael Yeo	Persons Contacted	Rudy Crespo, Assistant Chief Transportation Officer Kathy Gilbert, Group Manager, Operations Support and Review Transportation Tanya Holmes, Operations Supervisor Reginald L. Lewis, Senior Safety Specialist Randall E. Roderick, Manager, Operations Control Center David Sanborn, Manager, Employee/Patron Safety

REFERENCE CRITERIA

1. ATU Labor Agreement;
2. AFSCME Labor Agreement 7/1/2001 6/30/2005;
3. OCC Manual, Rev11.

CHARACTERISTICS AND METHOD OF VERIFICATION

Select a sample of names of those safety-sensitive employees. Review Daily Job Assignment Reports and payroll records to determine whether those employees meet the minimum rest requirements in the reference criteria.
The classifications of employees selected were:

1. Train Operators
2. Foreworkers
3. Train Controllers
4. Power and Support Controllers
5. Communications Specialists
6. Other OCC Employees, including Supervisors

ACTIVITIES

I performed the following:

Interviewed the Assistant Chief of Transportation Officer on BART's work-hour practices, and spoke to the OCC Manager and the Operations Supervisor on the specific records reviewed.
Examined the entire month of June 2003, the Daily Job Assignment Reports of those employees working in the Operation Control Center (OCC).
Reviewed the payroll records of eight specific employees for the number of hours worked in June 2003. Four of them were OCC staff while the other four pertained to job classifications outside of the OCC.
Checked for agreement on hours worked in the payroll record for those four OCC employees against the worked hours shown in the Daily Job Assignment Reports.

FINDINGS

1. One OCC employee did not have the required 12-hour rest period. That employee started work at 1:00 pm on June 22, 2003 and left work at 12:35 am June 23, 2003; she subsequently returned to work later that day at 12:00 pm. She therefore had a rest period of only 11 hours and 25 minutes. The number of hours worked as shown in the Daily Job Assignment agrees with the information shown in the payroll records.
2. Generally, BART maintains good records of their employees' work hours.

COMMENTS

1. BART should review their system of assigning employees' work hours to assure that the type of occurrence cited in the Findings is not repeated.

RECOMMENDATIONS

None.

2003 CPUC SYSTEM SAFETY & SECURITY AUDIT CHECKLIST FOR BAY AREA RAPID TRANSIT			
Checklist No.	**19**	Element	**18 – Configuration Management Car Restoration Project**
Date of Audit	**10/03/03**	Department	Transit System Development, Rolling Stock and Shops, Maintenance and Engineering
Auditors/ Inspectors	Dennis Reed	Persons Contacted	Ben Holland, Susan Presley

REFERENCE CRITERIA

Book 38, Procedure 030, 12/14/95

CHARACTERISTICS AND METHOD OF VERIFICATION

Review the applicable documentation for BART Vehicle restoration to determine if:

1. A project plan was in place, including change control procedures.
2. Any technical changes in the design were approved by the project engineer.
3. Technical changes to the project were submitted for safety certification and change control comment and approval.
4. The changes were recorded in accordance with BART control change and configuration management procedures.
5. The project was monitored through its internal oversight procedures.
6. Select a change control item/issue and track it through completion through the documentation and review process.

ACTIVITIES

I performed the following:

1. Discussed:

   a) The project plan for the Car Restoration Project

   b) The change control procedures

c) How technical changes for safety certification and change control were handled for the A&B Car Restoration project.

2. Reviewed Configuration Management Workflow for Contract Number 41MF – 110A to evaluate its internal oversight procedures.
3. Reviewed Management Procedure Number 29.10 change control Procedures.
4. Reviewed Engineering Ordering/Change Authorization (ECOA) process.
5. Reviewed Engineering Change Proposal (ECP) Number 1429/03 to evaluate the process for a change proposal (Brake Resistor Flashover Resolution).
6. Reviewed Engineering Change Notice (ECN) Procedure EDP-P18 (Revision 0) and tracked ECN Number 42709 (Brake Resistor Flashover Resolution) to evaluate the process and determine if the changes were recorded properly.

FINDINGS

1. The project plan and change control process were in place for this project, *Management Procedure Control of Modifications, Procedure Number 29.10.*
2. Requests for modifications are submitted to the Change Review Board only by BART's Engineering Department. Prime equipment contractors, Maintenance Engineering and other departments within the District must coordinate modification requirements with Engineering. This was exemplified in Engineering Change Proposal (ECP) Number 1429/03 as cited in 5 above (Activities)
3. Technical changes to the project were submitted for safety certification and change control for approval through a formal change control process as demonstrated by Engineering Change Notice (ECN) Number 42709 cited in 6 above (Activities).
4. The changes to this project (ECN 42709) were recorded in accordance with BART control change and configuration management procedures.
5. The documentation shows that internal safety oversight procedures were followed throughout this project. This was demonstrated through the Configuration Management Workflow for Contract Number 41MF – 110A cited above in items 2 – 6 (Activities).

COMMENTS

1. The configuration management process for the Car Restoration Project was well organized and well documented.

RECOMMENDATIONS

None

2003 CPUC SYSTEM SAFETY & SECURITY AUDIT CHECKLIST FOR BAY AREA RAPID TRANSIT			
Checklist No.	**20**	Element	**9, 12, 16 – Calibration of Measuring and Testing Equipment**
Date of Audit	**10/09/03**	Department	Rolling Stock and Shops
Auditors/ Inspectors	Joey E. Bigornia	Persons Contacted	Kirtland Smith – Assistant Shop Superintendent Mike Kincaid – Manager, Quality Assurance

REFERENCE CRITERIA

Book 15, Chapter 17, Section 1, 2/29/98

CHARACTERISTICS AND METHOD OF VERIFICATION

Obtain a copy of the Calibration Database and Recall List of items subject to calibration control. Select from this list at least three different items that require calibration, at the Concord Yard shops. From a combination of records review and visual inspection of the equipment items, determine whether or not:

1. The selected items are properly inventoried, stored, distributed for use, and calibrated against certified standards at the prescribed intervals.
2. The selected items have a calibration label firmly affixed stating the date the item was last calibrated and the date the item is next due for calibration.

ACTIVITIES

BART sends their measurement equipment to an outside vendor for calibration. SE Laboratories is responsible for calibrating electronic equipment on an Annual basis. Mobile Laboratories, Inc. is responsible for calibrating mechanical equipment on an Annual basis. A recall list is established by both vendors which identifies BART's shop equipment due for recalibration. BART coordinates the on-site visit for both vendors to calibrate the equipment at the job locations.

I performed the following:

1. Reviewed the following list of equipment identified by model and serial number from BART's Recall List:

2. Torque Wrenches
    a. Utica (0-150 ft/lbs) - s/n 1492013
    b. Snap On (50-250 ft /lbs) - s/n 1492265
    c. Snap-on (600 ft/lbs) - s/n 1492425
3. Pressure Gages
    a. .Ashcroft (0- 3000 psi) – s/n 1492676
    b. Ashcroft (0-3000 psi)– s/n 1492677
    c. Ashcroft (0-3000 psi) – s/n 4032485
    d. Dial Indicators
        i. Starrett (0-1") - s/n 4033389
        ii. Teclock (0-1") - s/n 4036518
        iii. I requested and reviewed copies of the Calibration Data Sheets and Certificates to confirm that the list of equipment selected for review was properly calibrated within the required Annual frequency.

FINDINGS

1. I inspected each measurement device listed above to determine if each had a fixed calibration sticker that identifies the last date of calibration and when the next scheduled date of calibration.
2. All devices listed above had a sticker affixed that showed the last date of calibration on December 10, 2002.
3. The next scheduled date of calibration for all devices listed above identifies December 10, 2003 on the sticker affixed.
4. Copies of the Calibration Data Sheets and Certificates for my list of equipment selected were reviewed to confirm that the independent vendors' calibrated the equipment. No exceptions were noted.

COMMENTS

None.

RECOMMENDATIONS

None.

2003 CPUC SYSTEM SAFETY & SECURITY AUDIT CHECKLIST FOR BAY AREA RAPID TRANSIT			
Checklist No.	**21**	Element	**10, 11, 12, 16 – Track Inspection Records**
Date of Audit	**10/07/03**	Department	Maintenance and Engineering Way and Facilities Maintenance
Auditors/ Inspectors	Joey E. Bigornia	Persons Contacted	Nick Lujan – Section Manager, Track Specialist Duncan Lawson – Track Section Manager

REFERENCE CRITERIA

Track Standards Manual, 6/1/95

CHARACTERISTICS AND METHOD OF VERIFICATION

1. Review BART file of completed track inspection reports for at least two separate weekly periods during the last three years to determine whether or not:

   a) all mainline track, yard leads, and transfer tracks were inspected weekly by hi-rail vehicle
   b) the required inspections were properly documented
   c) noted defects were corrected in a timely manner

2. Review BART file of completed track inspection reports for at least two separate weekly periods during the last three years to determine whether or not:

   a) all mainline track was inspected weekly from an <u>on-train</u> position
   b) the required inspections were properly documented
   c) noted defects were corrected in a timely manner

3. Review BART file of completed geometry car inspection reports for at least two separate quarterly (or yearly) periods during the last three years to determine whether or not:

   a) All mainline track was inspected quarterly (and all yard leads and transfer tracks were inspected yearly) by <u>geometry car</u>

b) The required inspections were properly documented

c) Noted defects were corrected in a timely manner.

4. Review BART file of completed internal rail defect reports during the last three years to determine whether or not:

   a) All mainline track was inspected twice-yearly by a device capable of detecting internal flaws in the running rails
   b) The required inspections were properly documented
   c) Noted defects were corrected in a timely manner.

ACTIVITIES

I performed the following:

1. Reviewed the following documentation to determine if the tracks were inspected by "Hi-rail":

   a) Mainline track and switch inspection reports for the A-Line (Mile post 11.00 – 23.00) dated May 29, 2002 to June 26, 2002 and June 2-30, 2003

   b) Mainline track and switch inspection reports for the M-line (Mile post 2.6 – 15.1) dated May 26, 2002 – June 27, 2002 and June 3-30, 2003

2. Reviewed the following documentation to determine if the tracks were inspected by "On-Train" position:

   a) Mainline track and switch inspection reports for the A-Line (Mile post 11.00 – 23.00) dated May 29, 2002 to June 26, 2002 and June 2-30, 2003.

   b) Mainline track and switch inspection reports for the M-line (Mile post 2.6 – 15.1) dated May 26, 2002 – June 27, 2002 and June 3-30, 2003

3. Reviewed the following documentation to determine if the A-Line (A1, A2), C-Line (C1, C2, C3), L-Line (L1, L2) and R-Line (R1, R2) tracks were inspected by "geometry car":

   a) Year 2001 Second Quarter Reports dated May 27, 2001 – June 18, 2001.

   b) Year 2001 Third Quarter Reports dated July 29, 2001 – September 10, 2001.

   c) Year 2002 Second Quarter Reports dated May 26, 2002 – June 17, 2002.

   d) Year 2002 Third Quarter Reports dated August 25, 2002 – September 22, 2002.

   e) Year 2003 Second Quarter Reports dated June 29, 2003 – July 6, 2003

4. Reviewed the following documentation to determine if the tracks were inspected by ultrasonic testing:
    a) Year 2001 Reports dated June 22, 2001 – July 8, 2001 and November 12, 2001 – December 1, 2001.
    b) Year 2002 Reports dated May 8, 2002 – May 22, 2002 and October 29, 2002 – November 17, 2002.
    c) Year 2003 Reports dated May 7, 2003 – May 30, 2003.

FINDINGS

1. Review of the records indicated the Hi-Rail, On-Train position, Geometry Car, and Ultrasonic Inspections were performed at the required frequency intervals.
2. Noted defects on the Hi-Rail, On-Train position, Geometry Car, and Ultrasonic Inspection forms were properly documented and corrected in a timely manner.
3. The first half of Year 2003 Ultrasonic testing was performed to date and the second half of Year 2003 testing is scheduled for November 2003.

COMMENTS

None.

RECOMMENDATIONS

None.

2003 CPUC SYSTEM SAFETY & SECURITY AUDIT CHECKLIST FOR BAY AREA RAPID TRANSIT			
Checklist No.	**22**	Element	**10, 11, 12, 16 – Turnout Inspection Records**
Date of Audit	**10/06/03**	Department	Maintenance and Engineering Way and Facilities Maintenance
Auditors/ Inspectors	Joey E. Bigornia	Persons Contacted	Mike Brown – Principal Track Engineer Nick Lujan – Section Manager, Track Maintenance Duncan Lawson – Track Section Manager

REFERENCE CRITERIA

Track Standards Manual, 6/1/95

CHARACTERISTICS AND METHOD OF VERIFICATION

1. Review BART file of completed track inspection reports for at least two separate monthly periods during the last three years to determine whether or not:

   a) All mainline and yard turnouts were inspected monthly by on-foot inspection
   b) The required inspections were properly documented
   c) Noted defects were corrected in a timely manner

2. Review BART file of completed track inspection reports for at least two separate quarterly (or yearly) periods during the last three years to determine whether or not:

   a) All mainline turnouts were inspected quarterly and all yard turnouts were inspected yearly by On-Foot Turnout Measurement Inspection
   b) The required inspections were properly documented
   c) Noted defects were corrected in a timely manner

ACTIVITIES

I performed the following:

1. Reviewed the following documentation to determine if the monthly on-foot turnout inspections were performed:

a. Reports for interlocking L-07 (switch numbers 123, 127, 223 & 227) dated August 29, 2002 to August 31, 2003.

b. Reports for interlocking C-35 (switch numbers 127, 133, 223, 237, & 323, 337) dated August 28, 2002 – October 2, 2003.

2. Reviewed the following documentation to determine if the quarterly on-foot turnout inspections were performed:

   a. Turnout inspection reports for interlocking L-07 (switch numbers 123, 127, 223 & 227).

      i. Switch #123 dated August 12, 1999 to October 2, 2003.

      ii. Switch #127 dated August 20, 1999 to October 2, 2003.

      iii. Switch #223 dated August 12, 1999 to October 2, 2003.

      iv. Switch #227 dated September 3, 1999 to October 2, 2003

   b. Turnout inspection reports for interlocking C-35 (switch numbers 127, 133, 223, 237, & 323, 337).

      i. Switch #127 dated October 18, 1999 to August 3, 2003.

      ii. Switch #133 dated October 18, 1999 to August 3, 2003.

      iii. Switch #223 dated October 18, 1999 to August 13, 2003.

      iv. Switch #237 dated October 18, 1999 to August 3, 2003.

      v. Switch #323 dated January 17, 2000 to August 3, 2003.

      vi. Switch #337 dated October 18, 1999 to August 3, 2003

FINDINGS

1. Review of the turnout records indicated the monthly and quarterly on-foot inspections were performed at the required frequency intervals.
2. Noted defects on the monthly and quarterly on-foot inspections were properly documented on the inspection forms and were corrected in a timely manner.

COMMENTS

None.

RECOMMENDATIONS

None.

2003 CPUC SYSTEM SAFETY & SECURITY AUDIT CHECKLIST FOR BAY AREA RAPID TRANSIT			
Checklist No.	**23**	Element	**12, 13,16 – Updating and Control of Track Maintenance Standards Manual**
Date of Audit	**10/06/03**	Department	Maintenance and Engineering Way and Facilities Maintenance
Auditors/ Inspectors	Joey E. Bigornia	Persons Contacted	Mike Brown – Principal Track Engineer Nick Lujan – Section Manager, Track Maintenance Duncan Lawson – Track Section Manager

REFERENCE CRITERIA

Management Procedure 34, 10/1/98

CHARACTERISTICS AND METHOD OF VERIFICATION

Determine the following:

1. The process for updating and maintaining control of the Maintenance Standards Manual.
2. Select an update and track the process.
3. Were these updates implemented in a timely fashion?

ACTIVITIES

I performed the following:

1. Interviewed the Principal Track Engineer to determine the Department of Maintenance and Engineering & Facilities Maintenances' practices for updating the Track Safety Standards Maintenance Manual.
2. Determined the "acceptance process" for final approval of a change or update to the current Track Safety Standards Maintenance Manual.
3. Requested BART staff to identify a list of recent changes made to the current Track Safety Standards Maintenance Manual.

4. Reviewed the BART's process of implementation of an update to the current Track Safety Standards Maintenance Manual.

FINDINGS

1. BART's Management Procedure No. 34, *Operations Rules and Procedures Manual, Supplementary Operations Manuals & Operating Bulletins* is the process used by all departments to describe the system to be used in originating, issuing, revising, and implementing all District operations manuals and bulletins.
2. The Chief Engineer of the BART's Maintenance and Engineering Department & Facilities Maintenances' is responsible for issuing Chief Engineer Bulletins that identify changes necessary to the Track Safety Standards Maintenance Manual.
3. Appendix L of BART's Track Safety Standard Maintenance Manual (effective date 6-1-95) identifies the active Chief Engineer's Bulletins to date.
4. The following Chief Engineer's Bulletins are in effect and continue to be active:

a) CE-01-001, Reporting Derailments, Split Switches and Switch Run- Through's on Inspection Reports, dated 1-31-2001.

b) CE-01-002, Rail Anchor Use and Inspection, dated 1-31-2001.

c) CE-00-001, Switch Point Wear – Additional Criteria, dated 10-15-2000.

d) CE-96-001, Rail / Wheel Flange Lubrication, dated 12-28-1995.

5. The four Chief Engineer's Bulletins provide an introduction, background, case study, photos (if applicable to describe situation), revised inspection form, and instructions on how to record data on the revised inspection form.
6. The Safety Department is given an opportunity to review and provide comments on the Chief Engineer's Bulletin prior to issuance.
7. The Chief Engineer's signature of approval is shown on the four active Chief Engineer's Bulletins.
8. Track Inspector's are given copies of the Chief Engineer's Bulletins to insert in them in the proper sequence at Appendix L in their assigned maintenance manuals.
9. Inspector's who receive the Chief Engineer Bulletin revisions must sign-off acknowledging the documents have been received.
10. Copies of the inspector's acknowledgement document showing receipt of revised Chief Engineer Bulletin's is kept by the Department Manager.

COMMENTS

None.

RECOMMENDATIONS

None.

2003 CPUC SYSTEM SAFETY & SECURITY AUDIT CHECKLIST FOR BAY AREA RAPID TRANSIT			
Checklist No.	**24**	Element	**12, 13,16 – Exclusive ROW Fence Inspection Records**
Date of Audit	**October 3, 2003**	Department	Maintenance and Engineering Way and Facilities Maintenance
Auditors/ Inspectors	Michael Yeo & Robert Strauss	Persons Contacted	Richard Leonard, Superintendent, Way and Facilities Jeffrey Conners, Grounds Supervisor, Way & Facilities Division

REFERENCE CRITERIA

CPUC GO 95

CHARACTERISTICS AND METHOD OF VERIFICATION

Confirm that ROW fence inspections were conducted on an on-going basis:

1. Review the file of completed fence inspection reports prepared during the past twelve months to determine if:
    a. All mainline fencing was visually inspected at least once each month by end of train or drive by observation.
    b. The required inspections were properly documented.
    c. Noted defects were corrected in a timely manner.
2. Interview staff to determine whether they receive regular reports of defects in fences and that these reports were documented and corrected in a timely manner.

ACTIVITIES

We performed the following:

1. Interviewed the Grounds Supervisor to learn about BART's on-going program on ROW fence inspections. We asked the Grounds Supervisor whether BART had a procedure on this specific inspection program. We were provided with a copy of a document entitled *Scheduled Right of Way Fence Inspection Program* with an effective date of 07/01/2001.
2. Reviewed the *Scheduled Right of Way Fence Inspection Program procedure* to determine if it is being followed.

3. Examined the files of completed fence inspection reports prepared by the four different groups from January 2002 to September 2003 inclusive. The records were reviewed to determine whether:
   a) All mainline fencing was visually inspected at least once each month by end of train or drive by observation.
   b) The required inspections were properly documented.
   c) Noted defects were corrected in a timely manner.
   d) Staff receive regular reports of defects in fences and that these reports were documented and corrected in a timely manner.

FINDINGS

1. The copy of BART's *Scheduled Right of Way Fence Inspection Program* provided to the auditors by the Grounds Supervisor was stamped "Preliminary". Even though the cover page has an effective date of 07/01/2001, the Grounds Supervisor did not have a copy of the final version nor did he have any knowledge of whether there was a more recent revision.
2. Shortly after the Year 2000 triennial audit, BART began their in-house inspection program on ROW fencing. Prior to March 2001, BART contracted the inspection records to an outside vendor.
   a) Field inspections of fences were performed under checklist element # 2.
3. The monthly inspection records consist of two sheets: the *Way & Facilities Scheduled Monthly Right of Way Barrier Inspection Summary Report* (*Summary*) and the *Way & Facilities Scheduled Right of Way Barrier Inspection Report Form* (*Form*). The *Summary* lists 35 items to be inspected on a monthly basis, and the work for inspecting the 35 items are divided among four different foreworkers.
   a) According to the records, not all scheduled inspection items were performed. There were at least ten instances where not all scheduled inspection items were performed. Some examples of specific items which were not identified as having been inspected in both *Summary* and *Form* are:
      1-1 Item #34 in January 2002.
      1-2 Item 33 in December 2002.
      1-3 Items #26 and #35 in March 2003
   b) In two monthly reports, there is no indication as to whether deficiencies found during inspections were corrected. There are boxes in the *Form* for the inspector to provide information on the date of repair and the person who performed the repair but those boxes were not completed in those cases. The two instances where there is no recorded information of corrective actions having been performed for the deficiencies found during the inspection pertains to the M Line in November 2002 and December 2002.
4. Not all forms (*Summary* and *Form*) were completed properly. Also, among completed forms, there were also inconsistencies in the items of information being

written on the forms. BART should revise the *Scheduled Right of Way Fence Inspection Program* procedure to consider the below observations found in their monthly inspection records so that the discrepancies can be avoided in the future.

a) Items shown in the *Summary* as having been inspected by a certain inspector were not always recorded in the *Form*; or conversely, some items were not checked off in the *Summary* but indicated as having been inspected in the *Form*. There were 14 such occurrences. Examples were found in the January 2002 report for items #31 and #32; in January 2003, item #35; in February 2003, items #26 and #29; in August 2003, item #26; and in April 2002, item #19.

b) For the month of September 2002 and January 2003, the name of the person who performed the inspection for the M-W Line was not identified on the *Summary* but was written on the *Form*.

c) For those *Forms* that stated that the repairs were performed, there was no indication on the records as to who did the work and when it was completed. The boxes in the *Forms* for the users to provide those items of information were, however, not filled out. There were six instances of this type of observation. Some instances of this type of observation are the C-K Line repairs identified in July 2002, June 2003 and July 2003.

d) In some *Forms*, the method of inspection used - viz. on-train, road vehicle or on-foot - was not always marked. The three instances of this type of observation were in April 2002 for the C-K Line, January 2002 for the M-W Line and July 2003 for the A-L Line.

e) In some *Forms*, the supervisor did not sign off the *Forms* to provide evidence that he or she had reviewed the reports. Some of the 35 instances of this type of observation can be found in the C-K Line reports from January 2003 to September 2003 inclusive and the R Line reports from January 2003 to August 2003 inclusive.

5. BART opened the San Francisco Airport line extension for revenue service in June 2003. The monthly inspection records from July 2003 to September 2003 inclusive did not include those mileposts of the extension. The supervisors indicated that these inspections were not occurring.

6. §79.4C of GO 95 requires that barriers to fencing should be provided in locations of thoroughfare and highway to prevent vehicular contact or damage to the fencing. Also, §4.0 of BART's *Scheduled Right of Way Fence Inspection Program* requires that the inspections to those barriers be performed. There are no records that those inspections of barriers had been performed.

COMMENTS

1. BART should review their procedures to assure that the appropriate employees receive the most current instructions.

RECOMMENDATIONS

1. BART should revise the monthly inspection records to include those areas pertaining to the San Francisco airport extension and begin inspecting those fences immediately. (#17)
2. BART should inspect and document all items identified for scheduled inspections. (#15)
3. BART should correct all deficiencies found during inspections, and document them. (#16)

2003 CPUC SYSTEM SAFETY & SECURITY AUDIT CHECKLIST FOR BAY AREA RAPID TRANSIT			
Checklist No.	**25**	Element	**10, 11, 12,16 – Transit Vehicle Maintenance**
Date of Audit	**10/08/03**	Department	Rolling Stock and Shops
Auditors/ Inspectors	Joey E. Bigornia	Persons Contacted	Kirtland Smith – Assistant Shop Superintendent Carl Smith – Senior Operations Safety Specialist

REFERENCE CRITERIA

Book 50 Volume 14,
Book 86, Volume 14,
Book 16, Section I, Procedures 24 and 27

CHARACTERISTICS AND METHOD OF VERIFICATION

1. Select two A-cars, four B-cars and four C-cars (two each assigned to Concord Yard shop or two each assigned to Hayward Yard shop). Review the completed PM records associated with each car selected to determine whether or not:
   a) a)The PMs required by the referenced procedure were performed within the required hour limits during the past three years
   b) The required documentation was properly prepared
   c) Noted discrepancies were corrected in a timely manner
   d) The car was turned annually for the purpose of equalizing wheel flange wear

** The **"A"** cars are located at the Richmond yard.

ACTIVITIES

I performed the following:

1. Reviewed the Preventive Maintenance Inspection (PMI) records at the Concord Yard Shop for:

a) Car No. 330 (B-car) dated October 17, 2002 – July 25, 2003.

b) Car No. 393 (B-car) dated September 5, 2002 – September 24, 2003.

c) Car No. 1514 (C-car) dated January 3, 2002 – September 2, 2003.

d) Car No. 1530 (C-cars) dated March 14, 2002 – September 29, 2003.

2. Reviewed the MARIS Computer Reports which track the status of cars, to determine the number of hours all cars had accumulated between the required PM-type inspections.

FINDINGS

1. The PMI records and documentation for all cars reviewed were complete and signed off. No exceptions were noted.
2. All discrepancies / corrections found during a PMI were properly recorded on the PMI form and Maintenance Discrepancy / Correction sheet forms.
3. The PMI form and Maintenance Discrepancy / Correction sheet forms showed corrective action and closure of maintenance defects found.
4. PMI's for all car records reviewed were performed within the 625 hour requirement.
5. The MARIS Computer Report of **10/08/03** showed that 2 cars were approaching the 600-hours accumulated limit. The MARIS Computer Report showed the two-cars were already removed from revenue service and the status of the two-cars indicated they were at the Concord Shop awaiting the required scheduled PM inspection. No exceptions were noted.
6. BART LRV Maintenance discontinued the practice of turning the cars on an Annual basis since Management determined it was no-longer necessary for reducing wheel flange wear.

COMMENTS

None.

RECOMMENDATIONS

None.

2003 CPUC SYSTEM SAFETY & SECURITY AUDIT CHECKLIST FOR BAY AREA RAPID TRANSIT			
Checklist No.	**26**	Element	**10, 11, 12,16 – Quality Assurance Transit Vehicles**
Date of Audit	**10/09/03**	Department	Rolling Stock and Shops
Auditors/ Inspectors	Raed Dwairi	Persons Contacted	James L. Wiscarson – Superintendent, Rolling Stocks and Shops (Concord Shop)

REFERENCE CRITERIA

Book 15

CHARACTERISTICS AND METHOD OF VERIFICATION

Select two B-car's and four C-car's (assigned to Concord Yard shop). Review the quality assurance records associated with the selected vehicles for six months during the past year to determine whether or not:

1. The records are complete and in an orderly, easily accessible arrangement.

2. The records include the results of:
   a. examinations
   b. inspections
   c. tests
   d. process controls
   e. disposition of discrepancies

3. Select 5 (600 hour inspection reports) during the past year and track the Quality Assurance process to completion.

ACTIVITIES

I performed the following tasks:

1. Asked to see Book 15 (BART Quality Assurance Manual). I copied and reviewed Chapter 2, Section 7 Transit Vehicle Required Inspection Items (Form #0196).

2. Randomly selected two, B-type and four C-type cars from the list of those cars assigned to the Concord Shop and reviewed the quality assurance records associated with these vehicles for the past six months. These vehicles were:

   B type: 1594 and 1764

   C type: 320, 330, 421, and 430

3. Randomly selected 5 (600-hour inspection reports) prepared during the last year and tracked the quality assurance process to completion. The reports selected pertained to car 335 and 382.

FINDINGS

1. The quality assurance records of all the vehicles selected were orderly and easily accessible. The quality assurance stamps were visible on the forms used (preventive, unscheduled, under warranty, and required modification by the manufacturer) and were placed in the appropriate fields.
2. The quality assurance records included all the pertinent information as required by the Quality Assurance Manual (type of discrepancy, its solution, the date the vehicle was released for revenue service, and the quality assurance stamp of approval prior to the vehicle returning to revenue service).
3. The quality assurance process was followed as required when the 600-hour inspection reports were reviewed during the past year for vehicles #335 and 382.
4. BART has a mature and effective quality assurance program for transit vehicles. I was impressed with the organization of the records and the knowledge of the manager in charge of the program.

COMMENTS

None

RECOMMENDATIONS

None

2003 CPUC SYSTEM SAFETY & SECURITY AUDIT CHECKLIST FOR BAY AREA RAPID TRANSIT			
Checklist No.	**27**	Element	**10, 11, 12,16 – Train Control Equipment Inspection and Tests**
Date of Audit	**10/06/03**	Department	Maintenance and Engineering Systems Maintenance Way and Facilities
Auditors/ Inspectors	Raed Dwairi	Persons Contacted	Babra A. Rosenberg - Assistant Superintendent, Systems Maintenance Norman On - Section Manager, Systems Maintenance

REFERENCE CRITERIA

Data Stream, Joint Switch and Turnout and Inspection Checklist

CHARACTERISTICS AND METHOD OF VERIFICATION

1. Select at least two stations. Review the inspection records for the station MUX associated with the selected stations to determine whether or not:

   a) The semi-annual inspections required by the referenced procedure were performed during the past three years
   b) The required documentation was properly prepared
   c) Noted discrepancies were corrected in a timely manner

2. Select at least five interlockings. Review the "Annual Track and Train Control Departments Joint – Switch, Turnout, and Interlocking Inspection Form" to determine whether or not:

   a) The monthly and semi-annual inspections required by the referenced procedure were performed during the past three years
   b) The required documentation was properly prepared and signed by the Track Representative and the Train Control Representative
   c) Noted discrepancies were corrected in a timely man

ACTIVITIES

I performed the following tasks:

1. Interviewed the Assistant Superintendent and the Section Manager of the Systems Maintenance Division (see the Findings Section for information on future plans for the Train Control System Preventive Maintenance Program).
2. Selected Richmond Station designated as R-60 and requested to review the inspection records prepared during the last 12 months. The Section Manager pointed out that this station is not a control station and therefore has no MUX associated with it.
3. Selected the Walnut Creek Station (control station) designated as C-40 and requested to review its MUX inspection and repair records prepared for the last 12 months. (Two Work Orders were tracked to completion: WO #02-0004818 & 03-0002540).
4. Selected the Berkeley Station (control station) designated as R-20 and requested to review its MUX inspection and repair records prepared for the last 12 months. (two Work Orders were tracked to completion: WO #02-0004842 & 03-0002550).
5. Reviewed the Annual Track and Train Control Department Joint-Switch, Turnout, Turnout and Interlocking Inspection Forms associated with A15 @ Sw227, K23 @ Sw347, M03 @ Sw227, L07 @ Sw123, R25 @ Sw123, AND W33 @ Sw133 interlockings prepared during the last three years.

FINDINGS

1. DataStream was implemented a few years ago with the objective of automating the BART train control preventive maintenance program.
2. Two committees (Steering & Development) were recently formed with the objective of developing comprehensive preventive maintenance procedures for train control signaling systems at BART that specifically address safety and reliability;
3. The Steering Committee will be composed of Systems Maintenance and Train Control Engineering staff to provide a broad background and expertise necessary to investigate OEM, FRA, AREMA, APTA, other transit agency practice, and equipment history to develop the program and assign priorities (for example, switches with high usage or movement require more frequent inspections); and
4. The Development Committee will develop procedures and documents as required by the Steering Committee Direction, perform field validation and verification procedures, and determine if the procedure can be performed during revenue operations.
5. The retrieved inspection and repair records of Richmond Station Interlocking (R-65) from DataStream showed inspections were performed as required on the monthly and semiannual basis and noted defects corrected in a timely manner.

6. The retrieved inspection and repair records of Walnut Creek and Berkeley Stations showed that the required semiannual inspections were completed as required and noted defects corrected in a timely manner
7. The Annual Joint-Switch, Turnout & Interlocking Inspection Forms were completed and signed off by the Track & Train Control Reps as follows:
    a) A15 @ Sw227: completed on 3/7/01, 3/12/02, and 4/15/03
    b) K23 @ Sw347: completed on 6/21/01, 2/20/02, and 1/21/03
    c) M03 @ Sw227: completed on 8/17/01, 2/27/02, and 5/6/03
    d) L07 @ Sw123: completed on 6/13/01, 3/20/02, and 5/13/03
    e) R25 @ Sw123: completed on 6/10/01, 4/18/02, and 3/18/03
    f) W33 @ Sw133: completed on 8/14/03 (W-Line opened in June 03)
8. Noted defects on annual forms were corrected in a timely manner (tracked T/R#3664 to completion recorded on 6/20/03 and closed out on the same day).

COMMENTS

None

RECOMMENDATIONS

None

2003 CPUC SYSTEM SAFETY & SECURITY AUDIT CHECKLIST FOR BAY AREA RAPID TRANSIT			
Checklist No.	**28**	Element	**10, 11, 12 – Emergency Ventilation Fans and Associated Dampers**
Date of Audit	**October 7, 2003**	Department	Maintenance and Engineering Power/Mechanical Maintenance
Auditors/ Inspectors	Raed Dwairi	Persons Contacted	Dean Giebelhausen – Section Manager, Power Mechanical Phil Corsetti – Section Manager, Power Mechanical Carlina K. Leong – Senior Safety Engineer (observer)

REFERENCE CRITERIA

Book 4, Volume 1, Chapter 1,2,3,4

CHARACTERISTICS AND METHOD OF VERIFICATION

Select at least three ventilation fans and associated dampers. Review the corresponding maintenance inspection records to determine whether or not:

1. The required monthly and annual inspections were performed during the past three years as required by the referenced procedure
2. The inspections were properly documented
3. Noted discrepancies were corrected in a timely manner.

ACTIVITIES

I performed the following tasks:

1. Interviewed the Section Managers in charge of the preventive maintenance program of the ventilation fans (night shift Manager was not presented at the time of the audit).
2. Selected three ventilation fans under the control of the night shift manager and another two under the day shift manager.

3. Reviewed both the mechanical and electrical portions of the preventive maintenance records performed during the last three years. Tracked Notices of Needed Repairs (NNRs) to completion.
4. Conducted a field inspection of emergency ventilation fan (KV16) located at the Oakland City Station (12th Street). This was outside the scope of the checklist to see whether or not the fan is operational.

FINDINGS

1. For all fans selected (under both the night shift and day shift managers), the Mechanical portion of preventive maintenance inspections were completed on the required annual basis and noted defects were corrected in a timely fashion. These inspections were as follows:
   a) RV16 (night shift): annual inspections on 9/20/01, 9/4/02, and 9/16/03
   b) KV21 (night shift): annual inspections on 3/13/01, 3/20/02, and 3/13/03
   c) MV52 (night shift): annual inspections on 9/24/01, 7/8/02, and 7/1/03
   d) RV11 (day shift): annual inspections on 7/1/01, 7/24/02, and 7/3/03
   e) KV16 (day shift): annual inspections on 3/1/01, 3/19/02, and 3/12/03
2. The electrical portion of inspections of the above selected fans was only performed at around 70% compliance with the required established frequencies and appears to have been moved twice in order to meet inspection schedule (moved from monthly to bimonthly in November 2001 and again to quarterly in January 2003).
3. I reviewed Notice of Needed Repair (NNR) #1544 that was originated on January 21, 2003 corresponding to line ventilation fan KV16. No documentation was found to show that the noted discrepancies were repaired. These ranged from the somewhat minor ("door gasket need to be repaired") to the serious ("diodes for DTSG, DTSF, FAILED").
4. I requested to be taken to the location of aforementioned fan (KV16) to witness the operational status of the fan. Section Manager, Phil Corsetti contacted BART Central Control at approximately 11:45 AM and the fan was operated remotely without any problems or delays. This suggests that the needed repairs were done but the documentation was not available to show their completion.

COMMENTS

I audited the same area in the Year 2000 Triennial Audit and issued recommendations to ensure that maintenance inspections for ventilation fans be performed at the required intervals. There has been a lot of improvement since then.

RECOMMENDATIONS

BART should ensure that the electrical portion of the line ventilation fans' preventive maintenance program is performed at the required frequencies and repairs for noted discrepancies are properly documented. (#18)

2003 CPUC SYSTEM SAFETY & SECURITY AUDIT CHECKLIST FOR BAY AREA RAPID TRANSIT

Checklist No.	**29**	Element	**11, 12 – Third Rail Maintenance**
Date of Audit	**10/07/03**	Department	Maintenance and Engineering Power/Mechanical Maintenance
Auditors/ Inspectors	Mahendra Patel	Persons Contacted	Clifton E. Black, Section Manager Power & Mechanical Maintenance Richard S. Rounke, Section Manager Power & Mechanical Maintenance Jonathan S. Rossen, Industrial Hygienist

REFERENCE CRITERIA

Book 31, Chapter 1, Section 17

CHARACTERISTICS AND METHOD OF VERIFICATION

1. Select at least three separate sections of third rail. Review the corresponding maintenance inspection records to determine whether or not:
   a) The required monthly and annual inspections were performed during the past twelve months as required by the referenced procedure
   b) The inspections were properly documented
   c) Noted discrepancies were corrected in a timely manner

ACTIVITIES

I performed the following:

1. Reviewed file folders containing maintenance inspection records for A, C, M, R, and L lines.
2. Reviewed wayside annual inspection tracking sheet for the year 2002 and 2003.
3. Reviewed file folder containing filled out Notice of Needed Repair (NNR) forms.
4. Discussed the findings and recommendations with BART representatives and obtained their concurrence.

FINDINGS

1. BART has developed a distinctive routing envelope in response to a recommendation of October 2000 triennial audit. This corrective action was taken to ensure that the maintenance inspection forms were delivered to the Power and Mechanical

Maintenance offices in the Oakland Shop Annex in a timely manner. However, the monthly inspection records were still found to be incomplete as follows:

a. For A line, no records were found for the months of June 2003, July 2003, and December 2002.

b. For C line, no records were found for the months of January 2003, February 2003, March 2003, April 2002, May 2002, and December 2002.

c. For M line, no records were found for the months of January 2003, February 2002, March 2002, April 2002, May 2002, July 2002, August 2002, September 2002, October 2002, and November 2002.

d. For R line, no records were found for the months of February 2003, April 2003, May 2003, September 2003, January 2002, and March 2002.

e. For L line, no records were found for the months of January 2003, May 2003, August 2002, and December 2002.

2. The Section Manager stated that most probably the monthly inspections were not performed for these missing records.

3. BART has also developed a three-part Notice of Needed Repair (NNR) Form 1466 along with instructions for it's the use in response to a recommendation of October 2000 triennial audit. This corrective action was taken to ensure that the noted discrepancies are properly documented and corrected in a timely manner. However, these records were still found to be incomplete as follows:

4. Inspections were not properly documented on the Notice of Needed Repair form. Discrepancies found include instances of repair not listed but the form signed off, missing signatures, etc.

5. A number of noted discrepancies were found to be open for a long period of time ranging from months to year. The Section Manager stated that the deficiencies are repaired based on safety significance.

6. The annual inspection records were not available for review during the October 200 triennial audit. Since then, BART is actively performing and documenting the annual inspections. However, the annual inspection of the third rail sections were found to be incomplete as follows:

   a. 2002 wayside annual inspection tracking sheet lists 192 third rail sections and shows that 27 third rail sections out of 192 listed were not inspected.

   b. 2003 wayside annual inspection tracking sheet lists 225 third rail sections and shows that the inspection for 112 third rail sections is completed and the inspection for 21 third rail sections is in progress.

   c. Currently used wayside annual inspection report form is revised and different from the one included in Book 31, Chapter 1, Section 17 dated 11/18/82.

   d. The records did not contain the completed annual wayside inspection and repair checklists. The Section Manager stated that the employees are well experienced and they do not use the checklist.

COMMENTS

None

RECOMMENDATIONS

1. BART should ensure that the monthly and annual third rail inspections are performed for the entire system; the noted discrepancies are tracked and corrected in a timely manner, and properly documented to show clear closures of the repairs of all deficiencies. (#19)
2. BART should update, as soon as possible, the existing Power & Way Electrical Maintenance Procedure Book 31, Chapter 1, Section 17 dated 11/18/82 to reflect current inspection practices, documentation requirements, inter-departmental coordination, etc. (#20)

2003 CPUC SYSTEM SAFETY & SECURITY AUDIT CHECKLIST FOR BAY AREA RAPID TRANSIT

Checklist No.	**30**	Element	**10, 11 – Vital Relays**
Date of Audit	**10/06/03**	Department	Maintenance and Engineering Power/Mechanical Maintenance
Auditors/ Inspectors	Raed Dwairi	Persons Contacted	Dan Stevenson – Section Manager, Systems Maintenance

REFERENCE CRITERIA

DataStream

CHARACTERISTICS AND METHOD OF VERIFICATION

Review the records of completed vital relay inspections prepared during the last three years to determine whether or not:

1. Inspections were performed at the required frequencies as specified in the reference criteria.
2. Inspections were properly documented
3. Noted defects were corrected in a timely fashion.

Additionally, conduct a field inspection of at least one relay to determine if the measured pick-up and drop-away voltages are within acceptable limits as specified in the reference criteria.

ACTIVITIES

I performed the following tasks:

1. Interviewed the Section Manager about the Vital Relays inspection program,
2. Obtained a copy of the "Relay PM Schedule & Assignments 2003" document,
3. Selected and reviewed the records which correspond to the following Vital Relay locations: R-65 (Richmond Yard), Stations C19 & C15.

FINDINGS

1. Vital relays at:
   a) R-65 were inspected on 5/14/02 and 5/25/03,
   b) C15 were inspected on 1/28/02 and 7/22/03,
   c) C19 were inspected on 4/9/02 and 5/13/03.
2. Inspections were properly documented. New equipment replaced relays that failed the tests. This was evident from the serial numbers of the new relays.

COMMENTS

No field inspections of vital relays were performed because these would have severely impacted revenue service operations.

RECOMMENDATIONS

None

2003 CPUC SYSTEM SAFETY & SECURITY AUDIT CHECKLIST FOR BAY AREA RAPID TRANSIT			
Checklist No.	**31**	Element	**11, 12, 16, 17 – Fire Alarms and Sprinkler Systems**
Date of Audit	**October 2, 2003**	Department	Maintenance and Engineering Power/Mechanical Maintenance
Auditors/ Inspectors	Michael Yeo	Persons Contacted	Randy Clark, Superintendent, Power & Mechanical Maintenance Dean Giebelhausen, Section Manager, Power Mechanical Phil Corsetti, Section Manager, Power & Mechanical Maintenance

REFERENCE CRITERIA

Book 31, Volume 5, Chapter 8, CCR Title 19

CHARACTERISTICS AND METHOD OF VERIFICATION

Select one aerial, one at-grade, and one subway station. Review the fire alarm and fire sprinkler system inspection, testing, and maintenance records for the selected stations to determine whether or not:

1. The required annual fire alarm inspections were performed during the past three years as required by the referenced procedure.
   a. The inspections were properly documented
   b. Noted discrepancies were corrected in a timely manner
2. The required fire sprinkler system inspections, testing, and maintenance were performed during the past three years as required by the referenced procedure. The inspections were properly documented.
3. The inspections were properly documented.

ACTIVITIES

I performed the following:

1. Interviewed the Power & Mechanical Maintenance Superintendent and his two Section Managers to learn about BART's program on fire alarms and sprinkler system.

2. Reviewed the quarterly and Title 19 records that were prepared since December 2000 for three stations - 12th Street Station (below grade), Richmond Station (at-grade) and the Coliseum Station (aerial).
3. Reviewed the maintenance schedules for all of the stations.

FINDINGS

1. BART introduced their in-house quarterly inspection program sometime in the later half of 2000. Since the quarterly inspection items do not require any special licensing, BART was able to embark on the program. Prior to that time, an outside vendor performed those inspections for BART, including the California Code of Regulations Title 19 inspection items which require a licensee to perform. The outside vendor continued to perform the Title 19 items until March 4, 2002 when the Office of the State Fire Marshal issued BART a license to service and test specific fixed fire-extinguishing systems. Henceforth, BART has been performing Title 19 inspection activities.
2. Each fire alarm system has its own site specific preventative record.
   There are two preventative maintenance schedules for fire alarm systems. Depending on the items and systems, some are performed semi-annually while others are performed annually. In the first nine months of 2003, BART, according to the maintenance schedule, failed to perform 50% of their maintenance program. Of the 38 scheduled semi-annual maintenances, only 13 were performed (34.2%) and of the 34 scheduled annual maintenances, only 8 were performed (23.5%). While there are similar lapses for 2002, the completion rates are, however, above 50%.
3. There is a low compliance rate performing the preventative maintenance scheduled checks. According to the auditees, the low compliance rates are due to not having sufficient electricians to do the job. In the Power and Mechanical Division, BART had 75 track miles in 1973 and 85 electricians, Today (September – 2003) there are 64 electricians and 110 miles of track.
4. When a quarterly-cycle inspection overlaps with the five-year cycle Title 19 inspection, all the quarterly inspection items are recorded on the Title 19 inspection form.
5. BART should develop a procedure to explain the usage of the quarterly inspection form to avoid the inconsistencies on how the various form items are to be completed. Not all forms were completed properly. Among completed forms, there were inconsistencies in the items of information being written on the newer Quarterly Inspection forms introduced in the last quarter of 2001.
   a) There are boxes on the form to record the system and supply pressures for the sprinkler and standpipe. In twelve instances, not all boxes on the form to record the system and supply pressures for the sprinkler and standpipe had information written on them.

1) Examples of instances where standpipe pressures were not recorded are the 12th Street Station quarterly reports for March 2002, June 2002, and June 2003.

2) Examples of instances where the sprinkler supply pressure were not recorded are the Richmond Street Station quarterly reports for December 2001, December 2002, and September 2003.

Many checklist items in the form are to be responded with a check mark under one of the columns, "YES", "NO" or "N/A". In some forms, the "YES" box for the checklist item was checked off and yet the bottom of the form indicated that there were no discrepancies found and no NNR (Notice of Needed Repair) form was generated. There were three instances where the boxes in the form were incorrectly marked as "YES" for the checklist items, "Valve leaks", "Visible or exterior obstructions" and "Leaking, corroded or painted". They are the Richmond Street Station quarterly reports for December 2001, June 2003 and September 2003.

b) In two instances, the checklist items for gauges were not marked as having been performed. They pertain to the Richmond Street Station December 2002 quarterly report.

6. From the documents reviewed, the highest recorded sprinkler pressure was 115 psi; and that occurred during the Richmond Station June 2001 quarterly inspection. Generally, most readings fall in the 70-80 psi range, and that range exceeds the minimum pressure of 20 psi as required under National Fire Protection Association standards. The auditees, however, did not know what would be the highest acceptable reading before there might be a failure of the sprinkler system.
7. Generally, BART maintains good records of their Fire Alarms and Sprinkler Systems program.

COMMENTS

1. BART Power and Mechanical should obtain a guideline on the maximum allowable sprinkler pressure to assure that the system is not unduly overstressed.

RECOMMENDATIONS

1. BART should ensure required inspections are performed at t he proper intervals. (#21)

2003 CPUC SYSTEM SAFETY & SECURITY AUDIT CHECKLIST FOR BAY AREA RAPID TRANSIT			
Checklist No.	**32**	Element	**11, 12, 16, 17 – Wet Pipe Sprinkler Systems and Line Pumps**
Date of Audit	**October 2, 2003**	Department	Maintenance and Engineering Power/Mechanical Maintenance
Auditors/ Inspectors	Michael Yeo	Persons Contacted	• Randy Clark, Superintendent, Power & Mechanical Maintenance • Dean Giebelhausen, Section Manager, Power Mechanical • Phil Corsetti, Section Manager, Power & Mechanical Maintenance

REFERENCE CRITERIA

Book 4, Volume 3, Chapter 1, CCR Title 19

CHARACTERISTICS AND METHOD OF VERIFICATION

Review the wet pipe sprinkler systems testing records and the line pumps maintenance inspection records to determine whether or not:

1. The service tests for wet pipe sprinkler systems required every five years were performed as required by the referenced procedure:

    a. The tests were properly documented
    b. Noted discrepancies were corrected in a timely manner

2. The required monthly, quarterly, semi-annual, and annual inspections of line pumps were performed during the past three years as required by the referenced procedure:

3. The inspections were properly documented.

4. Noted discrepancies were corrected in a timely manner.

ACTIVITIES

I performed the following:

1. Interviewed the Power & Mechanical Maintenance Superintendent and his two Section Managers to learn about BART's program on Wet Pipe Sprinkler Systems and Line Pumps.
2. Reviewed the Title 19 records that were prepared since December 2000 for three stations - 12th Street Station (below grade), Richmond Station (at-grade) and the Coliseum Station (aerial).
   a) These reviews were part of the Checklist 31 audit because of the overlapping inspections.
3. Reviewed the Embarcadero Station records dating from December 2000 to August 2003 inclusive.

FINDINGS

1. On March 4, 2002, the Office of the State Fire Marshal issued BART a license to service and test specific fixed fire-extinguishing systems. Prior to that date, an outside vendor performed the California Code of Regulations Title 19 inspection items for BART. Those Title 19 items are required to be inspected every five years.
2. When a quarterly-cycle sprinkler inspection overlaps with the five-year cycle Title 19 inspection, all the quarterly inspection items are recorded on the Title 19 inspection form.
3. Generally, BART maintains good records of their Wet Pipe Sprinkler Systems and Line Pumps program.

COMMENTS

None

RECOMMENDATIONS

None

2003 CPUC SYSTEM SAFETY & SECURITY AUDIT CHECKLIST FOR BAY AREA RAPID TRANSIT			
Checklist No.	**33**	Element	**11, 12, 16, 17 – Under-Car Deluge System**
Date of Audit	**10/08/03**	Department	Maintenance and Engineering Power/Mechanical Maintenance
Auditors/ Inspectors	Joey E. Bigornia	Persons Contacted	Dean Giebelhausen – Section Manager Power Mechanical Carlina Leong – Senior Safety Engineer

REFERENCE CRITERIA

Book 31, Chapter 2, Section 5

CHARACTERISTICS AND METHOD OF VERIFICATION

Select at least three underground stations. Review the corresponding under-car deluge system maintenance inspection records to determine whether or not:

1. The required quarterly inspections were performed during the past twelve months as required by the referenced procedure:

    a) The inspections were properly documented
    b) Noted discrepancies were corrected in a timely manner

2. The required Title 19 testing every five years was performed as required by the referenced procedure:

    a) The testing was properly documented
    b) Noted discrepancies were corrected in a timely manner

ACTIVITIES

I performed the following:

1. Reviewed the following documentation:

a. Under-car deluge inspection reports for the A-Line (Lake Merritt Station: A-10) dated November 1, 2000 to August 26, 2003.

b. Under-car deluge inspection reports for the K-Line (12th Street Station: K-10, 19th Street Station: K-20) dated September 12, 2000 to September 4, 2003.

c. Under-car deluge inspection reports for the R-Line (Ashby Station: R-10, Berkeley Station: R-20) dated May 11, 2000 to September 19, 2003

d. Under-car deluge inspection reports for the M-Line (Embarcadero Station: M-16, Civic Center Station: M-40, Daly City Station: M-70) dated November 13, 2000 to August 14, 2003.

2. Reviewed the Notice of Needed Repair (NNR) form which listed discrepancies found during an inspection that need corrective actions.

FINDINGS

1. The under-car deluge system inspections were performed on a semi-annual inspection interval in Year 2000 and 2001.
2. The under-car deluge system inspections inspection interval was revised to a quarterly inspection interval in Year 2002.
3. The under-car deluge system inspections were all performed at the required inspection intervals for Years 2000-2002.
4. The 5-Year Inspection as required by Title 19 was performed in March 2002 for all under-car deluge station systems. The next 5-Year Inspection is due in Year 2007.
5. The inspections were properly documented and discrepancies found during an inspection were noted on the Notice of Needed Repair (NNR) form.
6. The NNR forms showed that the discrepancy was repaired in a timely manner and closed out from the inspection records.

COMMENTS

None.

RECOMMENDATIONS

None.

2003 CPUC SYSTEM SAFETY & SECURITY AUDIT CHECKLIST FOR BAY AREA RAPID TRANSIT			
Checklist No.	**34**	Element	**11, 12, 16, 17 – Gap Breakers and Wayside Equipment**
Date of Audit	**October 7, 2003**	Department	Maintenance and Engineering Power/Mechanical Maintenance
Auditors/ Inspectors	Raed Dwairi	Persons Contacted	Clifton E. Black – Section Manager, Power & Mechanical Maintenance. Richard S. Rounke – Section Manager Power & Mechanical Maintenance.

REFERENCE CRITERIA

Book 31, Chapter 1, Section 1
Memo from C. Lippert dated 3/12/2003

CHARACTERISTICS AND METHOD OF VERIFICATION

Select at least three Gap Breaker Stations. Review the corresponding maintenance inspection records to determine whether or not:

1. The required weekly or biweekly inspections were performed during the past three years as required by the referenced procedure
2. The inspections were properly documented
3. Noted discrepancies were corrected in a timely manner

ACTIVITIES

I performed the following tasks:

1. Interviewed the Section Manager in charge of the inspection program of substations, gap breakers, and wayside equipment.
2. Reviewed gap breakers inspections records prepared during the last three years. The following gap breakers were selected:
   a. AYE located between San Leandro and Bay Fair Stations.
   b. RXC located between Berkeley and North Berkeley Stations.
   c. LXA located at the end of the Dublin Line.

FINDINGS

1. For the LXA gap breaker, all biweekly inspections records were completed and properly documented between the June 2001 and 9/15/03.
2. For the AYE gap breaker, all biweekly inspections records were completed and properly documented between 5/21/01 and 9/16/03.
3. For the RXC gap breaker, all biweekly inspection records were completed and properly documented between 5/21/01 and 9/15/03.
4. All noted discrepancies were corrected in a timely manner.

COMMENTS

None

RECOMMENDATIONS

None

2003 CPUC SYSTEM SAFETY & SECURITY AUDIT CHECKLIST FOR BAY AREA RAPID TRANSIT			
Checklist No.	**35**	Element	**12, 13 – Signal Maintenance Training and Certification**
Date of Audit	**10/09/03**	Department	Operations Training and Development Maintenance
Auditors/ Inspectors	Robert Strauss	Persons Contacted	Cal Coleman, and David Mohn

REFERENCE CRITERIA

BART Employee Certification, 1986
Train Control Technician Training Program

CHARACTERISTICS AND METHOD OF VERIFICATION

Interview the signal maintenance-training representatives & review the training and certification program.
Select at least 2 employees from each Train Control Technician Training Maintenance classification to determine:

1. Training & certification program and procedures are in place for each position
2. Each selected employee has successfully completed the training and certification program.
3. Training, certification and refresher training records are complete and in compliance with BART requirements
4. The training received corresponds to the signal maintenance activities they are certified to perform.

ACTIVITIES

1. Interviewed Cal Coleman and David Mohn on the structure and operation of the Train Control Technician certification and recertification program.

2. Reviewed the BART Employee Certification Plan, Revised December 1986, Technical Training Manual, Course Outline binder, and Instructor's Guide for the Switch Machine Course.
3. Randomly selected 8 of 76 certified technicians and reviewed their certification filed. The files contained the most recent test in each of seven certification areas (disciplines). Verified whether each employee received a passing grade in each area where certified.
4. Checked the certification status of the 76 technicians in each of the seven disciplines, using a printout from the electronic database.

FINDINGS

1. BART has an in-depth initial certification program for Track Control Technician Certification. Track Control Technician Certification is split into seven disciplines. Each employee must be tested and certified in a discipline to work in that area. New employees receive right-of-way training and work with an On-The-Job Trainer for the first 12 weeks. The trainees then receive classroom training and a certification test in each discipline. The process of training and certification in all disciplines can take over two years, as employees work in a discipline after being certified and before taking another training course. Employees who have not received certification in an area must work with a certified employee. Mr. Coleman explained that not all lines use all seven disciplines. Therefore, some technicians do not need certification in all disciplines.
2. On-The-Job Trainers work in the field and provide 3-7 hour refresher courses. They may also work with an individual employee or with small groups depending on training needs. Forepersons and supervisors can recommend employees for training by on-the-job trainers.
3. There is a classroom training course for each of the seven certification disciplines. Six of the seven classroom training classes are for two weeks, the seventh (switch machines) is one week. Classes generally accommodate 9 trainees. Employees who have taken the class are tested and must answer 75% of the test questions correctly to be certified or recertified.
4. BART has developed a training course for the systems on the SFO Extension, but has not integrated it into the certification program.
5. The general requirements for certification are contained in the BART Employee Certification Plan, Revised December 1986. Details of the training program are laid out in the Technical Training Handbook, which is available on BART's intranet. Each course should have an Instructor's Guide, Lesson Plan/Course Outline, and Student handbook. VHLC Interlocking course does not have a Lesson plan. Some Lesson Plans had handwritten notes or were outdated. The GRS VPI Software course has no instructor's guide.

6. There is only one copy of each Instructor's Guide, no file or back-up copy. The Guide is under the control of the course instructor who may change it as conditions warrant. The Instructor's Guide for the Switch Machine course was not set-up according to the requirements of the Technical Training Handbook. It included significant amounts of technical information and course material, but did not contain the detailed explanations of how to teach the course the Training Manual requires.
7. BART maintains an electronic database that contains the names of each technician, current certifications for each technician, and the date those certifications expire. This database is available to field supervisors.
8. Of the eight certification records reviewed, all contained copies of passing tests for each certification recorded in the electronic database. The scoring on each test was checked and no relevant discrepancies found.
9. The electronic database revealed that of the 76 certified technicians, nine are new employees who are only certified in switch machines. Eleven more technicians were never certified in at least one of the seven disciplines. Of the remaining 56 technicians, 25 are overdue for recertification in at least one area. There are a total of 55 overdue recertifications among the 67 technicians (not including the 9 new employees). Of the 55 overdue recertifications, 33 were at least six months overdue.

    a) Switch Machine — 1 overdue
    b) MUX System — 8 overdue
    c) Relay Interlocking — 12 overdue
    d) GRS ATP Track Circuits — 11 overdue
    e) GRS VPI Hardware — 11 overdue
    f) GRS VPI Software — 12 overdue
    g) VHLC Interlocking — 0 overdue

10. BART had a Relay Interlocking class in progress at the time of the audit. A GRS VPI Hardware and a GRS VPI Software class are planned for later this calendar year.
11. Checklist 36 Recommendation 2, from the 2000 audit stated: "BART should develop and implement the plan and schedule to eliminate the training backlog as soon as possible."

COMMENTS

None

RECOMMENDATIONS

1. BART should develop and implement a plan and schedule to eliminate the training backlog. (#7)
2. BART should ensure that all safety sensitive employees receive the necessary training and testing and are recertified before their certification lapses. BART should develop a procedure that establishes and implements effective communication between the training department, human resources department and other responsible departments so that the employee training certification/recertification program is effectively implemented in a timely manner. (#8)
3. BART should ensure that any employee, whose certification has lapsed, is not assigned to the position that requires the certification. (#9)
4. BART should increase the Training Department's oversight of Employee Development Specialists to ensure (#11):
    a. An up to date file copy exists of all training materials and instructor guides,
    b. All courses have an Instructor Guide, and the guides are in compliance with the Technical Training Handbook,
    c. All courses have an up to date Lesson Plan

2003 CPUC SYSTEM SAFETY & SECURITY AUDIT CHECKLIST FOR BAY AREA RAPID TRANSIT			
Checklist No.	**36**	Element	**22 – Contractor Safety Coordination**
Date of Audit	**10/08/03**	Department	System Safety, Operations Liaisons Transit System
Auditors/ Inspectors	Joey E. Bigornia	Persons Contacted	Len Hardy – Chief Safety Officer Carin E. Shoemaker –Senior Operations Supervisor: Operations Liaisons

REFERENCE CRITERIA

Operations Rules and Procedures Manual, 5/1/01
Operating Bulletins, current.
Management Procedure 31, 9/14/99

CHARACTERISTICS AND METHOD OF VERIFICATION

Interview the representative from BART who is responsible for the Contractors Safety Program, review documentation and requirements to determine if:

1. The contractor safety procedures have been revised/updated since the 2000 audit.
2. BART's procedures and policies clearly demonstrate that the Contractor's and their employees are responsible to comply with BART's safety rules and procedures.

ACTIVITIES

I performed the following:

1. Interviewed the Chief Safety Officer to determine BART's process for implementation of the Contractor Safety Program.
2. Requested documents of the Contractor Safety Program (CSP) and interviewed the Chief Safety Officer to determine how the CSP applies to new construction or capital improvement projects.
3. Requested and reviewed the current Operating Bulletins that cover the Contractor Safety Program.
4. Reviewed Procedures and Policies for Contractor's and their employees compliance with BART's safety rules and procedures

FINDINGS

1. BART's Management Procedure #31 *Standard Procedure for Access to the BART Operating System* dated September 14, 1999, identifies methods and requirements to permit work to be accomplished safely and efficiently while minimizing the effect on the Operating System.
2. Management Procedure #31 applies to all BART Operations and Maintenance activities (except for those activities scheduled and performed by BART staff as routine maintenances), system wide renovation programs, all BART construction, systems installation, expansion, modification & testing of projects, all construction & installation contracts, and all projects by other agencies which could potentially affect the BART Operating System.
3. There has been one revision to BART's Operating Bulletin 03-08, *Safety Monitor Responsibilities*. The initial effective date was April 10, 1998 and a reissue occurred on March 10, 2003.
4. Operating Bulletin 03-08 addresses the assignment of a "qualified person" assigned to monitor projects such as contractors hired by the District to work on BART property or those which may be undertaken by outside agency personnel (such as CALTRANS) working near BART property.
5. Operating Bulletin 03-02, *Contractor Work in Yard and Local Control Areas that could **not** affect the Safety of Train Movement* dated March 12, 2003 was created to encompass contractor work in the Yard and Local Control Areas.
6. Management Procedure 31 does not apply to work performed by contractors in yards and local control areas, provided the work could **not** affect the safety of train movement. Operating Bulletin 03-02 covers contractor work in the yard such as the hanging of posters or advertisements inside of the Bart cars.
7. BART's Section 01575, Operating System Interface identifies the specifications for a Contractor's interface with the BART Operating System.
8. BART's Section 01545, Construction Safety Requirements identifies the specifications for construction safety requirements, Contractor compliance to Cal/OSHA, Federal OSHA, ANSI and other applicable safety standards.
9. Section No. 01545 Construction Safety Requirements and Section No. 01575 Operating System Interface are always included in Bid Documents for construction work on the BART system

COMMENTS

None.

RECOMMENDATIONS

None

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