TRIENNIAL ON-SITE SAFETY AUDIT OF THE SANTA CLARA VALLEY TRANSPORTATION AUTHORITY

RAIL TRANSIT SAFETY SECTION
RAIL TRANSIT AND CROSSING BRANCH
CONSUMER PROTECTION AND SAFETY DIVISION
CALIFORNIA PUBLIC UTILITIES COMMISSION
505 VAN NESS AVENUE
SAN FRANCISCO, CA 94102

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FINAL REPORT

Richard W. Clark, Director
Consumer Protection and Safety Division

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Rail Transit Safety Program

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The California Public Utilities Commission's Rail Transit Safety Section staff conducted this system safety program audit. Staff members directly responsible for conducting audit activities include:

Joey Bogornia	Raed Dwairi
Joe Farley	Anton Garabetian
Bill Mealor	Don Miller
Mahendra Patel – Lead Auditor	Gary Rosenthal
Robert Strauss	Brian Yu

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1. EXECUTIVE SUMMARY

The Rail Transit Safety Section staff (staff) of the California Public Utilities Commission's (Commission) Consumer Protection and Safety Division conducted the third triennial, on-site, safety audit of the Santa Clara Valley Transportation Authority (VTA) from October 25, 2004 to October 28, 2004. The on-site audit was preceded by a pre-audit conference with VTA personnel including Chief Financial Officer, various Managers and Superintendents, on Monday, October 25, 2004. A post-audit conference, also attended by VTA personnel including Chief Operating Officer, Chief Financial Officer, various Managers, and Superintendents, was held on Monday November 8, 2004.

The audit results indicate that generally, VTA is effectively implementing its System Safety Program. Exceptions, however, were noted during the audit. These are described, where applicable, in the Results/Comments Section of each checklist along with recommendations to correct identified exceptions. Eleven checklists contain recommendations.

The staff audited 9 VTA departments on 26 separate subjects using specific criteria (checklists) and made 22 recommendations. The audit results indicate that VTA made significant progress between 2001 and 2004 audit in the areas of Vehicle Maintenance, Accident Investigation, Configuration Management, and Records Management. However, it also identifies areas where additional improvements should be made to further improve VTA safety program. The Way, Power & Signal Department needs to conduct the annual internal audit (Checklist No. 7) and biannual Insulating Stick Testing (Checklist No. 5); improve its vegetation control program (Checklist Nos. 4 & 8); and should ensure that all Preventive Maintenance Inspections are conducted and properly documented (Checklist No. 5 & 6). Vehicle Maintenance Department should redesign and construct a permanent structure to allow safe walkways/platforms for employees to safely enter and exit light rail vehicles while on the shop tracks (Checklist No. 1). Risk Management Department should provide annual hazardous material handling training to maintenance workers (Checklist No. 20) and should take appropriate corrective actions to eliminate causes of the unacceptable excuses from random drug testing (Checklist No. 24).

The introduction of this report is stated in Section 2. The background, Section 3, contains VTA rail system description and 2001 audit results. Sections 4 and 5 respectively depict 2004 audit procedure, and findings and recommendations. The Acronyms are listed in Appendix A. VTA 2004 Triennial Safety Audit Checklist Index, Recommendations List, and the Checklists are respectively included in Appendices B, C, and D.

2. INTRODUCTION

The Commission's GO 164-C, Rules and Regulations Governing State Safety Oversight of Rail Fixed Guideway Systems, and the Federal Transit Administration's (FTA) Final Rule, 49 CFR Part 659 require the staff to perform triennial, on-site, safety audits of each transit agency. The purpose of these audits is to verify compliance with, and evaluate the effectiveness of, each rail transit agency's SSPP. VTA was last audited in October 2001.

On August 17, 2004, staff sent a letter to VTA General Manager (GM), advising him that the system inspection portion of the triennial audit would be scheduled on September 20th, 21st, 22nd, and October 5 and the second part of the third on site triennial safety audit would be scheduled for the week of October 25. This letter included four checklists for light rail vehicle, track and switch, gated grade crossing warning devices, and traction power inspections. On September 16, 2004, staff sent a second letter confirming the audit dates for the second part and enclosed 22 checklists that would serve as the basis for the audit.

The Railroad Operation and Safety and Rail Transit Safety sections of the Commission's Consumer Protection and Safety Division conducted the VTA light rail vehicle, track and switch, gated grade crossing warning devices, and traction power inspections on September 20th, 21st, 22nd, and October 5. Staff conducted the third triennial, on-site, safety audit of VTA from October 25 to October 28, 2004. The on-site audit was preceded by a pre-audit conference with VTA personnel including Chief Financial Officer, various Managers and Superintendents, on Monday, October 25, 2004. A post-audit conference, also attended by VTA personnel including Chief Operating Officer, Chief Financial Officer, various Managers, and Superintendents, was held on Monday November 8, 2004. At the post-audit conference, staff provided VTA representatives a verbal synopsis of the preliminary findings and recommendations from the 26 checklists. Staff explained that a preliminary draft audit report would be prepared for VTA review and comments.

3. BACKGROUND

VTA is both a transit provider and a multi-modal transportation development organization of Santa Clara County. The governing Board of Directors has seventeen members and two ex-officio members, all of whom are elected officials appointed to serve on the Board by the jurisdictions they represent. Fourteen Directors are city council members and three are County Supervisors. Twelve Directors serve as voting members and five Directors serve as alternates. The ex-officio members are non-voting members and are Santa Clara County's representatives to the Metropolitan Transportation Commission (MTC).

VTA Rail System Description

VTA rail system consists of the Guadalupe, Tasman West, Tasman East, and Capitol Lines with the Vasona Line under construction and two other proposed extensions. The total operating system is about 37 miles with 54 Light Rail Stations. The average ridership of the system is approximately 17,000 per day in the year 2004.

Guadalupe Line

The 21-mile Guadalupe light rail line, in service since 1991, extends from south San Jose, into downtown and continues to employment centers of north San Jose and Santa Clara. The Downtown Center Plaza in San Jose serves as hub for rail/bus connections. It also links light rail and Caltrain service at Tamien Station in San Jose. It has 28 light rail stations.

Tasman West Line

The 7.6-mile Tasman West light rail line, in service since 1999, travels through four cities: San Jose, Santa Clara, Sunnyvale, and Mountain View serving major employment centers of Silicon Valley. It links with Caltrain in Downtown Mountain View. It has 16 light rail stations.

Tasman East Line

The Tasman East light rail line is a 4.8-mile extension from North First Street to Hostetter Road. The first phase, a 1.9-mile extension from North First Street to I-880 along the median of Tasman Drive opened for revenue service in May 2001 and marked the first arrival of VTA light rail vehicles in the City of Milpitas. The second phase, a 2.9-mile segment from I-880 to Hostetter Road along the Capitol Avenue median opened for revenue service in June 2004. Approximately 7,200 feet of this segment is grade separated over two railroad crossings, Montague Expressway, and other cross streets. This line has 6 light rail stations.

Capitol Line

The Capitol light rail line, a 3.5-mile extension of the Tasman light rail line opened for revenue service in June 2004. It travels along Capitol Avenue from just south of Hostetter Road to Alum Rock Avenue, north of Capitol Expressway and operates in the median of Capitol Avenue, with two vehicle travel lanes and a bike lane in each direction paralleling the track way. It has 4 light rail stations.

Vasona Line Extension Project

The Vasona Light Rail Project will be a two-phase 6.8-mile light rail extension to the existing VTA Light Rail system. Phase I will be a 5.3-mile segment, with 8 light rail stations, from downtown San

Jose to Winchester Station in Campbell, and Phase II will be a 1.5-mile segment, with 3 light rail stations, from Winchester in Campbell to Vasona Junction in Los Gatos. The Vasona Light Rail will operate primarily on the existing Union Pacific Railroad right-of-way between the San Jose Diridon Station and Vasona Junction, with the segment between the San Fernando and San Jose Diridon Stations operating within a tunnel alignment. This 850 feet tunnel will start at Autumn Street and pass under San Jose Diridon Station.. The San Jose Diridon Station will offer connections to Caltrain, Amtrak and the Altamont Commute Express (ACE) and direct access to the Compaq Center at San Jose. The revenue service for Phase I (between Downtown San Jose and Winchester in Campbell) is anticipated to begin in early 2006. The schedule for Phase II is dependent upon available funding.

Downtown East Valley Project

Current plans call for a 4.3-mile line extension from existing Alum Rock Station to Eastridge mall. The alignment will be at grade as well as grade separated. The project is in the preliminary engineering stage. Presently, there is no budget for final engineering and construction.

BART Extension to South Bay Project

Current plans call for a 16.3-mile extension of the BART system. It will begin at the planned Warm Springs BART Station in Fremont, extend along the Union Pacific Railroad line to Milpitas and then continue to 28th and Santa Clara Streets in San Jose. From there, BART will leave the railroad right-of-way, turning under Downtown San Jose to the Diridon Caltrain Station. The BART extension will then turn north under the Caltrain line and terminate at the Santa Clara Station. The project is in the preliminary engineering stage. The final engineering and construction is dependent upon securing the required funding.

2001 Audit

Staff performed VTA's second triennial on-site safety audit in October 2001. Twenty five checklists served as the basis for the audit. The audit resulted in 13 recommendations. Resolution ST-55 ordered VTA to develop an appropriate corrective action plan and implementation schedule to carry out these recommendations and to keep the staff advised of VTA's progress through quarterly status reports. VTA developed a corrective action plan to implement the recommendations. Twelve of the 13 recommendations were closed. The remaining open recommendation states, "Develop and implement a plan to correct the violations of GO 95, Rule 74.4-F, Overhead Trolley Contact Conductors". VTA is currently in the process of implementing this recommendation. The Catenary termination points are reinforced with "Philistrand" installation on the entire Guadalupe Line and parts of the Tasman West Line. VTA goal is to complete the "Philistrand" installation on the entire VTA system by the end of the year 2004. When VTA completes the "Philistrand" installation, they will be the first transit agency in California that would meet the GO 95 Rule 74.4F requirements at the dynamic weight tensioning OCS terminations.

4. AUDIT PROCEDURE

Staff conducted the audit in accordance with Rail Transit Safety Section Procedure RTSS-4, Procedure for Performing Triennial Safety Audits of Rail Transit Systems. Staff developed 26 checklists to evaluate the various departments with system safety responsibilities, using FTA and American Public Transit Association guidelines and the staff's knowledge of the transit system. The list of these 26 checklists is included in Appendix B.

Each checklist identifies the safety-related elements and characteristics that staff audited, VTA reference documents that established the acceptance requirements, and the method that staff used for evaluating compliance with the requirements. The methods used included:

- discussions with VTA 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

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

5. FINDINGS AND RECOMMENDATIONS

Staff audited 9 VTA departments with 26 checklists. Generally, the audit found that VTA has a comprehensive SSPP and is effective in carrying out that plan. The results indicate that VTA made significant progress between 2001 and 2004 audit in the areas of Vehicle Maintenance, Accident Investigation, Configuration Management, and Records Management. However, it also identifies areas where additional improvements should be made to further improve VTA safety program. Staff recorded the audit findings for each element/characteristic under the Results/Comments heading on each of the 26 checklists. Appendices B, C, and D depict the VTA 2004 Triennial Audit Checklist Index, Recommendation List, and Checklists respectively.

Following is a brief explanation of the responsibilities of each department, staff audit findings, comments, and recommendations for that department. There are 22 recommendations that are distributed among the Way, Power & Signal, Risk Management, Rail Operations, Vehicle Maintenance, Rail Design & Construction, and Quality Assurance departments. Staff did not make any recommendations for the senior management, Protective Services, and Records Management departments.

1. Senior Management

(Checklist No. 26)

The VTA General Manager (GM) has the overall management responsibility for all of the VTA departments, including the authority and responsibility for System Safety. The GM provides overall direction for the transit system, but relies on the Chief Operating Officer (COO) and other senior managers for the day-to-day implementation of the safety program.

Findings – Conforming Conditions:

1. The GM receives monthly and quarterly reports on statistics and trends relating to safety and security. He is also on the VTA emergency call-out list and as such, receives immediate notifications of serious accidents and other major incidents, such as, LRV fire, terrorism, disaster, major power outage, evacuation, etc.
2. The GM receives reports that track the implementation of corrective actions. The COO and other senior managers are responsible for implementing corrective actions in their respective areas.
3. The COO is very involved in oversight of accident investigations. He reviews accident investigation reports and tracking reports on corrective actions. An Accident Review Committee analyzes accident information. Major accidents are reviewed by the Serious Accident Committee, which addresses prevention and liability issues.

Findings – Non-Conforming Conditions:

None

Recommendations:

None

2. Protective Services Department

(Checklist No. 19)

The Protective Services Department is responsible for the security of the light rail agency. It gathers and reviews transit crime reports and identifies security breach causes to recommend additions or changes to policies & procedures.

Findings - Conforming Conditions:

1. VTA has a Security Awareness Program with training modules and has implemented the security awareness training to all employees.
2. The Security Threat Response Procedure identifies the contingency plans for bomb threats and the Emergency Response Procedures deal with issues such as communication, passenger evacuation, etc. during emergency situations.
3. Security measures are implemented when requested by the Federal Transportation Administration in response to the declared security alerts.
4. Security Breach Review Committee Meetings are held every quarter to identify security breach causes, and to propose and recommend additions or changes to policies and procedures in order to prevent or minimize further security breaches of similar nature.

Findings – Non-Conforming Conditions:

None

Recommendations:

None

3. Records Management Department

(Checklist No. 17)

The Records Management Department maintains all construction-related documents, document control, and reproduction at VTA.

Findings - Conforming Conditions:

1. VTA has developed a Light Rail Configuration Management Procedure.
2. Records Management maintains copies of RSSRB Meeting minutes, which reflect approved modifications to the rail system, as was required by the CPUC as a result of the previous triennial audit. The records showed that safety critical changes were presented to RSSRB for review and approval.
3. Changes to the rail system undergo the proper configuration management process.

Findings – Non-Conforming Conditions:

None

Recommendations:

None

4. Vehicle Maintenance Department

(Checklist Nos. 1 and 10)

The Vehicle Maintenance Department is responsible for the regular inspection and repair of the light rail vehicles. It utilizes various inspections procedures and maintenance procedures to ensure system safety and quality assurance.

Findings - Conforming Conditions:

1. All vehicles inspected were in compliance with VTA maintenance standards and the records reviewed were found to be in compliance with the applicable reference criteria. (Checklist No. 1)
2. The records reviewed showed that the daily inspection, the minor inspections (performed every 10,000 miles), and the major inspections (performed every 30,000 miles) were performed at the required maintenance interval. Noted defects were documented, assigned a work order numbers, and closed out in a timely manner. No exceptions were noted. (Checklist No. 10)

Findings – Non-Conforming Conditions:

1. The existing walkways / platforms in the vehicle maintenance facilities are designed for the old UTDC cars. The new KI car doors do not line up properly creating a potential unsafe condition for accessing the cars. Also, Employees presently use various heights of step ladder to enter and exit LRV while on shop tracks creating an unsafe condition. (Checklist No. 1)

Recommendations:

1. VTA should redesign and construct a permanent structure to allow safe walkways / platforms for employees to safely enter and exit vehicles while on shop tracks. (Checklist No. 1)

5. Way, Power and Signal Department

(Checklist Nos. 2, 3, 4, 5, 6, 7, 8, 9, and 13)

The Way, Power and Signal Department is responsible for the maintenance of track, traction power, train protection, train control, wayside signaling, train stations, and right-of-way.

Findings - Conforming Conditions:

1. All track and track components inspected were in compliance with the (FRA) Track Safety Standards and the VTA inspection and maintenance of turnout and diamond crossings procedures. (Checklist No. 2)
2. All TPSS inspected were properly anchored to the concrete slabs, properly locked to prevent intrusion, and had inspection logs in place. (Checklist No. 4)

3. The dynamic weight tensioning Catenary terminations were retrofitted with "Philistrand." VTA stated that the Catenary termination points were reinforced with "Philistrand" installation on the entire Guadalupe Line and parts of the Tasman West Line and the goal was to complete the "Philistrand" installation on the entire system by the end of year 2004. When VTA completes the "Philistrand" installation, they will be the first transit agency in California that would meet the GO 95 Rule 74.4F requirements at the dynamic weight tensioning OCS terminations. (Checklist No. 4)
4. From 2002 to 2004, Annual PM Inspections were conducted and the records were filed for the selected five TPSS (#1, #5, #11, #18, and #21). (Checklist No. 6)
5. VTA performs weekly PM inspections for the switches even though the procedural requirement is a monthly PM inspection. (Checklist No. 9)
6. All vital relays shown on the inspection list were inspected and documented as required. (Checklist No. 9)
7. The current maintenance procedure was updated to show the gated grade crossing equipment inspection intervals of monthly, quarterly and annual. This was done as a corrective action in response to the recommendation of 2001 triennial audit. (Checklist No. 13)
8. The monthly and semi-annual inspections for records dated January 2001 – September 2002 were performed at the required maintenance interval. Noted defects were documented and closed out in a timely manner. No exceptions were noted. (Checklist No. 13)
9. The monthly, quarterly, and annual inspections for records dated October 2002 – September 2004 were performed at the required maintenance interval. Noted defects were documented and closed out in a timely manner. No exceptions were noted. (Checklist No. 13)

Findings Non-Conforming Conditions:

1. Out of six gated grade crossings that were inspected, one crossing had low (~8 Volts) standby light voltage. (Checklist No. 3)
2. At various locations, tree branches and/or foliages were either touching or within 18 inches from the energized Messenger Wires. This condition is a violation of GO 95 Table 1 of Rule 37, Case 13 – Column 3, and Rule 35. (Checklist No. 4, 8)
3. Along the entire Almaden Spur track, Guys Guards were not installed at the Down Guy anchor points. This condition is in violation of GO 95 Rule 56.9. (Checklist No. 4)
4. Conditions such as a "running contact wire" not suspended by a "dropper" from a messenger wire, the mid sections of the Mid-point Anchors not properly insulated, and both Messenger and Contract wires directly connected to the OCS pole were found which would cause the energized portion of the OCS wires to fall within 10 feet from the ground. These conditions are in violation of GO 95 Rule 74.4F. (Checklist No. 4)
5. The auditor found that several Monthly and Annual PM inspection records were missing in files. (Checklist No. 5)
6. The auditor was unable to track resolutions of the work orders that were generated by the PM inspectors during their PM Inspections. (Checklist Nos. 5, 6)

7. The auditor found that the OCS clearance requirements were not quantified in the procedures. (Checklist No. 5)
8. The records for Biannual Insulating Stick Testing were not available for review. (Checklist No. 5)
9. The auditor found that several Quarterly and Semiannual PM inspection records for the selected five TPSS were missing. The auditor also noticed that if the Quarterly, Semiannual and Annual inspections were held on the same date, the VTA used the same work order numbers for all three inspections. This created missing data in the database for the Quarterly and Semiannual inspections as all inspections were stored under Annual PM Inspection. (Checklist No. 6)
10. VTA did not have any records of WPS Internal Audit being performed in accordance with the requirement of MTN-PR-6805 procedures. (Checklist No. 7)
11. VTA does not have a concrete inspection program in place, but is developing one. During the audit, VTA stated that draft specifications are currently going through the internal review process. (Checklist No. 8)
12. During the ROW Maintenance Inspection, the auditor noticed that tree branches were blocking the view of Variable Message Board on many station platforms throughout the Guadalupe Line. (Checklist No. 8)
13. During the ROW Maintenance Inspection, the auditor noticed that at various locations, tree/shrubbery branches were growing toward the ROW through fences and encroaching ballast area. This condition is in violation of VTA's ROW Procedure (MTN-PR-6404) Section 4.6. (Checklist No. 8)
14. The auditor found that, for three defects selected during the audit, work orders showing corrective actions had occurred were not available. (Checklist No. 9)
15. Vital Relays inspection for the year 2003 was scheduled for November. However, the actual inspection was started on 04/04/4 and was completed on 09/06/04. (Checklist No. 9)
16. The vital relays inspection reports show voltage and amperage readings captured however, no acceptable criteria (for comparison) was identified on the inspection records. A review of voltage and amperage readings showed variations when comparing the Year 2001 and 2003 inspection results. In general, variances of readings for pick-up voltage and drop-away voltage were from a minimal of 3.7% - 20%, however, some vital relays showed a significantly higher variation. (Checklist No. 9)

Comments:

1. While performing the track inspection, it was noted that, on two occasions (Tasman and Rio Robles and Tasman and Fairoaks), the train operators did not acknowledge "proceed hand signal" by sounding the horns as required by the Rulebook. (Checklist No. 2)
2. VTA Operations Manager immediately addressed the standby light voltage issue found during the gated grade crossing inspection. (Checklist No. 3)
3. The VTA's decision and effort to bring the dynamic weight tensioning system into compliance with GO 95 Rule 74.4F is commendable as this has been a long standing issue between the Commission and the transit agencies in California. (Checklist No. 4)

4. VTA's Overhead Contact System Preventive Maintenance Inspection procedures should refer to the GO-95 for the clearance requirements. (Checklist No. 5)
5. VTA should refer to AREMA (or equivalent) as a guideline to follow in the contract specifications and maintenance plans for inspecting bridges and tunnels. (Checklist No. 8)

Recommendations:

2. VTA should trim the vegetation along the OCS section between Pole # B1242 and B1248 and should inspect the entire system and provide necessary measures to ensure that vegetation clearances are maintained in accordance with the requirements of GO 95 Table 1 of Rule 37, Case 13 – Column 3, and Rule 35. (Checklist Nos. 4, 8)
3. VTA should install Guy Guards at down guy anchor points on entire Almaden Spur track and should inspect the entire system and provide necessary measures to ensure that Guys Guards are installed at the Down Guy anchor points to meet the requirements of GO 95 Rule 56.9. (Checklist No. 4)
4. VTA should install a "dropper" on the Catenary located at the North Bound track in the middle of Ohlone/Chynoweth Station and should inspect the entire system and provide necessary measures to ensure that the "running contact wire" is appropriately suspended by a "dropper" from a messenger wire which would prevent the contact wire to drop below 10 feet from the ground when a rod insulator holding the contact wire breaks to meet the requirements of GO 95 Rule 74.4F. (Checklist No. 4)
5. VTA should review the design and installation of the mid-point anchors on the entire system and provide necessary measures to comply with the GO 95 Rule 74.4F requirements. (Checklist No. 4)
6. VTA should ensure that the OCS terminations on the entire system are in compliance with GO 95 Rule 74.4F requirements. (Checklist No. 4)
7. VTA should devise a tracking method in the PM Inspection records that can verify the timely closure of the work orders generated by PM inspectors during the inspection. (Checklist Nos. 5, 6).
8. VTA should conduct the Insulating Stick Testing biannually as specified in MTN-PR-6150, and keep the records in a location that is readily accessible. (Checklist No. 5)
9. VTA should ensure that all the PM Inspections are conducted and properly documented. (Checklist Nos.5, 6).
10. VTA should conduct the annual Internal Audit and document the results according to MTN-PR-6805 procedures. (Checklist No. 7)
11. VTA should trim the vegetation blocking the view of the Variable Message Boards on station platforms. (Checklist No. 8)
12. VTA should inspect and ensure all fences along the Right-Of-Way are properly maintained. (Checklist No. 8)
13. VTA should trim the vegetation along the Right-Of-Way fences and should provide necessary measures to ensure that the Right-Of-Way is maintained clear of vegetation in accordance with the requirements of MTN-PR-6404. (Checklist No. 8)

14. VTA should revise procedures to include means of tracking the defects identified by inspections and documenting the corrective actions when defects have been corrected. (Checklist No. 9)
15. VTA should ensure that vital relay inspections are performed at required frequency interval. (Checklist No. 9)
16. VTA should identify the acceptable limits for voltage and amperage readings for vital relay inspections records. (Checklist No. 9)

6. Risk Management Department

(Checklist Nos. 11, 14, 15, 20, 24)

The Risk Management Department is responsible for the internal safety audit program, accident / incident reporting and investigations, employee and contractor safety program, and hazardous materials management at VTA. It is also responsible for employee safety screening and administering the Drug & Alcohol policies at VTA.

Findings - Conforming Conditions:

1. The Employee Safety Program is described in the Occupational Injury and Illness Prevention Program (IIPP) dated April 2004. It complies with the Federal, State and Local regulatory requirements. (Checklist No.11, 20).
2. Risk Management has prepared an Employee Safety Training Program manual dated February 28, 2001 that identifies the topics of discussion for Tailgate/Safety Talks. The tailgate sign-in sheet identified all employees by department and signatures of employees by their names indicated attendance of safety topics. No exceptions were noted. (Checklist No. 11)
3. Environmental Hazards & Safety (EH&S): review reports were properly documented with supporting attachments that indicated how the hazard was resolved. No exceptions were noted. (Checklist No. 11)
4. VTA has developed a Roadway Worker Protection (RWP) Program. No exceptions were noted. (Checklist No. 11)
5. VTA has a comprehensive Contractor Safety Program. No exceptions were noted. (Checklist No. 11)
6. VTA has an Internal Safety Audit Program in place and the implementation of this program is in compliance with GO 164-C requirements for internal safety audits. No exceptions were noted. (Checklist No. 14)
7. VTA has a Light Rail Accident Investigation/Reporting program in place and the implementation of this program is in compliance with GO 164-C requirements for accident investigation and reporting. The auditor noticed that the accident investigation report for North 1st Street and Charcott accident was submitted with no attachments to the CPUC staff. (Checklist No. 15)
8. Records show that all facility workers are trained annually on how to handle hazardous materials. (Checklist No. 20)
9. VTA provides confined space awareness training to all employees who work in confined spaces and CPR/first aid training to standby personnel required to be present during the confined space entry.

VTA also provides confined space entry training to all maintenance employees required to enter, work in, or serve as rescuers for confined spaces, and their supervisors. (Checklist No. 20)

10. VTA maintains appropriate records for confined space entry in accordance with the requirements of PRS-RM-1801 procedure. (Checklist No. 20)
11. The auditor found that the VTA Drug and Alcohol Policy is in compliance with State and Federal regulations and the policy is effectively implemented with one exception. (Checklist No. 24)

Findings – Non-Conforming Conditions:

1. Maintenance workers who handle hazardous materials have not taken a training course. VTA has a plan to train the maintenance workers by the end of 2004. (Checklist No. 20)
2. The auditor found that rail program safety sensitive employees were excused from random testing for unacceptable reasons as follows: (a) 15 times out of 50 (30%) excused in 2001; (b) 16 times out of 54 (30%) excused in 2002; and (c) 19 times out of 38 (50%) excused in 2003. (Checklist No. 24)

Comment:

1. VTA should develop a proactive formal process by which all the departments involved in accident/incident reporting and investigation as well as Hazard Identification/Resolution Process can perform trend analysis of data derived from reportable, immediately reportable, and unacceptable hazardous conditions (including near misses) database on a system wide basis. Appropriate recommendations should be developed and completed to mitigate the safety concerns identified as a result of such system wide trend analyses. (Checklist No. 15)

Recommendations:

17. VTA should provide annual hazardous material handling training to maintenance workers who handle hazardous materials. (Checklist No. 20)
18. VTA should take the steps necessary to identify the causes of the unacceptable excuses from random testing and take corrective actions to ensure that they are eliminated. (Checklist No. 24).

7. <u>Quality Assurance Department</u>

(Checklist No. 12)

The Quality Assurance department ensures that system components are per the safety standards and within allowable tolerances to safely operate the light rail system.

Findings – Conforming Conditions

1. Precision Measuring Equipment (PME) selected from the Way, Power and Signal Department and the LRV Department showed the current calibration status. No exceptions were noted.
2. Review of calibration certificates showed that each PME had been calibrated at the required frequency interval. No exceptions were noted.

Findings Non-Conforming Conditions

1. The monthly PME Calibration Random Monitor reports for October 2003 – December 2003, Annual Calibration Program Audit for Year 2003, and monthly PME Calibration Random Monitor reports for January 2004 – October 2004 could not be found.

Recommendations:

19. VTA should ensure that the monthly PME Calibration Random Monitor Reports and the Annual Calibration Program Audit are performed at the required frequency interval and appropriately documented. (Checklist No. 12)

8. Rail Design & Construction Department

(Checklist No. 16)

Rail Design & Construction Department is responsible for capital projects such as line extensions and major modifications to the existing system. It is also responsible for implementing the Safety Certification Plan.

Findings – Conforming Conditions

1. VTA formally certifies all capital projects such as light rail extensions and system modifications in accordance with a written plan entitled VTA Light Rail Safety Certification Plan dated September 2000. VTA identifies various safety certifiable elements on the basis of a safety criteria dated August 2000.
2. For modifications not meeting the capital projects threshold, VTA employs a less rigorous process called Safety Review which involves the identification of the safety critical elements, hazard analysis to identify a risk index, safety audits, integrated testing, training as well as rules and procedures. VTA documents all these activities in a safety review report.
3. All safety certification activities were performed in accordance with the reference criteria and properly documented. All safety certification documents were reviewed and approved by the RSSRB.

Findings Non Conforming Conditions:

1. VTA has not updated its System Safety Program Plan (SSPP) and Light Rail Safety Certification Plan to incorporate the safety certification requirements of GO 164-C.

Recommendations:

20. VTA should update its SSPP, Safety Certification Plan, and other affected safety certification documents to incorporate the safety certification requirements of General Order (GO) 164-C. (Checklist No. 16)

9. Rail Operations Department

(Checklist Nos. 18, 21, 22, 23, 25)

Rail Operations Department oversees all aspects of safely operating current light rail system, supports operational training of rail employees, and ensures compliance with all operations procedures.

Findings – Conforming Conditions

1. All updated governing documents including Operational Notices and Memorandums are distributed to the employees. Memos and notices are posted for 30 days and 90 days respectively (older ones are kept in binders for future reference), by the transportation superintendent. (Checklist No. 18)
2. Ride Check Reports are conducted 3 times per year at a minimum and the observation reports are sent to the Operations Department. (Checklist No. 18)
3. Emergency drills that included tabletop and practical exercises were planned and carried out with the participation of the appropriate external agencies (local, state, and federal agencies). All drills were evaluated and critiqued in a timely manner and recommendations were recorded. (Checklist No. 21)
4. VTA has a Fire Life Safety Kinkisharyo (KI) Light Rail Vehicle Emergency Responder Training program. All city emergency responders that VTA serves are trained on familiarity of the KI car in accordance with this program. (Checklist No. 21)
5. The auditor reviewed the training and re-certification records of various classification employees and found that retraining as well as refresher training is conducted and the records are maintained in accordance with the reference criteria. (Checklist No. 22, 23)
6. The VTA Roadway Worker Protection Program (RWP) and Restricted Area Access program for contractors and VTA employees training are well developed. No exceptions were noted. (Checklist No. 23)
7. The auditor interviewed four train operators and discussed their knowledge and understanding of operating rules and procedures and found that each train operator, with one exception, was at least reasonably familiar with the rules and procedures discussed. The remaining train operator proved to be reasonably familiar with rules and procedures when he was prompted. (Checklist No. 25)
8. The auditor observed, from the cab, the operation of various trains and found train operators alert, responsive, and in compliance with Train Orders, Special Instructions, as well as Light Rail Operations Rules and Procedures. (Checklist No. 25)
9. The auditor reviewed records involving the VTA program of operations evaluations and found that it was on track to complete the minimum three Ride Checks per year established in its program. (Checklist No. 25)

Findings Non Conforming Conditions:

1. VTA Transportation Light Rail Fire/Life Safety Program (FLSP), dated 8/14/2002, indicates that the program goal is to stage a minimum of four exercises per year (two tabletop drills, and two live exercises). However, VTA staged one tabletop drill and one live exercise in 2003 and 2004. (Checklist No. 21)

2. The auditor did not find any documentation about tracking the specific VTA recommendations to completion. (Checklist No. 21)
3. FLSP does not include a plan regarding tracking the tabletop drill or live exercise recommendations to completion. Also, the FLSP emergency drill planning does not require both accidental emergency events and security related emergency events. (Checklist No. 21)

Recommendations:

21. VTA should either stage minimum of four exercises per year as indicated in FLSP consisting of two tabletop drills and two live exercises or revise the FLSP to reflect one table top drill and one live exercise performed per year. (Checklist No. 21).
22. VTA should revise the FLSP to clarify that the tabletop drill and live exercise recommendations are tracked to completion. Also VTA should ensure that the FLSP emergency planning includes both accidental and security related emergency events. (Checklist No. 21)

APPENDICES

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Appendix A

Acronyms List

ACRONYM	MEANING
APTA	American Public Transportation Association
AREMA	American Railway Engineering Association Manual
CFR	Code of Federal Regulations
COO	Chief Operating Officer
CPUC	California Public Utilities Commission
CSP	Contractor Safety Program
DCN	Design Change Notice
EH&S	Environmental Hazards & Safety
EIC	Employee In Charge
ESP	Employee Safety Program
FLSP	Fire/Life Safety Program
FRA	Federal Railroad Administration
FTA	Federal Transportation Administration
GIS	Geographic Information System
GO	General Order
IIPP	Injury and Illness Prevention Program
ISA	Internal Safety Audit
KI	Kinkisharyo
LRV	Light Rail Vehicle
MP	Mile Post
OCC	Operation Control Center
OCS	Overhead Catenary System
PPE	Personal Protective Equipment
PM	Preventative Maintenance
PME	Precision Measuring Equipment
QA	Quality Assurance
ROW	Right Of Way
RPD	Rules and Procedures Development
RSSRB	Rail System Safety Review Board
RTSS	Rail Transit Safety Section
RWP	Road Worker Protection
SAP	Substance Abuse Professional
VTA	Santa Clara Valley Transportation Authority
SOP	Standard Operating Procedure
SSPP	System Safety Program Plan
TPSS	Traction Power Sub Station
WPS	Way Power & Signals

Appendix B

VTA 2004 TRIENNIAL SAFETY AUDIT CHECKLIST INDEX

Check List No	Element/Characteristics	Check List No	Element/Characteristics
1	Light Rail Vehicle Inspection	14	Internal Safety Audit (ISA) Program
2	Track and Switch Inspections	15	Accident/Incident Reporting & Investigation
3	Gated Grade Crossings Warning Devices	16	Safety Certification
4	Traction Power Inspection	17	Configuration Management
5	Overhead Catenary System Inspections and Records	18	Rules and Procedures Review
6	Sub Station Inspections and Records	19	Light Rail Security
7	Way Power and Signal Internal Audit Program	20	Hazardous Materials Programs / Environmental Management
8	Right-Of-Way Maintenance (Fence, Vegetation and Concrete) and Facility Inspections	21	Emergency Response Planning, Coordination, Training
9	Track Components, Signals and Vital Relays Inspections, Maintenance and Records	22	Light Rail Training and Certification
10	LRV Maintenance, Inspections and Records	23	Restricted Area Access Control
11	Employee and Contractors Safety Program	24	Drug & Alcohol Policy
12	Calibration Program	25	Train Operator Performance
13	Gated Grade Crossings	26	Authority and Responsibility for the System Safety Program

Appendix C

VTA 2004 TRIENNIAL SAFETY AUDIT RECOMMENDATIONS LIST

No.	Recommendations	Checklist No.
1	VTA should redesign and construct a permanent structure to allow safe walkways / platforms for employees to safely enter and exit vehicles while on shop tracks.	1
2	VTA should trim the vegetation along the OCS section between Pole # B1242 and B1248 and should inspect the entire system and provide necessary measures to ensure that vegetation clearances are maintained in accordance with the requirements of GO 95 Table 1 of Rule 37, Case 13 – Column 3, and Rule 35.	4 & 8
3	VTA should install Guy Guards at down guy anchor points on entire Almaden Spur track and should inspect the entire system and provide necessary measures to ensure that Guys Guards are installed at the Down Guy anchor points to meet the requirements of GO 95 Rule 56.9.	4
4	VTA should install a “dropper” on the Catenary located at the North Bound track in the middle of Ohlone/Chynoweth Station and should inspect the entire system and provide necessary measures to ensure that the “running contact wire” is appropriately suspended by a “dropper” from a messenger wire which would prevent the contact wire to drop below 10 feet from the ground when a rod insulator holding the contact wire breaks to meet the requirements of GO 95 Rule 74.4F.	4
5	VTA should review the design and installation of the mid-point anchors on the entire system and provide necessary measures to comply with the GO 95 Rule 74.4F requirements.	4
6	VTA should ensure that the OCS terminations on the entire system are in compliance with GO 95 Rule 74.4F requirements.	4
7	VTA should devise a tracking method in the PM Inspection records that can verify the timely closure of the work orders generated by PM inspectors during the inspection.	5 & 6
8	VTA should conduct the Insulating Stick Testing biannually as specified in MTN-PR-6150, and keep the records in a location that is readily accessible.	5
9	VTA should ensure that all the PM Inspections are conducted and properly documented.	5 & 6
10	VTA should conduct the annual Internal Audit and document the results according to MTN-PR-6805.	7
11	VTA should trim the vegetation blocking the view of the Variable Message Boards on station platforms.	8

No.	Recommendations	Checklist No.
12	VTA should inspect and ensure all fences along the Right-Of-Way are properly maintained.	8
13	VTA should trim the vegetation along the Right-Of-Way fences and should provide necessary measures to ensure that the Right-Of-Way is maintained clear of vegetation in accordance with the requirements of MTN-PR-6404.	8
14	VTA should revise procedures to include means of tracking the defects identified by inspections and documenting the corrective actions when defects have been corrected.	9
15	VTA should ensure that vital relay inspections are performed at required frequency interval.	9
16	VTA should identify the acceptable limits for voltage and amperage readings for vital relay inspections records.	9
17	VTA should provide annual hazardous material handling training to maintenance workers who handle hazardous materials.	20
18	VTA should take the steps necessary to identify the causes of the unacceptable excuses from random testing and take corrective actions to ensure that they are eliminated.	24
19	VTA should ensure that the monthly PME Calibration Random Monitor Reports and the Annual Calibration Program Audit are performed at the required frequency interval and appropriately documented.	12
20	VTA should update its SSPP, Safety Certification Plan, and other affected safety certification documents to incorporate the safety certification requirements of General Order (GO) 164-C.	16
21	VTA should either stage minimum of four exercises per year as indicated in FLSP consisting of two tabletop drills and two live exercises or revise the FLSP to reflect one table top drill and one live exercise performed per year.	21
22	VTA should revise the FLSP to clarify that the tabletop drill and live exercise recommendations are tracked to completion. Also VTA should ensure that the FLSP emergency planning includes both accidental and security related emergency events.	21

Appendix D

VTA 2004 TRIENNIAL SAFETY AUDIT CHECKLISTS

(1 THROUGH 26)

2004 CPUC SYSTEM SAFETY AUDIT CHECKLIST FOR THE SANTA CLARA VALLEY TRANSPORTATION AUTHORITY		
Checklist No.	**1**	Persons Contacted
Date of Audit	**September 21, 2004**	**Tom Kennedy, Light Rail Equipment Superintendent** **Wayne Suttkus, Light Rail Maintenance Supervisor** **Richard R. Stabler, Vehicle Maintenance Supervisor**
Auditors	**Don Miller** **Mahendra Patel**	
Department	**Vehicle Maintenance**	

REFERENCE CRITERIA

1. CPUC GO 143-B Section 14.04-Light-Rail Vehicle Maintenance Practices and Records
2. Light Rail System Safety Program Plan, March 2002, Version Number 6, Element # 11– Maintenance Audits / Inspection
3. MTN-PR-5150-Light Rail Vehicle Daily Inspection Procedures, Revised 09/24/01
4. MTN-PR-5158-Light Rail Vehicle Maintenance Work Orders, Revised 09/24/01
5. MTN-PR-5120 – LRV Wheel Inspections and Reprofiling, Issued 10/29/03
6. MTN-PR-5156 – Preventive Maintenance (PM) scheduling for Light Rail Vehicles, Issued 08/21/01

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

LIGHT RAIL VEHICLE INSPECTION – CPUC INSPECTOR

Utilizing the services of a CPUC/FRA qualified inspector from the Commission's Railroad Safety Branch:

1. Review and evaluate the adequacy of VTA's Light Rail Vehicle Inspection and Maintenance programs.
2. Randomly select at least three Kinkisharyo (KI) cars and perform detailed inspections to determine if VTA is properly and adequately maintaining:
    a. Traction motors
    b. Truck/wheel components
    c. Brake systems
    d. Doors and pantographs assemblies
    e. Coupling mechanisms
    f. Passenger compartment/safety appliances
    g. Operator cab/appurtenance
3. Based on the review and the inspections, determine whether or not the selected LRVs are in compliance with the applicable reference criteria.

RESULTS/COMMENTS

CPUC employee, Don Miller (FRA certified inspector) inspected Kinkisharyo (KI) Light Rail Vehicle (LRV) Numbers 904, 928 and 971 at the LRV Maintenance Facilities, Guadeloupe Division.

The scope of inspection included:

- Visual checks of passenger compartment, operator compartment, safety appliances, trucks/wheels

components, traction motors, brake system, pantographs, and coupling mechanisms.

- Review of maintenance records including Operator, Inspection Report, A, B and C Preventative Maintenance Report / Work Orders.
- Interviews with and observations of workmen during preventive maintenance inspection / repairs of LRV in shop.
- Comparisons of completed Work Orders against actual repairs on LRVs.
- Review of the maintenance standards used to perform LVR maintenance inspection.

Findings:

- All vehicles inspected were in compliance with VTA maintenance standards.
- Records reviewed were found to be in compliance with the applicable reference criteria.
- The existing walkways / platforms in the vehicle maintenance facilities are designed for the old UTDC cars. The new KI car doors do not line up properly creating a potential unsafe condition for accessing the cars. Also, Employees presently use various heights of step ladder to enter and exit LRV while on shop tracks creating an unsafe condition.

Recommendation:

VTA should redesign and construct a permanent structure to allow safe walkways / platforms for employees to safely enter and exit vehicles while on shop tracks.

2004 CPUC SYSTEM SAFETY AUDIT CHECKLIST FOR THE SANTA CLARA VALLEY TRANSPORTATION AUTHORITY		
Checklist No.	**2**	Persons Contacted
Date of Audit	**09/20/04 (signals)** **09/22/04 (track)**	**Chuck Maples, Acting WPS Superintendent** **Kyle Olson, Track Supervisor**
Auditors	**Bill Mealor (signals)** **Joe Farley (track)** **Mahendra Patel**	
Department	**Way, Power & Signal**	

REFERENCE CRITERIA

1. Code of Federal Regulations CFR 49, Part 213-Track Safety Standards
2. GO 143-B, Section 14.05-Track Maintenance Practices and Records
3. Light Rail System Safety Program Plan, March 2002, Version Number 6, Element # 11– Maintenance Audits / Inspection
4. MTN-PR-6415-Inspection & Maintenance of Turnouts & Diamond Crossings, Issued 09/15/00
5. MTN-PR-6416-Inspection & Maintenance of Rail Crossings, Issued 09/15/00
6. MTN-PR-6405-Track Geometry Standards, Issued 09/15/00

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

TRACK AND SWITCH INSPECTIONS – CPUC INSPECTORS

Utilizing the services of a CPUC/FRA qualified inspectors from the Commission's Railroad Safety Branch:

1. Review and evaluate the adequacy of VTA's track and signal inspection and maintenance programs and standards.
2. Randomly select at least two sections of the mainline track, two Rail crossings and two turnout / diamond crossings on the Guadalupe Line and Tasman Line and perform visual & dimensional inspections / measurements to determine whether or not all track components within the areas selected are in compliance with the applicable reference criteria.
3. Randomly select four switches and inspect for gauge measurements and components and perform an adjustment and functional check of selected switch machines to determine whether or not all selected components are in compliance with the applicable reference criteria.

RESULTS/COMMENTS

On September 20, 2004, CPUC employee, Bill Mealor (FRA certified signal inspector) inspected the following three power switches and two electric lock switches and performed an adjustment and functional check:

- SW130R at Mile post (MP) B12.96
- SW100R at MP B9.82
- SW97R at MP B9.77

- EL238R at MP B10.02
- EL239R at MP B9.98

Findings:

- All selected switches are in compliance with the applicable reference criteria.
- No exceptions noted.

CPUC employee, Joe Farley (FRA certified track inspector) conducted a track inspection on 09/22/04 for compliance with applicable regulations and standards.

The scope of inspection included:

- Tasman & First Street (Tasman Line), inspected two turnouts, and two rail crossings, walked west for a quarter mile, inspected tangent and curve track on both main tracks up to Rio Robles road.
- Fair Oaks & Tasman (Tasman Line), inspected four turnouts, and two crossovers.
- Ohlone & Chynoweth station (Guadalupe Line), inspected two turnouts.
- Woz & San Carlos (Guadalupe Line), inspected two turnouts and one rail crossing.
- First Street & San Carlos (Downtown Mall), inspected one turnout.

Finding:

All track and track components inspected were in compliance with the (FRA) Track Safety Standards and the VTA inspection and maintenance of turnout and diamond crossings procedures.

Comment:

While performing the track inspection, it was noted that, on two occasions (Tasman and Rio Robles and Tasman and Fairoaks), the train operators did not acknowledge “proceed hand signal” by sounding the horns as required by the Rulebook.

Recommendation: None.

2004 CPUC SYSTEM SAFETY AUDIT CHECKLIST FOR THE SANTA CLARA VALLEY TRANSPORTATION AUTHORITY		
Checklist No.	**3**	Persons Contacted
Date of Audit	**September 20, 2004**	**Chuck Maples, Acting WPS Superintendent** **George Ramos, Signal Supervisor**
Auditors	**Bill Mealor** **Mahendra Patel**	
Department	**Way, Power & signal**	

REFERENCE CRITERIA

1. Code of Federal Regulations CFR 49, Part 234-Grade Crossing Signal System Safety
2. Code of Federal Regulations CFR 49, Part 236 – Rules, Standards, & Instructions Governing the Installation, Inspection, Maintenance, and Repair of Signal and Train Control Systems Devices and Appliances
3. Light Rail System Safety Program Plan, March 2002, Version Number 6, Element # 24 – Grade Crossing Safety, and Element # 25-Joint Freight Operations
4. MTN-PR-6205-Grade Crossing Warning System Inspection and Preventive Maintenance, Version Number 02, Issued 10/30/02

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

GATED GRADE CROSSINGS WARNING DEVICES – CPUC INSPECTOR

Utilizing the services of a CPUC/FRA qualified inspector from the Commission's Railroad Safety Branch:

1. Review and evaluate the adequacy of VTA's Crossing Gate Preventive Maintenance programs and standards.
2. Randomly select at least five gated crossings and perform detailed inspections to determine whether or not the selected crossings are in compliance with the applicable reference criteria.

RESULTS/COMMENTS

CPUC employee, Bill Mealor (FRA certified signal inspector) inspected and checked the alignment of the warning lights, reflective striping on the gate arms, and the voltage levels of the warning lights both in normal mode (AC power) and in standby mode (DC battery power) for the following six gated crossings:

- Central Expressway, CPUC # 82B-13.08
- GTE West, CPUC # 82B-12.09
- 101 On Ramp, CPUC # 82B-11.76
- 101 Off Ramp, CPUC # 82B-11.69
- Fairchild, CPUC # 82B-11.8
- 5th Avenue, CPUC # 82B-9.79

Findings:

- No exceptions were noted for crossing 82B-13.08.
- Crossings 82B-11.76, 82B-11.69, 82B-11.8, and 82B-9.79 had the minimum allowed (8.5 volts)

standby light voltage.

- Crossing 82B-12.09 had low (~8 Volts) standby light voltage.

Comment:

VTA Operations Manager decided to give immediate attention to address the above findings disclosed during the briefing at the end of the inspection. VTA rectified the crossing 82B-12.09 by replacing the old incandescent lamp with an LED lamp on 09/20/04. Furthermore, VTA implemented a system wide upgrade of all crossing gate arms, including those mentioned above, from the incandescent lamps to the LED lamps. This system wide upgrade was completed on 09/24/04. Operations Manager also sent a letter dated November 23, 2004 to the CPUC representative describing these corrective actions taken by the VTA. A spreadsheet depicting all gated grade crossing arm lamp voltage values was attached with this letter showing that the minimum lamp voltages are now 9.5 to 11.0 VDC. This letter also stated that VTA has revised its Design Criteria Manual, 2001 Edition, to include the requirements of LED type gate lights and flashing lights.

Recommendation: None

2004 CPUC SYSTEM SAFETY AUDIT CHECKLIST FOR THE SANTA CLARA VALLEY TRANSPORTATION AUTHORITY

Checklist No.	**4**	Persons Contacted
Date of Audit	**October 5, 2004**	**Chuck Maples, Acting WPS Superintendent** **Chuck Justice, Light Rail Power Supervisor** **Belete Bekele, Substation Maintainer** **Steve Marquez, OCS Lineman**
Auditors	**Brian Yu** **Mahendra Patel**	
Department	**Way, Power & Signal**	

REFERENCE CRITERIA

1. CPUC General Order 95-Rules for Overhead Electric Line Construction
2. GO 143-B, Section 10-Traction Power Requirements and Section 14.06-Traction Power System Inspections and Records
3. Light Rail System Safety Program Plan, March 2002, Version Number 6, Element # 11– Maintenance Audits / Inspection
4. MTN-PR-6150-Inspection of Overhead Catenary System, Version Number 01, Issued 05/11/01
5. MTN-PR-6151 – Inspection of Way, Power and Signal Substations, Version Number 01, Issued 04/30/01

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

TRACTION POWER INSPECTION – CPUC INSPECTOR(S)

Utilizing the services of a CPUC qualified General Order 95 inspector(s):

1. Review and evaluate the adequacy of VTA's Overhead Catenary System (OCS) Maintenance programs and standards.
2. Randomly select at least three OCS sections and three Traction Power Sub Stations (TPSS) on the Guadalupe Line and Tasman Line and perform detailed inspections to determine whether or not the selected OCS sections and TPSS are in compliance with the applicable reference criteria.

RESULTS/COMMENTS

Activities and Findings:

We inspected three sections each on Tasman West Line and Guadalupe Line to check if the VTA OCS is in compliance with the clearance and insulation requirements of the Commission General Order (GO) 95. OCS sections inspected for GO 95 compliance were:

Guadalupe Line

- Orchard Station to Bonaventura Station including TPSS No. 3
- St. James Station to Paseo de San Antonio including TPSS No. 6
- Ohlone/Chynoweth to Almaden (Almaden Spur) including TPSS No. 11

Tasman West Line

- Whisman Station to Middlefield Station including TPSS No. 18
- 10 Poles East and 10 Poles West of Fair Oaks Station including TPSS No. 21
- 10 Poles East and 10 Poles West of Great America Station including TPSS No. 22

Overall, the VTA OCS sections inspected were maintained in good shape in terms of GO 95 requirements.

Contact Wire Height Clearance

• 1st and Plumeria Street	North Bound Track	19 feet 5 inches	Acceptable
	South Bound Track	19 feet 4 inches	Acceptable
• San Fernando and 2nd Street	North Bound Track	24 feet 2 inches	Acceptable
• Under I-85 Overpass	South Bound Track	17 feet 2 inches	Acceptable
• Winfield Crossing	South Bound Track	19 feet 6 inches	Acceptable
• Middlefield Crossing	East Bound Track	22 feet 10 inches	Acceptable
• Next to Pole # B807	West Bound Track	20 feet 6 inches	Acceptable

All contact wire heights measured were in compliance with GO 95 Table 1 of Rule 37, Case 2 – Column C, Case 3 – Column C, Case 5 – Column C, and Rule 77.4-E.

Tree Branch Clearance

• Between Pole # B1242 and B1248	West Bound Track	Branches within 18”	Violation

At various locations along this section of OCS, tree branches and/or foliages were either touching or within 18 inches from the energized Messenger Wires. This condition is a violation of GO 95 Table 1 of Rule 37, Case 13 – Column 3, and Rule 35.

Traction Power Substations (TPSS)

• TPSS # 3, 6, and 11	Along Guadalupe Line	Acceptable
• TPSS # 18, 21, and 22	Along Tasman West Line	Acceptable

All TPSS inspected were properly anchored to the concrete slabs, properly locked to prevent intrusion, and had inspection logs in place.

GO 95 Rule 56.9 – Guy Guard (Marker)

• Along the entire Almaden Spur track	Down Guy anchor	Guy Guard missing	Violation

Along the entire Almaden Spur track, Guys Guards were not installed at the Down Guy anchor points. This condition is in violation of GO 95 Rule 56.9.

GO 95 Rule 74.4F – At Points of Failure

• Middle of Ohlone/Chynoweth Station	North Bound Track	“dropper” missing	Violation

At this location, a “running contact wire” was not suspended by a “dropper” from a messenger wire which would cause the contact wire to drop below 10 feet from the ground when a rod insulator holding the contact wire breaks. This condition is in violation of GO 95 Rule 74.4F.

• Between Pole # 6.58A and 6.60A	Mid-point Anchor	Improper Insulation	Violation
• Between Pole # 6.60A and 6.60A-S	Mid-point Anchor	Improper Insulation	Violation
• Both Sides of Pole # 6.1B	Mid-point Anchor	Improper Insulation	Violation

At these locations, the mid sections of the Mid-point Anchors were not properly insulated in that if one of the suspension points of the Mid-point Anchors break, the energized portion of the Mid-point Anchor will fall within 10 feet from the ground. This condition is in violation of GO 95 Rule 74.4F.

• Between Pole # .35LS-S and .37LS-S	Catenary Terminal	Inadequate Support	Violation

At this location, both Messenger and Contract wires were directly connected to the OCS pole. If one point on the connection fails, energized portion of the wires will fall within 10 feet from the ground. This condition is

in violation of GO 95 Rule 74.4F. However, VTA representative informed us that this location is scheduled to be retrofitted with the "Philistrand" application.

- Dynamic Weight Tensioning Catenary Terminations on VTA

During the inspection, we found that the dynamic weight tensioning Catenary terminations were retrofitted with "Philistrand." According to VTA representative, the Catenary termination points were reinforced with "Philistrand" installation on the entire Guadalupe Line and parts of the Tasman West Line. VTA goal is to complete the "Philistrand" installation on the entire VTA system by the end of year 2004. When VTA completes the "Philistrand" installation, they will be the first transit agency in California that would meet the GO 95 Rule 74.4F requirements at the dynamic weight tensioning OCS terminations.

Comment:

The VTA's decision and effort to bring the dynamic weight tensioning system into compliance with GO 95 Rule 74.4F is commendable as this has been a long standing issue between the Commission and the transit agencies in California.

Recommendations:

1. VTA should trim the vegetation along the OCS section between Pole # B1242 and B1248 and should inspect the entire system and provide necessary measures to ensure that vegetation clearances are maintained in accordance with the requirements of GO 95 Table 1 of Rule 37, Case 13 – Column 3, and Rule 35. (See also Recommendation 3 of Checklist # 8).
2. VTA should install Guy Guards at down guy anchor points on entire Almaden Spur track and should inspect the entire system and provide necessary measures to ensure that Guys Guards are installed at the Down Guy anchor points to meet the requirements of GO 95 Rule 56.9.
3. VTA should install a "dropper" on the Catenary located at the North Bound track in the middle of Ohlone/Chynoweth Station and should inspect the entire system and provide necessary measures to ensure that the "running contact wire" is appropriately suspended by a "dropper" from a messenger wire which would prevent the contact wire to drop below 10 feet from the ground when a rod insulator holding the contact wire breaks to meet the requirements of GO 95 Rule 74.4F.
4. VTA should review the design and installation of the mid-point anchors on the entire system and provide necessary measures to comply with the GO 95 Rule 74.4F requirements.
5. VTA should ensure that the OCS terminations on the entire system are in compliance with GO 95 Rule 74.4F requirements.

2004 CPUC SYSTEM SAFETY AUDIT CHECKLIST FOR THE SANTA CLARA VALLEY TRANSPORTATION AUTHORITY

Checklist No.	**5**	Persons Contacted
Date of Audit	**October 10, 2004**	**Chuck Justice – Traction Power Supervisor** **Chuck Maples – WPS Superintendent**
Auditors	**Brian Yu**	
Department	**Way, Power, & Signal**	

REFERENCE CRITERIA

1. GO 143-B, Section 14.06-Traction Power System Inspections and Records
2. Light Rail System Safety Program Plan, March 2002, Version Number 6, Element # 11– Maintenance Audits / Inspection
3. MTN-PR-6150-Inspection of Overhead Catenary System, Version Number 01, Issued 05/11/01
4. Procedure for Rail Safety Internal Audits, Version Number 1, Dated 08/06/2002

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

OVERHEAD CATENARY SYSTEM INSPECTIONS AND RECORDS

Review the records of completed Overhead Catenary System (OCS) inspections prepared during the last four years to determine whether or not:

1. OCS was inspected and adjusted at the required frequencies as specified in the reference criteria
2. Inspections were properly documented
3. Noted defects were corrected in a timely manner

RESULTS/COMMENTS

Activities and Findings:

I reviewed VTA's Way, Power, and Signal Department's (WPS) Preventive Maintenance (PM) Inspection records to verify VTA's conformance to its PM Inspection requirements. I chose three zones out of seven as a sample (Tasman West, Mall, and Lick Spur). Monthly and Annual PM Inspection records from year 2002 to 2004 were reviewed. The Semi-annual PM Inspection only had Station/Parking Lot Lighting inspection elements added to the Monthly inspection. Semi-annual inspection records were not reviewed since the additional inspection elements were not relevant to the OCS maintenance.

OCS PM Inspection Records Review

- Overall, OCS PM Inspections were conducted at the specified intervals.

  Out of 26 segments subjected to Annual PM inspection in 2002, one inspection record was missing in file.

  - Out of 23 segments subjected to Annual PM Inspection in 2003, seven inspection records were missing in file.

  - Out of 23 segments subjected to Annual PM Inspection in 2004 by the time of the Audit, no inspection records were missing in file. Inspections for 2 segments were scheduled to be conducted by the end of year 2004.

- All of year 2002 Monthly PM Inspections were properly documented for the selected zones.

- Seven Monthly Inspection records (out of 36) for the year 2003 were missing in file.

- Most of the Year 2003 missing records were for the months (November/December) when the current Traction Power Supervisor was transitioning into his position.

- During the review of the inspection records, I was unable to track resolutions of the work orders that were generated by the PM inspectors during the PM Inspections. It would be easier to verify the timely closure of the work orders if the PM Inspection report had references to the work orders.
- Some of the missing PM Inspection records were stored in the record database (SAP); however, I found inconsistencies, such as, Monthly record labeled as Semi-annual.
- I chose to review the hard copy records for this audit. SAP was used only as a reference.
- I suggested that VTA should pay more attention to the records keeping.

<u>OCS Maintenance Procedures Review</u>

- During my review of the VTA's OCS Maintenance procedures, I found that the OCS clearance requirements were not quantified in their procedures. However, Traction Power Supervisor stated that they follow the GO 95 requirements. I suggested that VTA's OCS Maintenance procedures should refer to the GO 95 clearance requirements.

<u>Biannual Insulating Stick Testing Records Review</u>

- Traction Power Supervisor recalled that the testing was conducted either in 2003 or 2004; however, the record was not available for review because the record keeper for this testing was on a vacation during the audit period.

<u>Comments</u>:

VTA's Overhead Contact System Preventive Maintenance Inspection procedures should refer to the GO-95 for the clearance requirements.

<u>Recommendations</u>:

1. VTA should devise a tracking method in the PM Inspection records that can verify the timely closure of the work orders generated by PM inspectors during the inspection. (See also Recommendation 1 of Checklist # 6).
2. VTA should conduct the Insulating Stick Testing biannually as specified in MTN-PR-6150, and keep the records in a location that is readily accessible.
3. VTA should ensure that all the PM Inspections are conducted and properly documented. (See also Recommendation 2 of Checklist # 6).

2004 CPUC SYSTEM SAFETY AUDIT CHECKLIST FOR THE SANTA CLARA VALLEY TRANSPORTATION AUTHORITY

Checklist No.	**6**	Persons Contacted
Date of Audit	**October 26, 2004**	**Chuck Justice – Traction Power Supervisor** **Chuck Maples – WPS Superintendent**
Auditors	**Brian Yu**	
Department	**Way, Power, & Signal**	

REFERENCE CRITERIA

1. GO 143-B, Section 14.06-Traction Power System Inspections and Records
2. Light Rail System Safety Program Plan, March 2002, Version Number 6, Element # 11– Maintenance Audits / Inspection
3. MTN-PR-6151 – Inspection of Way, Power and Signal Substations, Version Number 01, Issued 04/30/01
4. Procedure for Rail Safety Internal Audits, Version Number 1, Dated 08/06/2002

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

SUBSTATION INSPECTIONS AND RECORDS

Randomly select at least four substations and review the records of completed substation inspections prepared during the last four years to determine whether or not:

1. Each substation was inspected at the required frequencies as specified in the reference criteria
2. Inspections were properly documented
3. Noted defects were corrected in a timely manner

RESULTS/COMMENTS

Activities and Findings:

I chose five (#1, #5, #11, #18, and #21) Traction Power Substations (TPSS) as samples and reviewed the Annual, Semiannual, and Quarterly Preventive Maintenance (PM) Inspection records from the year 2002 to 2004.

TPSS PM Inspection Records Review

- From 2002 to 2004, all five TPSS's Annual PM Inspections were conducted and the records were filed.
- From 2002 to 2004, all five TPSS's Semiannual PM Inspection were conducted and the records were filed except:
  - TPSS #11 – No records for year 2002.
  - TPSS #18 – August 2003 record was missing.
  - Three out of 30 records were missing. (10%)
- From 2002 to 2004, all five TPSS's Quarterly PM Inspections were conducted and the records were filed except:
  - TPSS #11 – April 2002 and April 2004 records were missing.

- TPSS #1 – September 2003 and September 2004 records were missing.
- TPSS #21 – November 2003 record was missing.
- TPSS #5 – April 2004 record was missing.
- TPSS #18 – August 2004 record was missing.
- Seven out of 60 records were missing. (11%)

- During the review of the inspection records, I was unable to track resolutions of the work orders that have been generated by the PM inspectors during the PM Inspection. It would be easier to verify the timely closure of the work orders if the PM Inspection report had references to the work orders.
- I chose to review the hard copy records for this audit. Computer Database (SAP) was used only as a reference.
- I found some records were filed in the wrong places that created mismatches between the hard copy records and the SAP.
- I noticed that if the Quarterly, Semiannual and Annual inspections were held on the same date, VTA's Way, Power, and Signal Department used the same work order numbers for all three inspections. This created missing data in the database for the Quarterly and Semiannual inspections as all inspections were stored under Annual PM Inspection.

Recommendations:

1. VTA should devise a tracking method in the Preventive Maintenance Inspection reports that can verify the timely closure of the work orders generated by the inspectors during the Preventive Maintenance Inspections. (See also Recommendation1 of Checklist # 5).
2. VTA should ensure that all the PM Inspections are conducted and properly documented. (See also Recommendation3 of Checklist # 5).

2004 CPUC SYSTEM SAFETY AUDIT CHECKLIST FOR THE SANTA CLARA VALLEY TRANSPORTATION AUTHORITY

Checklist No.	**7**	Persons Contacted
Date of Audit	**October 27, 2004**	**Chuck Maples – WPS Superintendent**
Auditors	**Brian Yu**	
Department	**Way, Power, & Signal**	

REFERENCE CRITERIA

1. Light Rail System Safety Program Plan, March 2002, Version Number 6, Element # 11– Maintenance Audits / Inspection
2. MTN-PR-6805 Dated 11/15/00

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

WAY POWER AND SIGNAL INTERNAL AUDIT PROGRAM

Interview the manager-in-charge of the audit and review the WP&S Audit Forms as well as records of preventive maintenance chosen at random that was performed during the last one year to determine whether or not:

1. The WPS Internal Audit requirements were satisfied
2. Preventive Maintenance procedure guidelines were followed

RESULTS/COMMENTS

Activities and Findings:

I interviewed the VTA's Way, Power, and Signal Department (WPS) Superintendent to verify WPS's compliance to the MTN-PR-6805.

Internal Audit Program

- VTA WPS did not have any records of WPS Internal Audit being performed.

Preventive Maintenance (PM) Procedure Guideline

- I interviewed the WPS Superintendent, reviewed the PM Inspection scheduling matrix and determined that the WPS is following the PM procedure guidelines.

Recommendation:

VTA should conduct the annual Internal Audit and document the results according to MTN-PR-6805.

2004 CPUC SYSTEM SAFETY AUDIT CHECKLIST FOR THE SANTA CLARA VALLEY TRANSPORTATION AUTHORITY

Checklist No.	**8**	Persons Contacted
Date of Audit	**October 27, 2004**	**Chuck Maples – WPS Superintendent** **Kyle Olson – Track Supervisor**
Auditors	**Brian Yu**	
Department	**Way, Power & Signal**	

REFERENCE CRITERIA

1. CPUC GO 143-B Section 9.03-Installation of Curbs, Fences, and Barriers; Section 9.12-Clearing Vegetation
2. Light Rail System Safety Program Plan, March 2002, Version Number 6, Element # 10– Facility Inspections
3. MTN-PR-6404-Right -Of -Way Maintenance, Issued 9/15/00
4. MTN-PR-6419-Right -Of -Way Maintenance, Dated 03/23/01
5. MTN-PR-6201-Monthly Platform Preventive Maintenance, Issued 04/06/99

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

RIGHT-OF-WAY MAINTENANCE (FENCE, VEGETATION AND CONCRETE) AND FACILITY INSPECTIONS

1. Review and evaluate the adequacy of VTA's Right-Of-Way maintenance procedures. Take a special note to determine if periodic concrete inspection program using American Railway Engineering Association Manual (AREMA) for Railway Engineering as a guideline is included.
2. Through a round trip train ride that includes at least five stations on each line (Guadalupe and Tasman), visually inspect the right-of-way to determine whether or not:
   a. Right-Of-Way is cleared of all vegetation to meet the requirements of Section 9.12 of GO 143-B
   b. Fences are such that they offer an adequate degree of security to the right-of-way from any possible intrusions
3. Randomly select at least three light rail stations and review their maintenance records to determine whether or not:
   a. Inspections were performed and documented as required
   b. Noted defects were corrected and documented in a timely manner

RESULTS/COMMENTS

Activities and Findings:

I reviewed the VTA's Right-Of-Way (ROW) maintenance procedures to verify if VTA is referring to AREMA as a guideline to inspect its concrete structures (bridges and tunnels). I rode trains back and forth from Gish Station to Baypointe Station on Guadalupe Line to inspect vegetation growth and condition of fences along the ROW. I rode trains back and forth from Baypointe Station to Mountain View Station on Tasman West Line to conduct the same inspection. I chose three stations as samples (Fair Oaks, Tamien, and Baypointe) and reviewed the station Preventive Maintenance (PM) Inspection records.

ROW Maintenance Procedure Review

- VTA does not have a concrete inspection program in place, but is developing one. During the audit, VTA personnel stated that they plan on contracting for the registered engineers with expertise in this area. The draft specifications are currently going through the internal review process and VTA hopes to award a contract by summer of 2005. VTA provided a copy of the draft specification after the audit. I reviewed the concrete inspection section of the spec and found that it did not contain any references to the AREMA, regarding the concrete structure inspection.
- I suggested that VTA should refer to AREMA (or equivalent), as a guideline to follow in the contract specifications and maintenance plans for inspecting bridges and tunnels.

ROW Maintenance Inspection

- During the ROW Maintenance Inspection, I noticed that tree branches were blocking the view of Variable Message Board on many station platforms throughout the Guadalupe Line.
- During the ROW Maintenance Inspection, I noticed that at following locations, tree branches appeared to be within 18 inches from the OCS Messenger wires. This condition is a violation of GO 95 Table 1 of Rule 37, Case 13 – Column 3, and Rule 35.
  - North of the Gish Station
  - North of the Karina Station.
  - North of the River Oaks Station.
  - South of the Tasman Station.
  - East of the Champion Station.
  - West of 101-Freeway Underpass.
- During the ROW Maintenance Inspection, I noticed that at following locations, tree/shrubbery branches were growing toward the ROW through fences and encroaching ballast area. This condition is in violation of VTA's ROW Procedure (MTN-PR-6404) Section 4.6.
  - East of Lick Mill crossing, on north side of track.
  - At Lockheed Station, on north side of track.
  - East of Moffet Park Station, on north side of track.
  - East of Orchard Crossing, north side of track.
  - At Middlefield Station, on south side of track.
- During the ROW Maintenance Inspection, I noticed two sections (panels) of the ROW fence were broken at West of NASA Station, on south side of track.

Station PM Inspection Records Review

- VTA uses the same form for Monthly, Semiannual, and Annual PM Inspections for the station platforms.
- Semiannual and Annual inspections differ from Monthly inspections by additional inspection requirements of Ticket Vending Machine maintenance; thus, I reviewed the Monthly inspections only.
- The last 24 Monthly Station PM Inspection records, for each of the three stations selected, did not have any safety concerns reported.

Comment:

VTA should refer to AREMA (or equivalent) as a guideline to follow in the contract specifications and maintenance plans for inspecting bridges and tunnels.

Recommendations:

1. VTA should trim the vegetation blocking the view of the Variable Message Boards on station platforms.
2. VTA should inspect and ensure all fences along the Right-Of-Way are properly maintained.
3. VTA should trim the vegetation around the Overhead Contact System wires and should inspect the entire system and provide necessary measures to ensure that vegetation clearances are maintained in accordance with the requirements of GO 95 Table 1 of Rule 37, Case 13 – Column 3, and Rule 35. (See also Recommendation 1 of Checklist #. 4).
4. VTA should trim the vegetation along the Right-Of-Way fences and should provide necessary measures to ensure that the Right-Of-Way is maintained clear of vegetation in accordance with the requirements of MTN-PR-6404.

2004 CPUC SYSTEM SAFETY AUDIT CHECKLIST FOR THE SANTA CLARA VALLEY TRANSPORTATION AUTHORITY		
Checklist No.	**9**	Persons Contacted
Date of Audit	**October 25, 2004**	**Chuck Maple** **Kyle Olson** **George Ramos**
Auditors	**Joey E. Bigornia** **Robert Strauss**	
Department	**Way, Power, & Signal**	

REFERENCE CRITERIA

1. Light Rail System Safety Program Plan, March 2002, Version Number 6, Element # 11– Maintenance Audits / Inspection
2. MTN-PR-6206, Biennial Vital Relay Testing Dated 12/01/00
3. Applicable Maintenance Procedures documented in the VTA Maintenance Standard Procedure Manual

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

TRACK COMPONENTS, SIGNALS AND VITAL RELAYS INSPECTIONS, MAINTENANCE AND RECORDS

Interview the manager-in-charge of the preventive maintenance, scheduled maintenance and unscheduled maintenance activities for the Track Components (Switches, Interlocking, etc.), Signal Systems, and Vital Relays. Randomly select at least four items of each category (Switches, Interlocking, Vital Relays, Signal Systems, etc.) and review the records of completed inspections prepared during the last four 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 manner

RESULTS/COMMENTS

Activities and Findings:

We performed the following activities:

1. Interviewed Way, Power, & Signal Track Supervisor to determine how maintenance is performed on the track components, signal systems, and vital relays.
2. Reviewed power switch inspection reports dated January 2000 – October 2004 for Almaden, Chynoweth, and Santa Teresa.
3. Reviewed spring switch inspection reports dated January 2003 – October 2004 for Almaden and Chynoweth.
4. Reviewed vital relay biennial inspection reports dated 2001 and 2003 for Santa Teresa.

The following findings were complied as a result of the above activities:

A. General:

1. Switches preventive maintenance consist of once/week, cab ride inspection once/week, walk the line

once/month-but not always. VTA is not performing monthly inspections, as required by procedure since the content of the weekly inspections is the same as the monthly inspection.

2. VTA acknowledges they do not perform every inspection weekly, but believe as long as they inspect at least monthly they are meeting the requirements. The weekly inspection provides more information than monthly inspections, but VTA does not have sufficient staff to perform every inspection weekly and they do not believe it is a safety issue.
3. The inspection reports have a provision line for supervisor review and stamp of approval as found with inspection records dated January 2000 – March 2004. A recent change in procedure for reports dated April 2004 – present show the supervisor only reviewing and stamping (signing) inspection reports if a defect is noted.
4. Unscheduled maintenance is captured on the weekly work logs and is transferred to the database as it occurs.

B. Power Switches:

1. Reviewed switch maintenance inspection records for Alamaden-L1, Chynoweth-1, and Chynoweth-3 dated October 2000 - October 2004, and Santa Teresa-3a dated October 2000-February 2002.
2. Defects noted on inspection reports included tamping, pumping at switch, alignment, loose screws, and insulators – loose/cracked.
3. Tamping, pumping at switch, and alignment defects were reported regularly at Almaden and Santa Teresa from late 2000 to early 2002.
4. Weekly inspection reports were performed on a regular basis however, some inspection reports (e.g. Almaden L1 10/27/03 inspection, 12-2-03 inspection) did not indicate if a defect had been addressed or closed out.
5. Almaden weekly inspection reports indicated inspections were not done on 4 occasions in 2000, 6 in 2001, 3 in 2002, and 5 in 2003. The longest gaps between inspections were November 20, 2000-December 2000 and July 31, 2001-August 20, 2001.
6. Almaden inspection report dated December 2, 2003 listed insulator pads and tamping as problems found however, the inspection report did not identify if corrective actions had occurred. VTA produced two work order reports dated 4/12/04 and 4/13/04 to show work was performed to replace lags and ties on the South Line. Work order report dated 5/12/04 indicated tamp and level were performed.

C. Spring Switches:

1. Reviewed switch maintenance inspection records for Chynoweth dated January 2003 – September 2004 and Almaden dated for January 2003 – September 2004.
2. Monthly, Quarterly, and Yearly inspection records were performed as required.
3. The Chynoweth 2nd Quarterly inspection due for April 2003 and April 2004 were performed one-month late (signed May 31, 2003 and June 3, 2004).
4. The monthly inspection reports show voltage and amperage readings captured however, no acceptable criteria (for comparison) are identified on the inspection records. The Track Supervisor and Signal Supervisor both explained how the switch shunt test is performed and that the voltage and amperage values measured are used for comparison / diagnostic purposes if a switch fails a test.
5. Inspection reports did not indicate if a defect had been addressed or closed out. Auditors asked for work orders to show corrective actions had occurred for three defects, (i.e. Chynoweth 2/18/03 inspection – worn wear plate SW1, 3/28/03 inspection - switch 3 heater register not working, and Nov 03 inspection - phones bad order 6436) however, VTA was unable to produce the work orders.

D. Vital Relays:

1. Reviewed vital relay biennial inspection records for Santa Teresa dated 2001 and 2003.
2. The 2001 inspection was scheduled for November. The relay inspections were started on 11/01 and completed on 12/28/2001.
3. Year 2003 inspection was scheduled for November. The actual inspection was started on 4/04 and was completed on 9/6/04.
4. All relays on the inspection list were inspected and documented as required.
5. The inspection reports show voltage and amperage readings captured however, no acceptable criteria (for comparison) was identified on the inspection records. A review of voltage and amperage readings showed variations when comparing the Year 2001 and 2003 inspection results. In general, variances of readings for pick-up voltage and drop-away voltage were from a minimal of 3.7% - 20% however, the following relays showed a significantly higher variation:

Location	Type	Serial #	Pick-up Voltage (2003)	Drop-Away Voltage (2003)
4TPSR	500	P38334	41% higher	n/a
1BNWR	500 MBO	P50528	44% higher	n/a
121GYLOR	LOR*	P55735	100%lower	99.9% lower
121B LOR	LOR*	P51626	99.9%lower	99.9% lower
118B LOR	LOR*	P39520	64% higher	n/a
1-3 LPR	500	P38332	n/a	37.6% higher
POSR	500	P37812	n/a	39% higher
3B OR	OLR*	P38476	80% higher	86% higher
3A OR	OLR*	P43502	73% higher	86% higher

6. Signal Supervisor believes the differences of relay values are within the normal bounds, but they do not have criteria to determine when a problem exists. The expertise of the inspector determines the acceptable limits.

Recommendations:

1. VTA should revise procedures to include means of tracking the defects identified by inspections and documenting the corrective actions when defects have been corrected.
2. VTA should ensure that vital relay inspections are performed at required frequency interval.
3. VTA should identify the acceptable limits for voltage and amperage readings for vital relay inspections records.

2004 CPUC SYSTEM SAFETY AUDIT CHECKLIST FOR THE SANTA CLARA VALLEY TRANSPORTATION AUTHORITY

Checklist No.	**10**	Persons Contacted
Date of Audit	**October 26, 2004**	**Tom Kennedy** **Wayne Suttkus**
Auditors	**Joey E. Bigornia**	
Department	**Vehicle Maintenance**	

REFERENCE CRITERIA

1. CPUC GO 143-B Section 14.04-Light-Rail Vehicle Maintenance Practices and Records
2. Light Rail System Safety Program Plan, March 2002, Version Number 6, Element # 11– Maintenance Audits / Inspection
3. MTN-PR-5149- Daily Inspection – KI Light Rail Vehicles, Issued 03/17/04
4. MTN-PR-5158-Light Rail Vehicle Maintenance Work Orders, Revised 09/24/01
5. MTN-PR-5120 – LRV Wheel Inspections and Reprofiling, Issued 10/29/03
6. MTN-PR-5156 – Preventive Maintenance (PM) scheduling for Light Rail Vehicles, Issued 08/21/01
7. MTN-PR-5159 Light Rail Vehicle Placement and Status Report, Issued 06/01/98

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

LRV MAINTENANCE, INSPECTIONS AND RECORDS

Randomly select 3 vehicles and review all the appropriate records prepared during the last four 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 manner
4. All Work Orders were closed out in a timely manner

RESULTS/COMMENTS

Activities and Findings:

I performed the following activities:

1. Interviewed Maintenance Superintendent and Vehicle Maintenance Supervisor to determine how maintenance is performed on the light rail vehicle fleet.
2. Selected LRV Car Nos. 903, 918, and 930 and reviewed the daily inspection records dated January 2004 – October 26, 2004 and minor & major inspection records dated January 2003 – October 26, 2004.
3. Reviewed work orders and defect log dated January 2003 – October 2004 for LRV Car Nos. 903, 918, and 930.

The following findings were complied as a result of the above activities:

1. Kinki-Sharyo (KI) model LRV's replaced the UTDC LRV models previously used for revenue service in late-2002. Therefore, only 2-years of inspection records were available for review.

2. KI identified the maintenance inspection intervals to VTA LRV maintenance for scheduling.
3. KI plans to complete the Final KI Maintenance Manuals for VTA LRV Maintenance by late 2004.
4. KI cars are covered by manufacturer warranty for a period of 2-years.
5. VTA will acquire a total fleet of 100 KI models. KI car nos. 901-966 are accepted by VTA, and the remaining 32 cars are in different stages of acceptance testing.
6. The daily inspection records for car nos. 903, 918, and 930 dated January 2004 – October 26, 2004 were performed at the required maintenance interval. Noted defects were documented, assigned a work order number, and closed out in a timely manner. No exceptions were noted.
7. The minor inspection is performed every 10,000 miles. The minor inspection records for car nos. 903, 918, and 930 dated January 2004 – October 2004 were performed at the required maintenance interval. Noted defects were documented, assigned a work order number, and closed out in a timely manner. No exceptions were noted.
8. The major inspection is performed every 30,000 miles. The major inspection records for car nos. 903, 918, and 930 dated January 2004 – October 2004 were performed at the required maintenance interval. Noted defects were documented, assigned a work order number, and closed out in a timely manner. No exceptions were noted.

Recommendation: None.

2004 CPUC SYSTEM SAFETY AUDIT CHECKLIST FOR THE SANTA CLARA VALLEY TRANSPORTATION AUTHORITY

Checklist No.	**11**	Persons Contacted
Date of Audit	**October 27, 2004**	**Jim Middleton** **Walter S. Marchetti** **Mark Thomas** **Jerry Horner** **Rudy Carlmason**
Auditors	**Joey E. Bigornia**	
Department	**Risk Management**	

REFERENCE CRITERIA

1. Light Rail System Safety Program Plan, March 2002, Version Number 6, Element # 19–Employee Safety Programs, and Element 22-Construction Contractor Operations
2. Occupational Injury and Illness Prevention Program – April 2004
3. Employee Safety Training Program Records
4. Roadway Worker Protection Program
5. Contract Documents

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

EMPLOYEE AND CONTRACTORS SAFETY PROGRAM

1. Interview the VTA representative in charge of Employee Safety program and review employee safety program records to determine whether or not:
   a. Appropriate procedure and reporting form have been developed for all employees to effectively report safety hazards in the work place
   b. Appropriate corrective action plans and schedules are developed, tracked, completed and documented to address the identified hazards
2. Interview the VTA representative in charge of Contractors Safety Program and review contractor safety program records to determine whether or not:
   a. Procedures and practices clearly identify, for the contractors and VTA managers , that VTA is in charge and that its contractors and their employees must comply with all established safety rules and procedures
   b. Procedures require audits and inspections of the construction sites to monitor compliance with all established safety requirements

RESULTS/COMMENTS

Activities and Findings:

I performed the following activities:

1. Interviewed Environmental Health & Safety Supervisor to determine how the Employee Safety Program (ESP) is implemented.
2. Reviewed current program topics and monthly “tailgate” meeting policies that support the ESP.

3. Interviewed Rail Safety Supervisor, Technical Training Supervisor, and Light Rail Technical Trainer to determine how the Contractor Safety Program (CSP) is implemented.
4. Reviewed the Roadway Worker Protection Program and Caltrain Basic Worker Protection Training Booklet implemented to support the CSP.
5. I interviewed the on-site/field Employee In Charge (EIC) to determine how the CSP is enforced on a daily basis when construction activities occur.

The following findings were complied as a result of the above activities:

A. Employee Safety Program:

1. The Employee Safety Program is described in the Occupational Injury and Illness Prevention Program (IIPP) dated April 2004.
2. Risk Management has prepared an Employee Safety Training Program manual dated February 28, 2001 that identifies the topics of discussion for Tailgate/Safety Talks.
3. The monthly Tailgate Safety Topics of discussion in general are: Introduction to the IIPP, Emergency Action Plan, Back Safety, Fire Prevention, Personal Protection Equipment Awareness, Blood Borne Pathogen Awareness, Hazard Communication, Flammables / Combustibles, Material Handling, Electrical Safety – General, Ergonomics, Lockout / Tagout Awareness, and Confined Space Awareness.
4. The monthly training topic schedule prepared for August 2003 – July 2004 covered the topics described above. A monthly training topic schedule for August 2004 – July 2005 has been prepared and implemented.
5. Reviewed Tailgate Safety Topic files dated March – September 2004. The tailgate sign-in sheet identified all employees by department (i.e. vehicle, track, power, signal, and station maintenance) and signature of employee by their name indicates attendance of safety topic. No exceptions were noted.
6. The process for identifying hazards is identified in IIPP, Document Number FRS-RM-0201 dated 3-7-03, Guidelines for Reporting Safety or Health Hazards. The steps for hazard resolution are:
   a. Employee or steward: reports problem to supervisor.
   b. Supervisor: takes corrective action to remove safety and health hazards reported.
   c. Superintendent/Manager: reviews corrective action recommended by Supervisor to reduce the hazard.
   d. Environmental Hazards & Safety (EH&S): reviews cases where employee and bargaining unit are not satisfied with corrective actions by unit management.
   e. Joint Safety Committee: reviews corrective actions taken that are not considered satisfactory to employee originator for the purpose of attempting to reach a mutually agreeable resolution.
7. Hazards that do not reach the EH&S level of review are generally handled at the division of origin and kept on-file at those locations.
8. Hazards resolved at the EH&S level of review were dated 7/19/04, 6/27/04, 10/2/03, 6/25/03, and 9/5/01. These reports were properly documented with supporting attachments that indicated how the hazard was resolved. No exceptions were noted.

B. Contractor Safety Program:

1. The Roadway Worker Protection (RWP) Program as required by the Federal Railroad Administration (FRA), was developed by VTA for the Vasona Extension since it is a shared corridor adjacent to freight railroad tracks.
2. The RWP Program was initially developed on June 5, 2002. The RWP was reviewed by the FRA and revised on October 28, 2003 to include a pocket size manual requirement. Employees must have a copy

of the RWP pocket size manual when working on the Vasona right of way.

3. Contractors who are qualified to work on the right-of-way are assigned a VTA sticker placed on the left side of the worker's hardhat for visibility. The sticker identifies a valid qualification date good for one year.
4. VTA's Employee In Charge (EIC) is responsible for ensuring that workers on the right-of-way comply with the following:
    a. Proper Personal Protection Equipment (PPE) (hard hat w/ VTA sticker, boot with a defined heel, safety glasses, and safety vest)
    b. Job briefing has been conducted.
    c. Safe refuge location for the work crew is identified.
    d. Valid VTA restricted access permit and a copy of the RWP is on-site.
    e. Operations Control Center (OCC) has been notified prior to start of work.
5. The EIC maintains a daily logbook that identifies contractors by company, work area locations, time on track, and time clear from work site. The logbook also identifies when the Control Center has been notified of worker's clear of the right-of-way.
6. Reviewed the EIC daily logbook of contractor entries dated March 18, 2004 – October 13, 2004. Contractors who did not comply with the RWP requirements identified in 4(a-e) above were not allowed to enter the right-of-way. No exceptions were noted.
7. Copies of contractor's who have received the RWP training are kept on-file at VTA's Training Center offices. No exceptions were noted.

Recommendation: None.

2004 CPUC SYSTEM SAFETY AUDIT CHECKLIST FOR THE SANTA CLARA VALLEY TRANSPORTATION AUTHORITY

Checklist No.	**12**	Persons Contacted
Date of Audit	**October 26, 2004**	**Ray Franklin** **Chuck Maples** **George Ramos** **Wayne Suttkus**
Auditors	**Joey E. Bigornia**	
Department	**Quality Assurance**	

REFERENCE CRITERIA

1. Light Rail System Safety Program Plan, March 2002, Version Number 6, Element # 11– Maintenance Audits / Inspection
2. MTN-PR-7202, Precision Measuring Equipment (PME) Calibration Program, Dated 01/15/00
3. MTN-FR-7202A, Calibration Program Audit Checklist, Dated 01/15/00
4. MTN-FR-7202B, Calibration Program Random Inspection Checklist, Dated 01/15/00
5. MTN-FR-7202C, Calibration Supplier Audit Checklist, Dated 01/15/00

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

CALIBRATION PROGRAM

Interview the VTA representative in charge of the calibration program and randomly select a sample of three or more PME (Multimeters, Torque Ranches, Micrometers, Gauges, Calipers, Oscilloscopes, etc.) and review calibration records to determine whether or not:

1. All PME are properly inventoried, stored, distributed for use, calibrated at prescribed intervals, and marked, tagged or otherwise identified to show current calibration status according to the reference criteria
2. Quality Assurance (QA) foreperson or Supervisor performed random PME checks at the required frequencies and documented properly
3. Next calibration due date is shown on each PME
4. Non-calibrated PME is not currently being used for maintenance inspections

RESULTS/COMMENTS

Activities and Findings:

I performed the following activities:

1. Interviewed Quality Assurance Specialist to determine how PME are scheduled and recalled for annual calibration.
2. Selected PME from the Way, Power and Signal Department to determine if equipment was marked, tagged or otherwise identified to show current calibration status according to the reference criteria.
3. Selected PME from the Vehicle Department to determine if equipment was marked, tagged or otherwise identified to show current calibration status according to the reference criteria.
4. Reviewed copies of PME calibration certificates filed with the QA Department.

5. Reviewed documentation of PME Random PME Inspection Checklists filed with the QA Department.

The following findings were complied as a result of the above activities:

1. The following PME from the Way, Power and Signal Department were selected for review:

   a. Multi-meter Model 36
      Q0542, s/n 72257712, calibrated 10/02/04 – next calibration due 10/02/05.

   b. Multi-meter Model 260
      Q0485, calibrated 9/22/04 – next calibration due 9/22/05.

   c. Oscilloscope -Techtronic Model 2225
      Q0149, s/n 206329, calibrated 10/20/04 – next calibration due 10/20/05.

   d. Digital Insulation Tester Model IT200
      Q0600, calibrated 9/20/04 – next calibration due 9/29/05.

   e. DC Insulation Tester Model 800 PL Series
      Q0204, s/n M9807118, calibrated 10/04/04 – next calibration due 10/04/05

   The following PME from the LRV Department were selected for review:

   f. Starrett Micrometer
      Q0534, calibrated 9/14/04 – next calibration due 9/15/05.

   g. Multi-meter Fluke Model 23
      Q0622, calibrated 9/9/04 – next calibration due 9/9/05.

   h. Torque Wrench Teknet Model 7775
      Q0130, calibrated 9/9/04 – next calibration due 9/9/05.

   i. Torque Wrench Teknet Model 7577
      Q0062, calibrated 9/9/04 – next calibration due 9/9/05.

   j. Torque Wrench Teknet Model 8671
      Q0533, calibrated 9/9/04 – next calibration due 9/9/05.

   k. Dial Torque Wrench Teknet Model 7072
      Q0595, calibrated 9/9/04 – next calibration due 9/9/05.

   l. Gauge – Air Pressure
      Q077, calibrated 9/15/04 – next calibration due 9/15/05

2. Each PME selected from the Way, Power and Signal Department and the LRV Department showed the current calibration status. No exceptions were noted.

3. Review of calibration certificates showed that each PME had been calibrated at the required frequency interval. No exceptions were noted.

4. Reviewed QA's PME Random Inspection Checklists dated January 2003 – October 2004 of Light Rail Department and the Way, Power & Signals Department. The monthly PME Calibration Random Monitor reports for October 2003 – December 2003, Annual Calibration Program Audit for Year 2003, and monthly PME Calibration Random Monitor reports for January 2004 – October 2004 could not be found.

<u>Recommendation</u>:

VTA should ensure that the monthly PME Calibration Random Monitor Reports and the Annual Calibration Program Audit are performed at the required frequency interval and appropriately documented.

2004 CPUC SYSTEM SAFETY AUDIT CHECKLIST FOR THE SANTA CLARA VALLEY TRANSPORTATION AUTHORITY		
Checklist No.	**13**	Persons Contacted
Date of Audit	**October 27, 2004**	**Chuck Maples** **George Ramos**
Auditors	**Joey E. Bigornia**	
Department	**Way, Power, and Signal**	

REFERENCE CRITERIA

1. Light Rail System Safety Program Plan, March 2002, Version Number 6, Element # 11– Maintenance Audits / Inspection, and Element # 24 – Grade Crossing Safety, and Element # 25-Joint Freight Operations
2. MTN-PR-6205-Grade Crossing Warning System Inspection and Preventive Maintenance, Version Number 02, Issued 10/30/02

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

GATED GRADE CROSSINGS

Randomly select at least five gated grade crossings and review the records of completed gated grade crossing equipment inspections prepared during the last four years to determine whether or not:

1. The grade crossing equipment inspections were performed at the required frequency
2. Inspections were properly documented
3. Noted defects were corrected in a timely manner

RESULTS/COMMENTS

Activities and Findings:

I performed the following activities:

1. Interviewed Wayside Signal Supervisor to determine how maintenance is performed on the gated grade crossing equipment.
2. Reviewed gated grade crossing equipment maintenance records dated January 2001 to September 2004 for Central Expressway, Fairchild, and 101 Off-Ramp on the Tasman Corridor.
3. Reviewed gated grade crossing equipment maintenance records dated January 2001 to September 2004 for the Blossom River and Winfield on the Guadalupe Corridor.

The following findings were complied as a result of the above activities:

1. The maintenance interval for gated grade crossing equipment was on a monthly basis and semi-annual basis (January and July) for records dated January 2001 – September 2002.
2. The maintenance interval for gated grade crossing equipment was revised to a monthly, quarterly (October, January, April), and annual (July) basis for records dated October 2002 – present. This was done as a corrective action in response to the recommendation of 2001 triennial audit.
3. The current maintenance procedure was updated to show the gated grade crossing equipment inspection intervals of monthly, quarterly and annual.
4. The monthly and semi-annual inspections for records dated January 2001 – September 2002 were performed at the required maintenance interval. Noted defects were documented and closed out in a

timely manner. No exceptions were noted.

5. The monthly, quarterly, and annual inspections for records dated October 2002 – September 2004 were performed at the required maintenance interval. Noted defects were documented and closed out in a timely manner. No exceptions were noted.

Recommendation: None.

2004 CPUC SYSTEM SAFETY AUDIT CHECKLIST FOR THE SANTA CLARA VALLEY TRANSPORTATION AUTHORITY		
Checklist No.	**14**	Persons Contacted
Date of Audit	**October 26, 2004**	**Bill Evans, Transit Safety Officer** **Jim Middleton, Transit Safety Supervisor**
Auditors	**Raed Dwairi**	
Department	**Risk Management**	

REFERENCE CRITERIA

1. Code of Federal Regulations, CFR 49 Part 659
2. CPUC General Order 164-C, Section 4 – Internal Safety Audit Requirements
3. American Public Transportation Association (APTA) Rail Safety Audit Program, Section 9 - Internal Safety Audit
4. Light Rail System Safety Program Plan, March 2002, Version Number 6, Element #9 - Internal Safety Audit Process

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

INTERNAL SAFETY AUDIT (ISA) PROGRAM

Interview the VTA representative in charge of the Internal Safety Audit Program and review the VTA Annual Internal Safety Audit Reports for the years 2001, 2002, 2003, and the work-in-progress for the year 2004 to determine whether or not:

1. Annual internal safety audits were performed in accordance with the reference criteria
2. All of the required safety program elements identified for ISA were completely covered within a three year period
3. The annual ISA reports were prepared and submitted to the CPUC by February 15^{tth} of each year
4. Corrective action plan recommendations were prepared, tracked and implemented in a timely manner.

RESULTS/COMMENTS

Activities and Findings:

I interviewed Mr. Bill Evans and Jim Middleton who are the VTA representatives in charge of the Internal Safety Audit Program and reviewed the audit reports for the years 2000, 2001, 2002, 2003, and 2004 and found the following:

1. In the years 2000 and 2001, all the required safety program elements were audited by VTA in preparation for the CPUC Triennial On-Site Safety Audit conducted in October 2001.
2. VTA prepared an internal safety audit schedule in the year 2002. It was designed to complete one full audit cycle prior to this year 2004 CPUC On-Site Safety Audit and covered all the required APTA Rail Safety Audit Program elements except for Element # 6, System Safety Program Plan Control and Update Procedure (scheduled for December 2004). VTA representatives made this exception in order to see whether or not their agency's SSPP would need to be updated as a result of their own internal audit activities and this CPUC Triennial Audit. This showed that the VTA representatives have a clear understanding of the primary and common objective of their agency's Internal Safety Audit Program and the Triennial On-Site Safety Audit Program of the CPUC set forth in the requirements of CPUC General

Order 164-C Section 4 Rule 4.1.

3. For the year 2001 report, I selected the checklist that was used to audit element # 8, Accident/Incident Reporting & Investigation, performed by Joey Pheiffer/Bus Technical Trainer on July 31, 2001.
4. For the year 2002 report, I selected the checklist that was used to audit element # 7, Hazard Identification/Resolution Process, performed by Tom Kennedy/Superintendent of Vehicle Maintenance on September 26, 2002.
5. For the year 2003 report, I selected the checklist that was used to audit element # 9, Internal Safety Audit Process, performed by Curt Nicks/Way Power & Signal Superintendent on August 21, 2003.
6. For the year 2004 report, I selected the checklist that was used to audit element # 24, Security performed by Thelma Simangau on July 29, 2004 and also the checklist that was used to audit element # 18, Configuration Management, performed by Elinor Yokoi/Construction Inspector on June 16, 2004. The latter was the only checklist resulting in a recommendation which asked for the revision of the Configuration Management Procedure. This recommendation was closed out in October 2004 when VTA issued MTN-PR-1001 "Light Rail Configuration Management Program".
7. All checklists selected were audited by personnel technically qualified to verify compliance and judge the effectiveness of the activity being audited. Auditors were independent from the first line of supervision responsible for performance of the activity being audited.
8. All the internal audit reports were distributed and approved at the agency's Rail System Safety Review Board (RSSRB) Meetings and submitted to CPUC staff under the signature of VTA General Manger prior to the 15th of February each year.

The above audit activities showed that VTA is in compliance with GO 164-C requirements for internal safety audits.

No exceptions were noted.

Recommendation: None.

2004 CPUC SYSTEM SAFETY AUDIT CHECKLIST FOR THE SANTA CLARA VALLEY TRANSPORTATION AUTHORITY		
Checklist No.	**15**	Persons Contacted
Date of Audit	**October 27, 2004**	**Bill Evans, Transit Safety Officer** **Tom Irion, Rail Integration Project Manager** **Kris Sabherwal, Rail System Engineer**
Auditor	**Raed Dwairi**	
Departments	**Risk Management** **Transportation** **Maintenance Engineering**	

REFERENCE CRITERIA

1. Code of Federal Regulations, CFR 49 Parts 659.41 Investigations & 659.43 Corrective Actions
2. CPUC General Order 164-C, Sections 5 and 6
3. APTA Rail Safety Audit Program, Section 8 – Accident/Incident Reporting & Investigation
4. Light Rail System Safety Program Plan, March 2002, Version Number 6, Element # 8 – Accident / Incident Reporting and Investigation, and Element # 17 – Interdepartmental / Interagency Coordination
5. VTA SOP 530 (LRA-PR-0530), Light Rail Accident Investigation/Reporting Procedure, Version Number 01, Dated 04/04/01
6. VTA Light Rail Operations LRV Accident Investigation Procedures Manual, Revised January 1, 1995
7. MSP 5101 - Impounding Light Rail Vehicles, Effective 05/01/01
8. SOP # 9.14 - Accident Investigation Procedures, Dated 01/01/95

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

ACCIDENT/INCIDENT REPORTING & INVESTIGATION

1. Interview VTA representatives that are directly involved in accident reporting and review at least four immediately reportable accident reports submitted to the CPUC during the past two years to determine whether or not:
   a. The accidents were reported to the CPUC within 4-hours
   b. The accident investigation activities and reports were in accordance with the reference criteria
   c. Interagency cooperation and coordination is at a sufficient level to assure that all causes are correctly identified and corrective action plans and implementation schedules are devised, tracked, and implemented in a timely manner
2. Review the accident records of the last two years to ascertain that a monthly accident, unacceptable hazardous condition, and corrective action summary report is filed on forms prescribed by the CPUC within 30 days from the last day of the month covered

RESULTS/COMMENTS

Activities and Findings:

I interviewed VTA representatives who are directly involved in accident reporting and reviewed the following

immediately reportable accidents:

1. Train vs. Motorcycle collision on Woz Way & San Carlos which occurred on 10/12/03 at 5:39 PM and was reported to CPUC at 8:55 PM the same day. Accident resulted in one fatality and one serious injury. Accident investigation report was submitted to CPUC staff on 12/11/03.
2. Train vs. Automobile collision on North 1st Street & Burton Avenue which occurred on 7/17/03 at 1:50 PM and was reported to CPUC at 3:50 PM the same day. Accident resulted in one fatality. Accident investigation reported was submitted to CPUC staff on 10/15/04.
3. Train vs. Pedestrian collision on North 1st Street & Trimble which occurred on 3/25/04 at 2:04 PM and reported to CPUC at 2:55 PM the same day. Accident resulted in one serious injury. Accident investigation report was submitted to CPUC staff on 5/21/04.
4. Train vs. Pedestrian collision on North 1st Street and Hedding which occurred on 8/20/02 at 9:00 AM and was reported to CPUC at 9:50 AM the same day. Accident resulted in one fatality. Accident investigation report was submitted to CPUC staff on 10/17/02.
5. Train vs. Automobile on North 1st Street and Charcott which occurred on 9/1/04 at 7:47 AM and was reported to CPUC at 11:00 AM the same day. Accident resulted in one serious injury. Accident investigation report was submitted to CPUC staff one week prior to the date of this audit. This accident investigation report was the only report submitted with no attachments to the CPUC staff. One corrective action was issued concerning the "Train Coming" sign to be replaced by visual signs system wide. This project is out to bid and should be awarded soon.

The above audit activities showed that all immediately reportable accidents were reported to the CPUC within 4 hours period as required by GO 164-C. The accident investigation activities and reports were in accordance with the reference criteria. Interagency cooperation and coordination is at a sufficient level to assure that all causes were correctly identified and corrective action plans and implementation schedules were devised, tracked, and implemented in a timely manner.

I continued the audit at the Guadalupe Division of 101 Younger Avenue in order to review the binders containing the monthly accident and unacceptable hazardous condition reports that are filed on forms prescribed by the CPUC (Forms T & V) within 30 days from the last day of the month covered. I found the binders for the years 2001, 2002, 2003, and 2004 were all complete and well organized. Mr. Kris Sabherwal, the custodian of these binders and associated electronic database, showed a very good grasp of the accident reporting and investigation requirements. Knowing that the accident database containing all reportable and all immediately reportable accidents and unacceptable hazardous conditions reports could serve as a valuable tool in identifying trends on a system wide basis, I suggested and VTA representatives agreed that a proactive formal process should be developed through which trend analyses can be conducted between Risk Management and the other departments involved to identify potential problems and mitigate potential safety concerns. A Geographic Information System (GIS) or a track chart of the entire system with red marks designating potential safety concerns were suggested as a means of looking at the entire system in order to perform a system wide trend analysis of safety concerns in order to recommend mitigation measures. This trending was suggested to be performed on an annual or semi-annual basis and may also be extended to include security-related information.

<u>Comment</u>:

Develop a proactive formal process by which all the departments involved in accident/incident reporting & investigation as well as Hazard Identification/Resolution Process can perform trend analysis of data derived from reportable, immediately reportable, and unacceptable hazardous conditions (including near misses) database on a system wide basis. Appropriate recommendations should be developed and completed to mitigate the safety concerns identified as a result of such system wide trend analyses.

<u>Recommendation</u>: None.

2004 CPUC SYSTEM SAFETY AUDIT CHECKLIST FOR THE SANTA CLARA VALLEY TRANSPORTATION AUTHORITY		
Checklist No.	**16**	Persons Contacted
Date of Audit	**October 28, 2004**	**Linda Meadow, Principal Linda Meadow & Associates** **Len Eaton, Construction Manager** **Cris Crisologo, QA/Warranty Manager** **Bill Evans, Transit Safety Officer**
Auditor	**Raed Dwairi**	
Department	**Rail Design and Construction Division**	

REFERENCE CRITERIA

1. CPUC General Order 164-C, Sections 7 and 8
2. Light Rail System Safety Program Plan, March 2002, Version Number 6, Element # 7-Hazard Identification / Resolution Process, Element # 13-Training and Certification, Element # 14-Emergency Response Planning, Coordination, Training, Element # 15-System Modification Review / Approval Process, Element # 17-Interdepartmental / Interagency Coordination, Element 18-Configuration Management, Element # 22-Construction Contractor Operations, Element # 23-Procurement,and Element # 25-Joint Freight Operations
3. VTA safety Criteria Dated August 2000
4. VTA Light Rail Safety Certification Plan Dated September 2000

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

SAFETY CERTIFICATION

Interview VTA representative in charge of the Safety Certification and select at least one contract for each of the new projects, namely, Tasman East extension, Capitol extension, and Vasona extension and review the safety certification documentation to determine whether or not:

1. The safety certification activities were performed in accordance with the reference criteria
2. Safety critical elements were identified, certified and properly documented
3. All design and construction changes were properly coordinated and addressed in the safety certification process
4. All safety certification activities were thoroughly documented throughout the life of the project to substantiate that safety certifiable elements, safety criteria, final design, construction, testing, operating, emergency and procedures, and training aspects of the project have been implemented in the completed project
5. Safety certification is performed on projects smaller than line extensions, but significant enough to qualify as major projects under GO 164-C.
6. A plan has been established to revise the System Safety Program Plan and Safety Certification Plan to incorporate the safety certification requirements of CPUC General Order 164-C

RESULTS/COMMENTS

Activities and Findings:

1. I interviewed Ms. Linda Meadow, Mr. Len Eaton, Mr. Cris Crisologo, and Mr. Bill Evans who are in

charge of the Safety Certification Program at VTA.

2. I randomly selected the several contracts for each of the new capitol projects (see detail below).
3. I reviewed relevant safety certification documentation.

The following findings were complied as a result of the above activities:

1- VTA formally certifies all capitol projects such as light rail extensions and system modifications in accordance with a written plan entitled VTA Light Rail Safety Certification Plan dated September 2000. VTA has plans to update this document in order to reflect the safety certification requirements of General Order 164-C. A draft should be available in January of 2005. VTA identifies various safety certifiable elements on the basis of a well-documented safety criteria dated August 2000. VTA is updating these criteria through the Rail System Safety Review Board (RSSRB) Criteria Subcommittee.

2- For modifications not meeting the capitol projects threshold, VTA employs a less rigorous process called Safety Review which involves the identification of the safety critical elements of the project at hand, performance of a hazard analysis in order to identify a risk index, safety audits, verification of the proper completion of all integrated testing, and verification that training as well as rules and procedures have all been adequately completed or modified as needed. VTA documents all these activities in a safety review report. The randomly selected Baypointe Interlocking Project served as an example of the safety review process of non-capitol projects at VTA since the modification involved a non-vital software change.

3- All safety certification documents are reviewed and approved by the RSSRB. Approval is granted only when an unanimous vote is secured by all board members.

4- All randomly selected contracts such as S-520 of the Tasman East Project to bring the overhead contact system (OCS) in compliance with GO 95 Rule 74.4-F which was initiated in October 2003 and completed in December of the same year (also Design Change Notice (DCN)#10), S-945 of the Capitol Project to modify existing communication (SCADA) system which was completed in April 2004, S-630 of the Station Platform Retrofits in conjunction with the Low Floor Vehicle Procurement Project from Kinkisharyo of Japan, and the Signals Retrofits Project were subjected to the formal safety certification process described above.

5- All safety certification activities were performed in accordance with the reference criteria and properly documented.

6- VTA has plans to update its System Safety Program Plan (SSPP) to incorporate the safety certification requirements of GO 164-C. Recent organizational changes at VTA and the 2004 CPUC Triennial Audit were the other reasons behind the update of the SSPP.

<u>Recommendation</u>:

VTA should update its SSPP, Safety Certification Plan, and other affected safety certification documents to incorporate the safety certification requirements of General Order (GO) 164-C.

2004 CPUC SYSTEM SAFETY AUDIT CHECKLIST FOR THE SANTA CLARA VALLEY TRANSPORTATION AUTHORITY		
Checklist No.	**17**	Persons Contacted
Date of Audit	**October 28, 2004**	**Chris Eichin, Maintenance Engineering Manager** **Bill Evans, Transit Safety Officer** **Len Eaton, Construction Manager** **Tom Kennedy, Maintenance Superintendent** **Jim Middleton, Safety Supervisor** **Tim Ellenberger, Document Management Supervisor**
Auditor	**Raed Dwairi**	
Departments	**Records Management** **Rail Design And Construction** **Vehicle Maintenance** **Maintenance Engineering** **Risk Management**	

REFERENCE CRITERIA

1. APTA Rail Safety Audit Program, Section 18 – Configuration Management
2. Light Rail System Safety Program Plan, March 2002, Version Number 6, Element # 18 – Configuration Management
3. OPS-PR-008- Light Rail Configuration Management Procedure, Version Number 01, Dated 10/27/03
4. EY000913-Procedure for completing record drawings, Dated 09/10/02
5. Procedure for archiving of Rail System Safety Review Board Documentation, Version 1, Dated 08/06/02

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

CONFIGURATION MANAGEMENT

Interview VTA representatives that are directly involved in configuration management and track a sample of changes to the rail system to determine whether or not:

1. The changes made were submitted, approved, implemented and documented in accordance with the reference criteria
2. The safety critical changes were presented to RSSRB for review and approval
3. The record drawings incorporated and distributed the changes to the appropriate departments
4. The completed documentation was archived properly in a timely manner

RESULTS/COMMENTS

Activities and Findings:

1. I interviewed VTA personnel who are involved in the Configuration Management process.
2. I Tracked a sample of changes to the rail system as follows: May 2004 Overhead Catenary System (OCS)-door bridge arm which was changed after it was identified during integrated testing that the arm had a tendency to damage the pantograph of the Light Rail Vehicles; Design Change Notice (DCN) #10 which was introduced to bring the OCS in compliance with GO 95 Rule 74.4-F; and the substation

flash-over emergency change.

3. I Reviewed Rail System Safety Review Board (RSSRB) Meeting documents that are used for archiving modifications introduced on the rail system.

The following findings were complied as a result of the above activities:

1. Light Rail Configuration Management Procedure (OPS-PR-0008) dated 10/27/03 has been deleted and replaced by a new procedure (MTN-PR-1001) dated 10/05/04. No system change has gone through this procedure yet.
2. Confirmed that Risk Management, the custodian of RSSRB records, did send to Records Management copies of RSSRB Meeting minutes, which reflect approved modifications to the rail system, as was required by the CPUC as a result of the previous triennial audit. These records showed that safety critical changes were presented to RSSRB for review and approval.
3. Confirmed that DCN #10 did undergo the proper configuration management process of VTA by reviewing the file entitled CPUC Supplemental Support Assembly. This change was initiated in October 2003 and completed in December of the same year to bring the OCS in compliance with GO 95 Rule 74.4-F which was also as a result of the previous CPUC triennial audit.
4. Confirmed that the Emergency Change of substation flash-over has gone through the configuration management procedure as required by the reference criteria.

No exceptions were noted.

Recommendation: None.

2004 CPUC SYSTEM SAFETY AUDIT CHECKLIST FOR THE SANTA CLARA VALLEY TRANSPORTATION AUTHORITY		
Checklist No.	**18**	Persons Contacted
Date of Audit	**October 25, 2004**	**Garry Stanislaw, Transportation Superintendent**
Auditor	**Raed Dwairi**	**Dean Palmquist, Light Rail Technical Trainer** **Dave Collura, Transit Operations Supervisor (Rail Activation)**
Department	**Rail Operations**	**Mark Thomas, Technical Training Supervisor**

REFERENCE CRITERIA

1. Light Rail System Safety Program Plan, March 2002, Version Number 6, Element-# 12-Rules & Procedures Review
2. Light Rail Operating Division Bulletin # 1

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

RULES AND PROCEDURES REVIEW

Interview the VTA manager in charge and review relevant documentation to determine whether or not:

1. All governing documents (Bulletins, Rules, and Standard Operating Procedures) are reviewed and updated annually by the Rules and Procedures Development (RPD) Committee
2. All updated governing documents were presented to RSSRB for review and ratification
3. All updated governing documents were distributed to the employees and appropriate training of staff on the changes was conducted as required
4. Periodic operational tests and inspections to ensure compliance with operating Rules and Procedures were properly documented
5. The Rules & Procedures that govern operational conduct on new, non-commissioned light rail extensions were developed and implemented.

RESULTS/COMMENTS

Activities and Findings:

1. I interviewed the above listed VTA personnel in charge of the process for reviewing the rules and procedures of the light rail system.
2. I reviewed randomly selected sample of records (from January 2003 to September 2004) at the training department such as training and certification records of operators and rail supervisors.
3. I reviewed pertinent records to confirm that actions were taking as appropriate. This included a review of the RPD meeting minutes for the 10/20/04, 10/13/04, 10/6/04, 9/22/04, 9/15/04, 9/8/04, and 7/21/04 scheduled meetings; a review of the year 2003 Operators Recertification Syllabus which included Operators Training Check Sheets prepared as part of the safety certification of the Tasman East Project; a review of the Rail Supervisors Test Controller Folders; and a review of Ride Check Reports from January until December 2003.

The following findings were complied as a result of the above activities:

1. A color-coded matrix is used to keep track of the status of the Rules and Procedures Development (RPD) Committee governing documents (purple indicates governing documents to be deleted; green

indicates approved documents that are ready for signature, yellow in the process of being reviewed by the committee).

2. Confirmed that all updated governing documents including Operational Notices and Memorandums are distributed to the employees by actually seeing the area at Rail Operations where these governing documents are displayed to all employees including operators and supervisors (controllers). Operational Notices for example are displayed on the wall for 30 days and Memorandums for 90 days. Memos and notices are posted by the transportation superintendent. Employees are required to check the notices, for which, they are checked regularly during performance evaluations. Memorandums and Operational Notices older than that are moved to the bottom rack and kept in binders for future reference. I observed posted notices and reviewed the binders containing older notices and memorandums. These were well organized.
3. Confirmed that Ride Check Reports are conducted 3 times per year as a minimum. When rule violations are observed and recorded, an Observation Report is generated and sent to the Operations Department where Come-See-Me notices are issued and appropriate action is taken which may include disciplinary action and re-instruction.
4. Confirmed training on rules and procedures that govern operational conduct on new, non-commissioned light rail extensions. Also, I was given a copy of a document entitled Light rail Operations Vasona Project Rulebook for Conducting Test Operations which will become effective November 2004 showing the development of rules and procedures that will govern the non-commissioned extension.
5. Confirmed that a Memorandum was transmitted to the CPUC designated rep to VTA showing that the agency has filed its Rulebook with the Commission staff as required by Rule 13.02 of General Order 143-B (Rulebook became effective in June 2004 and the VTA Memorandum was issued on 5/20/04).

No exceptions were noted.

Recommendation: None.

2004 CPUC SYSTEM SAFETY AUDIT CHECKLIST FOR THE SANTA CLARA VALLEY TRANSPORTATION AUTHORITY

Checklist No.	**19**	Persons Contacted
Date of Audit	**October 27, 2004**	**Chief Frank Raymond, Chief of Security** **Mark Bugna, Assistant Superintendent** **Kathy Hendrix**
Auditors	**Anton Garabetian**	
Department	**Protective Services**	

REFERENCE CRITERIA

1. Light Rail System Safety Program Plan, March 2002, Version Number 6, Element # 26– Security
2. Light Rail Safety Program Plan (Security Portion) Dated April 1999.

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

LIGHT RAIL SECURITY

Interview the Chief of Security of the Protective Services Unit and review the relevant documentation prepared during the past 12-months for Transit Patrol Divisional Summary Reports, Route Stabilization Team Summary Reports, Transit Patrol Vandalism Damage Summary Reports, Mandatory Crime Reports, Security Incident Reports, and the Security Breach Review Committee Meetings to determine whether or not:

1. Meetings were held on a regular basis to identify security breach causes, propose and recommend additions or changes to policies and procedures in order to prevent or minimize further security breaches of similar nature
2. Threat assessments have been performed and recommendations implemented
3. Periodic training is provided to the employees on identifying and reporting suspicious behavior (anti-terrorism)
4. Contingency plans for the identified scenarios, such as, violent criminal activities, bomb threats, etc. have been established
5. Security measures have been implemented when requested by the Federal Transportation Administration (FTA) in response to the declared security alerts
6. Security Plan modification process was followed as a result of changes to security needs and conditions of the transit agency

RESULTS/COMMENTS

Activities and Findings:

I interviewed the Chief of Security of the Protective Services Unit. VTA contracts the security of the system to Santa Clara Sheriff Department. Security Incident Database reports are sent to the VTA Chief Operating Officer (COO) and the General Manager. These reports are also shared with labor representatives.

I reviewed the relevant documentation prepared during the past 12-months as follows:

- Transit Patrol Divisional Summary Reports. All reports were in order.
- Route Stabilization Team Summary Reports. All reports were in order.

- Transit Patrol Vandalism Damage Summary Reports. All reports were in order.
- Mandatory Crime Reports. All reports were in order.
- Security Incident Reports. All reports were in order. Security Incident Reports summary is communicated to the COO and management.
- Security Breach Review Committee Meetings are held every quarter. All reports were in order.

1. Security Breach Review Committee Meetings identify security breach causes, propose and recommend additions or changes to policies and procedures in order to prevent or minimize further security breaches of similar nature. Guadalupe Division Fence Project was one of the results of these meetings. The project was completed in August 2004. Also Cal-Osha safety engineer incident prompted several changes in policies and procedures.
2. VTA Threat Venerability Assessment was performed in July 2002. Battelle Team Security performed the assessment. One of the recommendations of the assessment was security training for all VTA employees, which was completed at different employee levels. Most of the Threat Venerability Assessment recommendations are completed within the limitations of VTA.
3. VTA has Security Awareness Program with training modules. VTA implemented the security awareness training to all employees in August 2003 and completed it in January 2004.
4. Document No. OPS-PR-007 "Security Threat Response Procedure" identifies the contingency plans for bomb threats. Also, Emergency Response Procedures deal with emergency situations such as communication, passenger evacuation, etc.
5. Security measures are implemented when requested by the Federal Transportation Administration in response to the declared security alerts. The chief of security, depending on the threat level, communicates with COO, who communicates with all the involved departments on need to know basis.
6. VTA issued a new Security Emergency Preparedness Program Plan (Plan) on October 13, 2004. The Plan is for bus and rail combined. The plan is a living document and is revised on need basis. The previous version was dated April 1999. The new Plan indicates that it will be revised annually.

Recommendation: None.

2004 CPUC SYSTEM SAFETY AUDIT CHECKLIST FOR THE SANTA CLARA VALLEY TRANSPORTATION AUTHORITY		
Checklist No.	**20**	**Persons Contacted**
Date of Audit	**October 27, 2004**	**Merle Giles** **Walter Marchetti** **Jim Ersted** **Dwight Barnes**
Auditors	**Anton Garabetian**	
Department	**Risk Management**	

REFERENCE CRITERIA

1. Light Rail System Safety Program Plan, March 2002, Version Number 6, Element 20-Hazardous Materials Programs / Environmental Management
2. Bulletins #308-313
3. Occupational Injury and Illness Prevention Program, Dated March 2003
4. Employee Safety Training Program
5. FRS-RM-1801, Safety Procedures for Entry into Confined Spaces, Version Number 01, Dated 10/21/02

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

HAZARDOUS MATERIALS PROGRAMS / ENVIRONMENTAL MANAGEMENT

Interview the VTA manager-in-charge and review relevant documentation prepared during the last 12-months to determine whether or not:

1. The hazardous material and environmental management programs comply with the Federal, State and Local regulatory requirements.
2. Training that emphasizes safe handling of hazardous materials has been adequately provided as required by the reference criteria
3. Confined space awareness training is provided and documented to all employees and CPR/first training is provided and documented to standby personnel required to be present during the confined space entry
4. Confined space entry training is provided and documented to all Maintenance employees required to enter, work in, or serve as rescuers for confined spaces, and their supervisors
5. Annual review of the implementation and effectiveness of FRS-RM-1801 procedure is conducted and documented
6. Appropriate records are kept for confined space entry in accordance with the requirements of PRS-RM-1801

RESULTS/COMMENTS

Activities and Findings:

I interviewed the VTA manager-in-charge and reviewed relevant documentation prepared during the last 12-months as follows:

1. VTA has issued a new Occupant Injury and Illness Prevention Program in April 2004. This program is updated annually through a committee set up to review the program. It complies with the Federal, State

and Local regulatory requirements.

2. VTA has a training program that emphasizes safe handling of hazardous materials.
    a. Records show that all facility workers are trained annually on how to handle hazardous materials.
    b. Maintenance workers who handle hazardous materials have not yet taken this training course. VTA has a plan to train the maintenance workers by the end of 2004.
3. VTA provides confined space awareness training to all employees who work in confined spaces. VTA provided a list showing the employees that were trained in confine space awareness; however, the training results documentation was not available for review. Also, the auditor could not confirm if VTA provided CPR/first aid training to standby personnel required to be present during the confined space entry. VTA provided these documents to the CPUC representative on November 24, 2004 for his review and were found to be acceptable.
4. VTA provides confined space entry training to all maintenance employees required to enter, work in, or serve as rescuers for confined spaces, and their supervisors. VTA provided a list showing the employees that were trained in confine space; however, the training results documentation was not available for review. VTA provided these documents to the CPUC representative on November 24, 2004 for his review and were found to be acceptable.
5. Safety Procedures for Entry Into Confined Spaces (Document No. FRS-RM-1801) previously was revised on October 21, 2002. The next revision date was January 6, 2004. There is no requirement to revise this document annually. It is a living document and is revised on need basis.
6. VTA did not provide appropriate records for confined space entry in accordance with the requirements of PRS-RM-1801 for review. However, VTA provided these documents to the CPUC representative on November 24, 2004 for his review and were found to be acceptable.

<u>Recommendation:</u>

VTA should provide annual hazardous material handling training to maintenance workers who handle hazardous materials.

2004 CPUC SYSTEM SAFETY AUDIT CHECKLIST FOR THE SANTA CLARA VALLEY TRANSPORTATION AUTHORITY

Checklist No.	**21**	Persons Contacted
Date of Audit	**October 25, 2004**	**Curt Nicks** **Michael Avery** **Mark Bugna** **John Carlson**
Auditors	**Anton Garabetian**	
Department	**Light Rail Operations and Communication**	

REFERENCE CRITERIA

1. Light Rail System Safety Program Plan, March 2002, Version Number 6, Element 14-Emergency Response Planning, Coordination, Training
2. VTA Fire / Life Safety Program Plan

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

EMERGENCY RESPONSE PLANNING, COORDINATION, TRAINING

Interview the VTA representative in charge of the Emergency Response Planning, Coordination, Training program and review records and documentation for the last two years to determine whether or not:

1. Emergency drills that included tabletop and practical exercises were planned and carried out with the participation of the appropriate external agencies (local, state, and federal agencies)
2. Required training that included simulated emergency drills was provided to all emergency response agencies in the areas where VTA operates and emergency response teams
3. All drills were evaluated and critiqued in a timely manner and any recommendations were recorded, scheduled and tracked to completion.
4. Emergency planning addresses both accidental emergency events and security related emergency events

RESULTS/COMMENTS

Activities and Findings:

I interviewed the VTA representative in charge of the Emergency Response Planning, Coordination, Training Program and reviewed records and documentation for the last two years.

Mark Bugna holds the position of Fire Life Safety Incident Commander since October 2003. VTA light rail serves five cities in Santa Clara Valley.

1. VTA Transportation Light Rail Fire/Life Safety Program (FLSP), dated 8/14/2002, indicates that the program goal is to stage a minimum of four exercises per year. Two of these exercises are tabletop drills, and two are live exercises. Emergency drills that included tabletop and practical exercises were planned and carried out with the participation of the appropriate external agencies (local, state, and federal agencies).
   - VTA staged two live exercises and two tabletop drills in 2002. VTA staged the tabletop drills in April and September 13, 2002. The live exercises were staged in April and October 2002. Appropriate external agencies participated in these drills.
   - VTA staged one tabletop drill and one live exercise in 2003. The tabletop drill and live exercise were

staged in May 2003. Appropriate external agencies participated in these drills.

- VTA staged one tabletop drill and one live exercise in 2004. The tabletop drill and live exercise were staged in April 2004. Appropriate external agencies participated in these drills.

2. VTA light rail fleet consists of Kinkisharyo cars only. All city emergency responders that VTA serves are trained on familiarity of the car. VTA has an extensive emergency responders training program called Fire Life Safety Kinkisharyo Light Rail Vehicle Emergency Responder Training. VTA training also includes emergency responder's familiarization of the rail system.
3. All drills were evaluated and critiqued in a timely manner and recommendations were recorded. However, I did not see any documentation about tracking the specific VTA recommendations to completion. The FLSP does not include a plan regarding tracking the tabletop drill or live exercise recommendations to completion.
4. April 2004 tabletop drill and live exercise included both accidental and security related emergency events. The FLSP emergency planning does not require the drills to include both accidental emergency events and security related emergency events.

<u>Recommendations</u>:

1. VTA should either stage minimum of four exercises per year as indicated in FLSP consisting of two tabletop drills and two live exercises or revise the FLSP to reflect one table top drill and one live exercise performed per year.
2. VTA should revise the FLSP to clarify that the tabletop drill and live exercise recommendations are tracked to completion. Also VTA should ensure that the FLSP emergency planning includes both accidental and security related emergency events.

2004 CPUC SYSTEM SAFETY AUDIT CHECKLIST FOR THE SANTA CLARA VALLEY TRANSPORTATION AUTHORITY

Checklist No.	**22**	Persons Contacted
Date of Audit	**October 26, 2004**	**Mark Thomas** **Dean Palmquist** **Jennifer Stanislaw**
Auditors	**Anton Garabetian**	
Department	**Rail Operations**	

REFERENCE CRITERIA

1. CPUC General Order 143-B, Sections 12.02, 13.03, and 14.03
2. Light Rail System Safety Program Plan, March 2002, Version Number 6, Element # 5 and #13-Training and Certification
3. Light Rail Operating Rulebook effective June 1, 2004, Chapter 10 – Historic Streetcar Operation
4. SOP # 1.5 (LRA-PR-411.5), Version Number 6, Dated 11/14/01 - Operator Certification
5. SOP # 1.9 (LRA-PR-411.9), Version Number 07, Dated 04/18/01 - Light Rail Operator Retraining / Refresher
6. SOP # 1.10 (LRA-PR-411.10), Version Number 02, Dated 04/02/01 - Operator Evaluation / Ride Check

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

LIGHT RAIL TRAINING AND CERTIFICATION

Interview the VTA representative in charge of light rail training and certification programs and randomly select at least four persons in the classification of (1) Train Operator, (2) Operations Control Center Staff, (3) Light Rail Supervisors, (4) Way, Power and Signal Maintenance, Overhead Line, and Track workers and (5) Motormen and Conductors of Historic Streetcars and review their training and recertification records for a minimum of past 2-years to determine whether or not:

1. Retraining as well as refresher training is conducted in accordance with the reference criteria
2. Records are maintained in accordance with the reference criteria
3. There is an approved procedure for training and certification for Motormen and Conductors of Historic Streetcars

RESULTS/COMMENTS

Activities and Findings:

I interviewed the VTA representatives in charge of light rail training and certification programs and randomly selected four persons in the classification of (1) Train Operator, (2) Operations Control Center Staff, (3) Light Rail Supervisors, (4) Way, Power and Signal Maintenance, Overhead Line, and Track workers and (5) Motormen and Conductors of Historic Streetcars and reviewed their training and re-certification records of past 2-years as follows:

Train Operators

I reviewed the training and re-certification records of four Train Operators. Retraining as well as refresher training is conducted in accordance with the reference criteria. Records are maintained in accordance with the reference criteria. All historic car operators are trained on annual basis and one operator is certified all year

around.

Operations Control Center Staff

I reviewed the training and re-certification records of four Operations Control Center Staff. Retraining as well as refresher training is conducted in accordance with the reference criteria. Records are maintained in accordance with the reference criteria.

Light Rail Supervisors

I reviewed the training and re-certification records of four Light Rail Supervisors. Retraining as well as refresher training is conducted in accordance with the reference criteria. Records are maintained in accordance with the reference criteria.

Way, Power and Signal Maintenance, Overhead Line, and Track Workers and Motormen

I reviewed the training and re-certification records of two Signals employees, three Tracks employees, and one Electro-Mechanics employee. Retraining as well as refresher training is conducted in accordance with the reference criteria. Records are maintained in accordance with the reference criteria.

There is no specific approved procedure for training and certification for Motormen and Conductors of Historic Streetcars because the training is one part of the overall operator training and certification.

Recommendation: None.

2004 CPUC SYSTEM SAFETY AUDIT CHECKLIST FOR THE SANTA CLARA VALLEY TRANSPORTATION AUTHORITY		
Checklist No.	**23**	Persons Contacted
Date of Audit	**October 26, 2004**	**Dave Collura** **Sharol Gonzalez** **Dean Palmquest** **Mark Thomas**
Auditors	**Anton Garabetian**	
Department	**Rail Operations**	

REFERENCE CRITERIA

1. Light Rail System Safety Program Plan, March 2002, Version Number 6, Element # 22-Construction Contractor Operations
2. Light Rail Operating Rulebook effective June 1, 2004, Chapter 7 – Protection of Workers on the Right-Of-Way
3. Roadway Worker Protection (RWP) Training Booklet
4. Light Rail Operations Restricted Area Access Procedures Manual, Revised 03/01/00 & 05/19/00

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

RESTRICTED AREA ACCESS CONTROL

Interview the VTA representative in-charge RWP and Restricted Area Access Control programs and review relevant documentation to determine whether or not:

1. The required safety training and seminars are conducted and documented in accordance with the reference criteria
2. Access permits are issued and distributed as required
3. Access permits are monitored to ensure adherence to the rules and procedures (including Lockout and Tag procedures)

RESULTS/COMMENTS

Activities and Findings:

I interviewed the VTA representatives in-charge of RWP and Restricted Area Access Control programs and reviewed relevant documentation as follows:

VTA has two RWP and Restricted Area Access programs: One for contractors and one for VTA employees.

For new extensions, VTA has the Training Procedures for Contractors. The training is an on going program on weekly basis. The trained contractor workers are given completion stickers to be located on worker's hard hat. The sticker has an expiration date. The contractor workers must pass an exam with a grade of 70% or better. The contractor companies are issued VTA right of way access permits. VTA distributes notifications to contract workers if there is a new procedure issued. VTA supervisors are dispatched to the work site to monitor and ensure adherence to the rules and procedures.

The VTA employees, who work on the new extension projects or on the existing system right of way, are all safety trained. VTA maintains a database for all employees and contractors who are safety trained for RWP and restricted areas. When unauthorized personnel are noticed on the right of way, the Control Center is

notified. A supervisor is dispatched to the location to check the permits and training stickers. Sheriff Department deputies are called in if unauthorized individuals refuse to leave the right of way.

I checked the training records for three VTA and three non-VTA employees. The work permit number and the sticker expiration dates were in order.

I also interviewed the VTA Control Center controllers. The Control Center maintains a binder that includes all the contractors work permits. VTA track allocation meetings are held weekly and records of the allocation is maintained at the Control Center.

Recommendation: None

2004 CPUC SYSTEM SAFETY AUDIT CHECKLIST FOR THE SANTA CLARA VALLEY TRANSPORTATION AUTHORITY

Checklist No.	**24**	Persons Contacted
Date of Audit	**October 26, 2004**	**Jacquelyn Adams, Program Manager**
Auditors	**Gary Rosenthal**	
Department	**Risk Management**	

REFERENCE CRITERIA

1. Code of Federal Regulations, 49 Parts 40 and 655
2. CPUC GO 143-B, Section 12.03 - Use of Alcohol, Narcotics, or Drugs Forbidden
3. Light Rail System Safety Program Plan, March 2002, Version Number 6, Element # 21-Drug and Alcohol Policy
4. VTA Substance Abuse Control Program: Drug & Alcohol Policy for Safety Sensitive Employees under FTA Regulations, Revision # 2, Dated November 1998.

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

DRUG & ALCOHOL POLICY

1. Interview the VTA representative in charge of the Drug and Alcohol Policy and determine whether or not VTA's policy is in compliance with State and Federal regulations
2. Review the report from the most recent FTA audit of the VTA Drug Prevention and Alcohol Misuse Program and the status of any corrective actions resulting from FTA recommendations.
3. Review the relevant records of employees in safety sensitive positions who tested positive for drugs or alcohol in the past three years to determine, for each employee that tested positive, whether or not:
   a. The employee was evaluated and released to duty by a Substance Abuse Professional (SAP)
   b. The employee was administered a return-to-duty test with verified negative results
   c. Follow-up testing was performed as directed by the SAP according to the required follow-up testing frequencies of the reference criteria after the employee has returned to duty
   d. Consequences for repeat offenders were carried out as required by the reference criteria.
   e. Random testing of safety sensitive employees is performed within the one-week period without excusing individuals for unacceptable reasons as required

RESULTS/COMMENTS

Activities and Findings:

1. I Interviewed the VTA Drug & Alcohol Program Manager and found that the VTA policy is in compliance with State and Federal regulations.
2. I reviewed the report from the most recent FTA audit of the VTA Drug Prevention and Alcohol Misuse Program, which was performed February 23 through 25, 2004 and found that the agency has reported that all corrective actions, resulting from the FTA recommendations, have been completed.
3. I reviewed the program records of the ten rail employees in safety sensitive positions who tested

positive for drugs or alcohol in the past three years. I found that each employee that tested positive for a controlled substance:

a. Was evaluated and later, released to duty by a Substance Abuse Professional;

b. Was administered a return-to-duty test with verified negative results;

c. Had follow-up testing that was performed as directed by the SAP according to the required follow-up testing frequencies of the reference criteria after the employee has returned to duty;

d. The single repeat offence was addressed as required by the VTA Substance Abuse Control Program;

4. I found that random testing of rail program safety sensitive employees, when carried out, was performed within the one-week period as required. However, I found that rail program safety sensitive employees were excused from random testing for unacceptable reasons as follows:

   a. 15 times out of 50 (30%) excused in 2001;

   b. 16 times out of 54 (30%) excused in 2002, and;

   c. 19 times out of 38 (50%) excused in 2003.

Recommendation:

VTA should take the steps necessary to identify the causes of the unacceptable excuses from random testing and take corrective actions to ensure that they are eliminated.

2004 CPUC SYSTEM SAFETY AUDIT CHECKLIST FOR THE SANTA CLARA VALLEY TRANSPORTATION AUTHORITY

Checklist No.	**25**	Persons Contacted
Date of Audit	**October 27, 2004**	**Garry Stanislaw, Transportation Superintendent**
Auditors	**Gary Rosenthal**	
Department	**Rail Operations**	

REFERENCE CRITERIA

1. CPUC General Order 143-B, Sections 13.04
2. Light Rail System Safety Program Plan, March 2002, Version Number 6, Element # 12-Rules and Procedures Review
3. Light Rail Operating Rulebook effective June 1, 2004, Chapter 1 – General, and Chapter 3 – Train Operation

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

TRAIN OPERATOR PERFORMANCE

1. Interview at least four train operators to evaluate their knowledge and understanding of Rules and Procedures
2. Observe, on-board, the operations of at least one train on each line, namely, Tasman West, Tasman East, Guadalupe (including mall), and Capitol to determine if each train operator performs in compliance with the governing orders, and Rules and Procedures.

RESULTS/COMMENTS

Activities and Findings:

1. I interviewed four train operators and discussed their knowledge and understanding of operating rules and procedures. I found that each train operator, with one exception, was at least reasonably familiar with the rules and procedures discussed. The remaining train operator proved to be reasonably familiar with rules and procedures when he was prompted.
2. I observed, from the cab, the operation of two trains on the Tasman East and Capitol Lines, two trains on the Tasman West Line, and three trains on the Guadalupe Line, including the downtown pedestrian mall. With one apparently anomalous exception, each train operator was alert, responsive, and performed in compliance with Train Orders, Special Instructions, as well as Light Rail Operations Rules and Procedures. The exception involved an apparently knowledgeable, conscientious, and competent train operator who slowed his train while approaching a red (stop indication) home signal at the Alum Rock Interlocking, but then, inexplicably, failed to stop the train until it was several feet past the signal. Gary Stanislaw immediately addressed the failure with the train operator.
3. I also interviewed Garry Stanislaw the VTA Light Rail Transportation Superintendent and reviewed records involving the VTA program of operations evaluations. I found that the VTA program of operations evaluations is defined in SOP 1.10. It is very comprehensive and includes unobserved Ride Checks and in-cab Ride-Alongs. Records indicate that VTA is on track to complete the minimum three Ride Checks per year established in its program. I was also told that VTA is in the process of re-

implementing its Safety Efficiency Testing program to evaluate train operator's alertness, knowledge, and compliance with rules and procedures in staged abnormal or less frequently encountered operating conditions.

Recommendation: None.

2004 CPUC SYSTEM SAFETY AUDIT CHECKLIST FOR THE SANTA CLARA VALLEY TRANSPORTATION AUTHORITY

Checklist No.	**26**	Persons Contacted
Date of Audit	**October 06, 2004**	**Peter Cipolla, General Manager** **Matthew Tucker, Chief Operating Officer** **Chris Eichin, Maintenance Engineering Manager** **Curt Nicks, Operations Manager** **Denise Dally, Chief of Staff**
Auditors	**Robert Strauss** **Mahendra Patel**	
Department	**General Manager**	

REFERENCE CRITERIA

1. CPUC General Order 164-C, Section 3 - Requirements for System Safety Program Plan
2. CPUC Commission Resolution ST-55, Dated June 27, 2002
3. APTA Rail Safety Audit Program: Manual for the Development of Rail Transit System Safety Program Plans, Elements 2-4
4. Light Rail System Safety Program Plan, March 2002, Version Number 6, Element # 2- Description and Purpose of the System Safety Program Plan and Elements 3 & 4-Goals and Objective
5. Performance evaluation criteria for General Manager, Chief Operating Officer, Risk Manager, Rail Operations Manager, Maintenance Engineering Manager, and Superintendents

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

AUTHORITY AND RESPONSIBILITY FOR THE SYSTEM SAFETY PROGRAM

Interview VTA's General Manager and Chief Operating Officer to evaluate the scope of Management involvement, coordination, and communication in VTA's efforts to satisfy the commitments and recommendations of the CPUC's Triennial Audit 2002 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

RESULTS/COMMENTS

<u>Activities and Findings</u>:

1. The General Manager provides overall direction for the transit system, but relies on the Chief Operating Officer and other senior managers for the day-to-day implementation of the safety program. The General Manager receives monthly and quarterly reports on statistics and trends

relating to safety. He is also on the VTA emergency call-out list and as such, receives immediate notifications of serious accidents and other major incidents, such as, LRV fire, terrorism, disaster, major power outage, evacuation, etc.

2. VTA uses a generic performance appraisal form for all employees, except the General Manager. The form does not mention safety or other objective measures. It emphasizes traits such as planning, initiative, and communication skills. The General Manager stated he evaluates safety performance based on measures and trends, such as workers compensation claims, accidents, and compliance to regulations and code.
3. The Chief Operating Officer is very involved in oversight of accident investigations. He reviews accident investigation reports and tracking reports on corrective actions. A superintendent in Protective Services is the scene coordinator and ensures the proper collection of information relating to an incident. An Accident Review Committee analyzes accident information. Major accidents are reviewed by the Serious Accident Committee, which addresses prevention and liability issues.
4. Many key safety decisions are made in the Rail System Safety Review Board (RSSRB) meetings. There is a committee process that includes representatives of major departments in the decisions.
5. The General Manager receives reports that track the implementation of corrective actions. The Chief Operating Officer and other senior managers are responsible for implementing corrective actions in their respective areas.

Recommendation: None.