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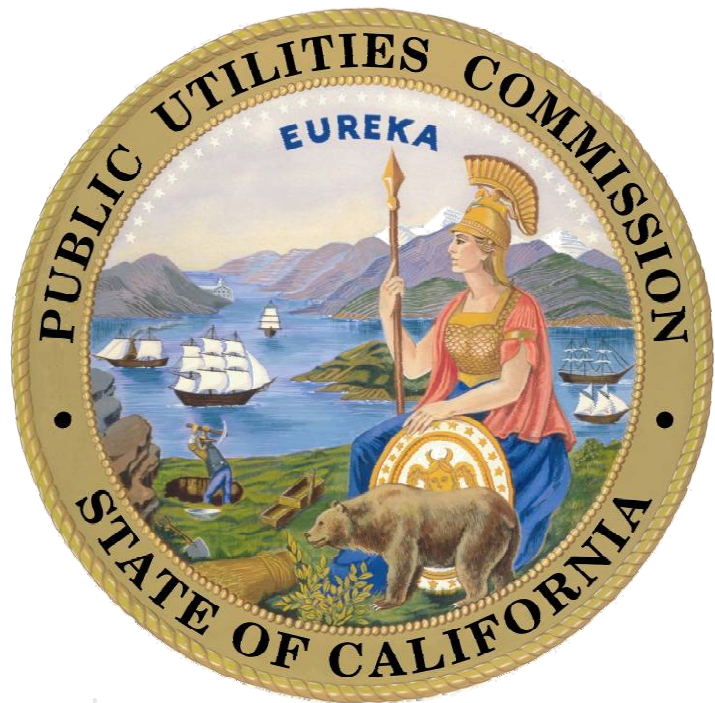
# **2007 TRIENNIAL ON-SITE SAFETY AND SECURITY REVIEW OF SANTA CLARA VALLEY TRANSPORTATION AUTHORITY (VTA)**

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

February 4, 2008

Final Report



Richard W. Clark, Director  
Consumer Protection and Safety Division

# 2007 TRIENNIAL ON-SITE SAFETY AND SECURITY REVIEW OF SANTA CLARA VALLEY TRANSPORTATION AUTHORITY (VTA)

## ACKNOWLEDGEMENT

The California Public Utilities Commission's Rail Transit Safety Section staff, with the assistance of the Commission's Railroad Operations Safety Branch, conducted this system safety and security programs review. Staff members directly responsible for conducting safety and security review and inspection activities include:

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## TABLE OF CONTENTS

|                                        | Page |
|----------------------------------------|------|
| 1. EXECUTIVE SUMMARY .....             | 1    |
| 2. INTRODUCTION .....                  | 2    |
| 3. BACKGROUND .....                    | 3    |
| VTA Rail System Description .....      | 3    |
| 2004 On-Site Safety Audit Result ..... | 5    |
| 4. REVIEW PROCEDURE .....              | 6    |
| 5. FINDINGS AND RECOMMENDATIONS.....   | 7    |

### APPENDICES

|                                                                |    |
|----------------------------------------------------------------|----|
| A.TSA Executive Summary of VTA System Security Review .....    | 15 |
| B. VTA 2007 Triennial Safety Review Checklist Index .....      | 18 |
| C. VTA 2007 Triennial Safety Review Recommendations List ..... | 20 |
| D. VTA 2007 Triennial Safety Review Checklists .....           | 22 |

## **1. EXECUTIVE SUMMARY**

The California Public Utilities Commission's (Commission) Consumer Protection and Safety Division (CPSD), Rail Transit Safety Section staff (staff), with assistance from the Railroad Operations Safety Branch and Utilities Safety Branch staff (staff), conducted an on-site safety and security review of Santa Clara Valley Transportation Authority's (VTA) system safety program in October 2007.

The on-site review was preceded by a pre-review conference with VTA personnel on October 15, 2007. Transportation Security Administration (TSA) representatives conducted the review of VTA's system security program on October 9, 2007.

Staff conducted the 2007 VTA on-site safety and security review from October 15 to October 19, 2007. The review focused on verifying the effective implementation of the system safety and security program plans.

Staff held a post-review conference with VTA personnel following the on-site safety and security review on October 30, 2007. Staff provided VTA personnel with a synopsis of the preliminary review findings and possible recommendations for corrective actions. TSA representatives held a similar post-review conference with VTA security personnel after their review of VTA's system security program on October 9, 2007. TSA representatives utilized the Surface Transportation Action Review Checklist to review VTA system security internal processes, procedures, and policies. Appendix A provides the TSA Executive Summary.

The review results indicate that VTA has a comprehensive System Safety Program Plan (SSPP) and has effectively carried out that plan. VTA was also found to have a progressive and effective security program by TSA which was invited to act as CPUC "security agent" during this triennial review. However, exceptions were noted during the review. These are described in the Findings and Recommendations section of each checklist. Of the 32 checklists, staff made 14 recommendations for corrective action. These are distributed among the Way, Power & Signal, Risk Management, and Maintenance Engineering departments.

The Introduction for this report is presented in Section 2. The Background, in Section 3, contains a description of VTA rail system and the 2004 on-site safety review results. Section 4 describes the review procedure. The review findings and recommendations are depicted in Section 5. The 2007 VTA Triennial Safety Review Checklist Index and the Recommendations List are included, respectively, in Appendices B and C. The Review Checklists are presented in Appendix D.

## 2. INTRODUCTION

The Commission's General Order (GO) 164-D<sup>1</sup>, *Rules and Regulations Governing State Safety Oversight of Rail Fixed Guideway Systems*, and the Federal Transit Administration's (FTA) Rule, Title 49 Code of Federal Regulations (CFR) Part 659, *Rail Fixed Guideway Systems: State Safety Oversight*, require the designated State Safety Oversight Agencies to perform a review of each rail transit agency's system safety program and system security plan at a minimum of once every three years. The purpose of the triennial review is to verify compliance and evaluate the effectiveness of each rail transit agency's System Safety Program Plan (SSPP) and System Security Plan (SSP) and to assess the level of compliance with GO 164-D as well as other Commission safety requirements. The previous on-site safety review of VTA was conducted by staff in October 2004.

VTA General Manager was advised by staff in a letter dated September 14, 2007 that the triennial review would be scheduled for the week of October 15, 2007. The letter included 32 checklists that served as the basis for the review. Four of the 32 checklists outlined inspection of track, signals, electric power systems, and vehicles. The remaining 28 checklists focused on the verification of the effective implementation of the safety and security program plans.

On October 17 and 18, 2007 staff from the Commission's Rail Operations Safety Branch conducted inspections of VTA's track and signals. Vehicle inspections were conducted on October 25, 2007. Staff conducted a pre-review conference on October 15, 2007 with VTA executives and department managers. TSA representatives conducted a review of VTA's system security program on October 9, 2007. TSA representatives utilized the Surface Transportation Act Review Checklist to review the internal processes, procedures, and policies of VTA system security program.

Staff conducted the on-site safety review and records review from October 15, 2007 to October 19, 2007. At the conclusion of each review activity, staff provided VTA personnel a summary of the preliminary findings and discussed any preliminary recommendations for corrective actions.

On October 30, 2007, staff conducted a post-review exit meeting with VTA's executives and department managers. Staff provided the attendees a synopsis of the findings from the 32 checklists and discussed the need for corrective actions where applicable.

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<sup>1</sup> The FTA's latest revision of 49 CFR Part 659 became effective in May 2006. Subsequently, the Commission revised and adopted General Order 164-D which superseded 164-C on May 3, 2007. Until the Commission's adoption of GO 164-D, staff requested VTA to revise their SSPP according to the FTA's latest revision of 49 CFR Part 659 which would be, in essence, the requirements of GO 164-D. Since this audit covered the time period that GO 164-D requirements weren't applicable, the reviewers referred to GO 164-C for a portion of the review. However, the reviewers referred to GO 164-D where applicable.

### **3. BACKGROUND**

VTA is both a transit provider and a multi-modal transportation development organization of Santa Clara County. The governing Board of Directors have 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.

#### **VTA Rail System Description**

VTA rail system consists of the Guadalupe, Tasman West, Tasman East, Capitol lines and Vasona Line with two other proposed extensions. The total operating system is about 42 miles with 62 Light Rail Stations. The average ridership of the system is approximately 26,000 per day in the year 2006.

##### 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, 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 vehicles 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 is a 5.3-mile light rail extension to the existing VTA Light Rail system and operates primarily on the existing Union Pacific Railroad right-of-way. Revenue service began in 2005. It has 8 light rail stations.

#### 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. This project is in the preliminary engineering phase.

#### BART Silicon Valley Project

The Silicon Valley project is a 16-mile extension of the BART system that would begin at the planned BART Warm Springs Station in the City of Fremont in Alameda County and proceed through the cities of Milpitas, San Jose, and Santa Clara in Santa Clara County. This fully grade separated project will add 6 stations and one future station in Milpitas. This project is in the preliminary engineering phase.

**2004 On-Site Safety Audit Result**

Staff performed the triennial on-site safety audit of VTA System Safety Program in October 2004. The 26 checklists resulted in 22 recommendations.

VTA developed corrective action plans to implement the recommendations. All 22 recommendations have been closed.



#### **4. REVIEW PROCEDURE**

Staff conducted the review in accordance with the Rail Transit Safety Section Procedure RTSS-4, *Procedure for Performing Triennial Safety Audits of Rail Transit Systems*.

Staff developed thirty-two (32) checklists to cover various aspects of system safety responsibilities, based on Commission and FTA requirements, VTA SSPP, safety related VTA documents, and the staff's knowledge of the transit system. The 32 checklists are included in Appendix D.

Each checklist identifies safety-related elements and characteristics that staff reviewed or inspected. Each of the checklists also references Commission, VTA, and other documents that establish the safety program requirements. The completed checklists include review findings, and recommendations if the review findings indicate deficiencies. The completed checklists may include comments and suggestions to improve VTA's system safety program. The methods used to perform the review include:

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

## **5. FINDINGS AND RECOMMENDATIONS**

The reviewers and inspectors concluded that the VTA rail system has a comprehensive SSPP and has been effectively implementing the plan.

Review findings identify areas where changes should be made to further improve VTA system safety program. The review results are derived from activities observed, documents reviewed, issues discussed with management, and inspections. Overall, the review result confirms that VTA is in compliance with its SSPP. The review identified 14 recommendations from the 32 checklists. Following are the findings and recommendations for each checklist:

### **1. Vehicle Maintenance Inspection**

Staff did not find any deficiencies.

### **2. Track and Switch Inspection**

Staff did not find any deficiencies.

### **3. Gated Grade Crossings Warning Devices Inspection**

Staff found the following deficiencies:

- Some crossings gate tips were not within the required 3'-6" from roadway as required by GO 75-D and FRA 234.223.05 and one pedestrian warning sign was blocked by vegetation (these were immediately corrected on October 18, 2007).
- Corrective actions pertaining to credible reports on the Vasona Line which are used to document repairs to correct activation failures were not documented properly.

#### **Recommendation:**

1. VTA should revise its appropriate grade crossing preventive maintenance procedures to add the requirements of ensuring crossing gate heights comply with General Order 75-D and pedestrian warning signs are not blocked by vegetation or other means.
2. VTA should develop controls to make certain that corrective actions pertaining to grade crossing credible reports are properly documented (CFR 49 Part 229.15).

### **4. Traction Power Inspection**

Staff found the following deficiencies:

- At some locations, tree branches and/or foliages were within 18 inches from the energized wires. This condition is a violation of GO 95 Table 1 of Rule 37, Case 13 – Column 3, and Rule 35.
- At some locations, VTA is still in violation of GO 95 Rule 74.4-F despite the use of the Philistrand at OCS terminations.

**Recommendation:**

3. VTA should inspect the entire OCS and take necessary measures to ensure tree branches and/or foliage are in compliance with the requirements of GO 95 Table 1 of Rule 37, Case 13 – Column 3, and Rule 35, as well as, the system is constructed in compliance with GO 95 Rule 74.4-F.

**5. Overhead Catenary System Inspections and Records**

Staff found the following deficiency:

- Some OCS inspection records did not display supervisor's signature approving the inspection. A person should be designated to review and approve maintenance forms in the event a supervisor is not available.

**Recommendation:** (see recommendation #4 in checklist #6)

**6. Substation Inspections and Records**

Staff found the following deficiencies:

- Inspection forms were not updated for use with the new Impulse substations.
- An observation was made that some Yr 2006 inspection records did not display supervisor's signature approving the inspection. Staff suggested that VTA should designate a person to review and approve maintenance forms in the event a supervisor is not available.

**Recommendation:**

4. VTA should revise its current annual substation inspection procedure to include forms which pertain to the new Impulse Substations and add the requirement of designating a qualified person to review and approve substation and OCS inspection and maintenance records in the event a supervisor is not available to do so.

**7. Internal Safety and Security Audits/Reviews**

Staff found the following deficiency:

- Staff found that VTA auditors had several recommendations as a result of the 2007 internal audit; however, there were no corresponding corrective action plans and implementation schedules listed in the checklist to address these recommendations.

**Recommendation:**

5. VTA should ensure that a description of Corrective Action Plan; Implementation Schedule Date of the Corrective Action Plan; and Completion Status (Date and Action taken to correct noted items) is included in the checklist for each recommendation made by the VTA auditor as a result of the audit and tracked by RSSRB to ensure that the recommendations are implemented in a timely manner (GO 164-D Rule 5.5).

**8. Right-of-Way Maintenance**

Staff found the following deficiency:

- At some locations, fencing was found to be in need of repair.

**Recommendation:**

6. VTA should prioritize fencing installation/repair such that fencing in areas with likely pedestrian intrusions be repaired expediently (GO 143-B Rule 9.03).

**9. Vital Relays Inspections, Maintenance and Records**

Staff found the following deficiencies:

- Yr 2005 Biennial Vital Relay records for some relay cases were not found (VTA immediately started Biennial Relay PM's on October 19, 2007 which are scheduled for completion on October 28, 2007 for Cases 26 to 71 and 72 to 119).
- At locations, VTA had exceeded the maximum allowable pick-up voltage values and did not replace these relays as required. This also applied to some Vane Relays which were found to have drop away voltage values below required minimums.

**Recommendation:**

7. VTA should produce documentation that it replaced all relays not meeting prescribed voltage requirements and develop controls to make certain that vital relays are maintained to standards with appropriate supporting documentation (MTN-PR-6206).

**10. Employee and Contractors Safety Program**

Staff found the following deficiency:

- No documentation was found to show closure of identified deficiencies in the Maintenance Superintendent's Inspection and Monthly Safety Inspection Checklist for facilities inspection records.

**Recommendation:**

8. VTA should document the closure of identified deficiencies found during Maintenance Superintendent's and Monthly Safety Facilities Inspections and incorporate a sign-off section in the applicable inspection records.

**11. Calibration of Measuring and Testing Equipment Program**

Staff did not find any deficiencies.

**12. Gated Crossing Maintenance**

Staff did not find any deficiencies.

**13. Accident/Incident Reporting and Investigation**

Staff did not find any deficiencies.

**14. Safety Certification**

Staff did not find any deficiencies.

**15. Configuration Management**

Staff did not find any deficiencies.

**16. Review Operating Rules and Procedures Manual**

Staff did not find any deficiencies.

**17. Hazardous Materials Programs / Environmental Management**

Staff found the following deficiency:

- The process of FRS-RM-1801 was internally reviewed January 5, 2005. The next internal review was dated January, 2007. FRS-RM-1801 Section 4.8 prescribes annual review of confined space entries.
- Confined space entries for some Sump Pump locations were not recorded by some employees and despite the fact that certain Sump Pump locations are not considered confined space they are listed on the Confined Space List.

**Recommendation:**

9. VTA should conduct an annual audit of its confined space entries as prescribed by FRS-RM-1801 Section 4.8 as well as update and clearly define the Confined Space Entry List.

**18. Emergency Response Planning, Coordination, Training**

Staff did not find any deficiencies.

**19. Light Rail Training and Certification**

Staff did not find any deficiencies.

**20. Light Rail Vehicle Maintenance**

Staff did not find any deficiencies.

**21. Drug and Alcohol Program**

Staff found the following deficiency:

- There were 9 cases of unacceptable excuses for random testing during the years 2004, 2005, and 2006.

**Recommendation:**

10. VTA should develop controls to eliminate unacceptable excuses for drug & alcohol testing when randomly attempting to test its safety sensitive employees (CFR 49 Parts 40 and 655).

**22. Operational Evaluation Records**

Staff did not find any deficiencies.

**23. Hours of Service – Train Operators, Train Controllers, and Supervisors**

Staff did not find any deficiencies.

**24. Way, Power, and Signal Internal Audit Program**

Staff found the following deficiency:

- MTR-PR-6805 (Way, Power & Signal Internal Audit Program) is not being followed.

**Recommendation:**

11. VTA should ensure that WP&S preventive maintenance audits are conducted and all required records are prepared in accordance with MTN-PR-6805 requirements.

**25. Bridges/Structures Inspections and Reports**

Staff found the following deficiency:

- VTA has no Standard Operating Procedure (SOP) for the maintenance of its concrete structures that distinguishes between structural and maintenance defects and requires the development of a corrective action plan and implementation schedule to address identified defects.

**Recommendation:**

12. VTA should develop a Bridge/Concrete Structures Inspection SOP distinguishing between maintenance and structural defects including documentation of appropriate corrective action plan, department responsible for corrective actions and implementation schedule to address identified defects.

**26. Procurement**

Staff did not find any deficiencies.

**27. Facility Inspections**

Staff found the following deficiency:

- Platform preventive maintenance is not being performed at the required frequencies.

**Recommendation:**

13. VTA should either adhere to its Monthly Platform Preventive Maintenance Procedure (MTN-PR-6201) or revise it to reflect actual practice.

**28. Track Components Inspection**

Staff found the following deficiency:

- There exist a number of deferred maintenance items and no controls currently exist to alert management when noted defects found during preventive maintenance inspections are not being corrected in a timely manner.

**Recommendation:**

14. VTA should develop controls to ensure track defects found during inspections are not being deferred but rather corrected in a timely manner (MTN-PR-6408).

**29. Security**

Staff did not find any deficiencies.

**30. Safety Data Collection and Analysis**

Staff did not find any deficiencies.

**31. Hazardous Management Process**

Staff did not find any deficiencies.

**32. System Modification**

Staff did not find any deficiencies.



## **APPENDICES**

- A. TSA Executive Summary of VTA System Security Review
- B. VTA 2007 Triennial Safety Review Checklist Index
- C. VTA 2007 Triennial Safety Review Recommendations List
- D. VTA 2007 Triennial Safety Review Checklists

**APPENDIX A**  
**TSA EXECUTIVE SUMMARY**

October 31, 2007

U.S. Department of Homeland Security



Transportation  
Security  
Administration

## EXECUTIVE SUMMARY

Ms. Georgetta Gregory  
Supervisor Rail Transit Safety Section  
State of California Public Utilities Commission  
Consumer Safety and Protection Division  
Rail Operations and Safety Branch  
320 W. 4<sup>th</sup> Street, Room 500  
Los Angeles, CA 90013

Re: State of California Public Utilities Commission (CPUC) Tri-ennial Safety and Security Audit of the Santa Clara Valley Transportation Authority (VTA)

Dear Ms. Gregory:

On behalf of the Surface Transportation Security Inspection Program (STSIP), the following reflects the results of our involvement with your organization and VTA system safety/security personnel during October, 2007 in San Jose as part of CPUC's Tri-ennial Safety and Security Audit process. Acting as your "security agent" in this process, we utilized the TSA Baseline Assessment and Security Enhancement (BASE) Review checklist to document and baseline the internal processes, procedures and policies inherent to the VTA system in light of the most recent CFR 49 Part 659 requirements.

Following our review of VTA documents and interviews of key personnel, we compared our findings with the Security Plan requirements contained in CPUC General Order No. 164-D, Sections 4 and 5. This letter provides a summary of our findings with respect to compliance with those sections.

The information collected reflects information contained in various documents including VTA's:

- System Security Plan (SSP),

- Emergency Operations Plan,
- Fire/Life Safety Program,
- Emergency response exercise after-action reports.

The System Security Plan was updated in July, 2007 and CPUC review of the document was confirmed by letter dated August 24, 2007.

Personnel interviews were also conducted with VTA security, operations, risk management and training personnel. In addition, STSIP personnel visited several VTA facilities and have observed operations.

Our findings of deficiencies are as follows:

- A process for conducting internal security reviews to evaluate compliance and measure the effectiveness of the Security Plan is not described in the SSP. (GO-164-D, Sec 4.3.d)
- A schedule of internal security audits to be performed during each calendar year has not been established. (GO-164-D, Sec 5.3)
- As a schedule for internal security audits has not been developed, annual security audits have not been performed nor documented. (GO-164-D, Secs. 5.1 and 5.5)
- Annual reports and formal letters certifying compliance with the SSP have not been submitted to CPUC. (GO-164-D, Secs. 5.5.a, 5.5.b and 5.5.c)

It should be noted that the deficiencies identified all relate to documentation required in the referenced sections of GO-164-D. While these deficiencies need remediation, it is also important to note that based on our overall review of documents, interviews and system observations, we found that VTA has a progressive and effective security program in place and is an active participant in emergency response exercises with police and fire departments in its service area.

Once again, we appreciate the opportunity to be of assistance to CPUC in conducting the security portion of the Tri-ennial Audits.

Sincerely,

Ken W. Dixon  
 Inspector  
 Transportation Security Administration  
 Surface Transportation Security Inspector Program  
 245 So. Spruce Avenue  
 South San Francisco, CA 94080

Cc: Mr. Raed Dwairi, CPUC  
 Ms. Cathy Hendrix – SC VTA

## APPENDIX B

### 2007 VTA TRIENNIAL SAFETY REVIEW CHECKLIST INDEX

| Checklist No. | Department                                                                                                                 | Element/Characteristics                                |
|---------------|----------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|
| 1             | Vehicle Maintenance                                                                                                        | Light Rail Vehicle Inspection – CPUC INSPECTOR         |
| 2             | Way, Power & Signal                                                                                                        | Track and Switch Inspection – CPUC INSPECTORS          |
| 3             | Way, Power & Signal                                                                                                        | Gated Grade Crossings Warning Devices – CPUC INSPECTOR |
| 4             | Way, Power & Signal                                                                                                        | Traction Power Inspection – CPUC INSPECTOR(S)          |
| 5             | Way, Power & Signal                                                                                                        | Overhead Catenary System Inspections and Records       |
| 6             | Way, Power & Signal                                                                                                        | Substation Inspections and Records                     |
| 7             | Risk Management                                                                                                            | Internal Safety & Security Audits/Reviews              |
| 8             | Way, Power & Signal                                                                                                        | Right-of-Way Maintenance                               |
| 9             | Way, Power & Signal                                                                                                        | Vital Relays Inspections, Maintenance and Records      |
| 10            | Risk Management                                                                                                            | Employee and Contractors Safety Program                |
| 11            | Quality Assurance                                                                                                          | Calibration of Measuring and Testing Equipment Program |
| 12            | Way, Power & Signal                                                                                                        | Gated Crossing Maintenance                             |
| 13            | Risk Management<br>Transportation<br>Maintenance Engineering                                                               | Accident/Incident Reporting and Investigation          |
| 14            | Risk Management<br>Engineering and<br>Construction                                                                         | Safety Certification                                   |
| 15            | Records Management<br>Rail Design and<br>Construction<br>Vehicle Maintenance<br>Maintenance Engineering<br>Risk Management | Configuration Management                               |

|    |                                   |                                                                        |
|----|-----------------------------------|------------------------------------------------------------------------|
| 16 | Rail Operations                   | Review Operating Rules and Procedures Manual                           |
| 17 | Risk Management                   | Hazardous Material Programs/Environmental Management                   |
| 18 | Risk Management                   | Emergency Response, Planning, Coordination, Training                   |
| 19 | Rail Operations<br>Tech. Training | Light Rail Training and Certification                                  |
| 20 | Vehicle Maintenance               | Light Rail Vehicle Maintenance                                         |
| 21 | Administrative Services           | Drug & Alcohol Program                                                 |
| 22 | Technical Training                | Operational Evaluation Records                                         |
| 23 | Operations                        | Hours of Service – Train Operators, Train Controllers, and Supervisors |
| 24 | Way, Power & Signal               | Way, Power & Signal Internal Audit Program                             |
| 25 | Engineering                       | Bridges/Structures Inspections & Reports                               |
| 26 | Materials Mgmt.                   | Procurement                                                            |
| 27 | Way, Power & Signal               | Facility Inspections                                                   |
| 28 | Way, Power & Signal               | Track Components Inspection                                            |
| 29 | Protective Services               | Security                                                               |
| 30 | Risk Management<br>Operations     | Safety Data Collection and Analysis                                    |
| 31 | Risk Management<br>Operations     | Hazard Management Process                                              |
| 32 | Maintenance Engineering           | System Modification                                                    |

## APPENDIX C

### 2007 VTA TRIENNIAL SAFETY REVIEW RECOMMENDATIONS LIST

| No. | Recommendation                                                                                                                                                                                                                                                                                                                                                                                                         | Checklist No. |
|-----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
| 1   | VTA should revise its appropriate grade crossing preventive maintenance procedures to add the requirements of ensuring crossing gate heights comply with General Order 75-D and pedestrian warning signs are not blocked by vegetation or other means.                                                                                                                                                                 | 3             |
| 2   | VTA should develop controls to make certain that corrective actions pertaining to grade crossing credible reports are properly documented (CFR 49 Part 225.19).                                                                                                                                                                                                                                                        | 3             |
| 3   | VTA should inspect the entire OCS and take necessary measures to ensure tree branches and/or foliage are in compliance with the requirements of GO 95 Table 1 of Rule 37, Case 13 – Column 3, and Rule 35, as well as, the system is constructed in compliance with GO 95 Rule 74.4-F.                                                                                                                                 | 4             |
| 4   | VTA should revise its current annual substation inspection procedure to include forms which pertain to the new Impulse Substations and add the requirement of designating a qualified person to review and approve substation and OCS inspection and maintenance records in the event a supervisor is not available to do so.                                                                                          | 6             |
| 5   | VTA should ensure that a description of Corrective Action Plan; Implementation Schedule Date of the Corrective Action Plan; and Completion Status (Date and Action taken to correct noted items) is included in the checklist for each recommendation made by the VTA auditor as a result of the audit and tracked by RSSRB to ensure that the recommendations are implemented in a timely manner (GO 164-D Rule 5.5). | 7             |
| 6   | VTA should prioritize fencing installation/repair such that fencing in areas with likely pedestrian intrusions be repaired expediently (GO 143-B Rule 9.03)                                                                                                                                                                                                                                                            | 8             |
| 7   | VTA should produce documentation that it replaced all relays not meeting prescribed voltage requirements and develop controls to make certain that vital relays are maintained to standards with appropriate supporting documentation (MTN-PR-6206).                                                                                                                                                                   | 9             |
| 8   | VTA should document the closure of identified deficiencies found during Maintenance Superintendent's and Monthly Safety Facilities Inspections and incorporate a sign-off section in the applicable inspection records.                                                                                                                                                                                                | 10            |

|    |                                                                                                                                                                                                                                                                                                  |    |
|----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|
| 9  | VTA should conduct an annual audit of its confined space entries as prescribed by FRS-RM-1801 Section 4.8 as well as update and clearly define the Confined Space Entry List.                                                                                                                    | 17 |
| 10 | VTA should develop controls to eliminate unacceptable excuses for drug & alcohol testing when randomly attempting to test its safety sensitive employees (CFR 49 Parts 40 and 655).                                                                                                              | 21 |
| 11 | VTA should ensure that WP&S preventive maintenance audits are conducted and all required records are prepared in accordance with MTN-PR-6805 requirements.                                                                                                                                       | 24 |
| 12 | VTA should develop a Bridge/Concrete Structures Inspection SOP distinguishing between maintenance and structural defects including documentation of appropriate corrective action plan, department responsible for corrective actions and implementation schedule to address identified defects. | 25 |
| 13 | VTA should either adhere to its Monthly Platform Preventive Maintenance Procedure (MTN-PR-6201) or revise it to reflect actual practice.                                                                                                                                                         | 27 |
| 14 | VTA should develop controls to ensure track defects found during inspections are not being deferred but rather corrected in a timely manner (MTN-PR-6408).                                                                                                                                       | 28 |



## **APPENDIX D**

### **2007 VTA TRIENNIAL REVIEW CHECKLISTS**

**2007 CPUC SYSTEM SAFETY AND SECURITY CHECKLIST FOR  
THE SANTA CLARA VALLEY TRANSPORTATION AUTHORITY**

|               |                                |                                                    |
|---------------|--------------------------------|----------------------------------------------------|
| Checklist No. | <b>1</b>                       | Persons Contacted                                  |
| Date of Audit | <b>10/25/07</b>                | James Ersted - Light Rail Equipment Superintendent |
| Auditors      | <b>Chris Ducote</b>            |                                                    |
| Department    | <b>Vehicle<br/>Maintenance</b> |                                                    |

**REFERENCE CRITERIA**

1. CPUC GO 143-B Section 14.04-Light Rail Vehicle Maintenance Practices and Records.
2. Light Rail System Safety Program Plan, June 2007
3. MTN-PR-5150-Light Rail Vehicle Daily Inspection Procedures, Revised 09/24/2001
4. MTN-PR-5158-Light Rail Vehicle Maintenance Work Orders, Revised 09/24/2001
5. MTN-PR-5120-Light Rail Vehicle Inspections and Reprofilng, Issued 10/29/2003
6. MTN-PR-5156-Preventive Maintenance (PM) Scheduling for Light Rail Vehicles, Issued 08/21/2001

**ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION**

**LIGHT RAIL VEHICLE INSPECTION – CPUC INSPECTOR**

Utilizing the services of CPUC/FRA qualified inspector from the Commission’s Railroad 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 mechanism
  - f. Passenger component/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.

**FINDINGS AND RECOMMENDATIONS**

Activities and Findings:

Staff conducted a focused mechanical inspection on the Santa Clara County Valley Transit LRVs (Light Rail Vehicles) at their main repair facility at 101 West Younger Avenue, San Jose, California. During this

inspection staff concentrated on the condition of the repair facility, adherence to periodic maintenance schedules and record keeping of the vehicles inspected. The following was found:

1. Repair facility was well organized, clean and safe environment to work in which is equipped with modern procedures and equipment. VTA has the in-house capability to perform wheel truing and re profiling, off-car traction motor testing, wheel mounting, truck repair and overhauling. It has a complete body and paint shop, an electronic shop for all on-board circuit testing, and a brake system repair shop.
2. VTA employees interviewed in the shop were knowledgeable.
3. All vehicles inspected (924, 902, 971, and the 950) which were in for various stages of their periodic maintenance schedules ("A" PM (10k miles) "B" PM (30k miles) "C" PM (60k miles) "D" PM (120k miles) and "E" PM (240k miles)), were found defect free.
4. Vehicle #924 which had oil on the roof stepping area coming from the air compressor that would create a slipping hazard.
5. An air compressor mounts were broken. Through further examination of maintenance records this item was already noted on the corresponding Work Order to be repaired.
6. Truck grounding straps were found rubbing against the outboard disk brake rotors on the "C" trucks on all four vehicles.
7. Through an inspection of the PM records and the Work Orders created from these inspections on the four vehicles, procedures and guidelines were carefully followed.
8. There was no evidence of deferred safety sensitive maintenance practices.

Recommendations:

None

**2007 CPUC SYSTEM SAFETY AND SECURITY CHECKLIST FOR  
THE SANTA CLARA VALLEY TRANSPORTATION AUTHORITY**

|               |                                      |                                                                      |
|---------------|--------------------------------------|----------------------------------------------------------------------|
| Checklist No. | <b>2</b>                             | Persons Contacted                                                    |
| Date of Audit | <b>10/17/07</b>                      | Tom Ryan – Signal Supervisor<br>Jose Hernandez – Senior Track Worker |
| Auditors      | <b>Brian Chavez<br/>Felipe Ayala</b> |                                                                      |
| Department    | <b>Way, Power &amp;<br/>Signal</b>   |                                                                      |

**REFERENCE CRITERIA**

1. Code of Federal Regulations CFR 49, Part 213-Track Safety Standards
2. CPUC GO 143-B Section 14.04-Light Rail Vehicle Maintenance Practices and Records.
3. Light Rail System Safety Program Plan, June 2007
4. MTN-PR-6415-Inspection and Maintenance of Turnouts and Diamond Crossings, Issued 09/15/2000
5. MTN-PR-6416- Inspection and Maintenance of Rail Crossings, Issued 09/15/2000
6. MTN-PR-6405-Track Geometry Standards, Issued 09/15/2000

**ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION**

**TRACK AND SWITCH INSPECTIONS – CPUC INSPECTORS**

Utilizing the services of CPUC/FRA qualified inspector 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 inspection/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.

**FINDINGS AND RECOMMENDATIONS**

Activities and Findings:

Staff inspected track and signal components from mile post 0004.00 to 0004.20 on the Vasona Line and found no visual defects during this inspection.

No exceptions were noted.

Recommendations:

None

**2007 CPUC SYSTEM SAFETY AND SECURITY CHECKLIST FOR  
THE SANTA CLARA VALLEY TRANSPORTATION AUTHORITY**

|               |                                                       |                                  |
|---------------|-------------------------------------------------------|----------------------------------|
| Checklist No. | <b>3</b>                                              | Persons Contacted                |
| Date of Audit | <b>10/18/07</b>                                       | George Ramos - Signal Supervisor |
| Auditors      | <b>Sherman Boyd<br/>Felipe Ayala<br/>Brian Chavez</b> | Tom Ryan - Signal Supervisor     |
| Department    | <b>Way, Power &amp;<br/>signal</b>                    |                                  |

**REFERENCE CRITERIA**

1. Code of Federal Regulations CFR 49, Part 234-Grade Crossing Signal System Safety
2. Light Rail System Safety Program Plan, June 2007
3. MTN-PR-6205-Grade Crossing Warning System Inspection and Preventive Maintenance, Version Number 02, Issued 3/8/2006.

**ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION**

**GATED GRADE CROSSINGS WARNING DEVICES – CPUC INSPECTOR**

1. Review and evaluate the adequacy of VTA's Gate Crossing Preventive Maintenance programs and standards.
2. Randomly select five gated crossings and perform detailed inspections to determine whether or not warning devices are in compliance with the applicable reference criteria. The inspection includes the alignment of 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).

**FINDINGS AND RECOMMENDATIONS**

Activities and Findings:

Staff inspected and checked the overall compliance of the grade crossing warning system with FRA 234 regulations, applicable CPUC General Orders, and VTA maintenance procedure MTN-PR-6205-Grade Crossing Warning System Inspection and Preventive Maintenance, dated 3/8/2006. Five crossings were inspected on the Vasona line. Four were combined freight and light rail and one was exclusively light rail.

Staff reviewed maintenance procedure MTN-PR-6205-Grade Crossing Warning System Inspection and Preventive Maintenance, dated 10/30/02. Additionally, staff reviewed the list of Credible reports for the Vasona Line for compliance with FRA regulations 234.103,105, 106,107.109, and 234.273. The following was found:

1. The revised version of MTN-PR-6205-Grade Crossing Warning System Inspection and Preventive

Maintenance, dated 3/8/2006 had been updated in many areas including testing for grounds, Grade Crossing Predictors and traffic pre-emption procedures. Staff found the revised version to be much more up to date and inclusive of both FRA regulations and applicable CPUC General Orders.

2. **Race Street Gated Grade Crossing (CPUC # 82D-4.12)** – Two exceptions noted; First, FRA 234.223.05, gate arms not in horizontal position. Both “F” & “G” gate tips below CPUC General Order 75-D required 3’-6” from crown of road. This can be corrected by leveling gate arms and bringing gate tips up to the required minimum of 3’-6” above roadway. (VTA Signal Supervisor will ask swing shift crew to make correction. Second, pedestrian warning sign view blocked by tree limbs. (VTA crew to make correction as well)
1. **Lincoln Ave CPUC # 82D-3.90** - One exception noted; FRA 234.223.05 Gate not in horizontal position. “C” gate tip below CPUC General Order 75-D required 3’-6” from crown of road. This can be corrected by leveling gate and bringing gate tip up to minimum 3’-6” above roadway. (Again VTA Signal Supervisor will ask swing shift crew to make correction).
2. **West San Carlos Street (CPUC # 82D-3.49)** – No exceptions noted.
3. **Parkmoor Ave (CPUC # 82D-4-16)**- No exceptions noted
4. **San Fernando (CPUC # 82D-2.66)**-No exceptions noted at this exclusive light rail crossing.
5. Credible reports reviewed which pertain to the Vasona Line showed great improvement since staff inspected for compliance with FRA regulations (CFR 49 Part 225.19). These reports document system failures including activation failures (partial activations and false activations included) and the corresponding corrective actions that are needed to address these failures. These corrective actions were not documented properly, in that, they did not describe clearly what repairs were made and the tests performed to ensure normal operation prior to returning the crossing to service. One concern was noted on the corrective action portion that is required. Corrective action is designed to document what repairs were made and that the crossing was properly tested then returned to service. The corrective action should not state what the problem that was found but what action was taken to correct the problem and the crossing was properly repaired before retuning it to service.
6. VTA staff does an excellent job on response time and on getting crossings repaired and returned back to service in a timely manner.

Recommendations:

1. VTA should revise its appropriate grade crossing preventive maintenance procedures to add the requirements of ensuring crossing gate heights comply with General Order 75-D and pedestrian warning signs are not blocked by vegetation or other means.
2. VTA should develop controls to make certain that corrective actions pertaining to grade crossing credible reports are properly documented (CFR 49 Part 225.19).

**2007 CPUC SYSTEM SAFETY AND SECURITY REVIEW CHECKLIST FOR  
THE SANTA CLARA VALLEY TRANSPORTATION AUTHORITY**

|               |                                              |                                                                                |
|---------------|----------------------------------------------|--------------------------------------------------------------------------------|
| Checklist No. | <b>4</b>                                     | Persons Contacted                                                              |
| Date of Audit | <b>10/16/07</b>                              | Philip Sharp – Power Supervisor                                                |
| Auditors      | <b>Brian Yu<br/>Ni Liu<br/>Vincent Kwong</b> | Woodson Kyle – Overhead Lineworker<br>Abdi Alaghmandan – Substation Maintainer |
| Department    | <b>Way, Power &amp;<br/>Signal</b>           |                                                                                |

**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, June 2007
4. MTN-PR-6150-Inspection of Overhead Catenary System, Version Number 02, Issued 09/30/05
5. MTN-PR-6151 – Inspection of Way, Power and Signal Substations, Version Number 02, Issued 09/30/05

**ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION**

**TRACTION POWER INSPECTION – CPUC 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, Tasman Line, and Vasona Line to perform detailed inspections and determine whether or not the selected OCS sections and TPSS are in compliance with the applicable reference criteria.

**FINDINGS AND RECOMMENDATIONS**

Activities and Findings:

Staff selected the following OCS sections and performed visual inspection and OCS height measurements:

- Gish Station (Southbound Platform) to Highway I-880
- Basset Tunnel
- San Jose Downtown Loop
- Children’s Discovery Museum Station
- Almaden Station
- Ohlone/Chynoweth Switch
- Tasman Station
- Tasman East/West Junction



- Baypoint Station
- Lick Mill Station

Staff also selected the following TPSS's and performed visual inspection:

- TPSS 2
- TPSS 5
- TPSS 6
- TPSS 7
- TPSS 11

Overall, the VTA OCS sections inspected were in good repair and comply with GO 95 requirements. However, staff noted the following violations:

#### Tree Branch Clearance

At the two locations below, tree branches and/or foliages were within 18 inches from the energized wires. This condition is a violation of GO 95 Table 1 of Rule 37, Case 13 – Column 3, and Rule 35.

- North and South of Gish Station (around Messenger Wires)
- Downtown Loop Pole 123A – M and 123B – M (around feeder cable)

#### Traction Power Substations

All TPSS inspected were properly anchored to the concrete slabs, properly locked to prevent intrusions, and inspection logs were all in place. No exceptions were noted.

#### Contact Wire Height Measurements

All contact wire heights measured at the locations listed below 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.

- South Edge of Basset Tunnel Southbound Track – 13 feet 6 inches
- South Edge of Basset Tunnel Northbound Track – 14 feet 2 inches
- Pole 129A – M – S – 20 feet 4 inches

#### GO 95 Rule 74.4F – At Points of Failure

Staff observed that VTA had installed “Philistrand” catch cables at every OCS termination; however, staff found that at the locations listed below, VTA was still in violation of GO 95 Rule 74.4F even with the “Philistrand” application:

- 1<sup>st</sup> OCS Pole North of I-880 – Philistrand wires should have been attached to the supporting bracket arm rather than the yoke plate
- Messenger wires at north end of Tasman Station Platform (on both tracks)
- Out of running Messenger and Contact wires terminating to Pole 4.46B
- Out of running Contact wires terminating to Pole 0.01T (on both sides)
- A Rod Insulator on the out of running Contact wire at Pole B916E made the out of running Contact wire to be in violation of GO 95 Rule 74.4F. Without the insulator, or if the insulator was placed on

the opposite side of the Pole, the Contact wire at this location would have been in compliance.

Recommendation:

VTA should inspect the entire OCS and take necessary measures to ensure tree branches and/or foliage are in compliance with the requirements of GO 95 Table 1 of Rule 37, Case 13 – Column 3, and Rule 35, as well as, the system is constructed in compliance with GO 95 Rule 74.4-F.

**2007 CPUC SYSTEM SAFETY AND SECURITY REVIEW CHECKLIST FOR  
THE SANTA CLARA VALLEY TRANSPORTATION AUTHORITY**

|               |                                     |                                 |
|---------------|-------------------------------------|---------------------------------|
| Checklist No. | <b>5</b>                            | Persons Contacted               |
| Date of Audit | <b>10/15/07<br/>10/17/07</b>        | Philip Sharp – Power Supervisor |
| Auditors      | <b>Brian Yu</b>                     |                                 |
| Department    | <b>Way, Power, &amp;<br/>Signal</b> |                                 |

**REFERENCE CRITERIA**

1. GO 143-B, Section 14.06-Traction Power System Inspections and Records
2. Light Rail System Safety Program Plan, June 2007
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 Overhead Catenary System (OCS) inspections performed during the last three 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 and tracking method used to verify the timely closure of work orders when generated as a result of scheduled inspections.
3. Noted defects were corrected in a timely manner.

**FINDINGS AND RECOMMENDATIONS**

Activities and Findings:

Staff selected the following segments of OCS and reviewed their inspection records:

- Lick Spur
- North Line
- Vasona Line

Overall, VTA conducted the scheduled inspections and maintenance repairs at the specified intervals.

- Staff found that VTA documented all of the Monthly and Annual Inspection activities. Staff also found that VTA has attached copies of completed Work Orders generated during scheduled inspection. Work Orders were completed in a timely manner.
- Staff found that Tree Trimming is a requirement under Semi Annual Inspection (MTN-PR-6150-Inspection of Overhead Catenary System, Section 4.2.4). However, VTA is conducting Tree

Trimming during the monthly inspections.

- Staff found that VTA conducts Isolator checks during monthly inspections. MTN-PR-6150, Section 4.2.2 specifies this as a Semi Annual Inspection requirement.
- Staff did not find Semi Annual Inspection forms possibly because VTA conducts isolator checks and tree trimming during monthly inspections. VTA keeps separate inspection forms for Shop Disconnect Switches/Stingers (Section 4.2.3) and Electric Gates (Section 4.2.5).
- Staff suggested that VTA personnel revise their maintenance procedure to reflect current and approved maintenance inspection practices.
- Staff found that VTA was using a database system (SAP) to record inspection/maintenance activities.
- Staff found that SAP had only a limited capability to cross-reference inspections and work orders generated from these inspections. VTA personnel informed staff that they are in the process of updating the SAP.
- Staff suggested that VTA should consider updating SAP with cross-reference capability.
- Staff found that inspection forms (May to December, 2006) were filed without Supervisor's approval. VTA personnel explained that the supervisor, at that time, had health problems and was not available. Since this case also appears in checklist #6, staff will address it in recommendation #4 of checklist #6. Current inspection records were properly signed off.

Suggestions:

1. Revise MTN-PR-6150 to reflect current maintenance & inspection practices.
2. Consider adding a "cross-reference" capability to the SAP.

Recommendation:

See checklist #6

**2007 CPUC SYSTEM SAFETY AND SECURITY REVIEW CHECKLIST FOR  
THE SANTA CLARA VALLEY TRANSPORTATION AUTHORITY**

|               |                                 |                                 |
|---------------|---------------------------------|---------------------------------|
| Checklist No. | <b>6</b>                        | Persons Contacted               |
| Date of Audit | <b>10/17/07</b>                 | Philip Sharp – Power Supervisor |
| Auditors      | <b>Brian Yu</b>                 |                                 |
| Department    | <b>Way, Power, &amp; Signal</b> |                                 |

**REFERENCE CRITERIA**

1. GO 143-B, Section 14.06-Traction Power System Inspections and Records
2. Light Rail System Safety Program Plan, June 2007
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 their inspection records prepared during the last three 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 and tracking method used to verify the timely closure of work orders when generated by scheduled inspections.
3. Noted defects were corrected in a timely manner

**FINDINGS AND RECOMMENDATIONS**

Activities and Findings:

Staff selected the following Traction Power Substations (TPSS) and reviewed their inspection records:

- TPSS 7
- TPSS 13
- TPSS 21
- TPSS 28

Overall, maintenance records were comprehensive and all work orders generated from the inspections were completed in a timely manner.

- TPSS 7 and 21 were manufactured by Impulse (new substations). Annual inspection forms in current use do not relate to the Impulse Substations.
- When maintaining Impulse substations, Not Applicable “N/A” was entered on the annual substation inspection forms. VTA personnel explained that the new substations require different procedures (use of on-board computer screen) and those procedures are in the process of being finalized. Staff

commented that VTA should have established the new procedure when the new substations became operational.

- Some of the records from May to December, 2006, did not display the approval of a supervisor. VTA personnel explained that, during that period, the Traction Power Supervisor was not available due to health issues.

Recommendations:

VTA should revise its current annual substation inspection procedure to include forms which pertain to the new Impulse Substations and add the requirement of designating a qualified person to review and approve substation and OCS inspection and maintenance records in the event a supervisor is not available to do so.

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**2007 CPUC SYSTEM SAFETY AND SECURITY REVIEW CHECKLIST FOR  
THE SANTA CLARA VALLEY TRANSPORTATION AUTHORITY**

|               |                                        |                                                                                         |
|---------------|----------------------------------------|-----------------------------------------------------------------------------------------|
| Checklist No. | <b>7</b>                               | Persons Contacted                                                                       |
| Date of Audit | <b>10/19/07</b>                        | Nanci G. Eksterowicz - Risk Manager                                                     |
| Auditors      | <b>Mahendra Patel<br/>Rupa Shitole</b> | Mark P. Bugna - Transit System Safety Supervisor<br>Bill Evans - Transit Safety Officer |
| Department    | <b>Risk<br/>Management</b>             |                                                                                         |

**REFERENCE CRITERIA**

1. Light Rail System Safety Program Plan, June 2007
2. GO 164-C
3. GO 164-D effective May 3, 2007

**ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION**

**INTERNAL SAFETY & SECURITY AUDITS/REVIEWS**

Interview the VTA representative in charge of the Internal Safety Audit Program and review the audit reports for the years 2004, 2005, 2006, and the work-in-progress for the year 2007 to determine whether or not:

1. Annual internal safety audits were performed in accordance with the applicable reference Criteria.
2. All of the required safety program elements were covered within a three year audit cycle and compliance with the SSPP and Security Plan was evaluated by auditors who are independent from the first line of supervision responsible for performance of the activity being audited.
3. The annual ISA reports were prepared and submitted to the CPUC by February 15<sup>th</sup> of each year and corrective action plan recommendations were prepared, tracked and implemented in a timely manner.

**FINDINGS AND RECOMMENDATIONS**

**Activities and Findings:**

Staff interviewed VTA representatives in charge of Internal Safety Audit Program and reviewed the internal safety audit reports for the year 2004, 2005, 2006 and 2007 and found the following:

1. VTA prepared a 2005-2007 (three year cycle) schedule of internal safety and security audit and submitted to CPUC on December 1, 2004 for review and approval and was approved on December 28, 2004.
2. VTA's three year audit cycle coincides with the CPUC Triennial Safety and Security Review cycle such that, all of the required safety program elements are covered in compliance with the SSPP and Security Plan and audited in accordance with the applicable reference criteria with the exception of

System Safety Program Plan (SSPP) Control and Update Procedure before the CPUC Triennial Safety and Security Review. This SSPP update element is scheduled for audit in December 2007. VTA made this exception to capture CPUC recommendations and suggestions regarding updating of SSPP as a result of the Triennial Safety and Security Review findings. This is an effective way to ensure the compliance with Section 3.1 of General Order 164-D regarding annual review and certification for updating SSPP.

3. Even though the General Order 164-D went into effect May 3, 2007, VTA elected to notify the staff at least 30 calendar days before any schedule audits beginning with the year 2006 by sending the checklists associated with the audit elements electronically for review and comments.
4. The review of all the selected checklists showed that they were audited by auditors who were independent from the first line of supervision responsible for performance of the activity being audited.
5. Annual Internal Safety Audit reports for the year 2004 to 2006 were prepared and submitted to the staff by February 15<sup>th</sup> of each year fulfilling the requirement of Section 5.5b of General Order 164-D.
6. Corrective Action Plans are prepared and tracked in the monthly Rail System Safety Review Board (RSSRB) meetings to ensure that they are implemented in a timely manner.
7. Staff found that the description of element 9 (Internal Safety Audit Process) of June 2007 Light Rail System Program Plan included the reference to American Public Transportation Association (APTA) Guidelines. The staff also found that the requirement of Section 5 of GO 164-D regarding the annual report to be accompanied by a formal letter of certification signed by the RTA's chief executive indicating that the RTA is in compliance with its SSPP and Security Plan was not included in the description.
8. Staff reviewed the checklist that was used to audit element 11, Maintenance Audit Inspection. This checklist audit was conducted on May 29, 2007. Staff found that the VTA auditors had several recommendations as a result of the audit, however, there were no Corrective Action Plans and implantation schedules listed in the checklist to implement these recommendations.

Comment:

Staff suggested that the reference to American Public Transportation Association (APTA) Guidelines should be removed from the description of element 9 (Internal Safety Audit Process) of June 2007 Light Rail System Program Plan and should include pertinent requirements of Section 5 of GO 164-D, specifically the requirement of the annual report to be accompanied by a formal letter of certification signed by the RTA's chief executive indicating that the RTA is in compliance with its SSPP and Security Plan.

Recommendation:

VTA should ensure that a description of Corrective Action Plan; Implementation Schedule Date of the Corrective Action Plan; and Completion Status (Date and Action taken to correct noted items) is included in the checklist for each recommendation made by the VTA auditor as a result of the audit and tracked by RSSRB to ensure that the recommendations are implemented in a timely manner (GO 164-D Rule 5.5).



**2007 CPUC SYSTEM SAFETY AND SECURITY REVIEW CHECKLIST FOR  
THE SANTA CLARA VALLEY TRANSPORTATION AUTHORITY**

|               |                                |                                                              |
|---------------|--------------------------------|--------------------------------------------------------------|
| Checklist No. | <b>8</b>                       | Persons Contacted                                            |
| Date of Audit | <b>10/15/07</b>                | Jose Hernandez – Senior Track Worker                         |
| Auditors      | <b>Ni Liu</b>                  | Joel Milburn – Passenger Facilities Wayside Maintenance Sup. |
| Department    | <b>Way, Power &amp; Signal</b> | Jerry Ossen – Operations Manager Rail Maintenance            |

**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, June 2007
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-6301-WPS Daily Station Maintenance, Dated 9/30/05

**ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION**

**RIGHT-OF-WAY MAINTENANCE**

Conduct operational observations by riding a train on the Vasona, Tasman East, Capital, etc. Lines and randomly select a total of at least three stations to visually inspect the right-of-way and determine whether or not:

- a. The requirements of Section 9.12 of GO 143-B are met
- b. Fences are such that they offer an adequate degree of security to the right-of-way from any possible intrusions

**FINDINGS AND RECOMMENDATIONS**

**Activities and Findings:**

Staff conducted visual inspection of the right-of-way along the following lines:

**Tasman West:**

1. Right-of-way appeared to be well-maintained.
2. Minor vegetation observed along the trackway west of Lick Mill Station.
3. The right-of-way appeared to be cleared of all vegetation that would obstruct operator's visibility.
4. The right-of-way appeared to be cleared of all vegetation that would interfere with employees in performing normal trackside duties.
5. Moderate vegetation observed along the trackway near Moffett Park Station.

**Guadalupe South:**

1. Right-of-way appeared to be well-maintained.
2. Minor vegetation observed along the trackway south of Branham Station.
3. The right-of-way appeared to be cleared of all vegetation that would obstruct operator's visibility.
4. The right-of-way appeared to be cleared of all vegetation that would interfere with employees in performing normal trackside duties.
5. The right-of-way appeared to be cleared of all vegetation that would obstruct emergency walkways.
6. Moderate vegetation observed along the right-of-way fencing south of Ohlone/Chynoweth Station.
7. Excess debris observed along on the trackway at the Ohlone/Chynoweth Station.
8. Excess debris (foliage) observed on the trackway at the Santa Teresa Station.

Staff conducted visual inspection at the following stations:

**Gish Station:** trees along the station have decreased the visibility of the Visual Message Board (VMB).

**Japantown/Ayer Station:** no trees were found that could decrease the visibility of VMBs. Continued improvements in removing right-of-way vegetation will decrease the fire hazards as well as increase the visibility of VMBs.

Staff conducted visual inspection of the right-of-way fencing along the following lines:

**Tasman West:**

1. Right-of-way fencing appeared to be well-maintained.
2. Fencing near the Guadalupe Creek has been damaged.
3. Chained-linked fence at stations appeared to be well-maintained.
4. Fencing near the 101 off-ramp and Ellis Street has been damaged.

**Guadalupe South:**

1. Right-of-way fencing appeared to be well-maintained.
2. Fencing on the northbound near Virginia Station has been damaged.
3. Fencing on the southbound near Tamien has been damaged.
4. Fencing on the southbound near the Branham Station has been damaged.

**Recommendation:**

VTA should prioritize fencing installation/repair such that fencing in areas with likely pedestrian intrusions be repaired expediently (GO 143-B Rule 9.03).

**2007 CPUC SYSTEM SAFETY AND SECURITY REVIEW CHECKLIST FOR  
THE SANTA CLARA VALLEY TRANSPORTATION AUTHORITY**

|               |                                     |                                     |
|---------------|-------------------------------------|-------------------------------------|
| Checklist No. | <b>9</b>                            | Persons Contacted                   |
| Date of Audit | <b>10/17/07</b>                     | George Ramos – LR Signal Supervisor |
| Auditors      | <b>Joey Bigornia<br/>Jimmy Xia</b>  |                                     |
| Department    | <b>Way, Power, &amp;<br/>Signal</b> |                                     |

**REFERENCE CRITERIA**

1. Light Rail System Safety Program Plan, June 2007
2. MTN-PR-6206, Biennial Vital Relay Testing Dated 9/30/05

**ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION**

**VITAL RELAYS INSPECTIONS, MAINTENANCE AND RECORDS**

1. Review the records of preventive maintenance, scheduled and unscheduled maintenance activities for vital relays to determine if inspections were performed at the required frequencies as specified in the reference criteria.
2. Determine if inspections were properly documented and corrected in a timely manner.
3. Determine if VTA identified and implemented the acceptable limits for voltage and amperage readings for vital relay inspection records.

**FINDINGS AND RECOMMENDATIONS**

**Activities and Findings:**

Staff interviewed VTA representatives in charge of Vital Relay Inspections and reviewed the inspection records for Year 2007 and found the following:

1. VTA revised its maintenance procedure with the minimum acceptable limits for voltage and amperage readings for vital relay inspections.
2. Reviewed Bi-Annual Vital Relay Records dated September 2007 for Case 26-72 and Case 72-119. Requested copies of Year 2005 Bi-Annual Vital Relay Records for Case 26-72 and Case 72-119 to compare voltage readings however, the records could not be found.
3. The maximum allowable Pick-Up Voltage for Relay Type 500HDFB is 7.15 Volts. VTA exceeded this maximum value and did not replace the relay as required at the following locations:

**Case 52:** Relay 52HR

**Case 65:** Relay 65HR

|                            |                                            |
|----------------------------|--------------------------------------------|
| <b>Case 81:</b> Relay 81HR | <b>Case 52:</b> Relay 52ATPR,<br>Relay 52H |
|----------------------------|--------------------------------------------|

4. The maximum allowable Pick-Up Voltage for Relay Type 200 Slow Pick-Up (SPU) is 9.90 Volts. VTA exceeded this maximum value and did not replace the relay as required at the following locations:

|                                               |                              |
|-----------------------------------------------|------------------------------|
| <b>Case 52:</b> Relay 52ATP                   | <b>Case 81:</b> Relay 81TPR  |
| <b>Case 87:</b> Relay 82CTPR,<br>Relay 89BTPR | <b>Case 92:</b> Relay 90BTPR |

5. The Vane Relay Test requires the Drop Away Voltage must be 80% or greater of the measured value of the Pick-Up Voltage. The drop-away voltage fell below the minimum requirement at the following locations:

|                                     |                                      |                                   |
|-------------------------------------|--------------------------------------|-----------------------------------|
| <b>Case 26:</b> 26A TR              | <b>Case 29:</b> 26B TR, 31B TR       | <b>Case 31:</b> 31A TR            |
| <b>Case 32:</b> 31A TR              | <b>Case 34:</b> 321B TR              | <b>Case 37:</b> 37A TR            |
| <b>Case 40:</b> 38B TR, 51C TR      | <b>Case 44:</b> 51B TR               | <b>Case 50:</b> 38D TR            |
| <b>Case 51:</b> 51A TR              | <b>Case 56:</b> 52B TR, 65D TR       | <b>Case 58:</b> 31A T             |
| <b>Case 72:</b> 72 TR               | <b>Case 74:</b> TR                   | <b>Case 77:</b> 77A TR            |
| <b>Case 81:</b> 81 TR,<br>82A TR    | <b>Case 84:</b> 82B TR,<br>89C TR    | <b>Case 87:</b> 82C TR<br>89B TR  |
| <b>Case 89:</b> 89A TR              | <b>Case 90:</b> 90A TR               | <b>Case 92:</b> 90B TR,<br>95C TR |
| <b>Case 94:</b> 90C TR<br>95B TR    | <b>Case 95:</b> 95A TR               | <b>Case 96:</b> 96A TR            |
| <b>Case 100:</b> 96B TR,<br>105B TR | <b>Case 105:</b> 105A TR             | <b>Case 106:</b> 106A TR          |
| <b>Case 107:</b> 106B TR            | <b>Case 110:</b> 106C TR,<br>111B TR |                                   |

The lead auditor received e-mail from George Ramos, VTA Signal Supervisor that two Biennial Vital Relay Preventive Maintenance activities on Cases 26 to 71 and 72 to 119 were started immediately on 10/19/07 to take care of all relays which failed. These maintenance activities are scheduled for completion on 10/28/07.

Recommendation:

VTA should produce documentation that it replaced all relays not meeting prescribed voltage requirements and develop controls to make certain that vital relays are maintained to standards with appropriate supporting documentation (MTN-PR-6206).

**2007 CPUC SYSTEM SAFETY AND SECURITY REVIEW CHECKLIST FOR  
THE SANTA CLARA VALLEY TRANSPORTATION AUTHORITY**

|               |                        |                                                                                                   |
|---------------|------------------------|---------------------------------------------------------------------------------------------------|
| Checklist No. | <b>10</b>              | Persons Contacted                                                                                 |
| Date of Audit | <b>10/16/07</b>        | Mark P. Bugna – Transit System Safety Supervisor                                                  |
| Auditors      | <b>Ni Liu</b>          | Nanci Eksterowicz – Risk Manager                                                                  |
| Department    | <b>Risk Management</b> | Bill Evans – Transit Safety Officer<br>Walter S. Marchetti – Environmental Health and Safety Sup. |

**REFERENCE CRITERIA**

1. Light Rail System Safety Program Plan, June 2007
2. Occupational Injury and Illness Prevention Program – July 2007
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. Employees are aware of the existence of such a program and are comfortable utilizing it
  - c. Appropriate corrective action plans and schedules are developed, tracked, completed and documented to address all reported 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

**FINDINGS AND RECOMMENDATIONS**

Activities and Findings:

Staff reviewed the blank Safety or Health Hazard Report Form (FRS-RM-0201) and the following Guadalupe Health Hazard Report Forms:

**Form reported on 9/12/07:**

1. Resolved by 9/12/07.
2. Reviewed by supervisor on 9/17/07.
3. Closed by 9/18/07.

**Form reported on 1/11/07:**

1. Resolved by 1/12/07.
2. Reviewed by supervisor on 1/11/07.
3. Closed by 1/12/07.

**Form reported on 1/26/06:**

1. Resolved by 1/28/06.
2. Reviewed by supervisor on 1/26/06.
3. Closed by 1/28/06.

The review indicated the health hazards identified using the Health Hazard Report Forms are documented, reviewed, and resolved in a timely manner.

Staff reviewed the Risk Management New Employee Training of December 2006. Health Hazard Report Form is one of the topics under the New Employee Orientation Safety.

Staff reviewed the Guadalupe Health Hazard Report Forms between 05 and 07 and found all identified hazards have been closed.

No documentation was found to show closure of identified deficiencies in the Maintenance Superintendent's Inspection and Monthly Safety Inspection Checklist for facilities inspection records.

Staff reviewed the VTA Roadway Worker On-Track Safety Protection Training with the following fields: Last Name, Company Name, VTA Employee ID Number, CalTrain Permit Number, CalTrain Permit Expires, VTA Basic Permit Number, and VTA Basic permit Expires. The record includes both VTA employees as well as its contractor.

Staff verified the existence of procedures requiring audits of the construction sites within section 2.11 in the Capitol Expressway Light Rail Safety and Security Certification Plan, dated 3/2/07.

**Recommendation:**

VTA should document the closure of identified deficiencies found during Maintenance Superintendent's and Monthly Safety Facilities Inspections and incorporate a sign-off section in the applicable inspection records.

**2007 CPUC SYSTEM SAFETY AND SECURITY REVIEW CHECKLIST FOR  
THE SANTA CLARA VALLEY TRANSPORTATION AUTHORITY**

|               |                                    |                                     |
|---------------|------------------------------------|-------------------------------------|
| Checklist No. | <b>11</b>                          | Persons Contacted                   |
| Date of Audit | <b>10/17/07</b>                    | Philip Sharp – WPS Power Supervisor |
| Auditors      | <b>Joey Bigornia<br/>Jimmy Xia</b> | George Ramos – LR Signal Supervisor |
| Department    | <b>Quality<br/>Assurance</b>       |                                     |

**REFERENCE CRITERIA**

1. Light Rail System Safety Program Plan, June 2007
2. MTN-PR-7202, Precision Measuring Equipment (PME) Calibration Program, Dated 06/15/05
3. MTN-FR-7202A, Calibration Program Audit Checklist, Dated 06/15/05
4. MTN-FR-7202B, Calibration Program Random Inspection Checklist, Dated 06/15/05
5. MTN-FR-7202C, Calibration Supplier Audit Checklist, Dated 06/15/05

**ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION**

**CALIBRATION OF MEASURING AND TESTING EQUIPMENT PROGRAM**

Interview VTA representatives and review records, examine equipment storage facilities and perform inspections of not less than eight pieces of measuring or testing equipment to determine whether or not:

1. The selected gauges, micrometers, calipers, torque wrenches, multi-meters, etc are properly inventoried, stored, distributed for use, calibrated at prescribed intervals, and marked, tagged or otherwise identified to show current calibration status.
2. The next schedule testing/calibration due date is shown on each equipment
3. Tools and instruments requiring calibration are addressed in department procedures

**FINDINGS AND RECOMMENDATIONS**

Activities and Findings:

Staff interviewed VTA representatives in charge of the Calibration of Test Equipment and reviewed the equipment and calibration records for the Year 2007 and found the following:

1. Reviewed the following testing equipment:
  - a. Multi-meter  
Q0368, calibrated 9-5-07, next calibration due 9-5-08  
Q0545, calibrated 9-5-07, next calibration due 9-5-08
  - b. Communications Analyzer  
Q0180, calibrated 9-4-07, next calibration due 9-4-08



- c. T-Carrier Analyzer  
Q0178, calibrated 9-4-07, next calibration due 9-4-08  
Q0187, calibrated 9-4-07, next calibration due 9-4-08
  - d. Torque Wrench  
Q0159, calibrated 9-5-07, next calibration due 9-4-08  
Q0229, calibrated 9-5-07, next calibration due 9-4-08
  - e. Stray Current Rail Tester  
Q0207, calibrated 9-4-07, next calibration due 9-4-08
  - f. Current Interrupter Meter  
Q0200, calibrated 9-5-07, next calibration due 9-4-08
  - g. Dial Caliper  
Q0160, calibrated 9-5-07, next calibration due 9-4-08
- 2. Each equipment selected for review had a calibration sticker identifying the date calibration occurred and the next calibration due date. No exceptions were noted.
  - 3. Eagle Calibration performs the calibration task of VTA's equipment. The Calibration & Certification Report for the equipment selected identified the standards used for equipment calibration. No exceptions were noted.
  - 4. Tools and instruments requiring calibration are addressed in Maintenance Procedure MTN-PR-7202 and are summarized on Way, Power and Signal MASTER LIST. No exceptions were noted.

Recommendation:

None

**2007 CPUC SYSTEM SAFETY AND SECURITY REVIEW CHECKLIST FOR  
THE SANTA CLARA VALLEY TRANSPORTATION AUTHORITY**

|               |                                       |                                                                                         |
|---------------|---------------------------------------|-----------------------------------------------------------------------------------------|
| Checklist No. | <b>12</b>                             | Persons Contacted                                                                       |
| Date of Audit | <b>10/15/07</b>                       | George Ramos – LR Signal Supervisor                                                     |
| Auditors      | <b>Joey Bigornia<br/>Rupa Shitole</b> | Tom Ryan – LR Signal Supervisor - Engineering<br>Jerry Oxsen – Rail Maintenance Manager |
| Department    | <b>Way, Power, and<br/>Signal</b>     |                                                                                         |

**REFERENCE CRITERIA**

1. MTN-PR-6205-Grade Crossing Warning System Inspection and Preventive Maintenance, Version Number 02, Issued 10/30/02
2. GO 143-B

**ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION**

**GATED CROSSING MAINTENANCE**

Randomly select at least five gated grade crossings (preferably long gate) and review their inspection & maintenance records during the last four years to determine whether or not:

1. The gates were inspected and maintained regularly
2. Inspections were properly documented
3. Noted defects were corrected in a timely manner

**FINDINGS AND RECOMMENDATIONS**

Activities and Findings:

Staff interviewed VTA representatives in charge of Gated Grade Crossing Maintenance and reviewed the gated crossing maintenance inspection records dated September 2004 to October 2007 and found the following:

1. Innovation Way West
  - a. All monthly inspection reports for Year 2004 – 2007 were performed however, July 2006 inspection report could not be found. No exceptions were noted.
  - b. All quarterly inspection reports for Year 2004 – 2007 were performed. No exceptions were noted.
  - c. All annual inspection reports for Year 2004 – 2007 were performed. No exceptions were noted.
  - d. All inspections were performed at the required frequency and noted defects were corrected in a timely manner. No exceptions were noted.

2. Tasman West

- a. All monthly inspection reports for Year 2004 – 2007 were performed. No exceptions were noted.
- b. All quarterly inspection reports for Year 2004 – 2007 were performed. No exceptions were noted.
- c. All annual inspection reports for Year 2004 – 2007 were performed. No exceptions were noted.
- d. All inspections were performed at the required frequency and noted defects were corrected in a timely manner. No exceptions were noted

3. Blossom Hill Road

- a. All monthly inspection reports for Year 2004 – 2007 were performed. No exceptions were noted.
- b. All quarterly inspection reports for Year 2004 – 2007 were performed. No exceptions were noted.
- c. All annual inspection reports for Year 2004 – 2007 were performed. No exceptions were noted.
- d. All inspections were performed at the required frequency and noted defects were corrected in a timely manner. No exceptions were noted

4. South Bascom Avenue

- a. Monthly inspection reports for June 2005 – September 2007 were performed however, July 2006 inspection report could not be found. No exceptions were noted. ***VTA took responsibility of monthly inspections for this grade crossing on June 2005 after completion of extension and contractor's release of maintenance tasks.***
- b. All quarterly inspection reports for Year 2005 – 2007 were performed. No exceptions were noted.
- c. All annual inspection reports for Year 2006 – 2007 were performed. No exceptions were noted.
- d. All inspections were performed at the required frequency and noted defects were corrected in a timely manner. No exceptions were noted

5. Hamilton Avenue

- a. Monthly inspection reports for December 2005 – 2007 were performed however, July 2006 inspection report could not be found. No exceptions were noted. ***VTA took responsibility of monthly inspections for this grade crossing on December 2005 after completion of extension and contractor's release of maintenance tasks.***
- b. All quarterly inspection reports for Year 2005 – 2007 were performed. No exceptions were noted.
- c. All annual inspection reports for Year 2006 – 2007 were performed. No exceptions

were noted.

- d. All inspections were performed at the required frequency and noted defects were corrected in a timely manner. No exceptions were noted

6. Kennedy Drive

- a. Monthly inspection reports for June 2005 – 2007 were performed. No exceptions were noted. ***VTA took responsibility of monthly inspections for this grade crossing on June 2005 after completion of extension and contractor's release of maintenance tasks.***
- b. All quarterly inspection reports for Year 2005 – 2007 were performed. No exceptions were noted.
- c. All annual inspection reports for Year 2006 – 2007 were performed. No exceptions were noted.
- d. All inspections were performed at the required frequency and noted defects were corrected in a timely manner. No exceptions were noted

Recommendation:

None.

**2007 CPUC SYSTEM SAFETY AND SECURITY REVIEW CHECKLIST FOR  
THE SANTA CLARA VALLEY TRANSPORTATION AUTHORITY**

|               |                                                                               |                                                  |
|---------------|-------------------------------------------------------------------------------|--------------------------------------------------|
| Checklist No. | <b>13</b>                                                                     | Persons Contacted                                |
| Date of Audit | <b>10/19/07</b>                                                               | Arthur Douwes - Operations Manager Engineering   |
| Auditors      | <b>Mahendra Patel<br/>Rupa Shitole</b>                                        | Nanci G. Eksterowicz - Risk Manager              |
| Department    | <b>Risk<br/>Management<br/>Transportation<br/>Maintenance<br/>Engineering</b> | Mark P. Bugna - Transit System Safety Supervisor |
|               |                                                                               | Bill Evans - Transit Safety Officer              |
|               |                                                                               | Kris Sabherwal - Light Rail Maintenance Engineer |

**REFERENCE CRITERIA**

1. Code of Federal Regulations, CFR 49 Parts 659.41 Investigations & 659.43 Corrective Actions
2. CPUC General Order 164-C
3. CPUC General Order 164-D effective May 3, 2007
4. Light Rail System Safety Program Plan, June 2007
5. VTA SOP 530 (LRA-PR-0530), Light Rail Accident Investigation/Reporting Procedure
6. MSP 5101 - Impounding Light Rail Vehicles, Effective 05/01/01
7. SOP #9.14 - Accident Investigation Procedures, Dated 01/01/95

**ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION**

**ACCIDENT/INCIDENT REPORTING & INVESTIGATION**

Interview VTA representatives that are directly involved in accident reporting and review at least six reportable accident reports submitted to the CPUC since May 3, 2007 to determine whether or not:

- a. The accidents were reported to the CPUC within 2-hours as required by GO 164-D, section 7.
- b. The accident investigation activities and reports were in accordance with the reference criteria

**FINDINGS AND RECOMMENDATIONS**

Activities and Findings:

Staff interviewed VTA representatives that are directly involved in accident reporting and reviewed the following reportable accident reports submitted to the CPUC since May 3, 2007:

1. Train vs. Automobile collision (left turn) at the intersection of San Carlos Avenue and Market Street that occurred on June 12, 2007 at 8:32 AM and was reported to CPUC at 8:50 AM on the same day. One passenger on the train claimed back pain and was transported to Regional Hospital. Accident Investigation Report was submitted to the staff on July 18, 2007.
2. Train vs. Pedestrian collision at the intersection of Capitol Avenue and Madden Street that occurred

on June 21, 2007 at 8:58 AM and was reported to CPUC at 10:26 AM on the same day. The car occupant waited in the left turn lane with the driver side door open at the intersection and when the train arrived, the occupant exited his car and walked in front of the train that resulted in a fatality. Accident Investigation Report was submitted to the staff on July 31, 2007.

3. Train vs. Pickup Truck collision at the intersection of Capitol Avenue and Penitencia Creek Street that occurred on June 30, 2007 at 10:18 PM and was reported to CPUC at 10:48 PM on the same day. There were no fatalities or injuries. Accident Investigation Report was submitted to the staff on July 31, 2007.
4. Train vs. Automobile collision (left turn) at the intersection of First Street and Brokaw Road that occurred on July 10, 2007 at 6:30 PM and was reported to CPUC at 8:02 PM on the same day. There were no fatalities or injuries. Accident Investigation Report was submitted to the staff on July 31, 2007.
5. Train vs. Automobile collision (U-turn) at the intersection of First Street and I-880 off ramp that occurred on August 2, 2007 at 5:50 PM and was reported to CPUC at 7:17 PM on the same day. One passenger on the train claimed back pain but refused medical. Accident Investigation Report was submitted to the staff on August 30, 2007.
6. Train vs. Automobile collision at the intersection of North First Street and Mission Street that occurred on September 7, 2007 at 9:38 AM and was reported to CPUC at 10:04 AM on the same day. One passenger was transported to the hospital for medical reasons. Accident Investigation Report was submitted to the staff on October 1, 2007.

Listed below are the findings of the review of the above listed accident reports:

- (a) All of the above reportable accidents were reported to the CPUC within 2 hours as required by Section 7.1 of the General Order 164-D.
- (b) Final Accident Investigation Reports for all of the above reportable accidents were submitted to the CPUC within 60 calendar days of the occurrence of the accident as required by Section 8.3e of the General Order 164-D. The accident investigation activities and reports were in accordance with the reference criteria. There was no corrective action plan required for any of these accidents.
- (c) Staff also reviewed two binders containing Forms T and V for the years 2000 to 2007. The binders were well organized and showed that these forms were submitted to the CPUC within 30 calendar days after the last day of the month in which the accident occurred in accordance with the requirement of Section 7.5 of the General Order 164-D.
- (d) Staff also discussed the comment regarding the trend analysis that was offered by the auditor during 2004 triennial audit. VTA formed two work groups, namely, Illegal Left Turn Prevention Work Group and track Intrusion Prevention Work Group. These work groups performed their respective studies and issued the Light Rail Left Hand Turn Incidents Analysis Report and Abatement Recommendations dated November 8, 2006 and Light Rail Track Intrusion Prevention Analysis Report and Abatement Recommendations dated May 24, 2007 to their upper management. VTA has assigned a task force and presently they are reviewing these recommendations to identify possible corrective action plans.
- (e) Staff also discussed VTA's SOP 530 and SOP 9.14 regarding Light Rail Accident/Incident Investigation/Reporting Procedures and made some suggestions to enhance these procedures. Presently VTA is in the process of revising SOP 530. Staff suggested that VTA should place high

priority to complete this SOP 530 and submit it to the CPUC for review and approval as soon as possible.

Recommendation:

None

**2007 CPUC SYSTEM SAFETY AND SECURITY REVIEW CHECKLIST FOR  
THE SANTA CLARA VALLEY TRANSPORTATION AUTHORITY**

|               |                                                                     |                                                                                                                                                                             |
|---------------|---------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Checklist No. | <b>14</b>                                                           | Persons Contacted                                                                                                                                                           |
| Date of Audit | <b>10/18/07</b>                                                     | Mark Bugna – Transit Systems Safety Supervisor                                                                                                                              |
| Auditors      | <b>Raed Dwairi<br/>Vincent Kwong<br/>Jimmy Xia<br/>Rupa Shitole</b> | Art Douwes – Operations Maintenance Engineering Manager<br>Ed Pasucal – Resident Inspector<br>Bill Evans – Transit Safety Officer<br>Mohamed Basma – Deputy Program Manager |
| Department    | <b>Risk<br/>Management<br/>Engineering and<br/>Construction</b>     | John Heggarty – Compliance Officer<br>Nanci Eksterwicz – Risk Manager                                                                                                       |

**REFERENCE CRITERIA**

1. CPUC General Order 164-D
2. Light Rail System Safety Program Plan, June 2007
3. VTA safety Criteria Dated December 2005
4. VTA Light Rail Safety Certification Plan Dated March 2007

**ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION**

**SAFETY CERTIFICATION**

Interview VTA representative in charge of the Safety Certification Program to review safety certification documentation of the Vasona Extension 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-D.

**FINDINGS AND RECOMMENDATIONS**

Activities and Findings:

Staff conducted interviews re the Safety Certification Program and reviewed the following documentation:

1. Vasona Light Rail Safety Certification Report dated September 26, 2005.



2. C610 Downtown Platform Station Project
3. Diridon Station to Winchester Station Safety Certification Report dated July 29, 2005.
4. Design Change Notices pertaining to the above listed projects.

Staff found that all required safety certification activities are thoroughly documented in the project-specific safety certification plans.

Going forward and to ensure the new safety certification requirements in General Order 164-D are met, staff suggested either developing a generic safety certification program or adding those requirements to the project-specific safety certification plans. For example, Rule 12.2 of GO 164-D requires the submission of the Safety Certification Verification Report (SCVR) at least 21 calendar days prior to the start of service. This requirement should be clearly stated in the generic program or the project-specific plan.

No exceptions were noted.

Recommendation:

None

**2007 CPUC SYSTEM SAFETY AND SECURITY REVIEW CHECKLIST FOR  
THE SANTA CLARA VALLEY TRANSPORTATION AUTHORITY**

|               |                                                                                                                                                                        |                                                                                                                            |
|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|
| Checklist No. | <b>15</b>                                                                                                                                                              | Persons Contacted                                                                                                          |
| Date of Audit | <b>10/15/07</b>                                                                                                                                                        | Arthur Douwes - Operations Manager Engineering                                                                             |
| Auditors      | <b>Anton Garabetian</b>                                                                                                                                                | Kris Sabherwal - Light Rail Maintenance Engineer                                                                           |
| Department    | <b>Records<br/>Management<br/><br/>Rail Design And<br/>Construction<br/><br/>Vehicle<br/>Maintenance<br/><br/>Maintenance<br/>Engineering<br/><br/>Risk Management</b> | Bill Evans - Transit Safety Officer<br>Mark Bugna - Transit System Safety Supervisor<br>John Heggarty – Compliance Officer |

**REFERENCE CRITERIA**

1. Light Rail System Safety Program Plan, June 2007
2. MTN-PR-1001- Light Rail Configuration Management Program, Version Number 01, Dated 10/05/04
3. EY000913-Procedure for completing record drawings, Dated 09/10/02
4. 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 who are responsible for configuration management and track a sample of changes to the rail system to determine whether or not:

1. The changes made were submitted, reviewed and approved, implemented and documented in accordance with the reference criteria.
2. VTA is actively addressing all the safety related issues stemming from the proposed changes to the rail system

**FINDINGS AND RECOMMENDATIONS**

Activities and Findings:

Staff interviewed VTA representatives who are responsible for Configuration Management and tracked a sample of changes to the rail system. VTA presented a list of projects from 2005 to 2007 that made changes on the system. The list includes Service Information Bulletins (SIB) and Service Change Bulletins (SCB). VTA manages system document changes through SIB and system physical configuration changes through SCB. Records Management Department maintains the records, which are eventually posted on the VTA

Share Drive accessible by all the departments. Staff reviewed Rail System Safety Review Board (RSSRB) meeting documents that VTA uses for archiving modifications introduced on the rail system.

Staff tracked documents for changes to the rail system as follows: HVAC Shop Stinger Ground Project, Additional Fuse Protection, Impulse Substation Re-closure Circuit Modification, and Improved Shunt Replacement, which followed all the required change process. VTA is consistently addressing all the safety related issues stemming from the proposed changes to the rail system

Staff checked the Capital LRT Stations Project as built drawings, which followed the required drawing updating process.

According to VTA, Configuration Review Board (CRB) meets on an as-needed basis to review any major safety configuration management issues. VTA could not provide any meeting minutes from CRB meeting. VTA stated that participants discuss issues during CRB meeting and if needed, they elevate the issues to Rail System Safety Review Board (RSSRB).

Risk Management, the custodian of RSSRB records, sends to Records Management copies of RSSRB meeting minutes. These records showed that departments presented safety critical changes to RSSRB for review and approval

VTA Light Rail Configuration Management Program MTN-PR-1001 explains the SCB process but does not refer to the SIB process that VTA implements. VTA SSPP Configuration Management Element 18 does not clearly refer to Light Rail Configuration Management Program MTN-PR-1001.

Staff did not note any exceptions.

Suggestion:

1. Staff suggests that VTA SSPP list all the standard operation procedure and reference documents that involve configuration management.
2. Staff suggests that MTN-PR-1001 explains the SIB process.
3. Staff suggests VTA records the CRB meeting minutes.

Recommendation:

None

**2007 CPUC SYSTEM SAFETY AND SECURITY REVIEW CHECKLIST FOR  
THE SANTA CLARA VALLEY TRANSPORTATION AUTHORITY**

|               |                        |                                                |
|---------------|------------------------|------------------------------------------------|
| Checklist No. | <b>16</b>              | Persons Contacted                              |
| Date of Audit | <b>10/16/07</b>        | Gary Stanislaw – Transportation Superintendent |
| Auditors      | <b>Noel Takahara</b>   | Dean Palmquist – Tech. Trainer                 |
| Department    | <b>Rail Operations</b> | Mark Thomas – Training Supervisor              |

**REFERENCE CRITERIA**

1. Light Rail System Safety Program Plan, June 2007
2. GO 143-B
3. Light Rail Operating Division Bulletin # 1

**ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION**

**REVIEW OPERATING RULES AND PROCEDURES MANUAL**

Interview the VTA manager responsible for the 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

**FINDINGS AND RECOMMENDATIONS**

Activities and Findings:

1. Standard Operating Procedures (SOP) are updated and maintained by the Transportation Superintendent after review and ratification by the Rail Rules and Procedures Development Committee (RRPD). The Light Rail Operating Rulebook (Rulebook) is re-issued at a maximum of 18 month intervals. Additions, deletions, and edits to the Rulebook before re-issue of the entire Rulebook are conducted via a sticker system. Additions/Deletions/Edits to the Rulebook are printed on “Stickers” and all employees that are required to have a Rulebook are required to sign for the Stickers each time they are issued. Each new issue of the Rulebook is signed by the Transportation Superintendent who is also the RRPD Committee Chairman.
2. All governing documents are presented to the Light Rail System Safety Review Board (RSSRB) and RRPD Committee. Signatures by Committee Chairpersons are evident on all documents.
3. Train Orders are issued daily in response to short term situations. When Train Orders become more than a short term rule, they can become Long Term Special Instructions. These in turn are reviewed by the Transportation Superintendent who decides whether or not it is necessary to add them to the Rulebook. Train Orders and Long Term Special Instructions are distributed daily to Light Rail Operators who must sign for them. Training of staff is covered by SOP 1.5 section 4.1, Light Rail Employee Re-Certification which requires all employees who work on the right of way and on

maintenance to attend class on an annual basis and test. The recertification process promotes education of the existing rules.

No exceptions were noted.

Recommendations:

None

**2007 CPUC SYSTEM SAFETY AND SECURITY REVIEW CHECKLIST FOR  
THE SANTA CLARA VALLEY TRANSPORTATION AUTHORITY**

|               |                            |                                                               |
|---------------|----------------------------|---------------------------------------------------------------|
| Checklist No. | <b>17</b>                  | Persons Contacted                                             |
| Date of Audit | <b>10/17/07</b>            | Walter Marchetti - Environmental Health and Safety Supervisor |
| Auditors      | <b>Noel Takahara</b>       |                                                               |
| Department    | <b>Risk<br/>Management</b> |                                                               |

**REFERENCE CRITERIA**

1. Light Rail System Safety Program Plan, June 2007
2. GO 164-D
3. Bulletins #308-313
4. Occupational Injury and Illness Prevention Program, Dated July 2007
5. Employee Safety Training Program
6. FRS-RM-1801, Safety Procedures for Entry into Confined Spaces, Version Number 03, Dated 5/17/07

**ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION**

**HAZARDOUS MATERIALS PROGRAMS / ENVIRONMENTAL MANAGEMENT**

Interview the VTA manager responsible for reviewing 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. Employees and contactors receive hazardous materials training
3. A program/procedure is developed and implemented for hazard reporting.
4. Confined space entry training is documented and provided to all maintenance employees who are required to enter, work in, or serve as rescuers for others in confined spaces, and their supervisors
5. An annual review of the proper 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

**FINDINGS AND RECOMMENDATIONS**

Activities and Findings:

1. The Hazardous Material and Environmental Management Programs comply with Federal, State, and Local regulatory requirements. Santa Clara County provides oversight of hazardous materials at the Guadalupe Light Rail Yard. The City of San Jose and the State Water Resources Board provide

oversight of wastewater storm water discharge. Documentation detailing Manifest Tracking (proper purchase to disposal paperwork of hazardous materials) was provided for review.

2. Hazardous Waste Handling Training is conducted by Enviro Safetech Inc. This company is contracted by VTA to train supervisors who are responsible for the staff that handles hazardous wastes. Hazardous Materials training is given to initial hires. Hazardous Materials Handling is also one of the topics of discussion in monthly Tailgate/Safety Meetings. MSDS are placed on the intranet for employee access.
3. Document # FRS-RM-0201 describes the procedure for hazard reporting. The document provides guidelines for reporting safety and health hazards and includes a form that outlines pertinent information that should be recorded in the event of a hazard.
4. Training for confined space entry is documented. Certificates are awarded after training is completed, and the names of employees who received the training are recorded. The training is given to initial hires and also on an as-needed basis.
5. The process of FRS-RM-1801 was internally reviewed January 5, 2005. The next internal review was dated January, 2007. FRS-RM-1801 Section 4.8 prescribes annual review of confined space entries.
6. VTA ensures that confined space entries are documented. Confined spaces include sump pump locations and man-holes. Some sump pump locations do not require actual entry and so although the location is included on the confined space list, no actual entries by employees were recorded or made. Sump pumps are maintained on a quarterly basis, and recorded entries into the confined space are consistent with that time frame. Confined spaces are marked to notify that permits are required for entry. Staff reviewed records and found that confined space entries were made only by employees who received the confined space entry training.

Recommendations:

VTA should conduct an annual audit of its confined space entries as prescribed by FRS-RM-1801 Section 4.8 as well as update and clearly define the Confined Space Entry List.

**2007 CPUC SYSTEM SAFETY AND SECURITY REVIEW CHECKLIST FOR  
THE SANTA CLARA VALLEY TRANSPORTATION AUTHORITY**

|               |                        |                                                 |
|---------------|------------------------|-------------------------------------------------|
| Checklist No. | <b>18</b>              | Persons Contacted                               |
| Date of Audit | <b>10/18/07</b>        | George Tacke – VTA Manager                      |
| Auditors      | <b>Dain Pankratz</b>   | Mark Bugna – Transit Safety Supervisor          |
| Department    | <b>Risk Management</b> | Garry Stanislaw – Transportation Superintendent |
|               |                        | Bill Evans – Transit Safety Officer             |
|               |                        | John Carlson - Transportation Superintendent    |

**REFERENCE CRITERIA**

1. Light Rail System Safety Program Plan, June 2007
2. VTA Fire/Life Safety Program Plan

**ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION**

**EMERGENCY RESPONSE PLANNING, COORDINATION, TRAINING**

Interview the VTA representative responsible for Emergency Response Planning, Coordination, Training program and review records and documentation for the last year to determine whether or not:

1. Emergency drills that included tabletop and practical exercises were planned and carried out with the involvement of 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.
3. All drills were performed regularly and any deficiencies were documented, scheduled and tracked to completion.
4. Emergency planning addresses both accidental emergencies as well as security related emergencies.

**FINDINGS AND RECOMMENDATIONS**

Activities and Findings:

1. As specified in the System Safety Program Plan (SSPP), One (1) emergency drill and One (1) tabletop exercise were completed for 2005 & 2006. The emergency drill and tabletop exercise for 2007 are currently in the planning stages. Responding agencies that participate in the drills include; Local Fire Dept, Police /Sheriff Dept, Security, Medical Response, VTA personal and CPUC Staff.  
In addition to the drill and tabletop exercises completed in 2005, a tabletop and emergency drill for the new Vasona Extension was also completed in July 2005.
2. VTA personal has a pro-active approach in training first responders. On average, VTA provides annual training exercises with the responding agencies. Training is often provided for all working shifts of the responders. Training was recently held on May 10-12, 2007.



3. VTA emergency drills are well documented. Documents including the pre-drill meetings, drill scenario, drill activities, hot-wash and post-drill comments are all recorded in a separate binder for each drill. If the drill has deficiencies or action items, depending on the action item, they can be tracked in three (3) different monthly committee meetings including; Fire Life Safety Committee, Rail Safety System Review Board and/or Joint Safety Meeting.
4. Accidental emergency planning is addressed in responder training documents, standard operating procedures and safety plans. Security related emergencies are addressed in the Security Threat Response Training Manual (“Red Book”) and is currently being updated to reflect new National Incident Management System (NIMS) procedures.

Recommendations:

None.

**2007 CPUC SYSTEM SAFETY AND SECURITY REVIEW CHECKLIST FOR  
THE SANTA CLARA VALLEY TRANSPORTATION AUTHORITY**

|               |                                           |                                  |
|---------------|-------------------------------------------|----------------------------------|
| Checklist No. | <b>19</b>                                 | Persons Contacted                |
| Date of Audit | <b>10/17/07</b>                           | Dean Palmquist – Tech. Trainer   |
| Auditors      | <b>Arun Mehta</b>                         | Mark Thomas: Training Supervisor |
| Department    | <b>Rail Operations<br/>Tech. Training</b> |                                  |

**REFERENCE CRITERIA**

1. CPUC General Order 143-B, Sections 12.02, 13.03, and 14.03
2. Light Rail System Safety Program Plan, June 2007
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

**ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION**

**LIGHT RAIL TRAINING AND CERTIFICATION**

Randomly select five 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 the 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
4. A policy or a procedure exists for retaking the exam when an employee fails the training.

**FINDINGS AND RECOMMENDATIONS**

Activities and Findings:

Staff interviewed VTA representatives and found the following:

1. All employees are given 9 weeks of intensive original (starting) training. Such trainings have 5 quizzes and 11 exams including both multiple choices and essay questions. Typical passing grades are 80-90%. Rulebook exams need 90% passing grades and critical safety sections such as knowledge of speed, signals, and switches need 100% passing grade. If a trainee fails an exam, he/she is allowed one more chance to pass it.
2. All the operators are required to possess an active California Class B license with a “P” endorsement

for carrying passengers. All LRV operators are also required to carry a “VTA LRV Operator Endorsement” badge at all times; this badge is valid for one year at a time and requires annual renewal.

3. Each operator requires annual re-certification training, requiring a 90% passing grade. Multiple retakes are allowed. More details on operator certification and re-certification are listed in SOP 1.5 (Document # LRA-PR-411.5, Version N0. 6 dated 11/14/01) and SOP 1.9 (Document # LRA-PR-411.9, Version N0.7 dated 4/18/01).
4. VTA has Roadway Worker Protection and Restricted Area Access programs for both contractors and VTA employees. 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. The trained contractor workers are given completion stickers to be located on worker’s hard hat. The sticker has an expiration date. VTA supervisors are sent to the work site to monitor and ensure adherence to the rules and procedures
5. Staff reviewed the training and re-certification records of eight persons in the classification of Train Operators, Operations Control Center, Light Rail Supervisors, Way, Power and Signal Maintenance, Overhead Line, Track workers, Motormen and Conductors of Historic Streetcars, and VTA Management. Staff found training, re-training, and re-certification for every single employee reviewed to have been conducted in accordance with the rulebook and reference criteria. All the records were meticulously maintained.
6. Staff found VTA Training Program to be comprehensive and exemplary. Many other rail agencies such as New Jersey, Washington State and Dallas, Texas have requested and received training material and assistance from VTA.

Recommendations:

None

**2007 CPUC SYSTEM SAFETY AND SECURITY REVIEW CHECKLIST FOR  
THE SANTA CLARA VALLEY TRANSPORTATION AUTHORITY**

|               |                                  |                                                         |
|---------------|----------------------------------|---------------------------------------------------------|
| Checklist No. | <b>20</b>                        | Persons Contacted                                       |
| Date of Audit | <b>10/17/07</b>                  | James Ersted, Jr. – Light Rail Equipment Superintendent |
| Auditors      | <b>Brian Yu<br/>Rupa Shitole</b> |                                                         |
| Department    | <b>Vehicle<br/>Maintenance</b>   |                                                         |

**REFERENCE CRITERIA**

1. GO 143-B
2. MTN-PR-5149-Light Rail Vehicle Daily Inspection Procedures, Revised 01/20/06
3. MTN-PR-5158-Light Rail Vehicle Maintenance Work Orders, Revised 09/24/01
4. MTN-PR-5120 – LRV Wheel Inspections and Retrofitting, Issued 10/29/03
5. MTN-PR-5156 – Preventive Maintenance (PM) scheduling for Light Rail Vehicles, Issued 08/21/01

**ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION**

**LIGHT RAIL VEHICLE MAINTENANCE**

Randomly select a minimum of 10 vehicles from the VTA fleet (UTDC and KI) and review their records to determine whether or not:

1. Vehicles were 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.

**FINDINGS AND RECOMMENDATIONS**

Activities and Findings:

Staff selected the following vehicles and reviewed their inspection records:

**901    914    916    917    938  
942    951    970    980    990**

Staff reviewed the hard copy records for the year 2007 and database (SAP) records for the years 2005 and 2006.

Overall, the VTA light rail vehicle maintenance records were thorough.

- Staff found VTA does not have UTDC vehicles anymore.
- Staff found that VTA vehicles were inspected at the required frequencies.
- Staff found that some hard copy records were filed without foreperson's approval signature. VTA personnel explained that they mainly use SAP to keep track of the maintenance activities. The foreperson logs the result of maintenance inspections into the SAP. VTA personnel explained "logging" results into the SAP is the approval process.

- Staff found that SAP automatically generates vehicle inspection orders based on the mileage the vehicle accrues.
- According to VTA personnel, VTA keeps the hard copies only for the purpose of audits. Staff suggested that, if kept, the hard copies should be completed with approval signatures. VTA personnel told staff that he will remind his forepersons about review and approval process.
- Staff found SAP system was very efficient in tracking the vehicle maintenance activities. Work orders generated from the inspections were easily traceable.

Comment:

It appears VTA Vehicle Maintenance is transitioning to “paperless” data keeping. VTA personnel asked staff how CPUC would prefer the records to be kept. Staff commented “going paperless” is the recent trend among transit agencies. GO 143-B requires the records to be kept for four years. Staff commented as long as VTA can substantiate that their electronic records are “permanent” (i.e. server back up, etc.), they do not need to retain “hard copies.”

Suggestion:

VTA should remind their forepersons about completing the inspection checklists with approval signatures as long as they choose to keep the hard copy records.

Recommendations:

None

**2007 CPUC SYSTEM SAFETY AND SECURITY REVIEW CHECKLIST FOR  
THE SANTA CLARA VALLEY TRANSPORTATION AUTHORITY**

|               |                                |                                   |
|---------------|--------------------------------|-----------------------------------|
| Checklist No. | <b>21</b>                      | Persons Contacted                 |
| Date of Audit | <b>10/17/07</b>                | Jackie Adams – HR Program Manager |
| Auditors      | <b>Dain Pankratz</b>           |                                   |
| Department    | <b>Administrative Services</b> |                                   |

**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, June 2007
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 PROGRAM**

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
4. Safety sensitive employees who have been off duty for more than 90 days have been drug tested before being allowed back to resume their duties.

**FINDINGS AND RECOMMENDATIONS**

Activities and Findings:

1. The VTA Drug & Alcohol Program Manager was interviewed and the VTA policy for 2004, 2005 &

2006 was in compliance with State and Federal regulations.

2. The most recent FTA audit (February 23, 2005) of the Drug & Alcohol testing program was reviewed. The two (2) FTA recommendations were closed out and accepted by the FTA.
3. VTA records for safety sensitive employees subject to Drug & Alcohol testing were reviewed for calendar years 2004, 2005, 2006 & 2007. All employees are entered into a database (Assistant) which is updated weekly with employee changes. The database randomly determines which employees are tested weekly such that the 50% of employees are drug tested and 10% of employees are tested for alcohol (*exception noted on item 6*).
  - a. VTA policy for 1<sup>st</sup> time drug and/or alcohol offenders is to meet with a Substance Abuse Professional (SAP). For the records reviewed, employees that tested positive were directed to a SAP and did not return to duty until the SAP released them.
  - b. Return-to-duty test results were reviewed for seven (7) Light Rail Transit (LRT) employees. Six (6) of LRT employee's tests were negative. For the one (1) positive test, the LRT employee was referred to the SAP for treatment before returning to duty.
  - c. Follow-up testing results were reviewed for two (2) employees. The testing plan determined by the SAP was followed and well documented by means of a test schedule, event log (outcome of the test and test date) and the test resulted were filed in the employee's records.
  - d. Consequences for repeat offenders are consentient and can result in the employee's termination. For the records reviewed, in one instance where a 1<sup>st</sup> time positive test was observed, the employee was directed to a SAP as specified in the policy.
  - e. Random testing excuses are well documented and tracked by the Drug & Alcohol Program Manager. Records for testing excuses were reviewed for 3-years.
    - 4 times out of 18 (20%) were unacceptably excused in 2004
    - 1 time out of 19 (5%) was unacceptably excused in 2005
    - 4 times out of 17 (24%) were unacceptably excused in 2006

All nine (9) of the unacceptable excuses are "Supervisor error" which generally means the department supervisor misplacement of employee test request package. Unacceptable excuses for random testing should be minimized.

4. The return-to-duty Drug & Alcohol test schedule for safety sensitive employees off work more than 90-days is well documented in the employee file and electronically. Of the summarized 156 pre-employment / return-to-duty employees, 5 tested positive (3%).
5. Annual reports for Drug & Alcohol tests results are summarized for upper management. In addition, Post Accident Drug & Alcohol test records were also reviewed. The results were well documented and summarized in quarterly reports so that trends in accidents, post-accident Drug & Alcohol test results, etc. can be reviewed.
6. On January 9, 2007, FTA released an update to 49 CFR part 655 (Prevention of Alcohol misuse and

prohibited Drug use in Transit Operations), that changed the minimum random drug test for safety sensitive employees from 50% to 25% annually. The VTA has implemented procedures to randomly test 25% of employees. VTA System Program Plan (SSPP) references the Drug & Alcohol Policy 416 & 421. The VTA Drug & Alcohol Policy (Dated October 10, 2002), states that employees will be randomly drug tested to a minimum of 50% annually. The Drug & Alcohol Policy needs to be updated to reflect the current FTA random drug test of 25% annually.

Comment:

Currently, VTA is randomly drug testing 25% of their employees annually in accordance with 49 CFR 655 updated on 01/09/07. However, the VTA Drug & Alcohol Policy has the old minimum test requirement for 50% of employees annually. VTA should revise their Drug and Alcohol policy to reflect the current random drug testing of 25% annually.

Recommendation:

VTA should develop controls to eliminate unacceptable excuses for drug & alcohol testing when randomly attempting to test its safety sensitive employees (CFR 49 Parts 40 and 655).



**2007 CPUC SYSTEM SAFETY AND SECURITY REVIEW CHECKLIST FOR  
THE SANTA CLARA VALLEY TRANSPORTATION AUTHORITY**

|               |                                          |                                                                                   |
|---------------|------------------------------------------|-----------------------------------------------------------------------------------|
| Checklist No. | <b>22</b>                                | Persons Contacted                                                                 |
| Date of Audit | <b>10/16/07</b>                          | George Tacke – VTA Manager                                                        |
| Auditors      | <b>Dain Pankratz</b>                     | Garry Stanislaw – Transportation Superintendent                                   |
| Department    | <b>Rail Operations<br/>Tech Training</b> | Mark Thomas - Technical Training Supervisor<br>Dean Palmquist – Technical Trainer |

**REFERENCE CRITERIA**

1. CPUC General Order 143-B, Sections 13.03 and 13.04
2. Light Rail System Safety Program Plan, June 2007
3. Light Rail Operating Rulebook effective June 1, 2004, Chapter 1 – General, and Chapter 3 – Train Operations
4. SOP # 1.10 (LRA-PR-411.10), Version Number 02, Dated 04/02/01 - Operator Evaluation / Ride Check

**ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION**

**OPERATIONAL EVALUATION RECORDS**

Randomly select 5 train operators and 5 Controllers and review their records to determine whether or not operational evaluations are periodically conducted to determine the extent of compliance with VTA's operating rules and instructions.

**FINDINGS AND RECOMMENDATIONS**

Activities and Findings:

The above listed VTA personal was interviewed for rules compliance of VTA employees.

The Standard Operating Procedures (SOP 1.10) is confirmed to be current with the June 2007 revision of the System Safety Program Plan (SSPP)

The Four (4) areas of rules compliance audited include:

- Ride-checks performance
- Annual Recertification
- Copy of the rulebook to employees
- Rule of the week

Supervisors and Training personal perform ride-check evaluations by unnoticeably riding the train as a passenger for 30-min while completing an evaluation of 20+ elements. Records for five (5) Train Operators, five (5) Controllers and one (1) Supervisor were randomly selected to confirm that the ride-check evaluations are performed as specified in the SOP. For the years 2005 & 2006, of the records selected (see table below), the five (5) train operators were given a ride-check three (3) times annually, the five (5) Controllers and one (1) Supervisor had been given a ride check once (1) annually as required. The VTA

personal is in the process of scheduling ride-checks for the employees that are lacking the 2007 ride-check.

The employee records were randomly inspected for annual recertification. Of the records selected, all of the employees were annually recertified.

VTA employees are given a copy of the rulebook and required to sign for the copy on a log sheet. The rulebook is to remain in the employee's possession. During ride-checks, one of elements evaluated is checking to see if the Train Operator has a copy of the rulebook. The log sheet that employees signed is well documented and employees' signatures were complete.

The rule of the week is distributed to employees by method of a train order. The train orders are distributed daily and contain vital information such as the equipment out of service, speed limit changes, security information, etc. A question of the week is also posted on the train order which discusses the SOPs. During ride-checks, both the rule of the week and question of the week are evaluated with the operator.

Recommendations:

None.

**2007 CPUC SYSTEM SAFETY AND SECURITY REVIEW CHECKLIST FOR  
THE SANTA CLARA VALLEY TRANSPORTATION AUTHORITY**

|                    |                   |                                                             |
|--------------------|-------------------|-------------------------------------------------------------|
| Checklist No.      | <b>23</b>         | Persons Contacted                                           |
| Date of Audit      | <b>10/15/07</b>   | George Tacke -Operations Manager, Bus & Rail Transportation |
| Auditors           | <b>Arun Mehta</b> | John Carlson – Supt. Service Management (OCC& Field Staff)  |
| Department         | <b>Operations</b> | Gary Stanislaw – Transportation Superintendent              |
| REFERENCE CRITERIA |                   |                                                             |

General Order 143-B, Rule 12.04 Hours of Service-Safety Sensitive Employees.

**ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION**

**HOURS OF SERVICE - TRAIN OPERATORS, TRAIN CONTROLLERS, AND SUPERVISORS**

Randomly select ten persons from the rosters of LRV operators, central controllers, and rail inspectors and review their hours of service records prepared during a two month period within the past two years for the selected employees and determine whether or not:

1. They complied with the requirement that employees in safety sensitive positions may not remain on duty for more than 12 consecutive hours, or for more than 12 hours spread over a period of 16 hours.
2. The initial on duty status of each safety sensitive employee only began after 8 consecutive hours off duty.
3. Method exists to track the employees' hours of services, in situations where violations were found, these were appropriately resolved by VTA.

**FINDINGS AND RECOMMENDATIONS**

Activities and Findings:

Staff reviewed the GO 143-B requirements and hours of service records and related materials supplied by the VTA staff during the audit. Staff also reviewed the two month operating records and schedules in 2007 for four LRV Operators, four OCC Controllers, and two Field Inspectors. Staff found the following:

1. VTA limits the employee work hours to 10 hours on a 13 hour spread. The OCC Controllers and inspectors normally work on an 8.5 hour schedule. The LRV operators work on a schedule not exceeding 10 hours
2. VTA provides a 10 hour rest period between shifts. If the employees, for some reason, are asked to come after an 8hr (absolutely minimum), VTA has to pay a penalty in addition to 2 hours of guaranteed overtime. VTA tries to avoid less than 10 hour of rest period because of these economic penalties.

3. VTA has a pool of about 95 LRV operators but need only 45 during peak and 80 for biddable assignments leaving a margin of ~ 20% above the minimum required. Thus there is never a need when “rested” operators are unavailable and the working operators are forced to work overtime.
4. VTA requires 2 central controllers 24 hours a day, seven days a week. They have a pool of 14 controllers, even though they only require 6 (3 shifts x 2 controllers per shift). VTA maintains a pool of 18 field supervisors who are also trained to perform the duties of central controllers as well. This level of excess capability ensures that VTA never has to exceed the Hours of Service (HOS) limitations set by 143-B.
5. VTA uses a computerized tracking method called BDT (Bid Dispatch Tracking Software) to track employee work hours. This system ensures that no employee and supervisors violate the “hours of service” limits knowingly or unknowingly. The dispatcher sets up employee assignments 24 hours in advance by inputting the employee name and badge number and the computer generates the weekly assignments.
6. If an employee shows repeat negligence and rule violations, the supervisor advises them to make use of Employee Assistance Program (EAP). VTA also offers use of a third party assistance program called “Horizon Services”. Field supervisors also act as random inspectors of employee work behaviors. Customer comments/complaints are also used to assess employee behaviors and any irregularities.
7. VTA tries to ensure safe employee work patterns. An example was offered where an employee showing repeated rule violations and negative customer complaints was made to take a mandatory referral to the EAP program including mandatory five sessions of counseling plus a mandatory attendance into a stress management program. The subject employee having attended all these programs, made one more rule violation. He was shown a video of his rule violation and then subjected to 10 days of disciplinary suspension. His subsequent work pattern improved significantly.
8. Staff reviewed the HOS records of twelve workers. All the work hours and resting period were within the rules and limits without exceptions.

Recommendations:

None

**2007 CPUC SYSTEM SAFETY AND SECURITY REVIEW CHECKLIST FOR  
THE SANTA CLARA VALLEY TRANSPORTATION AUTHORITY**

|               |                                |                                        |
|---------------|--------------------------------|----------------------------------------|
| Checklist No. | <b>24</b>                      | Persons Contacted                      |
| Date of Audit | <b>10/18/07</b>                | Jerry Oxsen - Rail Maintenance Manager |
| Auditors      | <b>Noel Takahara</b>           |                                        |
| Department    | <b>Way, Power &amp; Signal</b> |                                        |

**REFERENCE CRITERIA**

1. MTN-PR-6805 Dated 11/15/00

**ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION**

**WAY, POWER & SIGNAL INTERNAL AUDIT PROGRAM**

Review the Way, Power & Signal preventive maintenance audit records prepared during the last three years to determine whether or not:

1. Completed audit forms were submitted to the program coordinator and all necessary information filled out completely by the auditor.
2. A WPS Supervisor has audited two groups other than his/her own group.
3. Results of audits have been used to measure the effectiveness of maintenance, training and safety programs at WPS.

**FINDINGS AND RECOMMENDATIONS**

Activities and Findings:

1. The procedure outlined by document MTR-PR-6805 prescribing annual internal auditing of WPS programs is not being followed.
2. An internal audit of the WPS department, as part of the VTA Internal Rail Safety Audit, was conducted on May 29, 2007. This is not an annual internal audit and not related to the procedure outlined by MTR-PR-6805. The auditor found that a corrective action plan to address recommendations from that audit has not been developed.

Recommendation:

VTA should ensure that WP&S preventive maintenance audits are conducted and all required records are prepared in accordance with MTN-PR-6805 requirements.

**2007 CPUC SYSTEM SAFETY AND SECURITY REVIEW CHECKLIST FOR  
THE SANTA CLARA VALLEY TRANSPORTATION AUTHORITY**

|               |                    |                                                 |
|---------------|--------------------|-------------------------------------------------|
| Checklist No. | <b>25</b>          | Persons Contacted                               |
| Date of Audit | <b>10/19/07</b>    | Arthur Douwes, Operations Manager Engineering   |
| Auditors      | <b>Raed Dwairi</b> | Kris Sabherwal, Light Rail Maintenance Engineer |
| Department    | <b>Engineering</b> |                                                 |

**REFERENCE CRITERIA**

5. Light Rail System Safety Program Plan, June 2007

**ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION**

**BRIDGES/STRUCTURES INSPECTIONS & REPORTS**

1. Interview VTA representatives to determine if a procedure exists for structural inspections
2. Review available records of bridge and other structural inspections at VTA to determine whether or not these were inspected as required and remedial actions taken in a timely manner.

**FINDINGS AND RECOMMENDATIONS**

Activities and Findings:

Staff interviewed VTA personnel in charge of the VTA LRT structures preventive maintenance program and reviewed available documentation. Staff found the following:

1. Staff was provided with a list of VTA LRT Structures. This list was dated 10/18/2007 and contained 80 structures. Each is identified by an ID number, a structure number, a name/location, and a pole number. Another list identified the structure type: box culvert, bridge, soundwall, retaining wall, tunnel, and station.
2. Structural inspections were performed by an outside contractor (Hatch Mott Macdonald). The contactor prepared a binder dated 9/17/07 and titled LRT Structures Inspection - Guadalupe Corridor. No rating system was used.
3. A Bridge Management Program is being developed for VTA by Nolte & Associates which uses the National Bridge Inspection Standards (NBIS). This program will be finalized by the end of 2007.
4. VTA has no Standard Operating Procedure (SOP) for the maintenance of its concrete structures that distinguishes between structural and maintenance defects and requires the development of a corrective action plan and implementation schedule to address identified defects. VTA is interested in learning more about similar programs that have been developed by Sacramento Regional Transit

District and Los Angeles Metropolitan Transportation Authority as a result of CPUC Triennial Audits.

Recommendation:

VTA should develop a Bridge/Concrete Structures Inspection SOP distinguishing between maintenance and structural defects including documentation of appropriate corrective action plan, department responsible for corrective actions and implementation schedule to address identified defects.

**2007 CPUC SYSTEM SAFETY AND SECURITY REVIEW CHECKLIST FOR  
THE SANTA CLARA VALLEY TRANSPORTATION AUTHORITY**

|               |                        |                                             |
|---------------|------------------------|---------------------------------------------|
| Checklist No. | <b>26</b>              | Persons Contacted                           |
| Date of Audit | <b>10/18/07</b>        | Tom Smith – Purchasing & Materials Manager  |
| Auditors      | <b>Arun Mehta</b>      | Maureen Raine – Purchasing Supervisor       |
| Department    | <b>Materials Mgmt.</b> | Erick Walton – Materials & Warranty Manager |

**REFERENCE CRITERIA**

6. Light Rail System Safety Program Plan, June 2007

**ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION**

**PROCUREMENT**

Conduct the necessary interviews and review appropriate records to determine whether or not:

1. Adequate procedures and controls are in place to preclude the introduction of defective or deficient equipment into the rail transit environment at VTA.
2. Adequate procedures are in place to safely deal with defective or deficient equipment in the event these are introduced to the rail transit environment at VTA.

**FINDINGS AND RECOMMENDATIONS**

Activities and Findings:

Staff interviewed VTA representatives and found the following:

1. Staff reviewed the VTA policy on “Purchasing Agent Designation and Delegation Authority Document # FRS-PL-010, version 3 revision date 12/3/01. The policy document addresses conflict of interest issues, keeping proper procurement records, establishing fair purchase price, fairness of vendor selection, and issuance of various different types of contracts.
2. The lowest bid is not awarded the contract automatically. Every significant bid/contract goes through a formal “Life Cycle Cost Analysis”, which accounts for many details including the quality of materials, life expectancy of the material and work, etc. This process minimizes the introduction of defective or deficient equipment into the system.
3. The Contracts and Procurement department works closely with the operations and maintenance departments in evaluating/testing new products/ materials or evaluating repeat failures of certain components. Many of the examples given related to the VTA Bus operations, because their LRVs are still under manufacturer warranty. This warranty, however, is about to expire soon. The Procurement department is confident that the same “checks and balances” in place for the bus operations would apply to the rail operation as well.



4. VTA has a good warranty tracking process in place, as shown by documents on their “Gillig Buses” as an example.
5. Staff reviewed a sample of their bid solicitation # VTA05-525-P02 “Invitation to Bid Light Rail Pantograph Parts” dated 9/30/05 which requires the bidders to submit their bids by 10/28/08. The process appeared to be adequate and complete in its scope and nature.
6. VTA O&M department has a requisition to hire a new engineer who will help work out the specifications for replacement and worn out parts as their LRV fleet gets out of warranty.

Recommendations:

None

**2007 CPUC SYSTEM SAFETY AND SECURITY REVIEW CHECKLIST FOR  
THE SANTA CLARA VALLEY TRANSPORTATION AUTHORITY**

|               |                                |                                     |
|---------------|--------------------------------|-------------------------------------|
| Checklist No. | <b>27</b>                      | Persons Contacted                   |
| Date of Audit | <b>10/17/07</b>                | George A. Ramos – Signal Supervisor |
| Auditors      | <b>Ni Liu</b>                  |                                     |
| Department    | <b>Way, Power &amp; Signal</b> |                                     |

**REFERENCE CRITERIA**

MTN-PR-6201-Monthly Platform Preventive Maintenance, Issued 04/06/99

**ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION**

**FACILITY INSPECTIONS**

Randomly select at least three light rail station on the Vasona and Guadalupe Lines and review their maintenance records to determine whether or not:

1. Inspections were performed and documented as required.
2. Noted defects were corrected and documented in a timely manner.

**FINDINGS AND RECOMMENDATIONS**

Activities and Findings:

Staff reviewed the Monthly Platform Preventive Maintenance Checklist for the following stations:

**Santa Teresa:**

- Last three monthly preventive maintenances were conducted on 3/07, 1/07, and 9/06.
- Last quarterly preventive maintenance was conducted on 3/07.
- Last semi-annually preventive maintenance was conducted on 6/06.
- The checklists reviewed were all signed, dated, and filed by supervisor.

**Winchester:**

- Last three monthly preventive maintenances were conducted on 8/07, 7/07, and 6/07.
- Last quarterly preventive maintenance was conducted on 3/07.
- Record shown no semi-annually preventive maintenance has been conducted. The record begins from 6/05.
- The checklists reviewed were all signed, dated, and filed by supervisor.

**Downtown Mountain View:**

- Last three monthly preventive maintenances were conducted on 9/07, 8/07, and 7/07.
- Last quarterly preventive maintenance was conducted on 9/07.

- Last semi-annually preventive maintenance was conducted on 9/07.
- The checklists reviewed were all signed, dated, and filed by supervisor.

The quarterly and semi-annually preventive maintenance on the platform are related to maintenance of the Ticket Vending Machine (TVM), and are, therefore, not safety-related activities. Record review indicated the platform preventive maintenance is not performed as scheduled.

Staff reviewed the Monthly Platform Preventive Maintenance Checklist for the following stations:

**Santa Teresa:** no deficiency noted.

**Winchester:** no deficiency noted.

**Downtown Mountain View:** no deficiency noted.

Staff also reviewed the following work orders:

**Work order** opened on 10/1/07 and closed on 10/16/07.

**Work order** opened on 10/12/07 and closed on 10/12/07.

**Work order** opened on 10/12/07 and closed on 10/12/07.

Record review indicated deficiencies are documented and corrected in a timely manner.

**Recommendation:**

VTA should either adhere to its Monthly Platform Preventive Maintenance Procedure (MTN-PR-6201) or revise it to reflect actual practice.

**2007 CPUC SYSTEM SAFETY AND SECURITY REVIEW CHECKLIST FOR  
THE SANTA CLARA VALLEY TRANSPORTATION AUTHORITY**

|               |                                                   |                                                                                                                      |
|---------------|---------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|
| Checklist No. | <b>28</b>                                         | Persons Contacted                                                                                                    |
| Date of Audit | <b>10/16/07</b>                                   | Jerry Oxsen – Rail Maintenance Manager                                                                               |
| Auditors      | <b>Joey Bigornia<br/>Arun Mehta<br/>Jimmy Xia</b> | Jose Hernandez – Senior Track Worker<br>Carol Selby – Maintenance Scheduler<br>Kris Sabherwal – Rail System Engineer |
| Department    | <b>Way, Power &amp;<br/>Signal</b>                |                                                                                                                      |

**REFERENCE CRITERIA**

1. MTN-PR-6403 Wayside Inspections, Dated 8/18/05
2. MTN-PR-6405 Track Geometry Standards, Dated 9/15/00
3. MTN-PR-6407 Inspection and Maintenance of Ties, Dated 9/15/05
4. MTN-PR-6408 Inspection of Maintenance of Rail, Dated 9/15/00
5. MTN-PR-6409 Maintenance of Fastenings, Dated 9/15/00
6. MTN-PR-6410 Maintenance of Joints, Dated 9/15/00
7. MTN-PR-6411 Inspection and Maintenance of Continuous Welded Rail (CWR) Track, Dated 9/15/00

**ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION**

**TRACK COMPONENTS INSPECTION**

Review the records of track, timber & concrete ties, rail fastenings, rail joints, and continuous welded rail track (CWR) to determine whether or not:

3. Inspections were performed and documented as required.
4. Noted defects were corrected and documented in a timely manner.

**FINDINGS AND RECOMMENDATIONS**

Activities and Findings:

Staff interviewed VTA representatives in charge of Track and Switch Maintenance Program and reviewed the maintenance inspection reports dated January – October 2007 and found the following:

1. Mainline Switch Inspections
  - A. Monthly Switch Inspections
    1. Reviewed mainline switch inspection reports for the following locations:
      - a. Gish Station to Tasman Station: S-22A, S-22B, S-23A, S-23B, S-27A, S-27B, S-29A, S-29B
      - b. Cropley Station to McKee Station: 1109, 1106

- c. Middlefield Station to Bayshore Station: 131, 134
- d. Hamilton Station to Campbell Station: 2069
- e. Snell Station to Cottle Station: 107A, 107B
- f. Champion Station to Baypoint Station: 11,13,15,17, 19, 21

2. The mainline switch inspections were inspected once/month as required by Maintenance Procedure however, VTA inspected switches on a weekly basis (four inspections /month) for January to September. The October inspection and future inspections are now performed on a monthly basis.
3. The inspector corrects defect found during an inspection. Defects that cannot be repaired during the inspection are identified on the inspection report.
4. The current process for defects found during an inspection is a “notification number” is assigned to each deferred maintenance item and the Maintenance Scheduler enters information to the database.
5. The Track Supervisor reviews defects listed on the notification database and assigns the priority for repairs to be performed.
6. After completion of a defect from the database, a work order number is assigned to show closure of defect and this same number is recorded on the original inspection report that noted the defect.
7. A review of the Notification List identifies 35-deferred maintenance items. 22-items were identified from 2006 and 13-items are from 2007.
8. The Weekly Switch Inspection Preventive Maintenance (PM) Report for Switch 107B, Location Cottle dated February 2, 2007 identified a “cracked heel block weld at frog” and it was assigned a notification number. The subsequent weekly Switch PM reports captured the same finding and this defect remained open until July 26, 2007; a work order showed the defect was closed out.
9. Currently there is no closure loop on an inspector pointing out an unsafe problem and the actual work done so the activity can be closed out.

#### B. Quarterly Switch Inspections

1. Reviewed mainline switch inspection reports for the following locations:
  - a. Gish Station to Tasman Station: S-22A, S-22B, S23A, S-23B, S-27A, S-27B, S-29A,S-29B
  - b. Cropley Station to McKee Station: 1109, 1106
  - c. Middlefield Station to Bayshore Station: 131, 134
  - d. Hamilton Station to Campbell Station: 2069
  - e. Snell Station to Cottle Station: 107A, 107B
  - f. Champion Station to Baypoint Station: 11, 13, 15,17,19,21
2. All mainline switches were inspected at the quarterly frequency interval. No exceptions were noted.

#### 2. Mainline Track Inspections and Maintenance

##### A. Monthly Track Inspections

1. Requested Track Inspection Records for January – October 2007 however, only June, July, August, and October records were available for review.
2. Selected the track between Gish Station to Tasman Station for review. A review of the current track inspection form showed this section was inspected however it was difficult to accomplish this task.
3. A revised draft track inspection form was completed in September 2007 which shows each area

of track “sectionalized” by track number and location between stations for ease of identifying areas that have been track inspected but it has not been implemented.

B. Track Geometry Inspections

1. Requested Track Geometry Inspection Reports for Year 2004 – 2007 to review.
2. The Track Geometry Inspections for Year 2004 was performed on November 4, 2004 and Year 2005 was performed on March 3, 2005. No exceptions were noted.
3. The Track Geometry Inspections for Year 2006 was scheduled but cancelled due to the Contractor hired for the task faced problems with the California Contractor’s license requirements.
4. The Track Geometry Inspections for Year 2007 are scheduled for late Fall 2007.

C. Ultrasonic Testing

1. Requested Ultrasonic Test Reports for Year 2005 – 2007 to review.
2. The Ultrasonic Test for Year 2005 was performed on July 5, 7,8,10 and 11. No exceptions were noted.
3. The Ultrasonic Test for Year 2006 was performed on November 9-12, 2006. No exceptions were noted.
4. The Ultrasonic Test for Year 2007 is scheduled for late Fall 2007.

Recommendation:

VTA should develop controls to ensure track defects found during inspections are not being deferred but rather corrected in a timely manner (MTN-PR-6408).

**2007 CPUC SYSTEM SAFETY AND SECURITY REVIEW CHECKLIST FOR  
THE SANTA CLARA VALLEY TRANSPORTATION AUTHORITY**

|               |                            |                                                                                     |
|---------------|----------------------------|-------------------------------------------------------------------------------------|
| Checklist No. | <b>29</b>                  | Persons Contacted                                                                   |
| Date of Audit | <b>10/18/07</b>            | Mike Brill – Security Officer                                                       |
| Auditors      | <b>Ni Liu</b>              | Kathy Hendrix – Senior Management Analyst                                           |
| Department    | <b>Protective Services</b> | Julia Jones – Senior Management Analyst<br>Rick Sprain – Sergeant, Sheriff's Office |

**REFERENCE CRITERIA**

1. Security Plan
2. GO 164-D

**ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION**

**SECURITY**

Conduct the necessary interviews and review appropriate records to determine whether or not:

1. VTA has a process for identifying security breach as a result of the collection and analysis of security-related data.
2. VTA has a process for relocating security resources as a result of the analysis.

**FINDINGS AND RECOMMENDATIONS**

Activities and Findings:

1. Staff reviewed the Monthly Transit Patrol Divisional Summary Report generated by the Sheriff's Office. The report consisted of the following information:
  - a. Number of arrests for the month.
  - b. Total reports taken.
  - c. Citations issued.
  - d. Number of events.
  - e. Miscellaneous type events.
  - f. Vandalism Damage Summary Report.
  - g. Mandatory Crime Report.

Critical events from the report are reviewed by the Rail System Safety Review Board (RSSRB), the VTA-ATU Joint Safety Committee, and the Security Breach Review Committee.

Staff also reviewed a summary of the Security Incident Report generated by Protective Services for 03-07 and the summary of the Fare Inspection Unit Activity Report for 04-07.

Staff further reviewed the following operator training curriculums:

- a. Verification of Transit Training (VTT) Class 2007 Lesson Plan: consisted of a session of Security Awareness DVD viewing.
- b. 2007 Operations recertification Syllabus: consisted of topic: SOP 9.13 – Light Rail Emergency Guidelines.

In addition, operators are given incentives for completing a Security Incident Report.

Record review indicated an adequate system of security data collection and analysis.

2. Staff interviewed the representative from various areas within Protective Services and found that security reports are uploaded onto the applicable database. The data generated from the security reports, along with the Uniform Crime Report, are used to identify security trends and changes in security needs. There is a constant information exchange between the representatives and changes are made promptly with great coordination.

In addition, quarterly meetings are held between Protective Services, operations, and administrative staff to further discuss additional changes in security needs.

Recommendations:

None.



**2007 CPUC SYSTEM SAFETY AND SECURITY REVIEW CHECKLIST FOR  
THE SANTA CLARA VALLEY TRANSPORTATION AUTHORITY**

|               |                                           |                                                                                                                                                                                                           |
|---------------|-------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Checklist No. | <b>30</b>                                 | Persons Contacted                                                                                                                                                                                         |
| Date of Audit | <b>10/17/07</b>                           | Abrar Ahmad – OCC, Guadalupe                                                                                                                                                                              |
| Auditors      | <b>Arun Mehta</b>                         | Garry Stanislaw – Transportation Superintendent                                                                                                                                                           |
| Department    | <b>Risk<br/>Management<br/>Operations</b> | Bill Evans – Transit Safety Officer<br>Art Douwes - Operations Engineering Manager<br>Kris Sabherwal – Maintenance Engineer<br>Nanci Eksterowicz - Risk Manager<br>Mark Bugna – Transit Safety Supervisor |

**REFERENCE CRITERIA**

1. Light Rail System Safety Program Plan, June 2007

**ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION**

**SAFETY DATA COLLECTION AND ANALYSIS**

Conduct the necessary interviews and review appropriate records to determine whether or not:

3. VTA has a process for the collection and analysis of safety data
4. The above process was followed to identify safety issues where recommendations were generated and implemented (list specific case studies or projects).

**FINDINGS AND RECOMMENDATIONS**

Activities & Findings:

Staff performed this checklist in combination with checklist # 31 and found the following:

1. VTA maintains two types of databases: (1) Accident Database, and (2) Near Miss Database. The latter was initiated in 2004. VTA collects data for all incidents and accidents and puts it in its databases for analysis.
2. VTA has reviewed all their accident data and has flagged the six most significant root causes for the accidents/incidents. Out of all the root causes, two stand out as the most significant ones in terms of frequency; these being (1) Illegal Left Turns, and (2) Track Intrusions.
3. VTA has set up working groups to review, analyze and recommend mitigation/corrective actions for these most significant causes.
4. The Illegal Left Turn Working Group identified 98 accidents for the 2000-2006 period. These resulted in nine injuries and one fatality. 31 of the 98 accidents occurred at 6 locations – Burton Way, Karina, Charcot, Lawrence Expressway, Hostetter and McKee. The working Group studied incident reports, photographs, witness statements, traffic movement patterns, traffic light sequences

and signage at these 6 locations. The root cause was determined to be auto driver's lack of attention. Faced with a red left turn arrow and an international "train coming" image directly in front of the left lane, these drivers still proceed into the their turns seemingly oblivious to the approaching train behind their left shoulders.

5. The Group recommended a number of mitigation measures for the illegal left turn problem, including: Public education, Relocation of limit lines, 'Stop here on red' Signage, more visible limit stripes, Lagging left turn signal and Traffic enforcement campaign. VTA is evaluating these recommendations to determine effective mitigation measure.
6. Track Intrusion in which a motorist trespasses onto the LRV right of way, was analyzed to be the other major cause of VTA train accidents. For the period 2001-2006, VTA experienced 255 documented track intrusion incidents occurring at 78 of potential 126 sites. 86 of these incidents occurred at the following 6 locations: First & Tasman, Brokaw, McKee, Lawrence Expressway, Hostetter, and San Carlos/Woz Way.
7. The root cause of the Track Intrusion Incidents was found to be the lack of visibility of the tracks at crossings. The track barriers (small curbs) were found to be almost flush with the road surface misleading the motorists as another traffic lane. Motorists turn into the right of way mistaking it as a traffic lane and get stuck.
8. The Group recommended the following mitigation measures for track intrusion: Bollards and reflective paint scheme; better signage. VTA is evaluating these recommendations to determine effective mitigation measure.
9. Staff found the VTA staff to be very knowledgeable in data collection, analysis and developing mitigation measures.

Recommendations:

None

**2007 CPUC SYSTEM SAFETY AND SECURITY REVIEW CHECKLIST FOR  
THE SANTA CLARA VALLEY TRANSPORTATION AUTHORITY**

|               |                                           |                                                                                                                                                                 |
|---------------|-------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Checklist No. | <b>31</b>                                 | Persons Contacted                                                                                                                                               |
| Date of Audit | <b>10/17/07</b>                           | Abrar Ahmed – OCC, Guadalupe                                                                                                                                    |
| Auditors      | <b>Noel Takahara</b>                      | Gary Stanislaw – Transportation Superintendent                                                                                                                  |
| Department    | <b>Risk<br/>Management<br/>Operations</b> | Nanci Eksterowicz – Risk Manager<br>Bill Evans – Transit Safety Officer<br>Kris Sabherwal – Maintenance Engineer<br>Art Douwes – Operations Engineering Manager |

**REFERENCE CRITERIA**

1. Light Rail System Safety Program Plan, June 2007
2. GO 164-D

**ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION**

**HAZARD MANAGEMENT PROCESS**

Conduct the necessary interviews and review appropriate records to determine whether or not:

5. VTA has a process for managing hazards to its Light Rail System which is coordinated with other important activities such as accident/incident investigation and safety data collection and analysis.
6. The above process was followed to identify, categorize, and bring hazards down to acceptable levels of risk (provide specific examples).

**FINDINGS AND RECOMMENDATIONS**

Activities and Findings:

1. The two most evident hazards on the VTA system are illegal left hand turns and track intrusions. Illegal left hand turns involve automobiles turning into the street running LRVs and track intrusion involve automobile drivers mistaking LRV track for an automotive lane.
2. Several safety related committees exist in order to mitigate hazards including the Rail System Safety Review Board (RSSRB), Active Right of Way Review, VTA ATU Joint Safety Committee, Fire Life Safety Committee, Track Allocation Committee, and Weekly Accident Review Committee. VTA reviewed internally collected and recorded data (accident and near miss) and issued two reports related to illegal left hand turns and track intrusion. The result of the reports placed high priority to upgrade 6 intersections to mitigate safety hazards. VTA will upgrade these intersections and monitor results before instituting upgrades to other intersections. VTA states that better maintenance by the city of its vehicle lane markings would help to prevent track intrusions. VTA is working with the city to resolve these issues.

Recommendations:

None

**2007 CPUC SYSTEM SAFETY AND SECURITY REVIEW CHECKLIST FOR  
THE SANTA CLARA VALLEY TRANSPORTATION AUTHORITY**

|               |                                    |                                                                                      |
|---------------|------------------------------------|--------------------------------------------------------------------------------------|
| Checklist No. | <b>32</b>                          | Persons Contacted                                                                    |
| Date of Audit | <b>10/15/07</b>                    | Arthur Douwes – Operations Engineering Manager                                       |
| Auditors      | <b>Anton<br/>Garabetian</b>        | Kris Sabherwal – Maintenance Engineer<br>Bill Evans – Transit Safety Officer         |
| Department    | <b>Maintenance<br/>Engineering</b> | Mark Bugna – Transit Systems Safety Supervisor<br>Hohn Heggarty – Compliance Officer |

**REFERENCE CRITERIA**

Light Rail System Safety Program Plan, June 2007

**ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION**

**SYSTEM MODIFICATION**

Conduct the necessary interviews and review appropriate records to determine whether or not:

7. VTA has a documented review and approval process with specifics of sign-off requirements and exception capability.
8. The above process was followed in the review and approval of proposed modifications to the rail system at VTA.

**FINDINGS AND RECOMMENDATIONS**

Activities and Findings:

Staff interviewed VTA representatives who are responsible for rail system modification review and approval process. VTA presented a list of projects from 2005 to 2007 that showed how they followed the required process for project implementation. The list included Service Information Bulletins (SIB) and Service Change Bulletins (SCB). VTA manages system document changes through SIB and system physical configuration changes through SCB. Records Management Department maintains the records, which are eventually posted on the VTA Share Drive accessible by all the departments.

According to VTA, Configuration Review Board (CRB) meets on an as-needed basis to review any major safety configuration management issues. VTA could not provide any meeting minutes from CRB meeting. VTA stated that participants discuss issues during CRB meeting and if needed, they elevate the issues to the Rail System Safety Review Board (RSSRB).

Staff tracked documents for system modification review and approval process as follows: HVAC Shop Stinger Ground Project, Additional Fuse Protection, Impulse Substation Re-closure Circuit Modification, and Improved Shunt Replacement, which followed all the required system modification review and approval process. VTA is consistently addressing all the safety related issues stemming from the proposed changes to the rail system.

Staff did not note any exceptions.

Suggestion:

Staff suggests that VTA documents the CRB meeting minutes.

Recommendation:

None

