

PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

Rail Safety and Carriers Division
Rail Engineering Safety Branch
Rail Transit Safety Section

Resolution ST-40
Date: December 17, 1998

RESOLUTION

RESOLUTION ST-40. GRANTING APPROVAL OF A FINAL REPORT OF AN ON-SITE SAFETY AUDIT OF THE SANTA CLARA VALLEY TRANSPORTATION AUTHORITY PERFORMED BY THE RAIL TRANSIT SAFETY SECTION OF THE COMMISSION'S RAIL SAFETY AND CARRIERS DIVISION.

Summary

This resolution grants the request of the Rail Safety and Carriers Division for approval of the Rail Transit Safety Section's final audit report titled, "Triennial On-Site Safety Audit of the Santa Clara Valley Transportation Authority", dated November 17, 1998.

Background

Commission General Order No. 164-A, "Rules and Regulations Governing State Safety Oversight of Rail Fixed Guideway Systems" and Federal Transit Administration (FTA) Final Rule 49 CFR, Part 659, "State Safety Oversight of Rail Fixed Guideway Systems" require the Commission, as the designated state safety oversight agency for California, to conduct on-site safety reviews of transit agencies operating rail fixed guideway systems at least once every three years. Following the completion of each review, the Commission is required to issue a report containing its findings and recommendations. This report must also contain a determination of whether or not the transit agency's system safety program plan should be updated.

Discussion

Staff of the Rail Transit Safety Section of the Commission's Rail Safety and Carriers Division conducted an on-site, safety audit of the Santa Clara Valley Transportation Authority's (VTA) light rail transit system during a two week period from September 14 to September 25, 1998. The methods used to conduct the audit included:

- Discussions with VTA management
- Reviews of procedures and records
- Observations of operations and maintenance activities
- Interviews with rank and file employees
- Inspections and measurements of facilities and equipment

A full description of the audit, including the scope, results and recommendations, is contained in the final audit report, which is attached to this resolution as Appendix A. The results of the audit show that VTA is effectively implementing its System Safety Program. Exceptions, however, were noted during the audit. These are described, where applicable, in the Results/ Comments Section of each checklist within the final report, along with recommendations to correct each identified exception. Twenty-four checklists contain recommendations. They are Checklist numbers: 2, 7, 8, 10 - 12, 15 - 18, 20 - 29, 32, 34, 39, and 41.

The VTA System Safety Program Plan requires the plan to be reviewed and updated annually. The next review is scheduled in February, 1999. The only additional updating of the system safety program plan that is necessary due to the audit is addressed in a recommendation contained in Checklist No. 32 of the audit report that deals with configuration management. VTA is in agreement with the recommended change to the system safety program plan.

Following the audit, staff of both the VTA and the Rail Transit Safety Section were able to achieve full agreement on all aspects of the final audit report, including the recommendations. VTA will perform the necessary follow up actions to assure that the recommendations in twenty-four of the checklists are fully implemented. VTA will prepare a plan and schedule for each recommendation showing each step of the work to be done, when it will be done, and the person responsible for getting it done. The implementing plans and schedules for each recommendation will be provided to the staff of the Rail Transit Safety Section by February 1, 1999. VTA will also provide the staff of the Rail Transit Safety Section with a status report in August and February of each year until all recommendations are fully implemented. The semi-annual status

reports will include updates that show the work completed and the work remaining for each recommendation.

The Rail Safety and Carriers Division recommends that the Commission approve the Rail Transit Safety Section's final audit report titled, "Triennial On-Site Safety Audit of the Santa Clara Valley Transportation Authority", dated November 17, 1998. It is also recommended that the Commission order VTA to:

- submit by February 1, 1999, a report to the Rail Transit Safety Section, containing plans and schedules for implementing the recommendations contained in twenty-four of the checklists.
- implement all recommendations in accordance with the plans and schedules submitted.
- on August 1st. and February 1st. of each year, provide the Rail Transit Safety Section with semi-annual reports on the status of the recommendations until all recommendations are fully implemented.

Protests

All interested parties, including VTA have been advised of the contents of this resolution, and no protests or objections have been received.

THEREFORE, IT IS ORDERED that:

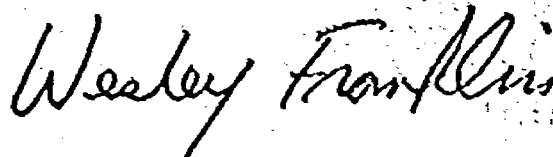
The Rail Safety and Carriers Division's request for approval of the Rail Transit Safety Section's final audit report titled, "Triennial On-Site Safety Audit of the Santa Clara Valley Transportation Authority", dated November 17, 1998, is granted.

VTA shall submit plans and schedules for implementing all recommendations contained in the final audit report to the staff of the Rail Transit Safety Section by February 1, 1999.

VTA shall implement all recommendations contained in the report, in accordance with the plans and schedules submitted to the Rail Transit Safety Section staff.

VTA shall prepare and submit semi-annual status reports on August 1st. and February 1st. of each year to the Rail Transit Safety Section. These reports shall continue to be submitted until all recommendations are fully implemented.

I certify that this resolution was adopted by the Public Utilities Commission of the State at its regular meeting in California held on December 17, 1998. The following Commissioners voting favorably thereon:

A handwritten signature in cursive script that reads "Wesley Franklin". The signature is written in black ink and is positioned above a horizontal line.

WESLEY M. FRANKLIN
Executive Director

Richard A. Bilas
President
P. Gregory Conlon
Jessie J. Knight, Jr.
Henry M. Duque
Josiah L. Neep
Commissioners

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

AUDITORS: LEN HARDY ERIK JUUL
 KARTIK SHAH GARY ROSENTHAL
 JOEY BIGORNIA AUDREY CHIU

RAIL TRANSIT SAFETY SECTION
RAIL SAFETY AND CARRIERS DIVISION
CALIFORNIA PUBLIC UTILITIES COMMISSION
505 VANNES AVENUE
SAN FRANCISCO, CA 94102

NOVEMBER 17, 1998

FINAL REPORT



PREPARED FOR:

SANTA CLARA VALLEY TRANSPORTATION AUTHORITY
3331 NORTH FIRST STREET
SAN JOSE, CA 95134

**FINAL REPORT
11-17-98**

CALIFORNIA PUBLIC UTILITIES COMMISSION

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

INTRODUCTION

The California Public Utilities Commission's General Order No. 164-A and the Federal Transit Administration's Final Rule, 49 CFR Part 659, require the Commission staff to perform triennial, on-site, safety audits of each transit agency operating a rail fixed guideway system in California. The purpose of these audits is to verify compliance with, and evaluate the effectiveness of, each rail transit agency's system safety program.

The first triennial, on-site, safety audit of the Santa Clara Valley Transportation Authority (VTA) was conducted by the Rail Transit Safety Section of the Commission's Rail Safety and Carriers Division during the two week period from September 14 to September 25, 1998. The on-site audit was preceded by a pre-audit conference with staff of the VTA on September 14, 1998. A post-audit conference, also attended by staff of the VTA, was held on September 25, 1998.

PROCEDURE

The audit was conducted in accordance with the Commission's procedure RTSS-4, Procedure for Performing Triennial Safety Audits of Rail Transit Systems. A set of 41 audit checklists covering various departments with system safety responsibilities was prepared in advance of the on-site audit. Each checklist identifies the safety related elements and characteristics that were audited, the reference documents that established the acceptance requirements, and the method

that was used for evaluating compliance with the requirements. The methods used included:

- discussions with VTA management
- reviews of procedures and records
- observations of operations and maintenance activities
- interviews with rank and file employees
- inspections and measurements of equipment and infrastructure

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

RESULTS AND RECOMMENDATIONS

The findings for each element / characteristic audited are recorded under the RESULTS / COMMENTS heading on each of the 41 checklists. An index of the 41 checklists is provided on Page 5 of this report. The findings were discussed in detail with the VTA personnel listed under "Persons Contacted" during the course of the on-site audit. In cases where the findings resulted in recommendations being made by Commission staff, the recommendations were entered on the checklist directly below the findings. Recommendations were summarized at the post-audit conference and were discussed with VTA staff during the 30-day comment period. As a result of these discussions, Commission staff and VTA staff have reached full agreement on the recommendations and requirements for corrective action.

For each recommendation, VTA has agreed to prepare and implement a corrective action plan and schedule that identifies each step of the work to be done to carry out the recommendation, when each step will be done, and the person responsible for getting it done. This planning and scheduling information will be provided to the Commission staff for review and acceptance by January 20, 1999. In

addition, beginning in July, 1999 VTA will also provide the Commission staff with a status report in July and January each year until all the required work to implement the recommendations is completed. The status reports will include plan and schedule updates that show the work completed and work remaining for each recommendation.

Finally, the Commission's designated representative for VTA, as part of his/her regularly assigned safety oversight duties performed in accordance with RTSS-1, Procedure for Safety Oversight of Design, Construction, Operation and Maintenance of Rail Fixed Guideway Systems, is responsible to monitor the work performed to assure it is fully responsive to the recommendations, and to report back to the Manager of the Rail Transit Safety Section when each corrective action plan is satisfactorily completed.

SUMMARY AND CONCLUSIONS

This, the first on-site, triennial, safety audit of the VTA conducted by the Rail Transit Safety Section of the Commission's Rail Safety and Carriers Division concentrated on those elements of VTA's system safety program that affect the safety of train operations, and that are important to reducing safety hazards and preventing accidents. The audit was conducted by interviewing management and staff personnel, reviewing documentation, observing operations, and inspecting equipment and infrastructure to evaluate compliance with, and determine the effectiveness of VTA's system safety program.

The vast majority of the hundreds of documents reviewed, activities observed, and items inspected were found to be in compliance with the requirements of VTA's System Safety Program Plan. However, there were exceptions noted. These are described under the Results / Comments section on each checklist, along with recommendations to address each exception.

VTA is in agreement with the recommendations made in this report. VTA has further agreed to develop appropriate corrective action plans and schedules to carry out the recommendations, and to keep the Commission staff advised of VTA's progress through semi-annual progress reports.

The Rail Transit Safety Section of the Commission's Rail Safety and Carriers Division would like to express its appreciation to VTA management and staff for their cooperation and support during every phase of this audit from development of the checklist requirements through the post audit review and comment period. All of the information requested was made readily available, and VTA personnel at every level were responsive to the auditors every request for assistance. This kind of cooperation contributed greatly to the successful performance of the audit.

**CPUC TRIENNIAL SAFETY AUDIT
OF
SANTA CLARA VALLEY TRANSPORTATION AUTHORITY**

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

Checklist No.	1	Date of Audit: Sept. 14, 1998	Persons Contacted:
Department	RAIL OPERATIONS	Auditor: Gary Rosenthal	Chester Patton Tom Irion

REFERENCE CRITERIA

1. VTA Light Rail Operating Rule Book, Page 18
2. Light Rail Operations Division Bulletin #1, Page 2 of 2

ELEMENT / CHARACTERISTICS AND METHOD OF VERIFICATION

TRAIN ORDERS, SPECIAL INSTRUCTIONS, AND BULLETINS

Randomly select and review two train orders, two special instructions, and two bulletins within the last two years to determine whether or not:

1. the train orders were entered on the OCC Master Train Order and the effective times were noted and initialed
2. changes to the special instructions were issued by the following Monday as required in the reference criteria
3. copies of all bulletins are kept in the Operations Department (supervisor's office)
4. bulletins issued within the last sixty days are posted in the Operations Department

RESULTS / COMMENTS

Arbitrarily selected several train orders and special instructions from those issued in 1997 and 1998 for review. Additionally, all seven bulletins currently in effect were reviewed.

The train orders and special instructions were entered in the OCC Master Train Order as required. Entry of the effective times and controllers initials, however, were sporadic. The practice of moving short term train orders to special instructions appear to be arbitrary but well intended.

Copies of all bulletins were maintained in the Operation Superintendent's office. Bulletins issued within the previous 60 days were posted in the Operations Department.

No exceptions were noted.

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

Checklist No.	2	Date of Audit: Sept. 14, 1998	Persons Contacted:
Department RAIL OPERATIONS		Auditor: Gary Rosenthal	Chester Patton Tom Irion

REFERENCE CRITERIA

VTA Light Rail Operations Division Bulletin #1, #2

ELEMENT / CHARACTERISTICS AND METHOD OF VERIFICATION

PROCESS / PROCEDURE TO MODIFY RULES, ISSUE BULLETINS, AND NOTICES

Interview the Deputy Director of Transit Operations and review appropriate documents to determine whether or not:

1. adequate procedures are in place for controlling the modification of rules, and for issuing bulletins and notices
2. adequate controls are in place to ensure that responsibilities for drafting modifications to rules and issuing bulletins and notices, including the need to distribute proposed modifications to departments with a need-to-know for review and comment, are clearly understood and practiced

RESULTS / COMMENTS

The deputy director of transit operations was not available for interview. The Superintendent of Operations and an Operations Supervisor, however, were interviewed regarding procedures for modification of rules and procedures and issuing bulletins and notices.

Bulletin No. 1 addresses bulletin revisions and numbering. Bulletin No. 2 addresses general responsibilities for light rail managerial positions. Bulletin No. 7 issued September 11, 1998 addresses the process for controlling and issuance of Rules, Bulletins, Notices, and Standard Operating Procedures. Bulletin No. 7 appears to provide adequate controls.

Recommendation:

Given that Bulletin No. 7 has only recently been issued, and given that its effectiveness could not be evaluated during this safety audit, VTA's internal audit program should include an examination of the adequacy of the procedures in Bulletin No. 7 during their 1999 internal audit review.

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

Checklist No.	3	Date of Audit: Sept. 18, 1998	Persons Contacted:
Department RAIL OPERATIONS		Auditor: Audrey Chiu	Gary Stanislow

REFERENCE CRITERIA

1. VTA Standard Operating Procedure # 1.5
2. VTA LRV Operator Training Course Outline
3. G.O. 143-A, Section 13.03

ELEMENT / CHARACTERISTICS AND METHOD OF VERIFICATION

TRAINING AND CERTIFICATION RECORDS FOR TRAIN OPERATORS, ON-RAIL EQUIPMENT OPERATORS AND OCC PERSONNEL

Randomly select operator rulebook training and certification records of at least two train operators, two on-rail equipment operators, and two OCC personnel for the past two years to determine whether or not:

1. each individual successfully completed the required initial and/or refresher training program
2. each individual, performing safety sensitive duties, is currently certified to do so.

RESULTS / COMMENTS

Reviewed the certification and recertification records for 2 high rail equipment operators, 2 line supervisors in OCC and 3 train operators. Records were reviewed from the time of initial certification through to the present date. Some initial certifications dated back to 1989, while other were recently acquired.

Two records (one initial certification, and one recertification) were missing. Given the number of records reviewed, and given evidence that several subsequent recertifications have taken place since the discrepancies, no exceptions were noted.

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

Checklist No.	4	Date of Audit: Sept. 17, 1998	Persons Contacted:
Department		Auditor: Audrey Chiu	Chester Patton Dave Collura
RAIL OPERATIONS			

REFERENCE CRITERIA

1. VTA Interoffice Memorandum Dated March 28, 1997
2. G.O. 164-A, Sections 5 and 6

ELEMENT / CHARACTERISTICS AND METHOD OF VERIFICATION

UNUSUAL OCCURRENCE REPORTS

1. Review at least five unusual occurrence reports prepared within the past two years to determine if the following required information, if applicable, is included:
 - a) Date
 - b) Time
 - c) Train #
 - d) Operator badge number
 - e) Train consist
 - f) Problem car number
 - g) Description of problem
2. Corrective actions noted, if any, were implemented in a timely manner.

RESULTS / COMMENTS

Reviewed 1997 and 1998 unusual occurrence reports for the criteria listed above (item Elements/Characteristics section of this checklist).

The unusual occurrence reports provided the required information and were all filled out correctly.

OCC lists problems that need to be evaluated by other departments and passes this information on to the appropriate departments affected. OCC does not track to ensure that corrective action, if any, is taken. However, review of the tracking systems used by different departments indicated that the appropriate departments do have a process in place to correct and track resolution of problems identified by the unusual occurrence reports.

No exceptions were noted regarding the elements reviewed in this checklist. However, Checklist No. 10 contains other elements related to the review of unusual occurrence reports, and Checklist No. 10 does contain a recommendation regarding these reports.

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

Checklist No.	5	Date of Audit: Sept. 16, 1998	Persons Contacted:
Department	RAIL OPERATIONS	Auditor: Gary Rosenthal	John Carlson

REFERENCE CRITERIA

1. Statement From Dispatch Instructor On VTA Hours Of Services Policy Dated 7/24/98
2. G.O. 143-A, Section 12.01b, and 12.04

ELEMENT / CHARACTERISTICS AND METHOD OF VERIFICATION

HOURS OF SERVICE

Randomly select the names of at least four train operators and review appropriate work records for the last 12 months to determine whether or not they abided by the hours-of-service rules as required by the reference criteria.

RESULTS / COMMENTS

All train operator's hours of service records were checked in four separate months of 1998. There were no records found which indicated that train operators had insufficient rest periods prior to going on duty or worked more than the allowed hours contained in the reference criteria.

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

Checklist No.	6	Date of Audit: Sept. 17, 1998	Persons Contacted: Chester Patton Dave Collura
Department RAIL OPERATIONS		Auditor: Audrey Chiu	

REFERENCE CRITERIA

1. VTA Light Rail Operations Ride Check Report (Draft)
2. California Public Utilities Commission General Order 143A, Section 13.04

ELEMENT / CHARACTERISTICS AND METHOD OF VERIFICATION

TRAIN OPERATOR PERFORMANCE EVALUATIONS BY SUPERVISORS

Randomly select train operator ride check reports for four different train operators for the last two years to determine whether or not:

1. each train operator was evaluated on a yearly basis
2. the checklists were appropriately filled in and signed by the supervisor
3. re-instruction was given or other follow-up action taken in cases of substandard performance

RESULTS / COMMENTS

Reviewed all ride-check reports for 1997 and 1998, approximately 200 reports in total.

All reports were thoroughly filled in and signed off, except one report which was not signed off.

The requirement is that a ride check be performed annually for each train operator. In 1997 some operators experienced up to three ride checks while other received none. This was corrected in 1998, with a plan in place to ensure that each train operators is evaluated on a yearly basis.

The ride-check checklist contains 20 performance skills that are evaluated by the supervisors. Of the roughly 200 reports no unsatisfactory performance was indicated for any of the performance skills. Consequently, no re-instruction or follow-up action has been taken as a result of the check rides.

No exceptions were noted regarding the elements reviewed in this checklist. However, Checklist No. 8 contains other elements related to the review of train operator performance evaluations, and Checklist No. 8 does contain a recommendation regarding these evaluations.

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

Checklist No.	7	Date of Audit: Sept. 16, 1998	Persons Contacted:
Department RAIL OPERATIONS		Auditor: Gary Rosenthal	John Carlson Rod Broom Dan Kelley

REFERENCE CRITERIA

VTA Light Rail Fire / Life Safety Program Plan

ELEMENT / CHARACTERISTICS AND METHOD OF VERIFICATION

EMERGENCY RESPONSE

Review available records to determine whether or not:

1. fire / life safety goals and standards have been developed as described in the reference documentation
2. planning sessions have been conducted with outside agencies to discuss fire / life safety strategies
3. scenarios of possible fire, or other emergency, conditions have been defined, and appropriate responses determined for responders
4. drills have been conducted on a regular basis, involving local emergency response units, and follow-up lessons-learned meetings were held

RESULTS / COMMENTS

Available records were reviewed and goals and standards were discussed with VTA representatives. VTA has been working with the appropriate jurisdictions in conjunction with the planning and development of the Tasman Rail Corridor project. This work includes addressing fire / life safety issues including goals and standards, planning sessions regarding fire / life safety strategies, and providing training for firefighters and others in relation to the light rail system and vehicles.

It is not clear whether fire / life safety goals and standards have been kept current for the existing system. It does not appear that emergency drills involving local emergency response units are being planned and conducted. VTA records define general scenarios of possible fire conditions, however there is no indication that these scenarios are still current or applicable or adequate for safely operating the system. The current VTA Light Rail Fire / Life Safety Program Plan was written for the start of the system and reflects an organization structure which has not been in existence for years.

CONTINUED ON NEXT PAGE

**CHECKLIST NO. 7
CONTINUED FROM PAGE 1**

Recommendation:

VTA should update and revise its Fire / Life Safety Program Plan to reflect its current organization and operation including planned extensions. Provisions should be added that address period review and update of the Fire / Life Safety Program Plan, and periodic meeting with representatives of all affected emergency response agencies. In addition, VTA should examine current industry standards for fire / life safety programs and include relevant material in its Fire / Life Safety Program Plan.

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

Checklist No.	8	Date of Audit: Sept.16, 1998	Persons Contacted:
Department	RAIL OPERATIONS	Auditor: Gary Rosenthal	Gary Stanislaw

REFERENCE CRITERIA

1. VTA Light Rail Operating Rule Book, Pages 13, 20
2. CPUC General Order 143A, Section 7.09 and 13.01
3. Superintendent Notice Dated 5/26/98
4. VTA Standard Operating Procedure # 5.3, Pages 1, 2

ELEMENT / CHARACTERISTICS AND METHOD OF VERIFICATION

TRAIN OPERATOR PERFORMANCE-MAINLINE

1. Observe on-board operations of not less than three trains between not less than four stations to determine whether or not:
 - each train operator performs in compliance with the governing rules and procedures
 - each operator possesses the required equipment in the cab, including a functional portable radio
2. Interview not less than five randomly selected train operators from the current roster to determine their understanding of rules, procedures, and policies related to train operations.

RESULTS / COMMENTS

On board observations of mainline train operations were carried out on five trains between at least four stations each. Evaluations were made regarding the operator's performance and adherence to governing rules and procedures, checks were made regarding required items and equipment in the cab, and four of the five train operators were interviewed regarding their knowledge and understanding of selected rules and procedures.

Train operator's performance and adherence to rules was generally good. One train operator, however, consistently exceeded speed limits and failed to perform proper audible warnings when approaching at-grade crossings. All train operators had the required equipment in their possession or in the cab. Interviews with the train operators disclosed a lack of knowledge regarding the rule of the week and question of the week. There was sporadic knowledge and understanding of the other rules and procedures.

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**CHECKLIST NO. 8
CONTINUED FROM PAGE 1**

Recommendation:

VTA should re-examine its program of operational evaluations to ensure that the program is adequately monitoring train operator's performance and train operator's knowledge of rules and procedures. The examination, analysis of findings, and plan to correct deficiencies, if any, should be coordinated with the CPUC's designated representative for VTA.

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

Checklist No.	9	Date of Audit: Sept.17, 1998	Persons Contacted:
Department	RAIL OPERATIONS	Auditors: Audrey Chiu Len Hardy	Dave Collura

REFERENCE CRITERIA

1. VTA Standard Operating Procedures # 5.2, 5.5, 6.9, Page 2
2. VTA Light Rail Operating Rule Book , Pages 12, 20, 21
3. G.O. 143-A, Section 13.01

ELEMENT / CHARACTERISTICS AND METHOD OF VERIFICATION

TRAIN OPERATOR PERFORMANCE -YARDS

Observe train operations in the yard for a period of not less than one hour to determine whether or not train operators are following appropriate rules and procedures, including: inspecting the LRV for defects and filling in defect cards where warranted (trains departing for revenue service), complying with speed limits of 10 mph on regular track and 5 mph through switches and crossovers, and performing proper coupling and uncoupling operations.

RESULTS / COMMENTS

Observed 5 train operators make pull-out inspections. No coupling or uncoupling of LRVs was made.

All 5 train operators made appropriate pull-out inspections, including brake tests. No speed violations in the yard were observed. Two defect cards were completed and these were correctly filled in. The defects were minor (graffiti) so the trains were not prevented from going into revenue service.

No exceptions were noted.

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

Checklist No.	10	Date of Audit: Sept. 15, 1998	Persons Contacted:
Department	RAIL OPERATIONS	Auditor: Gary Rosenthal	John Carlson Tom Irion

REFERENCE CRITERIA

1. VTA Standard Operating Procedures
2. VTA Light Rail Operating Rule Book
3. VTA Light Rail Operations Division Bulletins
4. VTA Interoffice Memorandum, Dated March 28, 1997
5. G.O. 143-A, Section 13.01

ELEMENT / CHARACTERISTICS AND METHOD OF VERIFICATION

OPERATIONS CONTROL CENTER (OCC) SUPERVISOR PERFORMANCE

1. Observe OCC Supervisors for not less than two hours in connection with the Reference Criteria Policy, Rules and Procedures.
2. Interview not less than two randomly selected OCC Supervisors regarding the Rules and Procedures listed under the Reference Criteria.
3. Review Access Permits, OCC Supervisor Passdown Forms, and the Unusual Occurrence Report Log for the past six months to determine whether or not they are being properly prepared and maintained.

RESULTS / COMMENTS

An OCC supervisor/controller was observed for more than two hours in connection with the reference criteria. Activities performed by the supervisor/controller were done so in compliance with appropriate rules and procedures.

Two additional OCC supervisor/controllers were interviewed regarding selected rules and procedures. Both had a good general understanding of the operating rules and procedures but were somewhat less knowledgeable about some specific issues related to OCC duties and responsibilities. Supervisors are required to attend an annual train operator refresher / recertification program, but OCC refresher / recertification training is required only once every two years. It was reported that plans are underway to implement an annual OCC refresher / recertification training program.

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**CHECKLIST NO. 10
CONTINUED FROM PAGE 1**

Selected access permits, OCC supervisor passdown forms and the Unusual Occurrence Report Log, prepared during the previous six months were reviewed. Preparation of access permits was found to be adequate.

The Access Permit form distribution list at the bottom of the page is out of date. Review of completed forms indicated that there is very little distribution of copies to other departments which may be affected by parties accessing the right-of-way. The distribution list on the Unusual Occurrence Report form was also out of date, and there was no indication of significant distribution. There was one interoffice memo dated March 28, 1997 which establishes specific procedures for OCC supervisor/controllers. According to certain VTA Bulletins in effect, however, an interoffice memo should not be used for issuing rules or procedures and that a designated form should be used for this purpose. According to John Carlson there is not currently a designated form for issuing rules and procedures to supervisors.

Recommendations:

1. VTA should develop and implement an annual OCC refresher / recertification training program for OCC supervisors / controllers. The plan and schedule for this activity should be submitted to the CPUC staff for review, comment, and follow-up monitoring.
2. Distribution lists for both access permits and unusual occurrence reports should be updated and maintained in a current status.
3. Copies of access permits and unusual occurrence reports should be distributed to all departments which may be affected. Note: Checklist 39 also contains a recommendation regarding access permits.
4. An appropriate and authorized form should be developed and used for issuing rules and procedures to supervisors.

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

Checklist No.	11	Date of Audit: Sept. 14, 1998	Persons Contacted:
Department	VEHICLE MAINTENANCE	Auditors: Joey Bigornia Audrey Chiu	Tom Kennedy Ed Toomey

REFERENCE CRITERIA

- 1) Maintenance Standard Procedure, dated 3-10-97, Section #V-8, Vehicles, Preventive Maintenance Scheduling
- 2) System Safety Program Plan, Rev 3, dated 11-96, Section, Vehicle Maintenance

ELEMENT / CHARACTERISTICS AND METHOD OF VERIFICATION

PREVENTIVE MAINTENANCE PROGRAM DOCUMENTATION FOR TRANSIT VEHICLES

Randomly select a minimum of 4 cars and for each selected, review the completed Preventive Maintenance Inspection (PMI) reports for the five different types of inspections and other applicable records to determine whether or not:

1. the required PMI's were performed during the required time and mileage limits
2. the inspection and maintenance activities were properly documented by the responsible maintenance workers
3. maintenance defects that were noted during the inspections and that required unscheduled repairs were properly documented and closed out in a timely manner

RESULTS / COMMENTS

Randomly selected four VTA vehicles (# 804, #810, #815, & #840) and reviewed selected samples of the preventative maintenance inspection records for the five different types of inspections prepared during the past 24 months.

The records showed that all of the required inspections were performed at the required frequency and were properly documented. Defects found during the inspections were corrected in a timely manner and were adequately documented.

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**CHECKLIST NO. 11
CONTINUED FROM PAGE 1**

The maintenance standard procedures were reviewed and it was found that the procedures were not formally approved and adopted. An explanation was given that the procedures were formally approved and signed-off in 1986 and that the essence of the procedures themselves has not changed. According to the vehicle maintenance representatives, the current draft procedures contain editorial changes and a different format.

Recommendation

The Maintenance Standard Procedures currently in draft form should be completed and approved with the required signed offs on an expedited basis.

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

Checklist No.	12	Date of Audit: Sept. 15, 1998	Persons Contacted: Tom Kennedy Ed Toomey
Department VEHICLE MAINTENANCE	Auditors: Joey Bigornia Audrey Chiu		

REFERENCE CRITERIA

No SOPs available

ELEMENT / CHARACTERISTICS AND METHOD OF VERIFICATION

CALIBRATION OF MEASURING & TEST EQUIPMENT

Obtain a copy of the measuring and test equipment subject to calibration control in the vehicle maintenance shop. Randomly select two each of VTA's micrometers, dial calipers, torque wrenches, and multimeters. From a combination of procedure and record reviews as well as visual inspections, determine whether or not:

1. the selected items are properly inventoried, controlled, calibrated at prescribed intervals, and marked, tagged or otherwise identified to show their current calibration status
2. the next scheduled testing / calibration is shown on the item

RESULTS / COMMENTS

Requested calibration records for safety critical measuring and test equipment.

Discussions with the vehicle maintenance department representatives established that a formal calibration program for safety related measuring and test equipment, including torque wrenches, Hegenscheidt wheel measuring devices, and voltmeters did not exist prior to September 11, 1998. Since that date, the Guadalupe maintenance department prepared a draft procedure (SOP No. 7002) that addresses the calibration of inspection and test equipment. The procedure contains a list of safety critical equipment subject to calibration that identifies the frequency of calibration and the last calibration date for each item.

To date, one item on the list has been calibrated (C-2 Pressure Tester). The auditors inspected this piece of equipment and found that a calibration sticker containing the date-of-calibration and the due date for the next calibration was attached. Additionally, it was found that a schedule has been prepared to calibrate the remaining equipment on the procedure list.

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**CHECKLIST NO. 12
CONTINUED FROM PAGE 1**

Recommendations:

1. SOP No. 7002 that is currently in draft form should be formally approved and adopted on an expedited basis.
2. The internal audit program should monitor the progress of the calibration program to ensure the timely implementation of SOP No. 7002.

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

Checklist No.	13	Date of Audit: Sept 17, 1998	Persons Contacted: Ed Toomey Tom Kennedy
Department VEHICLE MAINTENANCE		Auditor: Len Hardy Joey Bigornia	

REFERENCE CRITERIA

No SOPs available

ELEMENT / CHARACTERISTICS AND METHOD OF VERIFICATION

WHEEL FLANGE THICKNESS – MEASUREMENT

Randomly select 2 wheel sets on three different transit vehicles and measure the wheel flange thickness of each wheel with an AAR Wheel Gauge to determine whether or not the wheel flange thickness meets the specified minimum criteria in the applicable inspection procedure and/or maintenance standards.

RESULTS / COMMENTS

Determined the wheel flange condemning limit used by the transit agency.

Selected two vehicles in the maintenance shop (Car numbers 842 & 815), and using the shop gauge checked the wheel flange thickness for six wheels on each of the two cars selected.

All wheels checked were within safe tolerances. No exceptions were noted.

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

Checklist No.	14	Date of Audit: Sept 18, 1998	Persons Contacted: Ed Toomey Rick Jarosz
Department VEHICLE MAINTENANCE		Auditor: Joey Bigornia	

REFERENCE CRITERIA

- 1) VTA Guadalupe Rail Car Maintenance PM Schedule
- 2) VTA Guadalupe Rail Car Maintenance Minor Inspection Form
- 3) VTA Guadalupe Rail Car Maintenance Major Inspection Form

ELEMENT / CHARACTERISTICS AND METHOD OF VERIFICATION

PERFORMANCE OF PREVENTATIVE MAINTENANCE ACTIVITIES FOR TRANSIT VEHICLES

Review the schedule of planned preventative maintenance (P.M.) activities to be performed by VTA during the time the CPUC audit takes place. Witness the performance of the P.M. activities taking place to determine whether or not:

1. the P.M. activities are being performed in accordance with the applicable P.M. procedures
2. the required inspections are being properly documented
3. noted defects are being either corrected or recorded for further attention

RESULTS / COMMENTS

Witnessed the performance of the under-car portion of a Major Inspection (30,000 mile inspection) conducted on car No. 815 at the Guadalupe Division. This activity included the measuring of the brake rotors to ensure they were within specification.

An inspection checklist was being used and each item on the checklist was being appropriately checked off and initialed. Defects found were assigned appropriate work order numbers for subsequent attention and tracking through to closure. No exceptions were noted.

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

Checklist No.	15	Date: Sept 14 & 18, 1998	Persons Contacted:
Department VEHICLE MAINTENANCE		Auditor: Joey Bigornia	Rod Broome

REFERENCE CRITERIA

No SOPs available

ELEMENT / CHARACTERISTICS AND METHOD OF VERIFICATION

TRAINING AND CERTIFICATION OF TRANSIT VEHICLE EQUIPMENT MAINTENANCE PERSONNEL

Obtain a copy of VTA's list of qualified transit vehicle mechanics, inspectors, and technicians. Randomly select at least two persons from each of the three categories and review each selected person's training and certification file to determine whether or not:

1. training, certification, and recertification records are in compliance
2. the current training lesson plans and testing for certification / recertification reflects the persons assigned duties

RESULTS / COMMENTS

It was determined that there is no formal standard operating procedure in place that identifies the training and certification requirements for each of the eight classification of vehicle maintenance workers. However, a master list is available that identifies the training and certification requirements for each of the 8 classifications, the names of the vehicle maintenance workers, and the dates that training and certification was completed for each worker.

Randomly selected the name of one person from each of the following classifications: Electronic Technicians, Electromechanics, and Light Rail Foreman. Reviewed the training and certification files of the selected persons for the past 4 years. Found that the training and certification records were all in proper order.

Recommendation:

Develop and implement a formal SOP that defines the scope of training and the requirements for certification for each classification of vehicle maintenance worker.

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

Checklist No.	16	Date of Audit: Sept. 17, 1998	Persons Contacted:
Department VEHICLE MAINTENANCE		Auditor: Joey Bigornia	Ed Toomey Tom Kennedy Merle Giles

REFERENCE CRITERIA

Safety Program and Procedures Manual, Bulletins 301, 302, and 308

ELEMENT / CHARACTERISTICS AND METHOD OF VERIFICATION

HAZARDOUS MATERIALS MANAGEMENT AT THE VEHICLE MAINTENANCE SHOP

Inspect the vehicle maintenance shop to determine whether or not:

1. a hazardous material spills log is maintained and has been adequately filled out
2. hazardous materials discharge incident reports are kept on file at the facility
3. Material Safety Data Sheets (MSDS) are available and current at the facility
4. health and safety related chemicals and other materials are adequately labeled and stored

RESULTS / COMMENTS

Reviewed the Hazardous Materials Spills Log kept on file at the Vehicle Maintenance Department. The spills log shows that there have been no recordable spills or reportable events for the past 3 years.

Reviewed the MSDS binder kept on file at the Vehicle Maintenance Department. There are currently 84 types of products according to the MSDS log dated 9/7/98 used by the department. Was informed that 18 products on the MSDS log did not have corresponding MSDS product sheets associated with them.

Checked the hazardous materials liquid and solid waste containers and determined that they were adequately labeled with shipping tags appropriately attached.

Recommendation:

The missing 18 MSDS product sheets need to be acquired and added to the MSDS binder.

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

Checklist No.	17	Date: Sept. 15 & 17, 1998	Persons Contacted:
Department WAY, POWER, and SIGNAL		Auditors: Joey Bigornia Len Hardy	Keith Powley

REFERENCE CRITERIA

1. Way, Power, & Signal Standard Operating Procedure, Dated 10-18-93, Section 5.6, Track Inspections.
2. Way, Power, & Signal Standard Operating Procedure, Dated 9-1-87, Section 5.2, Defective Rail - Detection and Removal (Ultrasonic Tests).
3. Way, Power, & Signal Standard Operating Procedure, Dated 2-28-95, Section 2.13, Track Inspection & Maintenance.
4. Santa Clara Valley Transit Authority Track Manual, Dated 7-28-98, Section 10.6 (Draft)

ELEMENT / CHARACTERISTICS AND METHOD OF VERIFICATION

TRACK INSPECTIONS

Arbitrarily select not less than 8 consecutive weekly track inspection reports and not less than two years of quarterly and annual track inspection reports to determine whether or not:

1. all mainline track (including turnouts) was visually inspected as required by the reference criteria
2. the tightness of bolts used on direct fixation track were checked every year using a torque wrench
3. the required inspections were properly documented on the VTA Track Inspection Report
4. noted defects were posted on the Maintenance Log Sheet and corrected in a timely manner

RESULTS / COMMENTS

Ultrasonic Tests

Review of the ultrasonic test report file for the past 6 years revealed that there were no test records for the years 1995, 1996, and 1997. The March 1998 test results found seven Rate 2 (Rate 2 = not critical, schedule for routine repair) defects all in the same area (embedded track section near Children's Discovery Museum). These repairs have not yet been corrected. VTA plans to bid the work to an outside contractor and plans to correct the defects before the end of the year. Train speeds have been reduced in the area, and the VTA track maintenance department monitors the track condition.

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**CHECKLIST NO. 17
CONTINUED FROM PAGE 1**

Direct Fixation

Requested direct fixation bolt torque test reports for the past three years. Found that no bolt torque test reports were available. Discussions established that bolt tightness is randomly checked on occasions, but that a torque wrench set to the specification in the procedure of 180 foot-pounds is currently not being used.

Recently VTA developed the "Santa Clara Valley Transit Authority Track Manual" that addresses inspection frequencies and torque specification of bolts used for direct fixation of track. However, this manual has not been formally approved and adopted.

Weekly Track Inspection Reports

Reviewed the weekly track inspection reports from January 1998 to August 1998. Approximately 75% of the inspection reports were not on file. It could not be determined whether the discrepancies were due to inspections not being performed or due to reports not being filled out or lost.

Recommendations:

1. Despite the fact that the defects found as a result of the ultrasonic tests were rated as "non critical", train speed were reduced and maintenance personnel expressed concern regarding the defects. VTA should investigate its response to track defects to determine whether a more expedient response process can be put in place.
2. VTA's internal audit program should check to ensure that ultrasonic testing is performed annually as required in its track manual.
3. VTA should develop a record keeping program to document the inspection of bolt torque settings used for direct fixation of track, and should ensure that torque wrenches are being used.
4. The Santa Clara Valley Transit Authority Track Manual, currently in draft form should be formally approved and adopted on an expedited basis.
5. The cause of the discrepancy in weekly inspections should be investigated by VTA without delay. Corrective action should be taken to ensure inspections are conducted and adequately documented as detailed in the procedures. Additionally, the inspection reports should be monitored by management to ensure the success of the corrective action taken.

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

Checklist No.	18	Date of Audit: Sept 15, 1998	Persons Contacted: Keith Powley
Department WAY, POWER, and SIGNAL	Auditors: Joey Bigornia Audrey Chiu		

REFERENCE CRITERIA

1. Way, Power, & Signal Standard Operating Procedure, Dated 2-28-95, Section 5.5, Switch Maintenance By Track Crews.
2. Way, Power, & Signal Standard Operating Procedure, Dated 2-28-95, Section 3.9, Switch & Turnout Maintenance By Signal Crews.

ELEMENT / CHARACTERISTICS AND METHOD OF VERIFICATION

MAINLINE SWITCHES INSPECTIONS

Review VTA's file of completed Mainline Switch Inspection reports (weekly, monthly, quarterly) for not less than five randomly selected switches (one from each of the following categories: the Embedded H&K Spring Switch, Embedded Wharton Ambidex Spring Switch, Wire Rigid Switch with Spring Connecting Rod, Rigid Switch, and Power Switch) for the past 12 months to determine whether or not:

1. the mainline switches were inspected at the specified frequency as required by the reference criteria
2. the required inspections were properly documented on the Switch Inspection Report
3. noted defects were corrected in a timely manner

RESULTS / COMMENTS

Selected a mainline switch for each of the five classes of switches listed above. The switches selected were: SW 53B, SW 47A, SW 23A, SW 107A, and SW 1 at Almaden. For each switch selected, reviewed the weekly, monthly, and quarterly inspection records prepared for the past 12 months.

The findings, in summary, follow:

Weekly Inspections: 41% of the records were missing
 Monthly Inspections: 81% of the records were missing
 Quarterly Inspections: 25% of the records were missing

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**CHECKLIST NO. 18
CONTINUED FROM PAGE 1**

Could not establish whether the discrepancies were due to inspections not being performed or due to reports not being filled out or lost.

Recommendation:

The cause of the discrepancy in the mainline switch inspection records should be investigated by VTA without delay. Corrective action should be taken to ensure inspections are conducted and adequately documented as detailed in the procedures. Additionally, the inspection reports should be monitored by management to ensure the success of the corrective action taken.

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

Checklist No.	19	Date of Audit: Sept 16, 1998	Persons Contacted:
Department		Auditor: Joey E. Bigornia	Chuck Maples
WAY, POWER, & SIGNAL			

REFERENCE CRITERIA

Way, Power, & Signal Standard Operating Procedure, Dated 2-28-95, Section 3.9, Switch Maintenance by Signal Crews.

ELEMENT / CHARACTERISTICS AND METHOD OF VERIFICATION

INTERLOCKING TESTS

Randomly select not less than three interlockings (one from each of the following: T3, 5F, and Manual with Electric Lock series) and review the associated inspection and test reports (monthly and quarterly) for the past 3 years to determine whether or not:

1. the interlockings were tested at the specified frequency as required by the reference criteria
2. all of the required tests were satisfactorily completed and documented in the appropriate test reports
3. noted defects were corrected in a timely manner

RESULTS / COMMENTS

Selected the following interlockings: Downtown (SW49, SW51 and SW53), Almaden (SW1), and Tamien Crossover (SW57A and 57B) and reviewed the monthly and quarterly inspection reports dated 8-95 to 8-98.

The review showed that required monthly and quarterly inspections were conducted at the specified frequency and the results were properly documented, except for 4 inspections: the Downtown interlocking monthly inspection records dated 3/96 and 7/97, and the Almaden interlocking quarterly inspection records dated 1-17-96 and 10-16-96.

Additionally, the records showed that all noted defects were corrected in a timely manner.

Given the small number of records missing compared to the large number reviewed, no exceptions were noted.

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

Checklist No.	20	Date of Audit: Sept 16, 1998	Persons Contacted:
Department WAY, POWER, & SIGNAL		Auditor: Joey E. Bigornia	Chuck Maples

REFERENCE CRITERIA

Way, Power, and Signal Skills Standard Operating Procedures, Crossing Gate PM's # 3-5 (Draft)

ELEMENT / CHARACTERISTICS AND METHOD OF VERIFICATION

GRADE CROSSING PROTECTION

Review VTA's file of completed grade crossing protection inspection reports for at least 3 randomly selected grade crossings for the past 12 months to determine whether or not:

1. each grade crossing was inspected at the specified frequency as required by the reference criteria
2. the results of the inspections were properly documented
3. noted defects were corrected in a timely manner

RESULTS / COMMENTS

Reviewed the monthly grade crossing reports for Winfield, Santa Teresa, Blossom River and the Chenoweth Pedestrian grade crossing dated 7-11-97 to 8-18-98

The review showed that all of the required monthly inspection reports were properly documented and that noted defects were addressed in a timely manner.

Review of the procedure (SOP No. 3.5) for the subject inspection and subsequent discussions determined that the current procedure is being implemented, but has not been formally approved or adopted. The procedure has been in draft form for almost a year.

Recommendation:

SOP No. 3.5 that is currently in draft form should be formally approved and adopted on an expedited basis.

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

Checklist No.	21	Date of Audit: Sept 16, 1998	Persons Contacted:
Department WAY, POWER, & SIGNAL		Auditor: Joey Bigornia	Chuck Maples

REFERENCE CRITERIA

Way, Power, and Signal Standard Operating Procedures, Bi-Annual Vital Relay / Timer Testing SOP Number 3.6 (Draft)

ELEMENT / CHARACTERISTICS AND METHOD OF VERIFICATION

VITAL RELAYS

Randomly select at least four vital relays. From a combination of procedure and record reviews as well as visual inspections of the selected items, determine whether or not:

1. the vital relays are properly controlled and calibrated against certified standards at prescribed intervals as required by applicable procedures
2. vital relays have been marked, tagged or otherwise identified to show their calibration status

RESULTS / COMMENTS

Selected two vital relays from the Younger and 1st Street signal case (33RWPR and 37NWPR) and two vital relays from the Younger and San Pedro Street signal case (85TR and 85 TPR). Records for the past four years were reviewed for the 4 selected relays.

Results of the review showed that the records for the relays were satisfactory. Field inspection of the relays established that all relays were properly marked, tagged, and identified.

Review of the procedure (SOP No. 3.6) for the subject inspection and subsequent discussions determined that the current procedure is being implemented, but has not been formally approved or adopted. The procedure has been in draft form for almost a year.

Recommendation:

SOP No. 3.6 that is currently in draft form should be formally approved and adopted on an expedited basis.

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

Checklist No.	22	Date of Audit: Sept. 16, 1998	Persons Contacted:
Department		Auditor: Audrey Chiu	Tedd Hankins
WAY, POWER, & SIGNAL			

REFERENCE CRITERIA

- 1) Intersection Inspection Overhead Inspection Form, Annual.
- 2) Light Rail Division Overhead Inspection Form.
- 3) Catenary Inspection Form.

ELEMENT / CHARACTERISTICS AND METHOD OF VERIFICATION

OVERHEAD CATENARY SYSTEM

Review VTA's file of completed Overhead Catenary System (OCS) Inspection reports prepared during the past 2 years to determine whether or not:

1. the OCS was inspected and adjusted at the specified frequency as required by the reference criteria
2. the required inspections were properly documented
3. noted defects were corrected in a timely manner

RESULTS / COMMENTS

Inspection records were requested for the past two years (Aug '96 to Aug '98). However, roughly half of the records were not available (missing were August '96 to and including December '96, and June 97 to and including December '97). Was told that, given that the records are maintained in a computer data base file, the missing documentation was due to computer user error and/or due to the switchover from one database program to another and the loss of the back-up data disk.

The weekly, monthly, and quarterly inspections require different tasks to be performed. From the available data, it was found that in many cases, not all of the tasks were completed. Some of the semi annual and annual inspection tasks were completed this year, however it was not possible to confirm if all the required semi annual and annual tasks were completed due to the missing data.

Discussions regarding the inspection forms listed in the reference criteria established that the forms are no longer being used. Additionally, it was determined that there is no formal procedure describing the duties and functions for performing the OCS inspections.

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**CHECKLIST NO. 22
CONTINUED FROM PAGE 1**

Recommendations:

1. An evaluation should be conducted to determine the elements to be inspected and the condemning criteria to be used to ensure that a meaningful and effective preventative maintenance program is in place.
2. A procedure describing the OCS inspection process and frequency should be developed, formally adopted, and implemented.
3. The method of maintaining records needs to be evaluated, and corrected if necessary, to ensure that adequate controls (back-up of computer files, etc) are in place to protect against the losses of data experienced in the past.

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

Checklist No.	23	Date of Audit: Sept 17, 1998	Persons Contacted: Jim Tucker Tedd Hankins
Department WAY, POWER, & SIGNAL		Auditor: Joey Bigornia	

REFERENCE CRITERIA

- 1) Emergency Power Shutdown SOP 4.2
- 2) Substation Annual Test Procedure Form

ELEMENT / CHARACTERISTICS AND METHOD OF VERIFICATION

EMERGENCY TRIP STATIONS

Review VTA's file of completed Emergency Trip Stations (ETS) Inspection and test reports prepared during the past 2 years for at least 3 randomly selected ETS's to determine whether or not:

1. each ETS was inspected at the specified frequency as required by the reference criteria
2. the required inspections were properly documented
3. noted defects were corrected in a timely manner

RESULTS / COMMENTS

It was determined that the ETS inspections have not been performed to date. However, an ETS inspection form was recently created and added to the "Substation Annual Test Procedures". Additionally, a revision to SOP No. 4.2 dated 9/1/87 is being proposed that will reference the ETS inspection and test frequency requirements.

Recommendations:

1. Test the emergency trip stations throughout the systems as soon as practical.
2. SOP No. 4.2 should be revised, approved and adopted on an expedited basis.

Timely Response by VTA

Prior to completion of the safety audit the emergency trip stations were all tested. The manager in charge deserves credit for the immediate attention given to this matter.

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

Checklist No.	24	Date of Audit: Sept. 17, 1998	Persons Contacted: Tedd Hankins
Department WAY, POWER, and SIGNAL	Auditors: Len Hardy Joey Bigornia		

REFERENCE CRITERIA

No SOPs available

ELEMENT / CHARACTERISTICS AND METHOD OF VERIFICATION

**TRACK INSPECTOR, SIGNAL INSPECTOR, and TRACTION POWER INSPECTOR
QUALIFICATIONS**

Obtain a copy of VTA's list of qualified track inspectors, signal inspectors, and traction power inspectors. Randomly select 3 inspectors from each category and then review the training and examination records for those selected to determine whether or not they are qualified.

RESULTS / COMMENTS

Certification records were requested to determine the qualifications of track inspectors, signal inspectors, and traction power inspectors.

It was found that there is no formal training, certification or recertification program addressing the specific job knowledge required for the three subject classes of work. Subsequent discussions on this matter established that the department is currently considering the development of a training, certification, and recertification program to comply with VTA's System Safety Program Plan and industry standards.

Recommendation:

Develop and implement a formal training, certification, and recertification program for track inspectors, signal inspectors, and traction power inspectors. This program should include an approved and adopted SOP that clearly defines the scope of the training and the requirements for certification and recertification for each class of work.

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

Checklist No.	25	Date of Audit: Sept., 1998	Persons Contacted:
Department WAY, POWER, & SIGNAL	Auditors: Len Hardy Kartik Shah		Tedd Hankins Chuck Maple Keith Powley

REFERENCE CRITERIA

1. VTA's Track Standards Manual, Turnout And Diamond Crossings Inspections, Section 12, Page 37
2. Way, Power, and Signal, Power Switch PM's SOP # 3.4 (Draft)
3. Code of Federal Regulations CFR 49, Part 213
4. Way, Power, and Signal Track Inspection and Maintenance Standard # 2.13

ELEMENT / CHARACTERISTICS AND METHOD OF VERIFICATION

TURNOUT INSPECTION - CPUC INSPECTORS

Randomly select a minimum of three mainline turnouts (at no less than two different locations on the system) and utilizing the services of a FRA certified track inspector perform a detailed visual inspection and dimensional measurement inspection to determine whether or not the selected items are in compliance with VTA's track maintenance standards. Additionally, using the services of a FRA certified signal inspector perform an adjustment and functional check of at least one switch machine for each of the turnouts selected.

RESULTS / COMMENTS

CPUC employees, Mr. Joe Farley (FRA certified track inspector) and Bill Meador (FRA certified signal inspector) inspected 2 turnouts (switches 1 & 3) near Chenoweth Station.

The following elements were checked at each turnout:

- Gage ahead of switch points, behind switch points, at frogs, at guard rails, and at various arbitrary locations throughout the turnout.
- Surface wear of tracks, switch points, guard rails, and frogs
- Condition of fasteners and clips for track, switches, guard rails, and frogs
- Switch lock rod adjustments (obstruction test)
- Switch detector rod adjustment

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**CHECKLIST NO. 25
CONTINUED FROM PAGE 1**

All elements checked were found to be satisfactory, except for the detector rod adjustments. According to the CPUC inspector the detector rod should be adjusted independent to the lock rod (ie. lock rod loosened and allowed to float). When the detector rods for both switch machines were checked independent of the lock rods, they did not meet the required specification. An alternative method of ensuring adequate detector rod adjustment without losing the lock rod, according to the CPUC inspector, is to tighten up the specification of the lock rod adjustment from $\frac{1}{4}$ of an inch to $\frac{1}{8}$ of an inch. VTA's maintenance personnel agreed with the CPUC inspector's logic regarding the subject adjustments.

Recommendation:

Update the switch inspection/adjustment procedure to reflect the agreed upon method of inspection/adjustment of detector rods and use this method to inspect / adjust all switch machines in the system.

Timely Response by VTA

Prior to completion of the safety audit, the procedure addressing switch machine inspections / adjustments has been updated to include the agreed upon method for adjusting the detector rod. Formal approval and implementation of this procedure will satisfy the recommendation, above. The manager in charge deserves credit for the immediate attention given to this matter.

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

Checklist No.	26	Date of Audit: Sept., 1998	Persons Contacted: Chuck Maples
Department WAY, POWER & SIGNAL		Auditor: Len Hardy	

REFERENCE CRITERIA

1. VTA Way, Power, and Signal Crossing Gate Monthly PM Procedure Form
2. Code of Federal Regulations CFR 49, Part 234
3. Way, Power and Signal Power Switch PM's, SOP # 3.4 (Draft)

ELEMENT / CHARACTERISTICS AND METHOD OF VERIFICATION

GRADE CROSSING WARNING DEVICES - CPUC INSPECTOR

Randomly select a minimum of three grade crossings on the main line and utilizing the service of a FRA certified signal inspector from the Commission's Railroad Operations Safety Section, perform a detailed inspection to determine whether or not the selected crossings are in compliance with the reference criteria.

RESULTS / COMMENTS

CPUC employee, Bill Meador (FRA certified signal inspector) inspected the grade crossings at Winfield Road and Blossom River Road.

The scope of the inspection consisted of checking the alignment and cleanliness of the warning lights, checking the gate arms, checking the voltage levels of the warning lights both for normal mode (AC power) and for standby mode (DC battery power), performing a ground test in the signal cabinet (ensuring that the DC power is isolated from the cabinet ground) and checking that up-to-date track circuit drawings are available in the signal cabinet.

The following exceptions were noted at both crossings:

- Poor visibility of lights in both AC mode and DC mode.
- The reflective striping on some gate arms was badly faded
- The voltage levels in stand-by mode were below acceptable limits (7.8 Volts at the mast junction box for both locations)

Recommendations:

1. Investigate the cause of the poor light visibility (wiring voltage losses from the junction box to the gate arm tip, cleanliness, alignment, bulbs used, etc.).
2. Inspect all gated at-grade crossings and correct as necessary the visibility of the lights, the reflective striping on the gate arms, and the low voltages when in DC stand-by mode.

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

Checklist No.	27	Date of Audit: Sept. 14, 1998	Persons Contacted: Chuck Maples Tedd Henkins
Department	WAY, POWER & SIGNAL	Auditors: Kartik Shah Len Hardy	

REFERENCE CRITERIA

1. VTA Way, Power, And Signal Standard Operating Procedure # 2.7, 3.1 (Draft)
2. VTA Way, Power, And Signal Lighting Maintenance Log
3. PM Action Form (VTA, WP&S)
4. Maintenance Form (VTA, WP&S)

ELEMENT / CHARACTERISTICS AND METHOD OF VERIFICATION

STATION FACILITY

1. Review station facility maintenance records for three stations for the past year to determine whether or not:
 - telephones have been inspected
 - mobility impaired lifts have been inspected
 - elevator emergency phones and the talk plates have been checked
 - monthly lighting inspections were completed
 - noted defects on any of the above equipment were corrected in a timely manner
2. Inspect a minimum of two stations during evening hours to determine whether or not:
 - adequate number of lights are functioning
 - phones on platforms are functional
 - any safety or security hazards are present in the station area

RESULTS / COMMENTS

Inspection of Station Facilities During Evening Hours:

Inspected Ohlone-Chynoweth, St. James, Santa Clara Street, Almaden, and Gish stations during the evening hours. At each station, practically all lights were functioning, all phones were functioning, and no safety or security hazards were noted.

Review of Maintenance Records:

Reviewed several monthly station facility records for Santa Teresa Station, Virginia Station, Metro Station, and Great America Station (total of 12). The records showed that in each case, inspections were completed and that noted defects were corrected in a timely manner.

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**CHECKLIST NO. 27
CONTINUED FROM PAGE 1**

However, review of the monthly station facility record for Great America Station dated 1/13/98 indicated that a fire extinguisher inspection had been completed, but there are no fire extinguishers at Great America station. This error could be explained by the fact that inspectors do not fill in checklists when performing the actual inspections at the stations, but simply enter the completion of inspections into the computer when they return to the Way, Power, and Signal facility.

Reviewed the procedures (SOPs 2.7 and 3.1) for the subject inspections and determined that the current procedures have not been formally approved or adopted.

Recommendations:

1. SOPs 2.7 and 3.1 that are currently in draft form should be formally approved and adopted on an expedited basis.
2. A checklist should be developed, and inspectors should be required to acknowledge completion of each checklist item (checkoff and initial, or equivalent) as it is performed in the field.

Timely Response by VTA

Prior to completion of the safety audit, a procedure (Procedure No. 6201) was drafted that includes a checklist for use in the field to acknowledge completion of inspected items. Formal approval and implementation of this procedure will adequately satisfy Recommendation 2 above. The manager in charge deserves credit for the immediate attention given to this matter.

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

Checklist No.	28	Date of Audit: Sept. 17, 1998	Persons Contacted:
Department	WAY, POWER, & SIGNAL	Auditor: Kartik Shah	Alex Lavarico

REFERENCE CRITERIA

1. VTA Way, Power, And Signal Standard Operating Procedure # 6.6 (Draft)
2. Title 19, Article 4, Section 904 Of Barclays California Code Of Regulations

ELEMENT / CHARACTERISTICS AND METHOD OF VERIFICATION

TRANSIT TUNNEL / AERIAL SAFETY ELEMENTS

1. Review the standpipe and associated pump inspection reports prepared during the last five years for at least one underpass and one aerial structure to determine whether or not:
 - standpipes and associated pumps were inspected and tested at the specified frequency as required by the reference criteria
 - the required inspections and tests were properly documented
 - noted defects were corrected in a timely manner
2. Visually inspect at least one tunnel area in the system to determine whether or not:
 - emergency walkways and exits are unobstructed
 - fire/life safety equipment is functional
 - lighting is adequate
 - safety-related signage is adequate and readable

RESULTS / COMMENTS

Visually inspected the Santa Teresa Station tunnel. Determined that emergency walkways and exits were unobstructed, lighting was adequate, and safety related signage was readable.

Reviewed the procedure for Standpipe Testing and Certification (SOP 6.6) and found that it has not been formally approved and adopted.

Reviewed the dry standpipe Class 1 inspection records for the Tamian Station (12/6/95) and the Santa Teresa Station tunnel (12/6/95). No discrepancies were found for Tamian Station. However, testing at the Santa Teresa Station tunnel was not conducted. The reason given for not conducting the test was that the water main was broken. A contract has been put out for bids to correct this problem, and was informed that the main will be repaired within 30 days.

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**CHECKLIST NO. 28
CONTINUED FROM PAGE 1**

Recommendations:

- 1. Ensure that the water main at Santa Teresa tunnel is repaired without delay**
- 2. Conduct testing of the dry standpipes within the Santa Teresa tunnel immediately after the water main has been repaired**
- 3. SOP 6.6 that is currently in draft form should be formally approved and adopted on an expedited basis.**
- 4. Without delay, formally inform the fire department having jurisdiction that the standpipes in the Santa Teresa tunnel are not in service, and discuss with them possible interim measures that can be taken until the main is repaired.**

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

Checklist No.	29	Date of Audit: Sept. 17, 1998	Persons Contacted:
Department WAY, POWER, & SIGNAL		Auditor: Kartik Shah	Keith Powley

REFERENCE CRITERIA

No reference available.

ELEMENT / CHARACTERISTICS AND METHOD OF VERIFICATION

SEMI - EXCLUSIVE AND EXCLUSIVE ROW FENCING

1. Review VTA's records for fence inspections to determine whether or not:
 - all mainline fencing is being visually inspected on a periodic basis
 - noted defects are being corrected in a timely manner
2. Survey one or more sections of track where fencing is installed and determine whether or not the fence is in need of repair.

RESULTS / COMMENTS

Surveyed fencing in two areas of the mainline: Chenoweth Station, and the intersection of Blossom Hill Road and Winfield Road adjacent to Almaden Station. It was determined from the inspection that the fences were in good order with no signs of deterioration or damage.

It was determined that no fence inspections records are available. However, a draft SOP has been prepared (9/15/98) that addresses the implementation and frequency of fence inspections.

Recommendation:

The SOP addressing fence inspections that is currently in draft form should be formally approved and adopted on an expedited basis.

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

Checklist No.	30	Date of Audit: Sept. 15, 1998	Persons Contacted:
Department	WAY, POWER & SIGNAL	Auditor: Gary Rosenthal	Keith Powley

REFERENCE CRITERIA

VTA Way, Power, And Signal Standard Operating Procedure # 2.11

ELEMENT / CHARACTERISTICS AND METHOD OF VERIFICATION

ON - RAIL EQUIPMENT PERFORMANCE

1. Observe on-rail equipment operators for at least one hour on the mainline to determine whether or not they are following the rules for safe operations.
2. Verify whether the following equipment has been provided either to the operator or on-board the vehicle:
 - operating rule book
 - current time table
 - current special instructions and train orders
 - red flag
 - fuses (six minimum)
 - switch bar
 - operable radio
 - flash light (during hours of darkness)
3. Interview not less than one certified on-rail operator to determine whether or not he/she understands the controlling rules & procedures for on-rail vehicle operation.

RESULTS / COMMENTS

Several on-rail maintenance equipment operators were contacted to verify if they had the required equipment in their possession or on the vehicle. Each on-rail operator was found to have the necessary equipment.

Several on-rail equipment operators were interviewed regarding the controlling rules and procedures. All were conversant with the rules and procedures and had adequate understanding of the applications of those directives.

On-rail equipment operators and other track maintenance employees were observed relative to applicable operating rules and procedures. The observations were made during pre-operation, operation in the yard, accessing the mainline, operation to the worksite, and operation in the worksite area. The equipment operators and track workers appeared to carry out those operations in compliance with the applicable operating rules.

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

Checklist No.	31	Date of Audit: Sept. 14, 1998	Persons Contacted:
Department SAFETY		Auditor: Erik Juul	Dan Kelly Kris Sabherwal Mark Bugna

REFERENCE CRITERIA

1. CPUC General Order 164A, 9/3/97, Paragraph 5 Reporting Accidents And Paragraph 7 Investigating Accidents.
2. VTA System Safety Program Plan, Rev 3, 11/96, Paragraph 4.10 Accident Reporting & Investigation.
3. VTA Safety Program And Procedures Manual, 3/17/92, Paragraph 5.6 Accidents And Incidents In Safety Program Plan, Rev 3, 11/96, Safety Bulletins 501 - 503, Accident Investigation Section.
4. Accident/Incident Response, Policy No. 12 dated 05/04/98
5. 49 CFR Part 659.41 Investigations And Part 659.43 Corrective Actions.
6. CPUC General Order 143A, 4/6/94, Paragraph 15 Accident Reporting Requirements.

ELEMENT / CHARACTERISTICS AND METHOD OF VERIFICATION

ACCIDENT/INCIDENT REPORTING & INVESTIGATION

Randomly select at least 3 accidents involving injuries or fatalities reported to the CPUC during the past 12 months. Review the accident investigation procedures, reports, and corrective action plans and schedules utilized by VTA for the selected accidents to determine whether or not:

1. the accident investigation procedure clearly describes the method to be used and the person/department in charge of each phase of the investigation
2. the accident investigation reports correctly identified the most probable cause and any other contributing causes
3. the accompanying corrective action plan properly addresses the identified causes and contains requirements which can be expected to prevent the accident from recurring
4. the implementation schedule for corrective action has either been completed or is up-to-date

RESULTS / COMMENTS

1. Review of Accident Procedure:

Reviewed VTA's Accident/Incident Response Policy dated 5/4/98. The policy did describe the method used and listed the responsibilities for the initial, on-scene investigation.

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**CHECKLIST NO. 31
CONTINUED FROM PAGE 1**

2. Review of Accident Reports:

Reviewed a list of accidents and incidents that occurred at VTA for the past 12 months and selected three accidents for review. These accidents were:

1. Fatality of a bicyclist due to a collision with a train on October 1, 1997
2. Injury due to a collision between a train and an automobile on March 20, 1998
3. Derailment of a train on June 4, 1998

Results of this review and subsequent discussions found that all of the elements/characteristics listed under items 2 through 4 above were satisfactorily complied with for the three selected accidents. No exceptions were noted.

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

Checklist No.	32	Date: Sept.16 & 22, 1998	Persons Contacted: Dan Kelley Kris Sabherwal
Department RAIL ENGINEERING	Auditors: Erik Juul Kartik Shah Len Hardy		

REFERENCE CRITERIA

VTA Operating System Change Control Procedures, Rev 1, 4/1/98.

ELEMENT / CHARACTERISTICS AND METHOD OF VERIFICATION

VEHICLE CONFIGURATION MANAGEMENT

Review the Safety Department's file of vehicle engineering action request numbers 11, 12, 15, 16, 17, and 22, and for not less than two requests determine whether or not for each change:

1. a change number and title was logged in the data base
2. the Rail System Safety Review Board approved the change
3. red-marked drawings indicating the change were provided to Rail Projects Design
4. as-built drawings were up-dated with the change, and were distributed to the Operating Division and the Record Management Department

RESULTS / COMMENTS

Requested to review the status of Engineering Action Request Numbers 11, 12, 15, 16, 17, and 22.

The subject action request numbers were selected since they are the only changes proposed since the implementation of the current vehicle change control process. The current change process was approved by RSSRB on April 2, 1998 when Revision 1. to the "Operating System Change Control Procedures" added Light Rail Vehicle modifications. Prior to this revision to the procedures, Light Rail Vehicle configuration changes were accomplished using the Light Rail Service Bulletin procedure.

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**CHECKLIST NO. 32
CONTINUED FROM PAGE 1**

Found that the change control process as defined in the procedure is adequate, but review of the engineering action requests indicated that the process is not being followed. For example, proposed changes have already been made in the field prior to Safety Review Board approval and prior to the appropriate processing of the corresponding engineering action requests. None of the items in the elements/characteristics above were completed for any of the engineering action requests. One reason given for the discrepancy is that there is no clear authority to ensure that each department involved fulfills its responsibilities in attending to the needs of the change control process. Review of the System Safety Program Plan on this matter indicated that there is no single management position with the ultimate responsibility for the overall change control process, and with the authority to ensure that each department manager fulfills his/her responsibilities in a timely manner.

Although this checklist activity is focused on vehicle configuration management, discussions established that the same discrepancies may exist for other operational changes (those occurring after cutover to revenue service). Thus the comments made in this checklist and recommendations 1 & 2 below should not be limited to the vehicle change control process alone.

Additionally, it was suspected by the individuals interviewed that vehicle changes initiated by roughly 20 service bulletins used prior to the current procedure did not result in affected documentation being updated.

Recommendations:

1. VTA should delegate and assign responsibility to a single manager that has authority over departmental lines to ensure that the change control procedure is implemented as intended. Once the determination is made regarding the ultimate, single point authority for the change control process, the System Safety Program Plans should be updated with this information.
2. VTA should ensure that the Engineering Action Requests submitted to date are processed and that the documentation is appropriately updated, recorded, and distributed.
3. VTA should evaluate the roughly 20 Light Rail Service Bulletins used prior to the current change control process to determine those that did not adequately address the evaluation, updating, and recording of the documentation involved. The service bulletins found to contain deficiencies should be processed using the current change control procedure.

Note: This checklist found deficiencies regarding the initiation of changes through the review and approval steps of the change control process. Checklist No. 38 deals with the processing of configuration changes in general (i.e. for all departments) after the review and approval steps and involves the work performed by the Records Management Department.

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

Checklist No.	33	Date of Audit: Sept. 16, 1998	Persons Contacted: Dan Kelley
Department	RISK MANAGEMENT	Auditor: Erik Juul	

REFERENCE CRITERIA

1. VTA System Safety Program Plan, Rev 3, 11/96, Paragraph 4.2 Rail System Safety Review Board, Paragraph 4.5 Hazard Analysis, Paragraph 4.6 Hazard Reports, Paragraph 4.8 Hazard Resolution, Paragraph 7.3 Rail System Safety Review Board.
2. Rail System Safety Review Board Proceedings, Rev 6, 6/2/93.
3. APTA Manual For System Safety Program Plans, 8/20/91, Checklist Item 7 Hazard Identification / Resolution Process.

ELEMENT / CHARACTERISTICS AND METHOD OF VERIFICATION

RAIL SYSTEM SAFETY REVIEW BOARD FUNCTIONS

Review the Rail system Safety Review Board's meeting minutes during the past 12 months to determine whether or not:

1. a process is in place to foster interdepartmental participation for reviewing safety-related modifications to equipment, policies, plans, rules, procedures, and training in order to provide comments to the board
2. safety related modifications are reviewed and approved by the board
3. accidents and criminal incidents are reviewed in order to identify trends and to prepare corrective action when needed
4. reported hazardous conditions are properly evaluated, investigated, and resolved

RESULTS / COMMENTS

Reviewed the Rail System Safety Review Board (RSSRB) meeting minutes for the past 12 months. (October 1997 through September 1998)

The review determined that:

1. a process is in place to foster inter-department participation for reviewing safety-related modification to equipment, policies, plans, rules, procedures, and training in order to provide comments to the board
 2. safety related modifications are reviewed and approved by the board
 3. accidents and security incidents are reviewed in order to identify trends and prepare corrective action when needed
 4. reported hazardous conditions are evaluated and resolved by the board
- No exceptions were noted.

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

Checklist No.	34	Date of Audit: Sept. 18, 1998	Persons Contacted: Dan Kelley
Department RISK MANAGEMENT		Auditor: Kartik Shah	

REFERENCE CRITERIA

1. System Safety Program Plan, Section 7.2
2. California Public Utilities Commission General Order 164A, Section 4
3. Code Of Federal Regulations, CFR 49 Part 659

ELEMENT / CHARACTERISTICS AND METHOD OF VERIFICATION

INTERNAL AUDIT PROGRAM

Review the status of the 1998 VTA internal audit program to determine whether or not:

1. a schedule that outlines the audits to be performed through the year is in place
2. internal audits have been performed to date according to the schedule
3. corrective action plans in response to audit findings have, either been completed, or are scheduled for implementation

RESULTS / COMMENTS

Reviewed the 1998 Internal Rail Safety Audit Schedule. Determined that most internal audits have been performed as scheduled, but that the following three audits scheduled for the first quarter of the year (March and April) have yet to be performed: Risk Management Department, Operations/Service Department, and Protective Service Department.

Additionally, it was determined that out of 8 audits performed on different departments, only one department (Operations/Training Department) has submitted corrective action plans to the Risk Management Department in response to the internal audit recommendations.

Recommendations:

1. Take action to ensure that the internal audit program is satisfactorily completed by the end of the year.
2. Expedite the formulation of corrective action plans in response to the internal audit recommendations for those departments that have, as yet, not responded.

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

Checklist No.	35	Date of Audit: Sept. 15, 1998	Persons Contacted:
Department	RISK MANAGEMENT	Auditor: Erik Juul	Dan Kelly

REFERENCE CRITERIA

VTA Safety Program and Procedures Manual

ELEMENT / CHARACTERISTICS AND METHOD OF VERIFICATION

INJURY AND ILLNESS PREVENTION PROGRAM

Review appropriate documentation and interview the manager in charge of the program to determine whether or not:

1. the persons responsible for implementing different aspects of the program are clearly identified
2. a system in place for identifying and evaluating workplace hazards
3. procedures exist, and are being followed, for investigating occupational injuries and illness and for correcting unsafe or unhealthy conditions in a timely manner
4. the program includes occupational health and safety training for employees
5. records are maintained to verify compliance with training and inspection requirements

RESULTS / COMMENTS

Reviewed the "Safety Program and Procedures Manual" and the "Injury and Illness Prevention Program", both adopted by VTA on January 2, 1995. Furthermore, reviewed minutes of the Joint Safety Committee, lesson plans and overhead slides for training classes, and a sampling of sign-in sheets for employee training.

This review and subsequent discussion found that all of the elements/characteristics listed under items 1 through 5 above were in compliance. No exceptions were noted.

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

Checklist No.	36	Date: Sept. 14 & 15, 1998	Persons Contacted: Dan Kelly Ambrose Delfino Richard Stahler Merle Giles Robert Suzuki
Department	RISK MANAGEMENT	Auditor: Erik Juul	

REFERENCE CRITERIA

SCVTA Safety Program And Procedures Manual, Bulletins 300, 301, 302, AND 306

ELEMENT / CHARACTERISTICS AND METHOD OF VERIFICATION

HAZARDOUS MATERIAL SPILLS REPORTS

Randomly select a minimum of three hazardous material spills that occurred during the past two years and review the corresponding reports from the Risk Management Department's file of Hazardous Material Spills to determine whether or not the reports contain the following minimum information:

1. date and time of incident
2. incident location
3. VTA personnel and outside agencies responding to spill
4. nature and cause of incident
5. number and type of injuries
6. amount of released material and an estimate of gallons that entered the storm or sanitary sewer system if applicable
7. copies of citations that may have been issued
8. current status and location of released spill material

RESULTS / COMMENTS

Reviewed the binder titled "Environmental Records, Guadeloupe Division" which includes a section for Reportable Spills and Recordable Spills.

Review of this binder and subsequent discussions found that there has not been any hazardous materials spills in the Light Rail Division in the past two years.

Blank forms are available in the binder for the recording of hazardous materials spills, and these forms contain fields for the entry of the element/characteristics listed under items 1 through 8 above. Additionally, review of the documentation for a Bus Division spill showed that the material was adequately disposed off and that all pertinent information was filled out on the form.

No exceptions were noted.

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

Checklist No.	37	Date of Audit: Sept. 16, 1998	Persons Contacted:
Department	RAIL PROJECTS DESIGN	Auditor: Kartik Shah	Mark Robinson Robert Dona

REFERENCE CRITERIA

1. VTA System Safety Program Plan, Section 4.9
2. Instructions for Completing Safety Certification Compliance Forms, dated December 20, 1996

ELEMENT / CHARACTERISTICS AND METHOD OF VERIFICATION

SAFETY CERTIFICATION

Select one recently completed project that was safety certified and determine whether or not:

- the designer for each contract work package identified the specific safety criteria that applies
- forms were completed that demonstrate that the safety criteria was incorporated in the design specifications and plans
- specification conformance was conducted to verify that safety -related criteria requirements were incorporated in the as-built system or facility
- training needs were identified and training was certified when completed
- any non-compliance (open items) was recorded and resolved

RESULTS / COMMENTS

Selected one recently completed project (Contract C-741, the Champion Station Project) and reviewed the following documentation:

1. the Safety Certification Compliance Approval Sheet
2. the Safety Certification Compliance Summary Sheet
3. various memorandums and forms related to safety certification

The review of the above documentation determined that safety criteria was identified and incorporated into the contract specifications, specification conformance was conducted to verify that safety-related specifications were incorporated into the station facility, and non-compliance items (for example: safety element reference numbers 8.2.1 and 8.2.2) were adequately resolved. No extraordinary training was required for this project. No exceptions were noted.

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

Checklist No.	38	Date: Sept. 17 & 22, 1998	Persons Contacted:
Department	RECORDS MANAGEMENT	Auditors: Erik Juul Kartik Shah Len Hardy	Tim Ellenberger Marce Brown Elinor Yokoi

REFERENCE CRITERIA

VTA Operating System Change Control Procedures, Rev. 1, 4/1/98

ELEMENT / CHARACTERISTICS AND METHOD OF VERIFICATION

CONFIGURATION MANAGEMENT

Randomly select two or more projects involving operational changes (changes made after cutover to revenue service) from the Records Management Department's file and for each selected determine whether or not:

1. a change number and title was logged in the data base
2. the Rail System Safety Review Board approved the change
3. red-marked drawings indicating the change were provided to Rail Projects Design
4. as-built drawings were updated with the change and were distributed to the Operating Division and the Record Management Department

RESULTS / COMMENTS

Selected two completed projects from the Record Management Department's file for review. These projects were: (1) Moving of vehicle detector loop at Champion Court Station, and (2) Removal of Signal 26 R, just south of Technology Station.

Reviewed the configuration documentation associated with the two projects and found that the items in the elements/characteristics above were adequately satisfied. No exceptions were noted.

Note: This checklist deals with configuration management in general once the documentation is submitted to the Records Management Department for processing. The comments regarding configuration management in Checklist No. 32 deal with the initiation of changes through the review and approval steps of the change control process.

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

Checklist No.	39	Date of Audit: Sept. 14, 1998	Persons Contacted:
Department		Auditor: Kartik Shah	John Carlson Ben Gregg
RAIL OPERATIONS			

REFERENCE CRITERIA

Standard Operating Procedure No. 8.4, Issued January 1, 1995

ELEMENT / CHARACTERISTICS AND METHOD OF VERIFICATION

RESTRICTED AREA ACCESS CONTROL

Review the records on this subject for at least the last 12 months to determine whether or not:

1. LRT Operations conduct periodic Access Meetings for contractors to discuss access rules and requirements
2. Restricted Area Access Request forms were issued for individuals requesting access
3. for each access request, the OCC Supervisor contacted different supervisors from the other LRT departments (depending on the scope of work - see the reference criteria) to obtain their approval for the access requested, and that this process was recorded on the Access Request Permit
4. Copies of approved access requests were distributed per the distribution schedules on the Access Permit forms, and the information entered on the OCC log

RESULTS / COMMENTS

Reviewed two restricted area access permits (7/30/98 and 6/13/98) contained in the Operations Control Center Log.

This review and subsequent discussions indicated that the elements/characteristics above were being adequately satisfied except:

1. Contractor's supervisors are required to attend a safety seminar at the Light Rail Division or at the work site on "How to Work Around Light Rail" prior to commencement of work. No document was available to support that this requirement is being performed. Additionally, learned that when training in general is given, it is often inconsistent and incomplete.
2. Although the procedure states that Way, Power, and Signal should receive a copy of all permits issued, an OCC supervisor said that copies of permits are only forwarded to Way, Power, and Signal when it affects their equipment.

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**CHECKLIST NO. 39
CONTINUED FROM PAGE 1**

Recommendations:

1. Conduct consistent safety seminars as required by the procedure and document these events.
2. Determine Way, Power, and Signal needs regarding knowledge of access permits. If they require copies of all access permits, implement this practice. If they only require those that affect their equipment, up-date the procedure accordingly.

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

Checklist No.	40	Date of Audit: Sept. 15, 1998	Persons Contacted:
Department PROTECTIVE SERVICES	Auditor: Kartik Shah		Ray Frank Bud Smith Marlam Ayllon David Clifford Ron LeBaudour

REFERENCE CRITERIA

VTA Light Rail System Safety Program Plan, Security Portion, Chapter 6, Section 6.1

ELEMENT / CHARACTERISTICS AND METHOD OF VERIFICATION

SECURITY PLAN

Evaluate whether or not the schedule within the System Safety Security Plan (page 6-2), listing specific tasks that need to be performed to meet security objectives is being implemented as planned.

RESULTS / COMMENTS

Evaluated the Security Department's progress in implementing specified tasks listed in its System Safety Security Plan.

Determined that the following programs have been implemented and are currently on-going: installation of closed circuit televisions at selected locations and a program to reduce vandalism. Given the extent of the work involved with the two programs reviewed, was satisfied that adequate progress is being made regarding implementation of the Security Plan.

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

Checklist No.	41	Date of Audit: Sept. 23, 1998	Persons Contacted:
Department TRANS. AUTHORITY ADMINISTRATION		Auditor: Len Hardy Kartik Shah	Jackie Adams

REFERENCE CRITERIA

1. VTA Personnel Policy And Procedure Manual, Substance Abuse
2. FTA 49 CFR Part 653
3. FTA 49 CFR Part 654

ELEMENT / CHARACTERISTICS AND METHOD OF VERIFICATION

DRUG AND ALCOHOL TESTING PROGRAM

For each rail transit employee that tested positive for drugs or alcohol over the past two years and who is currently employed in a safety sensitive position, review the records to determine whether or not:

1. the individual was evaluated and released to duty by a substance abuse professional
2. the individual was administered a return-to-duty test with verified negative results
3. follow-up testing was performed as directed by the substance abuse profession, with not less than six follow-up tests performed with verified negative results during the first 12 months after returning to duty

RESULTS / COMMENTS

Reviewed drug and alcohol records specific to the rail transit portion of the transit agency for individuals in safety sensitive positions for the period January 1, 1996 to August 31, 1998.

This review and subsequent discussions showed that 6 individuals tested positive for drugs and 1 individual tested positive for alcohol. All 7 individuals were evaluated by a substance abuse professional (SAP) and all individuals were administered return-to-duty testing. Those that passed the return-to-duty testing were scheduled for follow-up testing. However, 4 of the 7 individuals failed subsequent tests after returning to duty.

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**CHECKLIST NO. 41
CONTINUED FROM PAGE 1**

One individual failed one random test (an individual can be subjected to the random testing program concurrent with the follow-up testing program) and three follow-up tests. The second individual failed one random test, one return-to-duty test, and one follow-up test. The third individual failed one random test and one follow-up test. And the final individual failed two random tests. In each case, the individual was removed from duty and referred to a SAP. However, there was no evidence of meaningful consequences for repeat offenders. 49 CFR Part 653 and Part 654 requires consequences to be included in the transit agency's drug and alcohol policy.

Additionally, the records showed that out of 876 drug and alcohol tests performed 365 tests were excused. Further review indicated that out of the 365 tests excused, 143 were excused for illegitimate reasons.

Recommendations:

1. VTA should address the issue of consequences, especially for repeat offenders, and up date its drug and alcohol policy accordingly.
2. VTA should cease the practice of excusing individuals from drug and alcohol tests for illegitimate reasons.