PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

Consumer Protection & Safety Division
Rail Transit Safety Section

Resolution ST-54
November 7, 2002

R E S O L U T I O N

RESOLUTION ST-54. GRANTING APPROVAL OF A FINAL REPORT OF AN ON-SITE SAFETY AUDIT OF THE LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY PERFORMED BY THE RAIL TRANSIT SAFETY SECTION OF THE CONSUMER PROTECTION AND SAFETY DIVISION

SUMMARY

This resolution grants the request of the Consumer Protection and Safety Division for Commission approval of the Rail Transit Safety Section's final audit report entitled, Triennial On-Site Safety Audit of the Los Angeles County Metropolitan Transportation Authority, dated October 4, 2002.

BACKGROUND

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

After the 1998 triennial audit of Los Angeles County Metropolitan Transportation Authority (LACMTA), the Commission approved Resolution ST-38. This resolution ordered LACMTA to implement twenty (20) recommendations developed by staff to improve the safety of the LACMTA system and to report progress in semi-annual reports.

DISCUSSION

Staff of the Rail Transit Safety Section conducted an on-site, safety audit of the LACMTA rail transit system during June 2001. The methods used to conduct the audit included:

- Discussions with LACMTA management
- Reviews of procedures and records
- Observations of operations and maintenance activities
- Interviews with rank and file employees
- Inspections and measurements of equipment and infrastructure
- Follow-up to the 1998 LACMTA Triennial Audit

The audit concentrated on requirements that affect the safety of operations and are known or believed to be important to minimizing safety hazards and preventing accidents. A full description of the audit, including the procedure, findings, recommendations and conclusions is contained in the final audit report which is included with this resolution as Appendix A. The audit findings are recorded directly on the forty-three (43) checklists that are included as a part of the final audit report. Based upon these recorded findings, staff made thirty-two (32) recommendations to effect improvements in LACMTA's system safety program.

The results of the audit show that LACMTA is inconsistent in implementing its System Safety Program Plan. LACMTA personnel demonstrated that some departments are effectively carrying out safety related policies and procedures, while other departments need improvement.

In particular, LACMTA has failed to fully implement seven (7) of the recommendations made in the 1998 triennial audit and ordered by Resolution ST-38. For some of the 1998 audit recommendations, LACMTA performed the appropriate analysis and developed acceptable plans but failed to implement those plans.

PROTESTS

On July 27, 2001, staff provided LACMTA with the preliminary draft triennial audit report. The letter directed attention to the draft recommendations and informed LACMTA that the thirty-day (30) review and comment period would end on August 27, 2001. On August 20, 2001, LACMTA provided staff with forty (40) comments regarding the draft audit report.

On June 6, 2002 staff provided LACMTA with a revised draft of the triennial audit report. On August 14, 2002 LACMTA provided staff with seventy-seven (77) comments regarding the draft report. Staff has reviewed LACMTA's comments and modified the report as appropriate.

COMMENTS

The draft Resolution was mailed to parties in accordance with Public Utilities Code Section 311(g) on October 4, 2002. On October 22, 2002, LACMTA filed comments.

LACMTA opposes adoption of the staff report. LACMTA opposes three of the reports thirty-two recommendations, and disagrees with the reports identifying most of the recommendations as "open" including four of the seven recommendations from the 1998 that the report identifies as open. In addition, LACMTA requests the corrective action status reports be required on a quarterly basis, rather than the monthly basis recommended by staff.

The three recommendations in LACMTA does not agree with are:

17. LACMTA should extend the insulators closer to the feeder pole, away from the dynamic weight system, as required by GO 95, Rule 74.4-F.
26. LACMTA should implement the requirements of the LACMTA AIP and GO 164-B, Section 6.
27. LACMTA should follow its own requirements as identified in the Safety Certification Plan for Construction for all projects including procurement projects.

The Commission has reviewed the comments and made changes in the Resolution and attachments as appropriate.

THEREFORE, IT IS ORDERED that:

1. The Consumer Protection and Safety Division's request for Commission approval of the Rail Transit Safety Section's report entitled, Triennial On-Site Safety Audit of the Los Angeles County Metropolitan Transportation Authority, dated October 4, 2002, is granted.

2. LACMTA shall submit to the Staff for its approval a set of project plans and schedules for implementing all recommendations contained in the final audit report within 60 days. The plans and schedules shall:

- Contain step-by-step descriptions of the tasks required to complete each recommendation.
- Establish milestone target dates for each step in each task with start dates and completion dates.
- Identify the person assigned responsibility for implementing the plan and schedule for each recommendation

3. LACMTA shall implement all recommendations contained in the report, in accordance with the plans and schedules submitted to the staff.

4. Within 90 days, LACMTA shall provide the Commission with monthly written status reports until all thirty-two (32) recommendations are fully implemented. The status reports shall include the project plan and schedule updates that show the work completed and the work remaining for each of the thirty-two (32) recommendations. The LACMTA Rail Operations Safety Department shall monitor the work performed to assure it is fully responsive to the recommendations, and shall verify compliance by signing each of the monthly status reports identifying the work actually performed.

5. This resolution is effective today.

I certify that the foregoing resolution was duly introduced, passed, and adopted by the Commission at its regularly scheduled meeting on November 7, 2002. The following Commissioners voted favorably thereon:

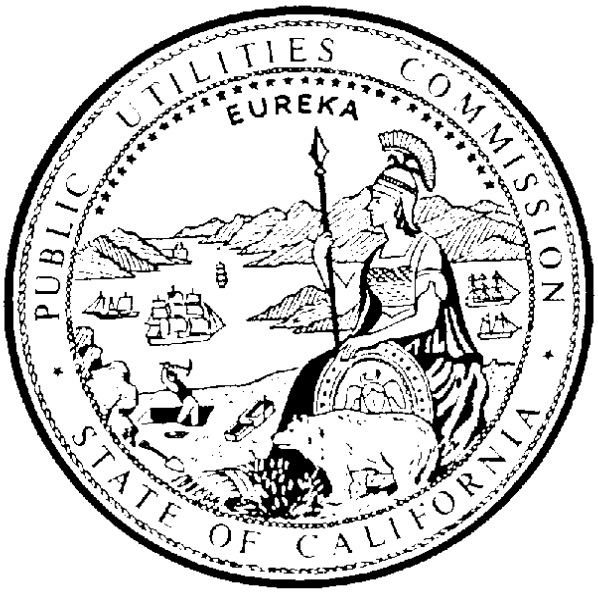
WESLEY M. FRANKLIN
Executive Director

TRIENNIAL ON-SITE SAFETY AUDIT OF THE LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

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

OCTOBER 4, 2002

FINAL REPORT



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1. EXECUTIVE SUMMARY

The Rail Transit Safety Section of the California Public Utilities Commission's (Commission) Consumer Protection and Safety Division conducted the second triennial, on-site, safety audit of the Los Angeles County Metropolitan Transportation Authority (LACMTA) from June 18 to June 27, 2001. The on-site audit was preceded by a pre-audit conference with LACMTA personnel on Monday, June 18, 2001. A post-audit conference, also attended by LACMTA personnel, was held on Wednesday June 27, 2001.

The audit results indicate that LACMTA is not in compliance with its own System Safety Program Plan (SSPP) for its safety sensitive departments. The SSPP, required by Commission and Federal Transit Administration rules, establishes a mechanism to identify and address hazards associated with the rail system.[1] LACMTA did not utilize the SSPP fully to eliminate, minimize and control the hazards associated with the rail system. Subsequent to the audit, LACMTA presented to the Commission Staff (staff) corrective action plans for some of the recommendations.

LACMTA management may not be giving adequate attention to the Commission audit process. In 1998, the Commission, in Resolution ST-38, ordered LACMTA to implement 20 recommendations. The 2001 LACMTA Triennial Audit results revealed that LACMTA did not implement seven of the 20 recommendations. Of those seven, several line departments had developed adequate remedies, but they were not implemented because resources were not made available. In addition, during the 2001 Triennial Audit, several departments did not have documents ready for staff to audit, even though staff had notified LACMTA of the upcoming audit one month ahead of time. Finally, the LACMTA Chief Executive Officer and some department managers did not attend the 2001 audit commencement and concluding meetings. Staff is concerned that LACMTA management may not take the Commission audit process seriously and may not respect the Commission's jurisdiction.

The staff audited 12 LACMTA departments on 43 separate subjects using specific criteria (checklists). The audit results indicate that LACMTA performance, in compliance with the agency SSPP, is not satisfactory[2]. The audit revealed areas in need for improvement in 29 of the 43 checklists. In particular, staff is concerned about the safety performance of Operations, System Safety, and Vehicle Maintenance Departments. Staff is concerned that LACMTA management may not be integrating safety into the agency's day to day operations.

LACMTA Operations Department lags in training and certifying its employees. Audits of both the light and heavy rail programs found that, of the records reviewed, most maintenance of way (MOW) and vehicle maintenance employees had not been re-trained or re-certified for the last two to four years, which is a violation of LACMTA and GO 143-B requirements. In addition, LACMTA did not establish

[1] The Commission's General Order (GO) 164-B and the Federal Transit Administration's (FTA) Final Rule, 49 CFR Part 659, establish a program to ensure the safety of rail fixed guideway systems in California. The rules describe the components of an SSPP and require transit agencies to mantain one. SSPPs are reviewed by the Commission before being adopted. SSPPs guide and direct transit agency safety activities. GO 164-B and FTA Rule 49 CFR Part 659, further require the Commission staff to perform triennial, on-site, safety audits of each transit agency. The purpose of these audits is to verify compliance with, and evaluate the effectiveness of, each rail transit agency's SSPP.

[2] The SSPP establishes a mechanism to identify and address hazards associated with the rail system. The agency also utilizes the SSPP to eliminate, minimize, and control the hazards.

a formal training program, has not conducted consistent periodic operator evaluations and is not performing check rides to ensure operator competence after accidents.

The LACMTA Rail Operations Safety Department is not following GO 164-B requirements. The Rail Operations Safety Department has not been updating the SSPP. In addition, the Rail Operations Safety Department has not been providing the staff an opportunity to participate in all aspects of accident investigations, as required by GO 164-B and LACMTA Accident Investigation Plan.

Vehicle Maintenance was another area of concern. Staff found unacceptable problems at the Metro Red Line Vehicle Maintenance Department. Inspection of eight Metro Red Line vehicles revealed three with maintenance problems. Four of six Metro Red Line cars examined were found to have exceeded the maximum number of miles allowed for preventive maintenance inspections by over 20 percent. In addition, one of six cars examined at the Metro Green Line yard had unacceptable brake wear (concavity). The last two LACMTA inspections of this vehicle had not checked for concavity as required. Also, LACMTA did not follow its own safety certification plan requirements for construction of the P2000 Vehicles.

Staff recommends:

1. LACMTA must integrate its SSPP in the agency management culture.

2. LACMTA must implement all the staff recommendations resulting from the 2001 Triennial Audit to improve safety at LACMTA.

3. LACMTA must implement the remainder of the 1998 recommendations ordered in Commission Resolution ST-38.

Acronyms List

Acronym	Meaning
AC	Alternating Current
AIP	Accident Investigation Plan
APTA	American Public Transportation Association
AREA	American Railway Engineering Association
ATP	Automatic Train Protection
CCC	Configuration Control Center
CDL	Commercial Driver's License
CFR	Code of Federal Regulations
CPUC	California Public Utilities Commission
CRC	Change Review Committee
DC	Direct Current
DMV	Department of Motor Vehicles
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
ETS	Emergency Trip Stations
FMIS	Facilities Maintenance Information System
FRA	Federal Railroad Administration
FTA	Federal Transportation Administration
GO	General Order
HRC	Hazard Resolution Committee
IOM	Interoffice Memorandum
LACMTA	Los Angeles County Metropolitan Transportation Authority
LAFD	Los Angeles Fire Department
LRT	Light Rail Transit
LRV	Light Rail Vehicle
MBL	LACMTA Metro Blue Line
MGL	LACMTA Metro Green Line
MOW	Maintenance of Way
MRL	LACMTA Metro Red Line
NFPA	National Fire Protection Association
OCS	Overhead Catenary System
PM	Preventative Maintenance
PMI	Preventative Maintenance Inspection
PQS	Personal Qualification Standard
QA	Quality Assurance
ROC	Rail Operations Control
ROS	Rail Operations Safety
RTOS	Rail Transit Operations Supervisors
SCADA	Supervisory Control and Data Acquisition
SMRC	System Modification Review Committee
SOP	Standard Operating Procedure
SSPP	System Safety Program Plan
TO	Train Operator
UOR	Unusual Occurrence Report

2. INTRODUCTION

The Commission's GO 164-B and the Federal Transit Administration's (FTA) Final Rule, 49 CFR Part 659, establish a program to ensure the safety of rail fixed guideway systems in California. The rules describe the components of an SSPP and require transit agencies to mantain one. SSPPs are reviewed by the Commission before being adopted and guide and direct transit agency safety activities.

GO 164-B and FTA Rule 49 CFR Part 659, further require the staff to perform triennial, on-site, safety audits of each transit agency. The purpose of these audits is to verify compliance with, and evaluate the effectiveness of, each rail transit agency's SSPP.

The Rail Transit Safety Section of the Commission Consumer Protection and Safety Division conducted the second triennial, on-site, safety audit of the LACMTA from June 18 to June 27, 2001. The on-site audit was preceded by a pre-audit conference with LACMTA personnel on Monday, June 18, 2001. A post-audit conference, also attended by LACMTA personnel, was held on Wednesday June 27 , 2001.

3. BACKGROUND

The LACMTA is the transportation agency of Los Angeles County. The LACMTA is governed by a 13-member Board of Directors comprised of: the five Los Angeles County Supervisors, the Mayor of Los Angeles, three Los Angeles mayor-appointed members, four city council members representing the other 87 cities in Los Angeles County, and one non-voting member appointed by the Governor of California.

LACMTA Rail System Description

The LACMTA rail system consists of the Metro Blue, Red, and Green Lines with the Metro Gold Line under construction and two extensions proposed. The total system is about 60 miles with 52 stations and with about 14 more miles under construction. The average weekday ridership of the system is about 244,000.

Metro Blue Line

The Metro Blue Line is a light rail line that runs between downtown Los Angeles and downtown Long Beach. It has 22 stations over a 22 miles route. The Metro Blue Line connects to the Metro Green Line at Rosa Parks/Imperial station and connects to the Metro Red Line at 7th/Metro Station in downtown Los Angeles. Currently two-car and three-car trains are running depending on the time of the day. The average weekday boarding is about 66,000 per day and the 2001 total yearly boarding was close to 18 million.

Metro Red Line

The Metro Red Line, a heavy rail subway, runs under downtown Los Angeles between Union Station and North Hollywood. It has 16 stations over its 17.4 miles of route. The Metro Red Line connects to the Metro Blue Line at the 7th/Metro station in downtown LA and connects to the Amtrak and Metrolink commuter rail at the Union Station. Either a four-car train or a six-car train is running depending on the

time of the day. The average weekday boarding is about 148,000 per day and the 2001 total yearly boarding was close to 34 million.

Metro Green Line

The Metro Green Line is a light rail line that runs east-west along the median of the Glenn Anderson (Century) Freeway (I-105) through Los Angeles County between the City of Norwalk and the City of Redondo Beach. It has 14 stations over its 20 miles of service route. It connects to the Metro Blue Line at Imperial/Wilmington (Rosa Parks) Station. Currently, a two-car configuration is running. The average weekday boarding is about 30,000 per day and the 2001 total yearly boarding was about 7.6 million.

Metro Gold Line (formerly named the Pasadena Metro Blue Line)

The Los Angeles to Pasadena Metro Blue Line Construction Authority, created by State Legislation (SB1847) effective January 1, 1999, is building a new transit line. Once completed, LACMTA will operate the light rail system. On November 29, 2001, LACMTA approved changing the name of the new line from Pasadena Metro Blue Line to Metro Gold Line. The Metro Gold Line, currently under construction, is due to open in July 2003. It will span 13.7 miles between Union Station and Pasadena and include 13 stations.

Eastside Extension LRT Project (Extension of the Metro Gold Line through East Los Angeles)

The proposed Eastside Extension would operate between Union Station and East Los Angeles for 6 total miles with 9 stations. The Eastside Extension LRT Project is in the Preliminary Engineering stage.

Exposition Light Rail Transit (LRT) Extension Project

The proposed Exposition LRT Extension project running between downtown Los Angeles and Santa Monica would connect with the Metro Blue Line in downtown Los Angeles. The location of the project is on LACMTA's abandoned railroad right-of-way that runs parallel to the Santa Monica Freeway (I-10). The project is in the Draft EIS/EIR stage.

FIGURE 1 – LACMTA Rail System Map

LACMTA 1998 Triennial Audit Recommendations Status

During the 1998 LACMTA triennial audit staff audited the departments of Rail Operations and MOW, Rail Operations Control (ROC) and Support, Human Resources, Operations and System Safety, Facilities and Vehicle Maintenance and SCADA System Engineering. The audit resulted in twenty (20) staff recommendations to LACMTA to improve the LACMTA system safety program. In Resolution ST-38, the Commission adopted the 1998 audit report and ordered LACMTA to implement the recommendations contained in the report. At the time, LACMTA recognized the need for improvements and informed staff that it had begun to implement them.

During the 2001 triennial audit, staff found that LACMTA has lagged behind in implementing some of the recommendations made after the 1998 audit. LACMTA's progress on the 1998 recommendations follows:

Rail Operations and MOW Departments

Staff had six (6) recommendations for these departments. The recommendations were in the areas of train operator check rides, temporary operator training, operator performance evaluation, "look back" rule and completion and issuance of different standard operating procedures (SOP). LACMTA fully implemented only two recommendations, issuing new SOPs for yard controllers and emergency preparedness. It did not complete two recommendations, those requiring operator check rides and operations performance evaluations. In 2001 Triennial Audit, staff recommended that LACMTA should provide the staff with a written report explaining why the check ride recommendation was not implemented. Also staff recommended that LACMTA should complete, adopt, and implement the draft LACMTA Program of Operational Evaluation. Finally, LACMTA evaluated the recommendation in operator "look back" rule and decided not to take any action. LACMTA did not provide the staff any substantiation for its analysis and evaluation.

ROC and Support Departments

Staff had six (6) recommendations for these departments. The recommendations concerned operations bulletins, employee understanding of newly issued procedures, utilization of newly developed training courses with Rail Operation Safety Department (ROS) participation, assuring that unusual occurrence reports are distributed to ROS, improving 40 channel tape recorder, and evaluation of configuration management and change control described in the SSPP and Rail Configuration Change Control Procedure. The 2001 audit confirmed that LACMTA implemented five of six recommendations. Staff could not confirm the completeness of one recommendation, whether LACMTA is utilizing newly developed training courses. However, training plans were included in LACMTA's configuration management program.

Human Resources Department

Staff did not have any recommendations for this department.

Operations and System Safety Departments

Staff had four (4) recommendations for these departments in the areas of advance notification of Commission representative to participate in major accidents multi-department meetings, SSPP updates as organizational and other changes occur, and preparation and utilization of an appropriate program to analyze accident data. LACMTA implemented only one (1) recommendation in including audit

elements in its next internal audit and did not implement three (3) recommendations. In the 2001 audit, staff recommended that LACMTA should provide the staff an opportunity to participate to the fullest extent possible, including advance notification of the accident investigation activities listed in Section 3.2.4 of the LACMTA's Accident Investigation Plan. Also staff recommended that LACMTA should review and revise the SSPP to reflect the current organizational practice. Finally, staff recommended that LACMTA prepare and implement an appropriate program and procedure to cover the periodic review and analysis of statistical accident data to identify and correct any apparent negative trends. Prior to the audit, LACMTA Rail Operations Safety Department wrote a letter to staff dated May 4, 2001, stating that a program is in place for accident data acquisition and analysis. The staff in 2001 found that this program was not adequate.

Facilities, Signal, Track and Traction Power Departments

Staff had three (3) recommendations for these departments. LACMTA partially completed the first recommendation and completed the two other recommendations. The first recommendation requested an evaluation of the frequency for preventive maintenance activities, inspections, and testing of material and equipment. Also staff recommended completing and expediting initial testing and certification of all signal and track inspectors. The third recommendation concerned inspection and repair of all Metro Blue Line grade crossings warning devices.

Vehicle Maintenance Department

Staff had one (1) recommendation for this department in the area of vehicle maintenance training of Metro Red Line to follow the same record-keeping format as for light rail to clarify the required training courses. LACMTA completed the recommendation and staff did not notice any exception in the 2001 audit.

Appendices B and C contain the LACMTA 1998 Triennial Audit Recommendation List and Commission Resolution ST-38.

4. PROCEDURE

The audit was conducted in accordance with the Commission's procedure RTSS-4, Procedure for Performing Triennial Safety Audits of Rail Transit Systems. Staff members Gary Rosenthal, Erik Juul, Audrey Ong, Joey Bigornia, Raed Dwairi, Hani Moussa, Anton Garabetian and Mahendra Patel audited LACMTA.

Staff developed the criteria to evaluate the various departments with system safety responsibilities, using FTA and American Public Transit Association guidelines and the staff's knowledge of the transit system. Each set of criteria became a checklist and was used to document the audit.

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

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

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

On April 10, 2001, staff notified LACMTA of the upcoming triennial audit. The letter informed LACMTA that the first part of the triennial audit would commence on May 15, 2001 with inspections performed by staff. Attached were four inspection checklists for review by LACMTA. Staff received no comments.

On May 11, 2001, staff notified LACMTA of the second part of the triennial audit. The letter informed LACMTA that the second part of the triennial audit would commence on June 18, 2001 with a pre-audit meeting and immediately afterwards the audit would begin. Attached were thirty-nine checklists for review by LACMTA. Staff received no comments.

On July 27, 2001, staff provided LACMTA with the preliminary draft triennial audit report. The letter directed attention to the draft recommendations and informed LACMTA that the thirty-day review and comment period ends on August 27, 2001. On August 20, 2001, LACMTA provided staff with forty comments regarding the various departments involved in the triennial audit. Staff has reviewed LACMTA's comments and modified the report as appropriate.

On June 6, 2002, staff provided LACMTA with an updated draft triennial audit report. The letter directed attention to the final recommendations and requested LACMTA to comment within 30 days. On July 26, 2002, staff and LACMTA management met in San Francisco to discuss the triennial audit report results. On August 14, 2002, LACMTA provided staff with thirty-eight general comments, thirty-two 2001-audit related recommendation comments and seven 1998-audit related recommendation comments. Alongside these comments, LACMTA proposed a schedule for correcting some of the recommendations. Staff has reviewed the LACMTA comments and modified the report as appropriate.

5. FINDINGS AND RECOMMENDATIONS

Staff audited 12 LACMTA departments with 43 checklists. The majority of documents reviewed, activities observed, and items inspected did not comply with the requirements of LACMTA System Safety Program. Staff recorded the audited findings for each element/characteristic under the Results/Comments heading on each of the 43 checklists. Appendices D, E, and F depict the LACMTA 2001 Triennial Audit Recommendation List, Checklist Index and Checklists.

Following is a brief explanation of the responsibilities of each department and staff audit findings for that department. There are 32 recommendations. The Operations Department had the most (9). Staff did not note any exceptions and did not have any recommendations for the Human Resources and Rail Quality Assurance Departments.

1. Human Resources Department

The Human Resources Department is responsible for ensuring that successful candidates for positions are capable of safely performing the tasks of these positions. The department is also responsible for administering the LACMTA Drug and Alcohol Policy, overseeing medical testing, retaining related records and administering the LACMTA Discipline Policy.

Findings - Conforming Conditions:

Staff did not note any exceptions when auditing the LACMTA drug and alcohol-testing program. All records were well organized, neat and thorough. An interview with the manager revealed new innovations to an already outstanding program. Staff found the administration of this program in full compliance with the LACMTA and Commission rules. Refer to Checklist No. 1 for more details.

2. Rail Quality Assurance Department

The responsibility of the Rail Quality Assurance (QA) Department is to inspect new rail vehicles and all trains involved in Code 2 accidents (accidents that involve injury requiring transport, death or derailments). It monitors prescribed rail scheduled maintenance activities and new equipment test programs for functionality, maintainability and safety.

Findings - Conforming Conditions:

Staff did not note any exceptions when auditing the QA Department. The staff verified that the QA Department responded to every applicable Code 2 rail accident. Each QA report included support documentation of post accident inspection forms, Controller's Unusual Occurrence Reports, recent vehicle maintenance inspection reports and photographs of damaged components. The staff reviewed the established Metro Blue & Green Line Gearbox Data overhaul program database dated May 31, 2001 and did not note any exceptions. Checklists No. 2 and 3 contain more details about these findings.

3. Signal Maintenance Department

The responsibility of the Signal Maintenance Department is to inspect and maintain train protection, train control and crossing warning systems and to maintain the wayside cab signaling system. It utilizes a maintenance plan to ensure system safety and quality assurance.

Findings - Conforming Conditions:

1. Staff did not find any exceptions when inspecting several grade crossings on the Metro Blue Line (MBL). Each grade crossing and interlocking/crossover that staff inspected in the field was operating as intended in accordance with LACMTA's signal maintenance standards. Metro Red Line (MRL) and Metro Green Line (MGL) use exclusive right-of-ways and do not have any grade crossings.

2. Staff did not find any exceptions when reviewing monthly, quarterly and bi-annual switch inspection reports prepared for the MBL , MRL and MGL. The Signal Maintenance Department performed and properly documented all the required inspections.

3. Staff did not find any exceptions when reviewing interlocking inspection reports for MBL, MRL and MGL. Inspection reports showed that LACMTA performed the required testing satisfactorily at the required two-year intervals during the past four years at all locations.

4. Staff did not note any exceptions of selected personal qualification standards (PQS) records of the MBL, MRL and MGL. Each of the PQS reviewed showed that signal inspectors are being trained on an on-going basis in each of the functional areas.

5. Staff did not note any exceptions in selected MBL monthly grade crossing inspection reports for the year 2000. Records show that LACMTA performed all the required monthly inspections and properly documented them.

6. Staff did not note any exceptions when inspecting records of signal calibration equipment from the MBL, MRL and MGL. All the selected items were properly stored, inventoried, marked and tagged.

7. Results of the review showed that the MRL and MGL relay records were satisfactory. The staff selected and reviewed the MRL and MGL vital relays test data records prepared for the year 1997 and 2000 respectively.

Findings - Non-Conforming Conditions:

8. When staff reviewed the MBL vital relay inspection and maintenace program, the records indicated that 13 of 21 relays failed when LACMTA staff tested them on 3/31/00 and 4/21/00. There are still failed relays in use, in certain stations, due to the unavailability of replacement relays.

   Subsequent to the audit, LACMTA advised staff that the 13 failed relays have been replaced. Signal Maintenance findings are depicted in detail in Checklists No. I-1 and 23 to 28.

Recommendations:

1. LACMTA should evaluate the test procedures of vital relays and establish a range of values that the vital relay should meet in order to pass the test. If a relay fails, LACMTA should replace it immediately. Vital relays should be readily available in the storage room.

2. Once LACMTA establishes the procedures, it should develop a training plan and train the employees. Refer to Checklist No. 25 for more detail about this recommendation.

4. Rail Operations Department

The Rail Operations Department is responsible for training of all rail maintenance and rail transportation operations employees, ROC controllers and train operators. It supports operational training to other rail

employees as required to ensure compliance with SOP. The audit findings and recommendations are documented as follows:

Findings - Conforming Conditions:

1. The MRL operation training, re-training, certification and re-certification records for the selected train operators (TO) and rail transit operations supervisors (RTOS) were current. Also, the MBL and MGL training, re-training, certification and re-certification records for the selected TO and RTOS were current. In addition, the MBL and MGL TO and all line Signal Maintenance & Equipment Maintenance Personnel records were in compliance with the hours of service and minimum rest requirements.

2. LACMTA has satisfied the 1998 Triennial Safety Audit Recommendations No. 3 and No. 4, concerning Rail Operations Bulletins and "sign for" requirements governing the issuance of new procedures, notices, and bulletins, by current operational practices.

3. LACMTA has satisfied the 1998 Triennial Audit Recommendation No. 10 and is currently distributing the Unusual Occurrence Reports (UOR) to all the departments that are listed at the bottom of the UOR.

4. LACMTA has replaced the old controller's 40-channel tape recorder with a new communication recorder (Dictaphone) in response to LACMTA 1998 Triennial Audit Recommendation No. 11. In 1998, staff recommended that LACMTA should improve the performance of 40-channel tape recorder. Although, LACMTA has not operated the new communication recorder in its full capacity. Checklists No. 10 and 11 give more detail about this finding.

Findings - Non-Conforming Conditions:

5. Heavy Rail and Light Rail Operations and Vehicle Maintenance staff are confused about which department has the responsibility to maintain the records for re-certification of vehicle maintenance employees. The audit result revealed that these records are not maintained properly. Subsequent to the audit, LACMTA, in a letter dated August 20, 2001, clarified the uncertainty by stating that the MOW and Vehicle Maintenance departments are responsible for maintaining all training records in the individual employee files.

6. At one incident, staff found that a Vehicle Maintenance employee has operated a rail vehicle in the yard with an expired operations certification. A clear violation of LACMTA operation requirements and GO 143-B.

7. The LACMTA does not maintain adequate/complete operator/student performance sheets. The LACMTA Instruction Department uses an Operator/Student Performance Sheet to document the operating performance evaluation of employees during the certification and re-certification process. For many employees, especially those other than train operators, the performance activity checklist boxes were blank or incomplete. As a result, staff could not substantiate an evaluation of the employee's ability to perform safety critical operations activities/tasks during the certification or re-certification process. Checklists No. 4 and 5 depict these shortcomings in detail.

8. LACMTA is in violation of GO 143-B, Section 13.03, which requires each transit system to adopt a program of instruction for all new employees. At least every 2 years, the agency shall provide a refresher course on the meaning and application of the carrier's operating rules. MOW and Vehicle Maintenance personnel were not receiving this refresher course every two years. LACMTA has not conducted any controller re-certification classes since 1998. Checklists No. 4 and 5 depict these shortcomings in detail.

9. LACMTA does not have a formal safety training document for Heavy and Light Rail employees. The agency uses Heavy Rail and Light Rail Instruction Training Matrices that identify frequency, type and amount of operations safety training required of the various classes of employees. However, these matrices were not formal documents and not subject to change control procedures. A change control procedure ensures that any element change does not adversely affect other individual system element or the overall system. Refer to Checklists No. 4, 5 and 9 for more details.

10. As required by GO 143-B, LACMTA does not have an established formal program for periodic operational evaluations. Operational evaluations are important to insure that operators are up to date on operations rules and procedures. LACMTA did not establish a formal program nor has it conducted consistent periodic operational evaluations. Instead, LACMTA has a draft plan but it has not been implemented.

11. LACMTA did not satisfy the 1998 Triennial Safety Audit Recommendation No. 5. LACMTA has drafted comprehensive programs of operational evaluations for train operators and controllers. Those programs have not been completed, adopted and implemented.

12. The light rail operations management reported that they reviewed and re-evaluated the look back procedure for trains leaving the station platform as required by the 1998 Triennial Safety Audit Recommendation No. 6. They concluded that it would be unsafe if the TO looked in the side rear view mirror after the train began to move since some stations had pedestrian crossings in close proximity and the operator should focus attention on that area. LACMTA did not provide the staff with a report explaining its analysis of these hazards or what other corrective actions should be taken in response to the 1998 Triennial Safety Audit Recommendation Number 6. Checklists No. 4, 5, 6 and 7 explain this finding in detail.

13. LACMTA does not follow its own directive to perform TO check rides after an accident. Recommendation No. 1 from the 1998 Triennial Audit states, "*Complete and issue for use the management directive which is currently being drafted to assure that accident follow-up check rides are performed as soon as possible, but not later than two weeks, after an operator returns to duty following an accident.*" In response to this recommendation, LACMTA issued a directive dated July 16, 1998 that required check rides to be performed within 10 days after the operator returns to work. LACMTA has not performed accident follow-up check rides within 10 days after an operator returned to duty as required. In most cases, train operators continued to operate trains for a year or more without receiving check rides.

14. LACMTA does not have hours of service rules for Heavy Rail operators and for supervisors and controllers as required by GO 143-B, Section 12.04. Records indicated that in at least one instance, a MRL Supervisor (Controller) went off-duty at midnight and returned to work only six hours later. GO 143-B Section 12.04 states that LRT systems shall not require or permit any safety sensitive

employee to remain on duty for more than 12 consecutive hours or more than an aggregate of 12 hours spread over a period of 16 hours.

Recommendations:

1. LACMTA should develop, adopt, and implement procedures to ensure that MOW and Vehicle Maintenance employees, who are required or allowed to operate or otherwise control the operation of any trains or other on rail equipment, are currently trained and certified. The procedures should also ensure that appropriate operations entities and the respective maintenance departments are provided with and maintain a current roster of maintenance employees who are required or allowed to be trained in operations and certified along with those employees' current training and certification status. It is particularly important that LACMTA Yard Control and ROC have current information about all employees authorized to operate trains or other on track equipment. Also, LACMTA should clearly establish and designate the custodian of MOW and Vehicle Maintenance employees' complete operations training and certification records. Checklists No. 4 and 5 depict these recommendations in detail.

2. LACMTA Rail Operations Safety Department should investigate future incidents such as the January 31, 2001 MBL yard split switch incident. The ROS did not perform any investigation during this incident, which staff finds questionable. Checklist No. 5 explains this recommendation in detail.

3. LACMTA should reevaluate the Operator/Student Performance Sheet used to document the operating performance evaluation for all employee classifications. Also, LACMTA should ensure that performance evaluation checklists reflect the established requirements for each employee classification and are properly prepared to record that information. Checklists No. 4 and 5 detail these recommendations. Subsequent to the audit, July 26, 2002, the LACMTA Instruction Departments, who provide training, were ordered to completely fill out all information on the Operator/Student Performance Sheets.

4. LACMTA should evaluate the current Operations' training program given to employees from the ROC Center, MOW, and Equipment Maintenance departments. LACMTA should adopt and implement both the Heavy Rail and Light Rail Instruction Training Matrix or a similar document as a formal, controlled program element to specify the operations training and certification requirements for designated employee classifications. Also, LACMTA should develop, adopt, and implement as a formal procedure a process for the periodic review and updating of the operations training and certification program, including appropriate change controls. Checklists No. 4, 5 and 9 depict these recommendations in detail. Subsequent to the audit, August 21, 2001, the LACMTA Rail Transportation Superintendant, formalized the Heavy Rail and Light Rail Instruction Training Matrices. Staff finds the formalization of the Heavy Rail and Light Rail Instruction Training Matrices acceptable but LACMTA should integrate these matrices as part of the document change control.

5. LACMTA should provide a report to the staff explaining why controllers have not been re-certified since 1998 as required by GO 143-B. The report should include the corrective action plans and schedules that LACMTA will promptly implement to comply with GO 143-B, Section 13. Checklist No. 9 provides more detail about this recommendation. Subsequent to the audit, August 1, 2002, the LACMTA Director of Rail Operations provided an explanation regarding recertification of

Controllers. In addition, since the Triennial audit, Rail Operations Control has increased the instruction personnel to concentrate on re-certification classes for the Controllers.

6. LACMTA should provide the staff with a written report explaining why it did not implement the 1998 Triennial Audit Recommendation No. 1. This report should explain why LACMTA did not implement the accident follow-up check ride program and what actions will be taken to restore the program. Checklist No. 5 details about this recommendation.

7. LACMTA should finalize, adopt and implement the draft LACMTA Program of Operational Evaluations in accordance with GO 143-B, Section 13.04. Checklists No. 4, 5, 6 and 7 provide more details about this recommendation.

8. LACMTA should complete development, adopt, and implement separate hours of service and minimum rest requirements for all Heavy Rail supervisors/train controllers, TO and other employees performing safety sensitive activities. Also, LACMTA should develop the controls necessary to ensure these requirements are followed. Checklist No. 8 has more detail about this recommendation. Subsequent to the audit, with a letter dated August 20, 2001, LACMTA provided excerpts from the original Procedure Manual of Transportation Department and then provided a complete copy of the manual with a letter dated July 29, 2002. The procedure manual did not meet the requirements of this recommendation.

9. LACMTA should establish a training course for the use of the Dictaphone by all senior management personnel. Checklist No. 10 depicts more detail about this recommendation. Subsequent to the audit, July 26, 2002, LACMTA informed staff that the Manager of the ROC or his designee will conduct the training and be responsible for documenting the training.

5. Track Maintenance Department

The responsibility of the Track Maintenance Department is to maintain guideway that consists of at grade and aerial ballasted track, embedded track, aerial and subway direct fixation track. It maintains crossovers, turnouts and track that is embedded in asphalt concrete in street running and yard storage areas.

Findings - Conforming Conditions:

1. The staff inspected the track inspector qualification records and did not find any exception. Refer to Checklist No. 30 for more details.

2. The LACMTA has satisfied the 1998 Triennial Audit recommendation No. 18 by initially testing and certifying the track inspectors. In addition, LACMTA is developing a new re-certification program.

Findings - Non-Conforming Conditions:

3. Staff found one exception when visually inspecting the tracks and measuring the track gauge and cross-level at several MBL, MRL and MGL locations. At two MRL locations, one of the bolts on a

switch rod was loose. Subsequent to the audit, August 29, 2001, LACMTA advised staff that it corrected the loose bolts. Checklist No. I-2 contains more detail about these findings.

4. Review of LACMTA records showed that inspectors performed the MBL, MRL and MGL mainline track, switch and frog visual inspections and yard switch and frog inspections at the required intervals and in accordance with all requirements, except for the following:
   - The staff noticed that the Switch and Frog Inspection Reports did not require signature of a supervisor as Track Inspection Reports.
   - The MBL and MGL MOW department reports noted the defects but did not document if and when the corrections were performed.
   - The staff did not find any documentation that the corrections on the yard Switch and Frog Inspection Reports were performed.
   - Checklist No. 29 has more details about these findings.

5. LACMTA did not perform track inspection, tamping, rail production grinding, floating slab inspection and bolt tests based on the frequency requirement of the approved LACMTA Wayside Systems Department Maintenance Plan effective March 1998. LACMTA performed these functions based on the draft copy of the new Maintenance Plan dated January 2001. Checklists No. 29, 31 and 32 have more details about these findings.

6. LACMTA did not follow Federal Railroad Administration (FRA) requirements during track inspections aboard a train.

7. LACMTA did not satisfy The LACMTA 1998 Triennial Audit recommendation No. 17. It recommended an engineering evaluation to be conducted for the Maintenance Plan specified frequencies for preventive maintenance, inspection and testing of material and equipment under the control of the Track Maintenance. The LACMTA did not present the staff such an engineering evaluation but the manager told the staff that special production crews inspected the tracks and the recommended track inspection frequencies are depicted in the January 2000 version of Maintenance Plan.

Recommendations:

1. LACMTA should finalize the draft Maintenance Plan and distribute for use. In addition, it should provide justification why the requirements for track inspection, tamping, rail production grinding, floating slab inspection and bolt tests have been revised in the draft Maintenance Plan. Checklists No. I-2, 31 and 32 have more details about these recommendations.

2. LACMTA should require Supervisor signature on the LACMTA Monthly Switch and Frog Inspection Reports.

3. LACMTA should document on the Monthly Switch and Frog Inspection Reports the date that a reported track defect is corrected at the Light Rail Track Department.

   Subsequent to the audit, July 22, 2002, LACMTA updated the Monthly Switch & Frog Inspection Report. However, the revised Monthly Switch & Frog Inspection Report is still missing a supervisor's signature requirement.

4. LACMTA should evaluate whether FRA Part 213, Track Safety Standards, Subpart F, Section 213.233 is being properly implemented. Checklist No. 29 has more details about these recommendations.

5. LACMTA should implement the 1998 LACMTA Triennial Audit Recommendation No. 17.

6. Traction Power Department

The responsibility of the Traction Power Department is to accomplish electrical power distribution and DC to AC power conversion. It maintains electrical power substations, overhead contact systems, auxiliary and other equipment.

Findings - Conforming Conditions:

1. No exceptions were found with the LACMTA emergency vent fans inspection. A review of a selected MBL and MRL "Emergency Fan Maintenance Checklist" records showed that these fans were inspected once every 6 months as required. LACMTA properly documented these inspections and corrected the noted defects in a timely manner.

2. No exceptions were found with the calibration of measuring and test equipment of traction power.

Findings - Non-Conforming Conditions:

3. LACMTA violated GO 95, Rule 74.4-F. A single point failure will allow a hot conductor to fall within 10 feet of the ground. From visual observation throughout the MBL, this appears to be a system wide problem. Refer to checklist No. I-3 for more details.

4. The staff's review of records indicated that LACMTA performed several inspections based on the draft Preventive Maintenance Plan, which is not approved and issued for use by LACMTA. Checklists No. 33 and 34 have more detail about these findings.

Recommendations:

1. LACMTA should extend the insulators closer to the feeder pole, away from the dynamic weight system, as required by GO 95, Rule 74.4-F. Checklist No. I-3 gives more detail about this recommendation.

2. LACMTA should finalize and implement the draft Traction Power Maintenance Plan. LACMTA should confirm that all the required traction power tests and inspections are performed based on the required frequencies in a timely manner. LACMTA should develop a process to alert management when required inspections are not performed or repairs are not closed out in a timely manner, particularly when more than one location/department is involved. Checklists No. 33 and 34 have more details about these recommendations.

7. Vehicle Maintenance Department

The responsibility of Rail Vehicle Maintenance Department is to conduct prescribed scheduled and non-scheduled maintenance and tests. It ensures that all inspection personnel are properly trained and certified. It also ensures that equipment maintenance personnel have the required licenses and/or certification.

Findings - Conforming Conditions:

1. Staff did not note any exception when reviewing the MBL, MRL and MGL employee training course records. The employee exams, certification and dates match the master summary list that identifies all employees and their current training record. Refer to Checklist No. 37 for more details.

2. The LACMTA 1998 Triennial Audit Recommendation No. 20 has been satisfied and has been implemented at the MRL Maintenance yard. As recommended, the MRL vehicle maintenance training department adopted the same record format used by the MBL and MGL.

3. LACMTA performed all the necessary MBL vehicle preventive maintenance inspections on time and schedule. Checklist No. 38 contains more details.

4. The staff did not note any exception when inspecting the calibration of measuring and test equipment. Checklist No. 39 has more details.

Findings - Non-Conforming Conditions:

5. The inspection and audit of the records revealed the following problems at the MRL Vehicle Maintenance Department:
   - 3 of the 8 vehicles inspected yielded an unacceptable discrepancy: snap rings that secure the wobble plate were loose, and a coupler housing cover plate was separated. The wobble plate connects the motor and the gearbox.
   - LACMTA did not document the quality control checks performed by supervisory staff.
   - 4 of 6 vehicles inspected exceeded the mileage limits between preventative maintenance inspections by over 20 percent.

6. The inspection and audit of the records revealed the following problems at the MGL Vehicle Maintenance Department:
   - One of 6 vehicles inspected a brake caliper of a "C truck" showed signs of uneven wear. The LACMTA staff measured the concavity and found it to be beyond the maximum concave-wearing limit.
   - The Brake Disk Inspection Form of the aforementioned brake caliper revealed that LACMTA did not make concave dimensional measurements during the last two "B Inspections". Refer to Checklists No. I-4 and 38 for more details.

Recommendations:

1. LACMTA should direct the MRL Vehicle Maintenance Department to evaluate the vehicle mileage tracking methods currently in use for scheduling preventative vehicle maintenance inspections. The

system should be improved to alert vehicle maintenance personnel to take revenue vehicles out of service before the maximum allowable mileage between vehicle inspection intervals are exceeded.

2. LACMTA should reevaluate the frequency of the vehicle Preventative Maintenance schedule and the frequencies that inspections of truck and gearbox related components are inspected.

3. LACMTA should improve the random check program by tracking which vehicles are checked by the supervisory staff and signed by the supervisor.

4. LACMTA should ensure that the Brake Disk Inspection Form, which includes making a Concave Dimensional Measurement, is being completed. Refer to Checklists No. I-4 and 38 for more details about these recommendations. Subsequent to the audit, August 14, 2001, LACMTA Rail Equipment Maintenance Manager directed his personnel to complete all the forms for vehicle inspections, including Brake Disc Inspection Forms.

8. Facilities Maintenance Department

The responsibility of Facilities Maintenance Department is to maintain rail systems in safe operating condition. It performs preventive and remedial maintenance on shop and rail facility equipment; and also constructs and repairs buildings.

Findings - Conforming Conditions:

1. LACMTA performed all the required MBL, MRL and MGL emergency sprinkler system, Emergency Management Panel and Telephones inspections, documented properly, and corrected the noted defects in a timely manner.

2. Examination of MRL Gas Analyzer records show that LACMTA performed gas analyzer inspections regularly, documented properly and repaired all noted defects in a timely manner. Staff was impressed with the quality of the Gas Analyzer Unit maintenance program.

3. LACMTA inspected All MRL Regulation 4 elements (LAFD City Code) regularly, documented properly, and repaired all noted defects were in a timely manner.

4. The quality of work done by Rail Communications was impressive. Staff did not find any discrepancies.

Findings - Non-Conforming Conditions:

5. Staff review of records indicated that there were numerous missing monthly inspection sheets at Location 34, Rail Facilities Maintenance Department. Therefore, staff had difficulty verifying whether the Facilities Maintenance Department performed regular maintenance work. Also, staff had difficulty tracking whether the Facilities Maintenance Department repaired the noted defects.

Recommendations:

1. LACMTA should develop a mechanism to confirm that Location 34 personnel regularly perform all monthly station maintenance inspections. More importantly, LACMTA should confirm that the defects noted on the monthly inspection forms are closed out in a timely manner.

2. LACMTA should develop a system between Locations 34 & 61 to confirm that the defects noted on the inspections performed by Location 34 personnel that are to be corrected by Location 61 personnel are properly communicated and tracked to completion through appropriate means of documentation. The developed process should alert LACMTA management when the communication fails between the two locations. Checklists No. 20, 21 and 22 depict more details for these recommendations.

Subsequent to the audit, LACMTA advised the staff that the Rail Facilities Maintenance Department (Location 34) has developed a controlled procedure and tracking mechanism to convey defects noted during their inspections and receive feedback from the Traction Power Department (Location 61) that is responsible for completing the noted defects. LACMTA submitted this procedure to staff on August 20, 2001 as part of LACMTA's review and comment on the Preliminary Triennial Audit Report. Staff found this procedure to be acceptable.

9. System Safety Department

System Safety Department includes Rail Operations Safety Department (ROS) and the Safety Certification Department. The responsibility of System Safety Department is to coordinate HRC and Fire/Life Safety Committee activities, report its findings and recommendateions per SSPP, conduct safety inspections, coordinate internal safety/operational audit to monitor system-wide compliance with SSPP, and develop proposed safety rules/procedures and emergency procedures. It also responds to emergencies and major accidents, investigates rail system operational accidents, incidents, injuries and property losses; and makes recommendations to mitigate or prevent recurrences. System Safety Department completes the requirements of Safety Certification Process.

Findings - Conforming Conditions:

1. Staff did not note any exceptions with the System Safety Department's file of completed Reports of Unsafe Condition or Hazard.

2. LACMTA planned, scheduled and performed internal safety audits annually. System Safety has complied with the requirements of filing the annual reports to CPUC.

3. LACMTA implemented the 1998 Triennial Audit Recommendation No. 14. As recommended, LACMTA revised its procedures for investigating accidents to include a requirement that the designated Commission representative be notified in advance of multi-department meetings convened to address major accidents involving injuries or fatalities.

Findings - Non-Conforming Conditions:

4. The next LACMTA SSPP revision was due on November 2001. To this date, LACMTA has not provided the revised SSPP to the Commission

5. LACMTA is not investigating accidents as required by LACMTA's Accident Investigation Plan (AIP) and GO 164-B, Section 6. The ROS Department has not been providing the staff an opportunity to participate to the fullest extent possible, including advance notification of the accident investigation activities. LACMTA has not been implementing and documenting the corrective action plans, including check rides, on a timely basis. Checklist No. 15 has more details about these findings.

6. LACMTA has not been following its own requirements as identified in the Safety Certification Plan for Construction for all projects including procurement projects. Specifically, LACMTA did not comply with the requirements identified in Section 9, Safety Certificaiton Overview and Procedures, of the Safety Certification Plan for Construction for the P2000 Vehicle Safety Certification Plan. Refer to Checklist No. 18 for more details.

7. LACMTA did not comply with The 1998 Triennial Audit Recommendation No. 16, " *An appropriate program and procedure to cover the periodic review and analysis of statistical accident data to identify and correct any apparent negative trends should be prepared and put into use*". During interviews, managers reported that System Safety does work with Risk Management to conduct periodic review and analysis of statistical accident data to identify and correct any apparent negative trends. However, no procedures have been established between System Safety and Risk Management. LACMTA has not established any formal link between the Safety Data Acquisition/Analysis function and Hazard Identification and Resolution Program. Also, LACMTA did not establish any procedures between the System Safety and Risk Management departments. Checklist No. 17 contains more details about these findings.

8. LACMTA did not include the American Public Transportation Association (APTA) Security element in the LACMTA Internal Safety Audit Program. Checklist No. 19 lists more details about this finding.

Recommendations:

1. LACMTA should review and revise the SSPP to reflect the current organizational practice. It should submit subsequent revisions of the SSPP to the staff for review and approval as required by GO 164-B. Checklist Nos. 4, 5, 10, 11 and 12 contain more detail about this recommendation. On August 21, 2002, LACMTA provided staff with a draft copy of an updated SSPP for review.

2. LACMTA should implement the requirements of the LACMTA AIP and GO 164-B, Section 6. Checklist No. 15 has more details about this recommendation. Subsequent to the audit, November 12, 2001, LACMTA submitted a revised AIP to staff, which staff did not find acceptable.

3. LACMTA should follow its own requirements as identified in the Safety Certification Plan for Construction for all projects including procurement projects. Checklist No. 18 contains more detail

about this recommendation. Subsequent to the audit, in August 2001, LACMTA provided staff with a copy of P2000 vehicle Specification Conformance Certificate, which does not satisfy the requirements of this recommendation.

4. LACMTA should implement 1998 Triennial audit recommendation 16 which states, "*An appropriate program and procedure to cover the periodic review and analysis of statistical accident data to identify and correct any apparent negative trends should be prepared and put into use.*" Checklist No. 17 has more details about this recommendation. Prior to the audit, LACMTA Rail Operations Safety Department wrote a letter to staff dated May 4, 2001 stating that a program is in place for accident data acquisition and analysis. The staff found that this program was not adequate.

5. LACMTA should include the APTA Security element in the Internal Safety Audit Program and System Safety Department should conduct an internal safety audit for Security during its 3-year audit cycle. Checklist No. 19 lists more details about this recommendation.

10. System Engineering Department (Configutation Control Center)

The responsibility of Configuration Control Center is to perform cost, schedule and quality checks on Change Requests.

Findings - Conforming Conditions:

1. The Configuration Manager and the Senior Analyst have made significant progress since the 1998 audit, specifically with the development, approval, and implementation of the Rail Configuration Plan.

Findings - Non-Conforming Conditions:

2. LACMTA did not implement the 1998 Triennial Audit Recommendation No. 12. This recommendation states, "*The entire subject of configuration management and change control as described in LACMTA System Safety Program Plan and Rail Configuration Change Control Procedure should be re-evaluated*". Since the 1998 audit, the Rail Operations Support Group has been reorganizing and redeveloping the Change Control Process. However, full implementation of this process is not in place. Checklists No. 4, 5, 9 and 12 contain more details about this finding.

Recommendations:

1. LACMTA should continue implementing the 1998 Triennial Audit Recommendation No. 12. LACMTA should develop a process that documents all departmental submittals to Engineering Configuration Management, as required by the Rail Configuration Plan. All departments should submit these documents on a timely basis as outlined in the Rail Configuration Plan. LACMTA should distribute the Rail Configuration Plan to all departments and itemize the documents that should be submitted to the Configuration Management Department. Refer to Checklists No. 4, 5, 9, and 12 for more details.

11. Rail Operations Support Department

The responsibility of Rail Operations Support Department is to ensure that all rail facilities and equipment, which are being planned, designed, built and operated, provide utmost passenger safety, comfort and convenience and cost effective operation and maintenance.

Findings - Non-Conforming Conditions:

1. LACMTA did not implement The 1998 Triennial Audit Recommendation No. 17. The 1998 Triennial Audit determined that LACMTA did not perform concrete structure inspections per American Railway Engineering Association (AREA) Chapter 8, Part 21 requirements. During this audit, staff again determined that LACMTA still is not performing concrete structure inspections. Checklist No. 13 has more detail about this finding.

Recommendations:

1. LACMTA should implement inspections of concrete structures. If the LACMTA Board does not approve subcontracting of these inspections, LACMTA should establish a program to perform the required concrete inspections in accordance with the requirements of the Los Angeles Metro Rail Existing Structures Evaluation and Inspection Manual. Refer to Checklist No. 13 for more details. Subsequent to the audit, LACMTA Senior Contract Administrator issued a contract MQ055 for concrete structures inspection. LACMTA mailed the contract Notice to Proceed to staff with a letter dated July 24, 2002.

12. Security Department

The Security Department is responsible for overseeing the security issues of the Authority.

Findings - Conforming Conditions:

1. Staff reviewed the basic LACMTA training outline and new employees orientation and found it to be satisfactory.

2. Staff reviewed the minutes of recent weekly staff meetings held by the Director of Security and Law Enforcement Policy and found them to be satisfactory.

3. Staff reviewed the Law Enforcement Program Report for the months of February 2001, March 2001, and April 2001. The resolution of Identified Threats and Vulnerabilities were made. Staff found this to be satisfactory.

4. Staff reviewed the findings of the last progress review by Administration, including the LACMTA Management Action Plan issued at the end of March 2001. Staff found this to be satisfactory.

Findings - Non-Conforming Conditions:

5. The Training section of System Security Program Plan is outdated. For example, the section on Firearms Permits is outdated. In addition, the list of training manuals is outdated.

6. A draft revision of the System Security Program Plan was presented to staff at the time of the audit. However, the staff has not approved this draft revision.

Recommendations:

1. LACMTA should review and revise the System Security Program Plan to reflect the existing work practices, including the section on the firearm permits and the list of training manuals. The plan should have a page showing all the appropriate approval signatures with dates. LACMTA should also update and submit the plan to the staff for review and approval.

APPENDICES

A. Definitions List

B. LACMTA 1998 Triennial Audit Recommendations List

C. LACMTA 1998 Triennial Audit Commission Resolution ST-38

D. LACMTA 2001 Triennial Audit Recommendations List

E. LACMTA 2001 Triennial Audit Checklist Index

F. LACMTA 2001 Triennial Audit Checklists

Appendix A
Definitions List

BALLAST	The crushed rock utilized as a base for the purpose of holding the track in alignment and profile.
CAB SIGNAL SYSTEM	A signal system whereby block condition and the prevailing civil speed commands are transmitted and displayed directly within the train cab. The cab signal system may be operated in conjunction with a system of fixed wayside signals or separately.
CARRIER	Unless the context indicates otherwise, "carrier" means a LRT system.
CAB SIGNAL	A signal located in the driver's cab, transmitted through a TWC system, indicating a condition affecting the movement of the train, and/or displaying the specified track speed.
COMMISSION	The Public Utilities Commission of the State of California.
CONCAVE	Curved inward, like a bowl.
CONSIST	A train consisting of one or more cars.
COUPLER	A device for making electrical, mechanical and pneumatic connections between LRVs and/or other rail equipment.
CROSSOVER	Special track work including two switches and track work that allows trains to be routed from one track to another. Wooden ties must be used under all special track work due to the possibility of damage to concrete ties by lateral forces of the train. Additionally, wooden ties are used in special track work, as many different lengths and shapes are needed to accommodate the diverging rails, the economy of making these in quantity is significantly increased.
EIS/EIR	Environmental Impact Statement / Environmental Impact Report
FAIL-SAFE	A characteristic of a system which ensures that any malfunction affecting safety will cause the system to revert to a state that is known to be safe.
FEEDER POLE	A traction Electrification System pole that houses the feeders. Usually multiple feeders are routed from the underground conduit to the Overhead Catenary System inside feeder poles.
FROG	A track structure used at the intersection of two running rails to provide support for wheels and passageways for their flanges, thus permitting wheels on either rail to cross the other.
GRADE CROSSING	A crossing of the track at grade (or street) level over a roadway.
INSULATOR	A device or material that prevents the flow of electric current in a track circuit from passing from one rail to the other or through switches and other track structures.
INTERLOCKING	An arrangement of signals and track switches and switches so interconnected that their functions shall succeed each other in proper sequence and for which interlocking rules are in effect.
LIGHT-RAIL TRANSIT (LRT)	A mode of urban transportation employing light-rail vehicles capable of operating on all the alignment classifications described in General Order 143-B
LIGHT-RAIL VEHICLES (LRV)	A wheeled vehicle, for the conveyance of passengers, which is electrically propelled and operates upon a track or rails on the alignment classifications described in General Order 143-B
“LOOK BACK” RULE	Operators are required to open the cab window and “look back”, each time the train departs from station platforms, to make sure it is safe to move the train.
OPERATOR	The LRT employee on board the train having direct and immediate control over the movement of the train.
OVERHEAD CATENARY SYSTEM (OCS)	Also referred to as the overhead (wire). That part of the overhead line equipment consisting of: contact wire, contact wire supports, messenger wires, isolators, counter-weights, hangers and other equipment and assemblies that distributes DC electric power from substations to the Electric Trolley Bus (ETB), trolley or light rail vehicle. Also refers to the overhead wire that is under direct suspension, that is not Catenary.
PUBLIC TRANSIT GUIDEWAY	A system of public transportation utilizing passenger vehicles that are physically restricted from discretionary movement in a lateral direction.
SEPARATE RIGHT-OF-WAY	A corridor within which LRVs operate apart from parallel motor vehicle traffic but may contain locations of mixed traffic crossings.
SWITCH	A track structure used to divert rolling stock from one track to another.
TRAIN	A single LRV or multiple LRVs combined to operate as one unit.
TRUCK	The assembly that includes the wheels and/or tires and supports an LRV. The vast majority of LRVs have 3 trucks. Most trucks also include one or more AC or DC electric motors.
TURNOUT	A piece of special track work containing a switch and frog with guardrails by means of which an LRV may be diverted from one track to the other.
TWC	Train to Wayside Communications. An electronic communication system that permits the remote operation

	of switches, selecting routes through interlockings, activating traffic lights, and grade crossing. Additionally, some TWC systems allow the transmission of train, route and vehicle numbers to be used as part of the overall train control system.
APTA GUIDELINES	It means the American Public Transit Association's "Manual for the Development of Rail Transit System Safety Program Plans"
FATALITY	It means the death of a person at the scene of an accident, or the transit agency knows that the person died within 30 days of the incident from injuries related to the accident.
FIRST AID	It means medical attention for minor conditions such as abrasions, cuts, or bruises, and is typically confined to a single treatment.
HAZARDOUS CONDITION	It means a condition that may endanger human life or property. It includes unacceptable hazardous conditions.
IMMEDIATE NOTIFICATION	It means as soon as possible, but not to exceed 4 hours.
RAIL FIXED GUIDEWAY SYSTEM	It means any light, heavy, or rapid rail system, monorail, inclined plane, funicular, trolley, or automated guideway that is: (a) Included in the Federal Transit Administration's calculation of fixed guideway route miles or receives funding under FTA's formula program for urbanized areas (49 U.S.C. 5336); and (b) Not regulated by the Federal Railroad Administration.
SAFETY	It means freedom from danger.
SCADA	Supervisory Control And Data Acquisition. A system of computers, Remote Terminal Unit (RTU), Traction Electrification System (TES), and signalization that allows the constant remote monitoring and control of components of a system from a single (or multiple) location(s).
SECURITY	It means freedom from intentional danger.
SERIOUS INJURY	It means an injury that requires the individual to be transported to a medical facility for medical treatment, beyond medical observations, diagnostic procedures such as X-rays and drawing blood samples, or first aid.
SYSTEM SAFETY PROGRAM PLAN (SSPP)	It means a document adopted by the transit agency detailing its safety and security policies, objectives, responsibilities, and procedures.
TRANSIT AGENCY	It means an entity operating a rail fixed guideway system.
UNACCEPTABLE HAZARDOUS CONDITION	It means a hazardous condition determined to be an unacceptable hazardous condition using the APTA Guidelines' Hazard Resolution Matrix (APTA Guidelines, checklist number 7).
WAYSIDE SIGNAL	A device conveying a visual indication to the Operator concerning conditions affecting the train. The signal as viewed by the Operator is the aspect. The information conveyed is the signal's indication.
WOBBLE PLATE	A steel plate which connects the motor and the gearbox of a LRV.
YARD	A set of tracks with defined limits for LRV cleaning, repair, storage or other purposes as designated in the rules and procedures.

Appendix B
LACMTA 1998 Triennial Audit Recommendations List

No.	Recommendations	Status on 8-14-02
1*	Complete and issue for use the management directive which is currently being drafted to assure that accident follow-up check rides are performed as soon as possible, but not later than two weeks, after an operator returns to duty following an accident.	Open
2	The temporary train operators who received their initial training and certification in 1995 should be given a four-day refresher training course as currently scheduled before they are elevated to full time, permanent operators.	Closed
3	Rail Operations Bulletins should be issued in a size and format to facilitate insertion in the Train Operator's individual rulebooks.	Closed
4	The existing "sign for" requirements governing the issuance of new procedures, notices and bulletins should be strengthened to assure that all employees with a need to know receive, read and understand the content and purpose of each newly issued document.	Closed
5*	The existing program of operations performance evaluations should be expanded and strengthened to ensure that employees: **(a)** have up to date rule books and other required equipment in their possession while on duty, **(b)** are familiar with and have a correct understanding of the latest rule changes and newly issued bulletins, notices and procedures and **(c)** communicate information to the Rail Operation's Control center in strict conformance with the rules and procedures.	Open
6*	The "look back" rule should be reviewed and re-evaluated to determine whether or not it needs to be revised to require light rail train operators to continue to monitor their side view mirrors as the train moves forward out of a station to make certain that no one is being dragged or has fallen under the train.	Open
7	The standard operating procedures for Yard Controllers that are currently under development should be completed and issued for use on an expedited basis.	Closed
8	The System Safety Program Plan requirements for maintenance of way SOP's, equipment maintenance SOP's, an emergency preparedness plan, an earthquake action plan and a fire action plan should all be re-evaluated. If it is determined that such plans and procedures are truly needed, they should be prepared and issued on an expedited basis.	Closed
9	The lesson plans for refresher training and other courses currently under development for rail operations controllers should be completed and put into use on an expedited basis. In addition, consideration should be given to requiring the Rail Operations Safety Department to review and provide input to these lesson plans before they are issued for use.	Closed
10	The governing procedures for the preparation and distribution of Unusual Occurrences Reports should be revised and strengthened to assure that the Rail Operations Safety Department and others with a need to know receive copies of these reports in a timely manner.	Closed
11	The Controller's 40-channel tape recorder should be checked out to see if its performance can be improved. In addition, consideration should be given to creating a special log to record the date and time of failures, broken tapes, and tape changes.	Closed
12	The entire subject of configuration management and change control as described in the LACMTA System Safety Program Plan and Rail Configuration Change Control Procedure should be re-evaluated. As a first step, the LACMTA should conduct a more detailed study of the existing program and procedures to determine the full depth and true nature of the problems described in checklist No. 11. Following the completion of this study, a comprehensive corrective action plan should be prepared and implemented to correct the identified deficiencies. The entire process from conducting the study to preparing the corrective action plan and following up to	Closed

No.	Recommendations	Status on 8-14-02
	evaluate the effectiveness of the corrective action should be carried out with the active involvement of the Rail Operations Safety Department.	
13	When the Rail Operations Safety Department conducts its next internal audit it should include the elements and characteristics described in checklist Nos. 12, 15 and 26 with full time participation by the designated CPUC representative for the LACMTA.	Closed
14*	Revise the applicable LACMTA standard operating procedure for investigating accidents to include a requirement that the designated CPUC representative be notified in advance of multi-department meetings convened to address major accidents involving injuries or fatalities.	Open
15*	Organizational and other changes such as those described in checklist No. 20 that occur between the normal three years cycle of system safety program plan reviews and updates should be prepared and issued as amendments or supplements to the plan.	Open
16*	An appropriate program and procedure to cover the periodic review and analysis of statistical accident data to identify and correct any apparent negative trends should be prepared and put into use.	Open
17*	An engineering evaluation of the specified frequencies for preventive maintenance, inspection, and testing of material and equipment under the control of the Facilities Maintenance, Signal Maintenance, Track Maintenance (including inspection of concrete structures), and Traction Power Maintenance departments should be conducted to determine whether or not changes, to more closely reflect actual practices, are justified. Following this evaluation the required frequencies should be firmly established under a controlled scheduling program that will alert senior management when PM activities are deferred without prior engineering approval.	Open
18	The initial testing and certification of all signal inspectors and track inspectors should be completed on an expedited basis.	Closed
19	The LACMTA should first inspect and then repair all of the Blue Line grade crossing warning devices to correct the kind of problems described in checklist No. 39.	Closed
20	The Red Line vehicle maintenance training department should adopt the same record format as used by the Blue Line / Green Line to clearly show for each employee the required training courses, optional training courses, which courses have been completed, the date they were completed, and which courses have not been completed.	Closed

* 2001 Triennial Audit revealed that these recommendations were not implemented.

Appendix C
LACMTA 1998 Triennial Audit Commission Resolution ST-38

RSCD/RTSS/ccm

PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

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

Resolution ST-38
Date: September 3, 1998

RESOLUTION

RESOLUTION ST-38. GRANTING APPROVAL OF A FINAL REPORT OF AN ON-SITE SAFETY AUDIT OF THE LOS ANGELES COUNTY METROPOLITAN 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 entitled, "Triennial On-Site Safety Audit of the Los Angeles County Metropolitan Transportation Authority", dated August 5, 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 an analysis of the efficacy of the transit agency's system safety program plan, and a determination of whether or not the 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 Los Angeles County Metropolitan Transportation Authority's (LACMTA) light and heavy rail transit systems during the two week period from June 15 to June 26, 1998. The methods used to conduct the audit included:

- Discussions with LACMTA 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 included as an appendix to this resolution. The results of the audit show that the LACMTA is effectively implementing its system safety program plan. Exceptions noted during the audit are described in the Results / Comments section on each of the applicable checklists included with the final audit report. Twenty separate recommendations to correct identified exceptions are also contained in the final report.

The LACMTA system safety program plan requires the plan to be reviewed and updated every three years. The next review is scheduled to take place in November, 1999. No additional updating of the system safety program plan, other than the issuance of occasional supplemental organization chart changes, appears to be necessary at this time.

Following the audit, staff of both the LACMTA and the Rail Transit Safety Section were able to achieve full agreement on all aspects of the final audit report, including the recommendations. The LACMTA Operations Safety Department will perform the necessary follow up actions to assure that the 20 recommendations are fully implemented. The LACMTA 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 October 5, 1998. Beginning in 1999, the LACMTA will also provide the staff of the Rail Transit Safety Section with a status report in April and October of each year until all 20 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 entitled, "Triennial On – Site Safety Audit of the Los Angeles County Metropolitan Transportation Authority", dated August 5, 1998. It is also recommended that the Commission order LACMTA to implement the 20 recommendations contained in the final report, and provide staff of the Rail Transit Safety Section with semi-annual status reports describing the progress made in implementing the recommendations.

Protests

All interested parties, including the LACMTA have been advised of the contents of this resolution, and no protest or objection has been received.

Findings

1. Staff of the Rail Safety and Carriers Division's Rail Transit Safety Section performed an on-site, safety audit of the LACMTA's light and heavy rail transit systems during the two week period from June 15 to June 26, 1998.

2. A description of the audit, including the scope, results and recommendations is contained in the final audit report entitled, "Triennial On-Site Safety Audit of the Los Angeles County Metropolitan Transportation Authority", dated August 5, 1998.

3. The audit results show that the LACMTA is effectively implementing its system safety program plan.

4. The final audit report contains 20 recommendations for improvements to the LACMTA system safety program based upon the audit findings.

5. The LACMTA has accepted and agreed to implement all 20 recommendations.

6. The LACMTA will submit its plans and schedules for implementing the 20 recommendations to the Rail Transit Safety Section by October 5, 1998.

7. Beginning in April, 1999, the LACMTA will prepare and submit to the Rail Transit Safety Section semi-annual reports on the status of the 20 recommendations.

8. It is recommended that the Commission approve the final audit report.

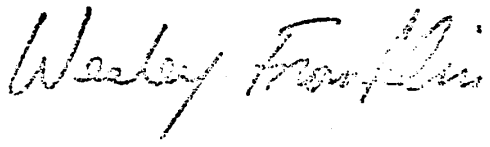
9. It is further recommended that the Commission order the LACMTA to:

   - implement the 20 recommendations
   - submit plans and schedules for implementing the 20 recommendations to the Rail Transit Safety Section by October 5, 1998
   - provide the Rail Transit Safety Section with semi-annual reports beginning in April, 1999 on the status of the 20 recommendations until all recommendations are fully implemented.

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 entitled, "Triennial On-Site Safety Audit of the Los Angeles County Metropolitan Transportation Authority", dated August 5, 1998 is granted. In addition, the LACMTA shall implement the 20 recommendations contained in the report. The LACMTA shall also prepare and submit to the Rail Transit Safety Section the implementation plans and schedules and the semi-annual status reports as described in the final audit report. The plans and schedules shall be submitted by October 5, 1998, and the first semi-annual status report shall be submitted in April, 1999 and shall continue to be issued until all 20 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 September 3, 1998. The following Commissioners voting favorably thereon:



WESLEY M. FRANKLIN
Executive Director

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

Appendix D
LACMTA 2001 Triennial Audit Recommendations List

No.	Recommendations	Status on 8-14-02
1	LACMTA should evaluate the test procedures of vital relays and establish a range of values that the vital relay should meet in order to pass the test. If a relay fails, LACMTA should replace it immediately. Vital relays should be readily available in the storage room.	Open
2	Once LACMTA establishes the procedures, it should develop a training plan and train the employees. Refer to Checklist No. 25 for more detail about this recommendation.	Open
3	LACMTA should develop, adopt, and implement procedures to ensure that MOW and Vehicle Maintenance employees, who are required or allowed to operate or otherwise control the operation of any trains or other on rail equipment, are currently trained and certified. The procedures should also ensure that appropriate operations entities and the respective maintenance departments are provided with and maintain a current roster of maintenance employees who are required or allowed to be operations trained and certified along with those employees' current training and certification status. It is particularly important that LACMTA Yard Control and ROC have current information about all employees authorized to operate trains or other on track equipment. Also, LACMTA should clearly establish and designate the custodian of MOW and Vehicle Maintenance employees' complete operations training and certification records. Checklists No. 4 and 5 depict these recommendations in detail.	Open
4	LACMTA Rail Operations Safety Department should investigate future incidents such as the January 31, 2001 MBL yard split switch incident. The ROS did not perform any investigation during this incident, which staff finds questionable. Checklist No. 5 explains this recommendation in detail.	Open
5	LACMTA should reevaluate the Operator/Student Performance Sheet used to document the operating performance evaluation for all employee classifications. Also, LACMTA should ensure that performance evaluation checklists reflect the established requirements for each employee classification and are properly prepared to record that information. Checklists No. 4 and 5 detail these recommendations.	Open
6	LACMTA should evaluate the current Operations' training program given to employees from the ROC Center, MOW, and Equipment Maintenance departments. LACMTA should adopt and implement both the Heavy Rail and Light Rail Instruction Training Matrix or a similar document as a formal, controlled program element to specify the operations training and certification requirements for designated employee classifications. Also, LACMTA should develop, adopt, and implement as a formal procedure a process for the periodic review and updating of the operations training and certification program, including appropriate change controls. Checklists No. 4, 5 and 9 depict these recommendations in detail.	Open
7	LACMTA should provide a report to the staff explaining why controllers have not been re-certified since 1998 as required by GO 143-B. The report should include the corrective action plans and schedules that LACMTA will promptly implement to comply with GO 143-B, Section 13. Checklist No. 9 provides more detail about this recommendation.	Open
8	LACMTA should provide the staff with a written report explaining why it did not implement the 1998 Triennial Audit Recommendation No. 1. This report should explain why LACMTA did not implement the accident follow-up check ride program and what actions will be taken to restore the program. Checklist No. 5 details about this recommendation.	Open

9	LACMTA should finalize, adopt and implement the draft LACMTA Program of Operational Evaluations in accordance with GO 143-B, Section 13.04. Checklists No. 4, 5, 6 and 7 provide more details about this recommendation.	Open
10	LACMTA should complete development, adopt, and implement separate hours of service and minimum rest requirements for all Heavy Rail supervisors/train controllers, TO and other employees performing safety sensitive activities. Also, LACMTA should develop the controls necessary to ensure these requirements are followed. Checklist No. 8 has more detail about this recommendation.	Open
11	LACMTA should establish a training course for the use of the Dictaphone by all senior management personnel. Checklist No. 10 depicts more detail about this recommendation.	Open
12	LACMTA should finalize the draft Maintenance Plan and distribute for use. Provide justification why the requirements for track inspection, tamping, rail production grinding, floating slab inspection and bolt tests have been revised in the draft Maintenance Plan. Checklists No. I-2, 31 and 32 have more details about these recommendations.	Open
13	LACMTA should require Supervisor signature on the LACMTA Monthly Switch and Frog Inspection Reports.	Open
14	LACMTA should document on the Monthly Switch and Frog Inspection Reports the date that a reported track defect is corrected at the Light Rail Track Department.	Open
15	LACMTA should evaluate whether FRA Part 213, Track Safety Standards, Subpart F, Section 213.233 is being properly implemented. Checklist No. 29 has more details about these recommendations.	Open
16	LACMTA should implement the 1998 LACMTA Triennial Audit Recommendation No. 17.	Open
17	LACMTA should extend the insulators closer to the feeder pole, away from the dynamic weight system, as required by GO 95, Rule 74.4-F. Checklist No. I-3 gives more detail about this recommendation.	Open
18	LACMTA should finalize and implement the draft Traction Power Maintenance Plan. LACMTA should confirm that all the required traction power tests and inspections are performed based on the required frequencies in a timely manner. LACMTA should develop a process to alert management when required inspections are not performed or repairs are not closed out in a timely manner, particularly when more than one location/department is involved. Checklists No. 33 and 34 have more details about these recommendations.	Open
19	LACMTA should direct the MRL Vehicle Maintenance Department to evaluate the vehicle mileage tracking methods currently in use for scheduling preventative vehicle maintenance inspections. The system should be improved to alert vehicle maintenance personnel to take revenue vehicles out of service before the maximum allowable mileage between vehicle inspection intervals are exceeded.	Open
20	LACMTA should reevaluate the frequency of the vehicle Preventative Maintenance schedule and the frequencies that inspections of truck and gearbox related components are inspected.	Open
21	LACMTA should improve the random check program by tracking which vehicles are checked by the supervisory staff and signed by the supervisor.	Open
22	LACMTA should ensure that the Brake Disk Inspection Form, which includes making a Concave Dimensional Measurement, is being completed. Refer to Checklists No. I-4 and 38 for more details about these recommendations.	Open
23	LACMTA should develop a mechanism to confirm that Location 34 personnel regularly perform all monthly station maintenance inspections. More importantly, LACMTA should confirm that the defects noted on the monthly inspection forms are closed out in a timely manner.	Closed

24	LACMTA should develop a system between Locations 34 & 61 to confirm that the defects noted on the inspections performed by Location 34 personnel that are to be corrected by Location 61 personnel are properly communicated and tracked to completion through appropriate means of documentation. The developed process should alert LACMTA management when the communication fails between the two locations. Checklists No. 20, 21 and 22 depict more details for these recommendations.	Closed
25	LACMTA should review and revise the SSPP to reflect the current organizational practice. It should submit subsequent revisions of the SSPP to the staff for review and approval as required by GO 164-B. Checklist Nos. 4, 5, 10, 11 and 12 contain more detail about this recommendation.	Open
26	LACMTA should implement the requirements of the LACMTA AIP and GO 164-B, Section 6. Checklist No. 15 has more details about this recommendation	Open
27	LACMTA should follow its own requirements as identified in the Safety Certification Plan for Construction for all projects including procurement projects. Checklist No. 18 contains more detail about this recommendation.	Open
28	LACMTA should implement 1998 Triennial audit recommendation 16 which states, "*An appropriate program and procedure to cover the periodic review and analysis of statistical accident data to identify and correct any apparent negative trends should be prepared and put into use*". Checklist No. 17 has more details about this recommendation.	Open
29	LACMTA should include the APTA Security element in the Internal Safety Audit Program and System Safety Department should conduct an internal safety audit for Security during its current 3-year audit cycle. Checklist No. 19 lists more details about this recommendation.	Open
30	LACMTA should continue implementing the 1998 Triennial Audit Recommendation No. 12. LACMTA should develop a process that documents all departmental submittals to Engineering Configuration Management, as required by the Rail Configuration Plan. All departments should submit these documents on a timely basis as outlined in the Rail Configuration Plan. LACMTA should distribute the Rail Configuration Plan to all departments and itemize the documents that should be submitted to the Configuration Management Department. Refer to Checklists No. 4, 5, 9, and 12 for more details.	Open
31	LACMTA should implement concrete inspection. If the LACMTA Board does not approve subcontracting of these inspections, LACMTA should establish a program to perform the required concrete inspections in accordance with the requirements of the Los Angeles Metro Rail Existing Structures Evaluation and Inspection Manual. Refer to Checklist No. 13 for more details.	Closed
32	LACMTA should review and revise the System Security Program Plan to reflect the existing work practices, including the section on the firearm permits and the list of training manuals. The plan should have a page showing all the appropriate approval signatures with dates. LACMTA should also update and submit the plan to the staff for review and approval.	Open

Appendix E
LACMTA 2001 Triennial Audit Checklist Index

Checklist No	DEPARTMENT	ELEMENT/CHARACTERISTIC	Inspector/Auditor
I-1	Signal Maintenance	Signal Inspection – CPUC FRA Certified Inspector	G. Muffley & H. Moussa
I-2	Track Maintenance	Track Inspection – CPUC FRA Certified Inspector	E. Damron & A. Garabetian
I-3	Traction Power	Traction Power Inspection – CPUC GO 95 Inspector	B. Shovlain
I-4	Vehicle Maintenance	Vehicle Inspection – CPUC FRA Certified Inspector	D. Warnberg & A. Ong
1	Human Resources	Drug and Alcohol Testing Program	A. Ong
2	Quality Assurance Rail	Inspection of Rail Vehicles and Systems Involved in Accidents	J. Bigornia
3	Quality Assurance Rail	Rebuilt Rail Components	J. Bigornia
4	Rail Operations	Heavy Rail Operations Training & Certification	G. Rosenthal & M. Patel
5	Rail Operations	Light Rail Operations Training & Certification	G. Rosenthal
6	Rail Operations	Red Line Train Operator Performance	G. Rosenthal
7	Rail Operations	Blue Line & Green Line Train Operator Performance	G. Rosenthal & A. Ong
8	Rail Operations & Maintenance	Hours of Service – Safety Sensitive Employees	G. Rosenthal & H. Moussa & J. Bigornia
9	Rail Operations Control	Training & Certification of Light & Heavy Rail Operations Controllers	G. Rosenthal
10	Rail Operations Control	Blue Line & Green Line Rail Operations Controllers Activities	A. Ong & A. Garabetian
11	Rail Operations Control	Red Line Rail Operations Controllers Activities	A. Ong & A. Garabetian
12	System Engineering	Configuration Change Control	E. Juul & M. Patel
13	Rail Operations Support	Concrete Inspection - Annually	E. Juul & M. Patel & A. Ong
14	Security	Security	E. Juul & M. Patel
15	System Safety	Accident/Incident Reporting & Investigation	E. Juul & M. Patel
16	System Safety	Reporting of Hazardous Conditions	E. Juul & M. Patel
17	System Safety	Safety Data Acquisition/Analysis	E. Juul & M. Patel
18	System Safety	Vehicle Safety Certification	E. Juul & M. Patel
19	System Safety	Internal Safety Audits Program	E. Juul & M. Patel
20	Facilities Maintenance	Blue Line Inspections	R. Dwairi
21	Facilities Maintenance	Green Line Inspections	R. Dwairi
22	Facilities Maintenance	Red Line Inspections	R. Dwairi
23	Signal Maintenance	Mainline Switches Inspection – Quarterly	H. Moussa & R. Dwairi
24	Signal Maintenance	Interlocking Tests	H. Moussa & R. Dwairi
25	Signal Maintenance	Vital Relays	H. Moussa & R. Dwairi
26	Signal Maintenance	Training & Certification of Signal Inspectors – Every Two Years	H. Moussa & R. Dwairi
27	Signal Maintenance	Grade Crossing Protection – Monthly	H. Moussa
28	Signal Maintenance	Calibration of Measuring & Test Equipment	H. Moussa & R. Dwairi
29	Track Maintenance	Visual Track & Switch Inspection	A. Garabetian
30	Track Maintenance	Track Inspector Qualifications	A. Garabetian
31	Track Maintenance	Track Annual Maintenance	A. Garabetian
32	Track Maintenance	Rail Track Maintenance Work	A. Garabetian
33	Traction Power	Emergency Trip Stations	R. Dwairi
34	Traction Power	Overhead Catenary System – Annually	R. Dwairi
35	Traction Power	Emergency Vent Fans – Semi-Annual	R. Dwairi
36	Traction Power	Calibration of Measuring & Test Equipment	R. Dwairi
37	Vehicle Maintenance	Training & Certification of Transit Vehicle Equipment Maintenance Personnel – Every Two Years	J. Bigornia
38	Vehicle Maintenance	Review of Preventative Maintenance Program Documentation for Transit Vehicles	J. Bigornia
39	Vehicle Maintenance	Calibration of Measuring & Test Equipment	J. Bigornia

Appendix F

LACMTA 2001 Triennial Audit Checklists

CPUC SYSTEM SAFETY AUDIT CHECKLIST FOR THE
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

Checklist No.	**I–1**	Persons Contacted
Inspection Date	**May 22-25, 2001**	George E. Matejovsky - Manager Rail Signal Marty Maggard - Rail Signal Supervisor Russell Becraft - Signal Inspector Keven Smith - Signal Inspector Moses Jones - Signal Inspector Normandie Romasanta - Signal Inspector
Inspectors	**Gerald Muffley** **Hani Moussa**	
Department	**Signal Maintenance**	

REFERENCE CRITERIA

1) System Safety Program Plan – Operations, Rev. 2, dated 11-25-98, Sect. 2.6.4 Rail Signal Maint.
2) Code of Federal Regulations CFR 49, Part 234
3) CPUC General Order 143-B, Sect 16.01
4) Signal Maintenance Plan for Blue Line, undated
5) Signal Maintenance Plan for Red Line, dated 1-14-97
6) Signal Maintenance Plan for Green Line, undated

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

SIGNAL INSPECTION – CPUC FRA CERTIFIED INSPECTOR

A FRA certified signal inspector from the Commission's Railroad Operations Safety Section will arbitrarily select a minimum of 2 grade crossings on the Blue Line and 3 interlockings/crossovers for all rail lines. Detailed inspections and measurements will be made to determine whether or not the selected items are in-compliance with LACMTA's signal maintenance standards.

RESULTS/COMMENTS

An FRA certified signal inspector from the Commission's Railroad Operations Safety Section, inspected the following grade crossings and interlockings/crossovers:

May 22, 2001 – Metro Blue Line

Grade Crossings	Interlockings/Crossovers
(1) 41st Street	(1) Washington
(2) 55th Street	(2) Imperial Pocket
(3) Century Blvd.	(3) Florence Ave.
(4) Florence Ave.	

CONTINUED ON NEXT PAGE

May 23, 2001 - Metro Green Line

Interlockings/Crossovers

- Norwalk Tail track
- Wilmington West & Wilmington East
- Yard to Main Line

May 24-25, 2001 - Metro Red Line

Interlockings/Crossovers

- Union Station
- Wilshire/Vermont Station Turnouts
- Wilshire/Western Station Pocket

The scope of the grade crossing and interlocking/crossover inspections consisted of :

- Checking gates, relays, traffic signal preemption, voltage levels of warning lights for both normal mode (AC power) and for standby mode (DC battery power)
- Checking the alignment of the grade crossing warning lights
- Performing ground tests in the signal cabinet (ensuring DC power is isolated from cabinet ground)
- Checking that up-to-date track circuit drawings are available in the signal cabinet
- Performing switch obstruction test
- Checking switch circuit controller
- Performing shunt test
- Performing pry test
- Performing reverse switch test

Each grade crossing and interlocking/crossover inspected in the field was found to operate as intended in accordance with LACMTA's signal maintenance standards.

No exceptions were noted.

CPUC SYSTEM SAFETY AUDIT CHECKLIST FOR THE
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

Checklist No.	**I–2**	Persons Contacted
Inspection Date	**May 15-17, 2001**	Keith Kranda – Manager Track Wayside Systems Johnnie Padilla – MBL & MBL Track Supervisor Jeff Root – MBL & MGL Senior Track Supervisor Paul Squires – MRL Track Supervisor
Inspectors	**Eddie Damron** **Roger Clugston** **A. Garabetian**	
Department	**Track Maintenance**	

REFERENCE CRITERIA

1) System Safety Program Plan – Operations, Rev. 2, dated 11-25-98, Sect. 2.6.2 Track Maint
2) Code of Federal Regulations CFR 49, Part 213
3) CPUC General Order 143-B, Sect 14.05
4) LACMTA Track Maintenance Plan for all Rail Lines, dated 12-97

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

TRACK INSPECTION – CPUC FRA CERTIFIED INSPECTOR

A FRA certified track inspector from the Commission's Railroad Operations Safety Section will arbitrarily select a minimum of 3 mainline turnouts, one section of tangent track, and one section of curved track for all rail lines. Detailed visual inspections and dimensional measurement inspection will be made to determine whether or not the selected items are in-compliance with LACMTA's track maintenance standards.

RESULTS/COMMENTS

FRA Certified Track Inspectors visually inspected the tracks and measured the track gage and cross-level at the following locations:

May 15 – Metro Blue Line
- Amoco Crossover
- Imperial Pocket
- Rosecrans Fly-over
- Artesia Crossover Interlocking

May 16 – Metro Green Line
- Norwalk Station
- Wilmington Transfer Track
- Wilmington to Marine Station
- Green Line Maintenance Yard Turnout

May 17 – Metro Red Line
- 7th and Flower Station
- Westlake / Mac Arthur Station
- Wilshire / Vermont Station
- Union Station tail Track Turnout

CONTINUED ON NEXT PAGE

Blue Line Track Inspection Findings:

At the Amoco crossover, the LACMTA track staff told the CPUC staff that they have a 30-mph 'slow order' at this crossover. The 30-mph is on all turnouts and crossovers due to a change in the wheel set dimensions to help reduce wheel hunting along the tracks. A 3/8" spacer was placed in the guardrails and reduced the flange ways in the guardrails to 1 ½". This also affected the guard check and guard face measurements at the frog. The net effect resulted in the flange way, guard check, and guard face measurements being reduced to minimum acceptable levels of compliance with the Federal Track Safety Standards. LACMTA stated the wheel sets where being re-set and the spacers would be removed as soon as the wheel set changeover is complete. At this crossover, the switch points, frog, guardrails and track were in good condition with no signs of unusual wear.

At the Imperial Pocket, the stock rails, frog, switch rods, and switch points were in good condition with no significant signs of wear. The switch point fit to the stock rails and the switch point throw (4 ¾") were acceptable to the inspector. The switch point bolts were tight and the cotter pins were in good shape. The rail braces and guardrails were in good condition. The guard check and guard face gage measurements met the FRA Class 5 specification. At this pocket turnout (T/O), the track was in good condition.

The Rosecrans fly-over track represented a compound curve. The inspector measured the degree of curve at 1 3/4 degrees and the cross level elevation at 2". Per FRA requirements, using the 4" unbalance formula, the maximum track speed was 70 mph for passenger train service. The maximum speed on the Blue Line is 55 mph.

At the Artesia crossover interlocking, the frog point at the T/O showed some wear and the LACMTA staff told us that some grinding was performed at this point. The track gage and turnout measurements were all in compliance with the FRA Track Safety Standards. At this crossover-interlocking pocket T/O, the track was in good condition.

Green Line Track Inspection Findings:

At the Norwalk station tail track crossover, visual inspection of the frogs, guardrails, switch rods, and switch points yielded no discrepancies. All the track measurements were in compliance with the FRA Track Safety Standards. At this crossover, the frog points, guardrails and track were in good condition.

The inspectors proceeded to the run-over track located at the west side of Norwalk Station and measured the curvature of the T2 eastbound track to be 2 1/2 degrees and the cross level elevation to be at 3". Per FRA requirements, using the 4" unbalance formula, the maximum track speed was 63 mph for passenger train service.

At the crossover located on the west side of Norwalk Station, the inspectors checked the switch points and frogs. The bolts on one of the switch rods were too close to the tie but they were still within the standards. At this crossover, the switch points, frogs, guardrails and track were in good condition.

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At the Wilmington Transfer Track, the Inspectors checked the frogs, guardrails, switch rods, and switch points. Visual inspection showed that the track at this location was in good condition.

The whole team rode on a test train from Wilmington Station to Marine Station to visually inspect from the cab the tangent track located between these two stations and to test the ride quality of the train. No discrepancies were found with the track.

At the Green Line maintenance yard turnout, the inspectors checked the tracks visually and took measurements at the turnouts and crossovers. The overall track condition met the FRA Track Safety Standards.

Red Line Track Inspection Findings

At the 7th and Flower Station, the inspectors measured the degree of curve at 5 degrees and the cross level elevation at 4". Using the 4" unbalance formula, the maximum track speed was 48 mph for passenger train service. LACMTA staff told us that they operate this section at 40 mph, which is within the FRA standards. The tracks at this location were in good condition.

At Westlake / Mac Arthur Station the CPUC staff inspected the AL tracks located on East side of the station. The inspector noticed that one of the bolts on a switch rod was loose and the nut was held in place only by the cotter pin. Subsequent to the audit, on August 29, 2001, LACMTA advised Commission staff that the loose bolt has been corrected. The CPUC staff proceeded to the turnout point located on the West side of the station. By visual inspection, the track turnout and frog point was in good condition. Further down the tracks the inspector measured the track, the guard check gage measured 54 3/8". The LACMTA told us that trains travel at 9-mph speed through the turnout. The frog point at this location had signs of wear on it. Further down west, the inspector inspected the pocket tracks. He checked the frogs and the bolts and measured the track and the guard check gage. The tracks, including the frog points, and switch points were in good condition.

At Wilshire / Vermont Station the inspector visually checked the tracks and they were in good condition.

At the Union Station tail track turnouts the inspector visually inspected most of the turnouts and interlockings (diamonds). He measured the track and guard check gage. At another turnout, the inspector noticed that there were wheel wear marks near the gage side of the rail. He stated that wheel marks like this are an indication of wide gage. He measured the track gage at 56 1/2" which was within FRA standards. Checking the bolts on one of the switch point rods of the rail track, the inspector noticed that a bolt was loose. He reported this finding to the LACMTA staff. Subsequent to the audit, on August 29, 2001, LACMTA advised Commission staff that the loose bolt has been corrected)

Recommendation:

1. LACMTA should finalize the draft Maintenance Plan and distribute for use. Provide justification why the requirements for “Monthly checking of 10 percent of bolts” and “Yearly detailed floating slab inspection” have been revised in the draft Maintenance Plan.

Note that the above recommendation is identical to that of Checklist No. 31.

CPUC SYSTEM SAFETY AUDIT CHECKLIST FOR THE
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

Checklist No.	**I–3**	Persons Contacted
Date	**May 15-16, 2001**	Stephen Norton-Traction Power Supervisor
Inspectors	**Byron Shovlain**	Ron Regenor-Safety Specialist
Department	**Traction Power**	Gilbert Cabral-Associate Engineer Armando Almazan-Senior Traction Power Supervisor

REFERENCE CRITERIA

1) System Safety Program Plan – Operations, Rev. 2, dated 11-25-98, Sect. 2.6.3 Traction Power
2) CPUC General Order 95
3) CPUC General Order 143-B, Sect 10 & Sect 14.06
4) Rail Maintenance of Way, Blue Line, dated 1-28-98

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

TRACTION POWER INSPECTION – CPUC GO 95 INSPECTOR

An inspector from the Utilities Safety Branch who enforces GO 95 will make an inspection of the Overhead Catenary System on the Blue Line and Green Line. Detailed visual inspections and dimensional measurement inspection will be made to determine whether or not the selected items are in-compliance with the Commission's GO 95 rules and LACMTA's traction power maintenance standards.

RESULTS/COMMENTS

A CPUC GO 95 Inspector made visual inspections and conductor height measurements to determine compliance with General Order 95, the following are the locations inspected:

May 15 – Metro Blue Line starting at Washington Station (Long Beach Ave./20th St. and also Long Beach Ave./Washington Blvd.) to Long Beach Ave. n/o Vernon Ave. (pole # 2052). Then to Long Beach Blvd./14th St. and Long Beach Blvd./23rd St.. Finally at Willowbrook Ave./ Reeve St., site of New Years Eve 2000 incident.

May 16 – Metro Green Line starting at Hawthorne Station to Crenshaw Station and lastly the Hawthorne Yard.

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Finding:

1. Violation of GO 95, Rule 74.4-F. A single point failure will allow hot conductor to fall within 10 feet of the ground. From visual observation throughout the Blue Line, this is a system wide problem. Stephen Norton suggested a fix involving extending the insulators closer to the feeder pole, away from the dynamic weight system. The jumpers, located close to the pole help support the remaining hot span or conductor. This would not allow a long hot span or conductor to drop within 10 feet of the ground.

Recommendation:

1. LACMTA should extend the insulators closer to the feeder pole, away from the dynamic weight system, as required by General Order 95, Rule 74.4-F.

CPUC SYSTEM SAFETY AUDIT CHECKLIST FOR THE
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

Checklist No.	**I–4**	Persons Contacted
Inspection Date	**May 15-17, 2001**	Bill Crocker – Acting MBL Rail Equipment Maintenance Manager Russell Homan – MBL Instructor Glenn Siamau – MBL Supervisor Ed Smith – MGL Rail Equipment Maintenance Manager Tom Lingenfield – MGL Supervisor Bob Ogus – MRL Rail Equipment Maintenance Manager Brian Rydell – MRL Senior Supervisor Tim Porter – MRL Supervisor Gary Dewater – MRL Instructor
Inspectors	**Dave Warnberg** **Audrey Ong**	
Department	**Vehicle Maintenance**	

REFERENCE CRITERIA

1) System Safety Program Plan – Operations, Rev. 2, dated 11-25-98, Sect. 2.6.1 Vehicle Maint
2) CPUC General Order 143-B
3) Rail Vehicle Maintenance Plans for Division 11, 20, and 22, dated 12-22-97

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

VEHICLE INSPECTION – CPUC FRA CERTIFIED INSPECTOR

A FRA certified vehicle inspector from the Commission's Railroad Operations Safety Section will perform detailed visual inspections and dimensional measurement inspection on the Blue Line and Red Line fleet to determine whether or not the selected items are in-compliance with CPUC and LACMTA's vehicle maintenance standards:

A minimum of 3 vehicles for each type of Blue Line vehicle: P865 & P2020
A minimum of 3 vehicles for each type of Red Line vehicle: base buy only

RESULTS/COMMENTS

At the Vehicle Maintenance Shops, the following vehicles were chosen for visual inspection:

MBL Yard – P865: Car 109/148, 147/124, 100/119
MGL Yard - P2020: Car 156, 165/163, 168/158, 160
MRL Yard – base buy: Car 522/527, 503/504, 523/528, 513/514

The following is a general list of visual inspection items: cleanliness of contacts, detection of cracks, brake pads worn, leaks, splits in air hoses, good springs, tie wraps and brackets secured, gearbox, wear limit of disc brakes

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Findings:

1. Visual Inspection of the MBL P865 fleet yielded no discrepancies.

2. At the MGL yard, a brake caliper of a "C truck" showed signs of uneven wear. The concavity was measured and found to be beyond the maximum concave wearing limit. Brake Disk Inspections are made during Inspection Type B. The Inspection Records for this vehicle were reviewed. It was found that no concave dimensional measurements were made during the last two “B Inspections” which occurred May 7 and Feb 2.

3. No other discrepancies found in the MGL P2020 fleet.

4. The MRL base buy fleet consists of 30 vehicles. Three of the 8 vehicles yielded an unacceptable discrepancy: snap rings that secure the wobble plate were loose, and a coupler housing cover plate was separated. A loose snap ring and the separated coupling were found on a married pair. The other loose snap ring was found on a different vehicle.

5. Review of the records and by interviews ruled out the possibility of the problem being defective snap rings but concluded that the snap rings may not have been installed correctly. Because the coupler housing was on the married pair that also had the loose snap ring, it could be concluded that incorrect installation was the problem. The last visual inspection of the coupler housing was made during a preventative maintenance “C Inspection “ that occurred on April 28 with a mileage of 287,353. The next scheduled preventative maintenance is 15,000 miles later. At the time of this inspection, the mileage was 287,775 miles, a difference of 422 miles.

6. It was also found that the supervisory staff makes random checks of the mechanics’ work. However, there is no documentation of such quality control checks.

Recommendations:

1. LACMTA should ensure that the Brake Disk Inspection Form, which includes making a Concave Dimensional Measurement, is being completed.

2. LACMTA should reevaluate the frequency of the Preventive Maintenance schedule and the frequencies that inspections of truck and gearbox related components are inspected.

3. LACMTA should improve the random check program by tracking which vehicles are checked by the supervisory staff and signed by the supervisor.

CPUC SYSTEM SAFETY AUDIT CHECKLIST FOR THE
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

Checklist No.	**1**	Persons Contacted
Date of Audit	**June 19, 2001**	Jessica Gill – Drug & Alcohol Program Coordinator Byron Warfield-Graham – Human Resources Manager, Special Programs
Auditors	**Audrey Ong**	
Department	**Human Resources**	

REFERENCE CRITERIA

1) System Safety Program Plan - Operations, Rev. 2, dated 11-25-98, Sect 4.3.16 Human Resources & 6.11 Drug and Alcohol Abuse
2) LACMTA Alcohol and Drug Abuse Policy
3) Code of Federal Regulations CFR 49 Parts 653 and 654
4) CPUC General Order 143-B, Section 12.03 Use of Alcohol, Narcotics, or Drugs Forbidden

- Is the SSPP available for reference by employees in this department? Yes
- Is the LACMTA Alcohol & Drug Abuse Policy available to all employees? Yes

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

DRUG AND ALCOHOL TESTING PROGRAM

Ask LACMTA to review their records for the following Types of Drug and Alcohol Testing conducted during the past three (3) years on Safety Sensitive Rail Employees:
Pre-Employment & Transfer, Reasonable Suspicion, Post-Accident, Random, Return From Extended Medical Leave, Return-to-Duty, and Follow-Up Testing.

From this review ask LACMTA to identify those individuals, if any, who either tested positive (i.e. failed one or more of the tests) or refused to take a test. Perform a further review of the employment records of the above-identified individuals to confirm that they were subsequently prohibited from performing safety sensitive duties unless and until they successfully completed the Employee Assistance Program and passed the required Return-to-Duty testing. Finally, perform a further review of the records of any identified individuals who were allowed to return to work in safety sensitive positions to confirm that they have been subjected to and successfully passed the required Follow-up Testing as specified in the reference criteria.

RESULTS/COMMENTS

A review of the program records for Rail employees in safety sensitive positions during the period of 1998 to 2000 disclosed three employees tested positive for illegal drugs.

It was found in the triennial audit performed in 1998, that an employee tested positive in May 1996 and was suspended rather than terminated due to an administrative error in the handling of the testing process. That employee agreed to participate in the Employee Assistance Program and was subject to follow-up testing. This employee tested positive in 1999 violating the last chance agreement and was terminated.

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CFR 49 Parts 653 and 654 require that once an employee is allowed to return to duty, he/she is subject to unannounced follow-up testing for at least 12 months but not more than 60 months. The frequency and duration of the follow-up testing will be recommended by the substance abuse professional as long as a minimum of six tests are performed during the first 12 months after the employee has returned to duty. This department met the six-test requirement and continued to perform follow-up tests. The employee tested positive prior to the conclusion of the 60 months and was terminated as required by the CFR.

In 1998 and 1999, two other employees tested positive. One was tested during a random test type; this employee was terminated. The other one during a periodic/CDL test type. The California Department of Motor Vehicles (DMV) requires Commercial Driver's License (CDL) holders of Class A or B licenses to pass a medical examination to obtain or renew their medical certificates. A test for controlled substances is included as part of this examination to ensure that the CDL holder is qualified to operate a commercial motor vehicle. If a test is administered off-duty and it is positive, the employee is retested on-duty. The employee in question was tested off-duty, resulting in a positive; he was retested on-duty 5 days later with a negative result.

All records were well organized, neat, and thorough. An interview with the manager revealed new innovations to an already outstanding program. The administration of this program was found to be in full compliance with the referenced criteria for the element/characteristic reviewed.

No exceptions were noted.

CPUC SYSTEM SAFETY AUDIT CHECKLIST FOR THE
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

Checklist No.	**2**	Persons Contacted
Date of Audit	**June 19, 2001**	Mike Stange – Quality Assurance Superintendent Ronald Green – Quality Assurance Supervisor Fred Kan – Engineering Associate Damon Cannon – Maintenance Rail Specialist Tam Nguyen – Maintenance Rail Specialist
Auditors	**Joey Bigornia**	
Department	**Quality Assurance Rail**	

REFERENCE CRITERIA

1) LACMTA Quality Assurance Department Brief Book, dated 12-2-98
2) System Safety Program Plan - Operations, Rev 2, dated 11-25-98,

- Is the SSPP available for reference by employees in this department? Yes

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

INSPECTION OF RAIL VEHICLES AND SYSTEMS INVOLVED IN ACCIDENTS

Review a random sample of light rail vehicles involved in Code 2 accidents within the past 2 years to determine whether or not:

1. The QA Dept investigated all Code 2 rail accidents, accidents involving an injury requiring transport, a death or a derailment and other related incidents and equipment failures in accordance with CPUC mandates.
2. The QA Dept performed the required tests and an unbiased assessment of the vehicles' functionality.
3. Any reports noting vehicle defects as well as damage exceeding $100,000 are forwarded to the System Safety Department.

RESULTS/COMMENTS

The Rail Operations Control Center was requested to generate a report of all 10-70 Series accidents that occurred during the period of January to December 2000. 10-70 Series accidents are any accidents that involve a train collision. 10-72 is a Train vs. Pedestrian accident; 10-73 is a Train vs. Automobile accident.

The auditor verified that the QA Department responded to every applicable Code 2 rail accident. The QA department did not respond to two accidents that occurred on July 18, 2000 & December 2, 2000. These two accidents did not involve injuries.

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Green Line Car No 155A / 155B Split Switch in Yard Incident Report (dated August 8, 2000), and Green Line incident of Insulator Runners / Pantograph Entanglement Report (dated May 29, 2001) were selected to confirm that the QA Department investigated other related incidents & equipment failures. No exceptions were noted.

The role of QA is to perform a Post Accident Investigation of all vehicles involved in any accident, review the applicable maintenance records, and determine if any pre existing defects may have contributed to the cause of the incident. Each QA report included the support documentation of post accident inspection forms, Controller's Unusual Occurrence Reports, recent vehicle maintenance inspection reports, & photographs of damaged components.

The QA Department does not have the responsibility of assigning an estimated monetary value to vehicles involved in accidents. The monetary amount is assessed from the Vehicle Maintenance records in terms replacement parts cost and the labor hours to repair the vehicle. Regardless of the repair cost incurred, the System Safety Department receives copies of all Quality Assurance Post Accident Inspection Reports.

No exceptions were noted.

CPUC SYSTEM SAFETY AUDIT CHECKLIST FOR THE
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

Checklist No.	**3**	Persons Contacted
Date of Audit	**June 21&26,2001**	Ronald Green – Quality Assurance Supervisor Fred Kan – Engineering Associate Damon Cannon – Maintenance Rail Specialist Mona Lisa Montez – Maintenance Rail Specialist
Auditors	**Joey Bigornia**	
Department	**Quality Assurance Rail**	

REFERENCE CRITERIA

1) LACMTA Quality Assurance Department Brief Book, dated 12-2-98
2) System Safety Program Plan - Operations, Rev 2, dated 11-25-98,

- Is the SSPP available for reference by employees in this department? Yes

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

REBUILT RAIL COMPONENTS

Review all records of light rail vehicle components which were rebuilt during the past 2 years to determine whether or not:

1. The QA Dept performs a receiving inspection when the component is returned from the vendor.
2. The QA Dept ensured the component complies with LACMTA specification.
3. Any component not meeting LACMTA specification is not used.

RESULTS/COMMENTS

A record file that contains information on rebuilt light rail vehicle components during the past 2 years was not readily available for the audit review. Quality Assurance (QA) staff however, showed to the auditor a computer database file that was created to track the Metro Blue & Green Line Gearbox Data Overhaul Program, Traction Motor Overhaul Program, post Paint & Body Inspection Form, etc.

The auditor reviewed the established Metro Blue & Green Line Gearbox Data overhaul program database dated May 31, 2001. Each gearbox is coded with a serial number. The database tracks by serial number: the LRV that the gearbox is installed on; last overhaul date, repair date, accumulated mileage; the status of when an overhaul is due. The database program also provides gearbox history that identifies the mileage of each gearbox failure; date removed from the LRV; date sent out to a vendor to perform the repairs. This program is established in support of the 10 year / 1 million mile Gearbox Settlement Agreement which tracks the ongoing maintenance activities and overhauls of the light rail gearboxes.

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QA Department performs a receiving inspection for all gearboxes that are sent out for an overhaul and returned from the vendor (Flender). The QA inspection consists of a physical check of the component to confirm that the serial numbers match, dimensional checks of parts (i.e. Wheel dimensions) etc. Components that are shipped back to the LACMTA undergo a receiving inspection by a QA inspector. The QA inspector who accepts the component places his QA Stamp of Approval on the packing slip / delivery slip that accompanies the component.

QA generates a RECEIVING EXCEPTION REPORT for any component not meeting the LACMTA specification and the component is sent back to the vendor for additional repairs. QA does not and is not required to perform a receiving inspection of sealed internal components. QA depends upon the vehicle maintenance specialists to note defects found during a regular preventive maintenance inspection after the gearbox is installed on a LRV and for revenue service. If a gearbox or a great number of others experiences a high failure rate, the QA Department performs a follow-up by reviewing the gearbox history details. QA determines if the gearbox problem is isolated to one particular vendor or if an internal component is failing due to a manufacturer specific problem.

No exceptions were noted.

CPUC SYSTEM SAFETY AUDIT CHECKLIST FOR THE
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

Checklist No.	**4**	Persons Contacted
Date of Audit	**June19- 21, 2001**	Rita Malone – Rail Division Transportation Manager/MRL Cristobal Medina – Rail Transit Operations Supervisor/MRL
Auditors	**Gary Rosenthal** **Mahendra Patel** **Joey Bigornia**	
Department	**Heavy Rail Operations**	

REFERENCE CRITERIA

1) System Safety Program Plan – Operations, Rev. 2, dated 11-25-98, Sect 3.2.9 Safety Training
2) Heavy Rail Instruction Training Matrix
3) CPUC General Order 143-B, Section 12.02, 13.03, 14.03

- Is the SSPP available for reference by employees in this department? Yes

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

HEAVY RAIL OPERATIONS TRAINING & CERTIFICATION

Select a random sample of employees from each of the following employee classifications:

- Train Operators
- Rail Transit Operations Supervisors (Includes ROC Controllers & Yard Controllers),
- Maintenance Of Way
- Equipment Maintenance Personnel

1. Review their training, certification, and re-certification records to determine whether or not they are in compliance with the Reference Criteria.
2. Review the current training, certification and re-certification programs for each classification to determine whether or not they are complete and current.
3. Review Discipline and Accident/Incident Records for all classifications involved in an accident in the past 3 years. Determine whether or not accident follow-up ride checks are performed as soon as possible, but not later than two weeks, after an operator returns to duty or within 30 days of the accident. Obtain a roster of part-time operators and temporarys, determine whether accident/incident frequency is higher in this category of operators.

RESULTS/COMMENTS

A sample of employees consisting of the following employee classifications was selected:

- 10 Red Line Train Operators (TO)
- 8 Red Line Rail Transit Operations Supervisors (RTOS)
- 10 Maintenance of Way employees
- 17 Vehicle Maintenance employees

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The train operation training, re-training, certification and re-certification records for the selected TOs and RTOSs were found to be current and satisfactory for each employee checked.

A review of the operations training and certification records for compliance with reference criteria 2 and 3 involving10 Maintenance Of Way employees selected from the training roster disclosed most had not been re-trained or re-certified since at least 1997 or 1998. It was also noted that their certifications had expired. The records for 12 of 17 Vehicle Maintenance employees selected from the training roster revealed they have not received retraining or re-certification within the last two years as required by reference criteria 2 and 3. Their certification had also expired.

Operations training and certification records at the training facility for Maintenance of Way and Vehicle Maintenance employees were found to be incomplete. There was insufficient information in the training folders to verify compliance with LACMTA and GO 143-B, Section 13.03, minimum train or on rail equipment qualifications. The auditors were told by operations training representatives that the complete operations training and certification records would probably be found at the respective Maintenance of Way and Vehicle Maintenance division offices.

At the vehicle maintenance facility, a second auditor determined that the only re-certification requirement of vehicle equipment maintenance personnel occurs for those employees that move vehicles within the Yard Limits. Limited Yard Certification is not a requirement of all maintenance personnel but is available as an option to the employee if he/she chooses to have this training to operate vehicles in the yard. LACMTA's current practice allows the maintenance personnel to operate vehicles within the shop area. If a train must be operated outside of the shop, a qualified train operator or a yard qualified maintenance specialist is called upon to complete this task. Vehicle Maintenance representatives told the auditor that the current files of yard qualified maintenance specialist records are kept with the Operations Department since they are responsible for scheduling and updating the re-certification records of equipment maintenance personnel.
The auditor determined that:

- There are limited yard qualifications for 7 Blue Line Maintenance Specialists expired 3-7-01.
- There are no qualified Green Line maintenance Specialists eligible
- There are 5 Red Line Maintenance Specialists qualified to move trains in the yard and qualifications expire 2-1-03.

A standard LACMTA Operators/Student Performance Sheet is used to document the operating performance evaluation of employees during the certification and re-certification process. For many of the affected employees, especially those other than train operators, the performance activities checklist boxes are left blank or are not completely filled out. As a result, there is little or no record of those employees ability to perform safety critical operating activities during the certification/re-certification process.

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Section 3.2.9 of the System Safety Program Plan (SSPP) describes specific personnel and employee positions involved with train movements that require certification and re-certification. Of those positions, the auditors were unable to find any record of operations safety certification or re-certification for persons working in Safety, Crane Operation or Fork Lift Operation. Operations system safety representatives later told the auditors that those three classifications do not require operations training and certification.

The auditors found no record of Red Line employees, who had received post-accident ride checks or re-training within the past 3 years. Operations system safety representatives later told the auditors that there had been no Red Line accidents that required post-accident ride checks.

The SSPP states, "*That the frequency and amount of training . . . is dependent upon regulatory requirements and the level of hazard associated with the operation*." The Division uses a Heavy Rail Instruction Training Matrix as a reference to determine training requirements. However, the auditors found no formal authorization for the document in the reference criteria. The "Matrix" also contained no control indications such as revision number, date or agency authorization.

The auditors were unable to locate any formal requirement for the periodic review and updating of the Red Line training and certification programs.

A copy of the SSPP was available at the Division office. In discussions with employees at that location, most were not aware of the SSPP's existence.

Recommendations:

1. LACMTA should develop, adopt, and implement a formal procedure for the periodic review and updating of the Red Line operations training and certification program, including appropriate change controls.

2. LACMTA should adopt and implement the Heavy Rail Instruction Training Matrix or a similar document as a formal, controlled program element to specify the operations training and certification requirements for designated employee classifications.

3. LACMTA should develop, adopt, and implement procedures to ensure that Maintenance of Way and Vehicle maintenance employees, who are required or allowed to operate or otherwise control the operation of any trains or other on rail equipment, are currently trained and certified. The procedures should also ensure that appropriate operations entities and both maintenance departments are provided with and maintain a current roster of the respective maintenance employees who are required or allowed to be operations trained and certified along with those employees' current training and certification status. It is particularly important that LACMTA Yard Control and Rail Operations Control have current information about all employees authorized to operate trains or other on track equipment.

4. LACMTA should clearly establish and designate the custodian of Maintenance of Way and Vehicle Maintenance employees' complete operations training and certification records.

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5. LACMTA should take the steps necessary to ensure that performance evaluation checklists, including the Operators/Student Performance Sheet, reflect the established performance requirements for each employee classification and are properly prepared to record that information.

6. LACMTA should revise the SSPP Section 3.2.9 to eliminate employee classifications that do not require heavy rail operations training and certification.

CPUC SYSTEM SAFETY AUDIT CHECKLIST FOR THE
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

Checklist No.	**5**	Persons Contacted
Date of Audit	**June 19-21, 2001**	Duane Martin - Rail Division Transportation Manager/MBL & MGL Bob Johnson – RTOS, Rail Instruction Coordinator/MBL George Kennedy – MBL Rail Equipment Maintenance Manager Russell Homan – MBL Instructor Glenn Siamau – MBL Supervisor Ed Smith – MGL Rail Equipment Maintenance Manager Tom Lingenfield – MGL Supervisor
Auditor	**Gary Rosenthal** **Joey Bigornia**	
Department	**Light Rail Operations**	

REFERENCE CRITERIA

1) System Safety Program Plan – Operations, Rev. 2, dated 11-25-98, Sect 3.2.9 Safety Training
2) Light Rail Instruction Training Matrix
3) CPUC General Order 143-B, Section 12.02, 13.03, 14.03

- Is the SSPP available for reference by employees in this department? Yes

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

LIGHT RAIL OPERATIONS TRAINING & CERTIFICATION

Select a random sample of employees from each of the following employee classifications:

- Train Operators
- Rail Transit Operations Supervisors (Includes ROC Controllers & Yard Controllers),
- Maintenance Of Way
- Equipment Maintenance Personnel

1. Review their training, certification, and re-certification records to determine whether or not they are in compliance with the Reference Criteria.
2. Review the current training, certification and re-certification programs for each classification to determine whether or not they are complete and current.
3. Review Discipline and Accident/Incident Records for all classifications involved in an accident in the past 3 years. Determine whether or not accident follow-up ride checks are performed as soon as possible, but not later than two weeks, after an operator returns to duty or within 30 days of the accident. Obtain a roster of part-time operators and temporarys; determine whether accident/incident frequency is higher in this category of operators.

Determine whether or not the LACMTA 1998 Triennial Audit recommendations 1 and 2 have been satisfied and are currently being implemented.

RESULTS/COMMENTS

The auditor reviewed samples consisting of the following employee classifications:

- 10 Blue & Green Line Train Operators (TO)
- 6 Blue & Green Line Rail Transit Operations Supervisors (RTOS)
- Maintenance of Way
- Vehicle Maintenance employees

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The auditor found that training, re-training, certification and re-certification records for the selected Train Operators and Rail Transit Operations Supervisors were current and complete for each individual checked. However, the Rail Transit Operations Supervisors' records disclosed that in three of six instances, the previous periods between certifications had exceeded the two years maximum established in Commission General Order 143-B, Section 13.03. All six exceeded the one-year (annual) certification requirement shown on the Light Rail Instruction Training Matrix. The auditor found that the Light Rail Instruction Training Matrix (Reference Criteria 2) specifies the light rail operations training and certification requirements for designated employees but is not a controlled document.

The auditor's review of the operations training and certification records for all Maintenance Of Way and all Vehicle Maintenance employees listed on the operations training roster disclosed that none of those individuals had been re-trained or re-certified for at least two and as long as four years. All operations certifications for those employees had expired. The Operations training and certification records were also incomplete for these two employee classifications. Discussion with the training representatives indicated confusion regarding responsibility for the control and maintenance of operations training records.

At the vehicle maintenance facilities, a second auditor determined that the only re-certification requirement of vehicle equipment maintenance personnel occurs for those employees that move vehicles within the Yard Limits. Limited Yard Certification is not a requirement of all maintenance personnel but is available as an option to the employee if he/she chooses to have this training to operate vehicles in the yard. LACMTA's current practice allows the maintenance personnel to operate vehicles within the shop area. If a train must be operated outside of the shop, a qualified train operator or a yard qualified maintenance specialist is called upon to complete this task. The current files of yard qualified maintenance specialist records are kept with the Operations Department since they are responsible for scheduling and updating the re-certification records of equipment maintenance personnel.

The auditor determined that:

- There are limited yard qualifications for 7 Blue Line Maintenance Specialists expired 3-7-01.
- There are no qualified Green Line maintenance Specialists eligible
- There are 5 Red Line Maintenance Specialists qualified to move trains in the yard and qualifications expire 2-1-03.

The auditor also noted an incident that occurred on January 31, 2001, involving vehicle maintenance employees, who were not currently certified and operated an LRV in the Blue Line yard. The employees did not obtain permission from the Blue Line Yard Controller to operate the LRV in the yard. While operating the LRV, they split a track switch and also failed to notify the Yard Controller that the switch had been damaged. These activities were reported to have taken place under the direction of a Vehicle Maintenance Supervisor. An observant train operator discovered and reported the damaged switch, preventing a potential derailment. LACMTA did not report the event, as an accident and did not identify any or all associated conditions as unacceptable hazardous conditions, to the Commission's staff. Representatives of the LACMTA operations system safety staff contend that the event is not reportable to the Commission as an accident and does not indicate the existence of an unacceptable hazardous condition.

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The LACMTA Operators/Student Performance Sheet is used by the Instruction Department to document the operating performance evaluation of employees during the certification and re-certification process. For many employees, especially those other than train operators, the performance activity checklist boxes are left blank or are not filled out completely. As a result, there is little or no record to substantiate an evaluation of the employee's ability to perform safety critical operations activities/tasks during the certification or re-certification process.

The System Safety Program Plan (SSPP) describes specific personnel and employee positions involved with train movements, which require certification and re-certification. Of those positions, the auditor was unable to find any record of operations safety certification or re-certification for persons working in Safety, Crane Operation or Fork Lift Operation. Discussions with LACMTA representatives at the audit site indicated that operations training and certification is not required for those employee classifications.

The review of training records disclosed that accident follow-up ride checks are <u>not</u> performed as soon as possible following an accident nor within two weeks after an operator returns to duty as was proposed by the LACMTA during the 1998 Triennial Safety Audit. The auditor determined that these corrective actions, specified in the LACMTA 1998 Triennial Safety Audit report - Recommendation 1, have not been implemented as ordered by Commission in Resolution ST-38. The records showed that 37 light rail train operators, with one or more accidents, did not have the post-accident ride checks within the specified periods. At the time of the review, there were 18 train operators who were involved in two and as many as six accidents without having received a single post-accident ride check. The records also showed that some operators had not received the post accident ride checks for accidents dating back to January 1998. The auditor found that, not only has LACMTA failed to comply with the Commission's order, it has allowed the condition and efficacy of the post-accident ride check program to deteriorate even further since Commission Resolution ST-38 was adopted. The records also indicated that adequate resources have not been allocated to effectively implement the program.

The auditor did not review the roster of part-time train operators and temporary train operators to determine if they received four days of refresher training before becoming full time operators in 1998. The auditor also did not determine whether accident/incident frequency is higher in this category of operations employees. The auditor was unable to identify or document any LACMTA requirement for the periodic review and updating of the light rail training and certification programs. The auditor did not find a clear link to the Change Review Committee identified in the SSPP or any other formal change control program for modification of the training program.

The auditor reviewed the Light Rail Instruction Training Matrix including the lists of training tasks to be performed and the lists of LACMTA employees and non-employees who require training. The auditor also interviewed the LACMTA contact representatives regarding the training program and the associated training tasks. Based on the information resulting from the review and interviews, the auditor found that the adequacy of resources being allocated to carry out the light rail training programs is questionable at best.

A copy of the current SSPP was available at the light rail training office. Auditor did not confirm that employees, other than those who regularly work in light rail training, are aware that the SSPP is available at this location.

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Recommendations:

1. LACMTA should adopt and implement the Light Rail Instruction Training Matrix or a similar document as a formal, controlled program element to specify the operations training and certification requirements for designated employee classifications.

2. LACMTA should develop, adopt, and implement procedures to ensure that Maintenance of Way and Vehicle maintenance employees, who are required or allowed to operate or otherwise control the operation of any trains or other on rail equipment, are currently trained and certified. The procedures should also ensure that appropriate operations entities and the respective maintenance departments are provided with and maintain a current roster of maintenance employees who are required or allowed to be operations trained and certified along with those employees' current training and certification status. It is particularly important that LACMTA Yard Control and Rail Operations Control have current information about all employees authorized to operate trains or other on track equipment.

3. LACMTA should clearly establish and designate the custodian of Maintenance of Way and Vehicle Maintenance employees' complete operations training and certification records.

4. LACMTA should provide a report to the Commission staff explaining the hazard identification and hazard resolution processes and activities associated with the January 31, 2001 Blue Line yard split switch incident. Also, LACMTA should include any causal effects related to the light rail operations training and certification program and proposed corrective actions.

5. LACMTA should take the steps necessary to ensure that performance evaluation checklists, including the Operators/Student Performance Sheet, reflect the established performance requirements for each employee classification and are properly prepared to record that information.

6. LACMTA should revise the SSPP Section 3.2.9 to eliminate employee classifications that do not require heavy rail operations training and certification.

7. LACMTA should provide the Commission staff with a written report explaining why the 1998 Triennial Audit, Recommendation 1, the accident follow-up check ride program, was not implemented. This report should also address the adequacy of training resources available to carry out the program and explain what actions will be taken to restore the program.

8. LACMTA should establish a periodic review of the entire light rail operations training program including requirements for training and certification of train operators, other on-rail equipment operators, supervisors and managers and non-LACMTA personnel. The review should include an evaluation of the operations training program tasks associated with the Light Rail Instruction Training Matrix and address the adequacy of available training resources. A report describing the scope, tasks, findings, and recommendations for corrective actions should be sent to the agency's top management.

CPUC SYSTEM SAFETY AUDIT CHECKLIST FOR THE
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

Checklist No.	**6**	Persons Contacted
Date of Audit	**June 22, 2001**	Ron Regenor – Safety Specialist, Rail Operations Safety
Auditors	**Gary Rosenthal**	
Department	**Heavy Rail Operations**	

REFERENCE CRITERIA

1) Heavy Rail Operations Rulebook, undated
2) Heavy Rail Standard Operating Procedures, effective 2-1-98
3) Heavy Rail - Rail Operations Bulletins
4) Heavy Rail - Rail Operations Procedure Notices, Special Notices, and General Notices
5) LACMTA Program of Operational Evaluations, Rev 0, dated January 2001
6) CPUC General Order 143-B, Section 13.04 and 14.03

- Is the SSPP available for reference by employees in this department? Yes

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

RED LINE TRAIN OPERATOR PERFORMANCE

1. Select three of the following Performance Evaluations to be tested by Operations on three different Train Operators:

   - Speed Requirements
   - Radio Communications
   - Certification Compliance
   - Entering/Exiting Mainline
   - Dark or Improperly displayed Interlock Signal
   - Yard Safety
   - Audible Signals
   - Yard Operations

2. Review Performance Evaluation records for the past 3 years.
3. Observe on-board operations of not less that two trains between not less than four stations to determine whether or not each train operator is in compliance with the corresponding Rules and Procedures addressed in the Reference Criteria.

Determine whether or not the LACMTA 1998 Triennial Audit recommendations 3,4 and 5 have been satisfied and are currently being implemented.

RESULTS/COMMENTS

Recommendation 5, from the LACMTA 1998 Triennial Audit concerning the program of operational evaluations has not been completed and implemented. Commission Resolution ST-38 ordered LACMTA to expand and strengthen its existing program of operational evaluations to include additional safety related performance activities. However, the auditors found that LACMTA has a comprehensive draft Program of Operational Evaluations, Rev 0, and dated January 2001, which remains to be adopted and implemented. The auditor also found that no plan and schedule are in place to complete and implement the program.

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LACMTA did not conduct operations performance evaluations or tests during the review. Information gathered by the auditor indicated that no performance evaluation testing is being performed or currently planned on the Red Line. However, the auditor made on-board observations of two train operators while aboard two Red Line trains. Each observation was made while the train was operated between six stations. One train operator performed according to appropriate operations rules and procedures. That operator checked for a Cab Pass and ID when the auditor entered the operating cab; notified ROC that the auditor was on-board; performed train station departure look-backs consistently; sounded the horn approaching stations and observed patrons on the passenger platforms while approaching stations. The second train operator checked the auditor's Cab Pass and ID when the auditor entered the cab; sounded the horn and observed patrons on the passenger platforms while approaching stations. The second train operator failed to notify ROC after the auditor entered the train cab and did not continue the look-back until the train started to depart the station.

Recommendations 3 and 4, concerning Rail Operations Bulletins and "sign for " requirements governing the issuance of new procedures, notices and bulletins from the 1998 Triennial Safety Audit are being satisfied by current operational practices.

Recommendations:

1. LACMTA should complete, adopt, and implement the draft LACMTA Program of Operational Evaluations in accordance with LACMTA 1998 Triennial Audit Recommendation 5.

2. LACMTA should include the procedures for look-backs as an element in its program of operational evaluations to ensure that no one is being dragged or has stepped into the gap between the side of the train and the platform or has fallen under the train as it departs the station.

CPUC SYSTEM SAFETY AUDIT CHECKLIST FOR THE
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

Checklist No.	**7**	Persons Contacted
Date of Audit	**June 20&26, 2001**	Bob Johnson – RTOS, Rail Instruction Coordinator/MBL Henry Castaneda – Assist Rail Division Transp Manager/MBL Ron Regenor – Safety Specialist, Rail Operations Safety
Auditors	**Audrey Ong** **Gary Rosenthal**	
Department	**Light Rail Operations**	

REFERENCE CRITERIA

1) Light Rail Operations Rulebook, undated
2) Standard Operating Procedures, Metro Blue Line, Los Angeles/Long Beach Light Rail System
3) Standard Operating Procedures, Metro Green Line, Norwalk/Redondo Beach Light Rail System
4) Light Rail - Rail Operations Bulletins
5) Light Rail - Rail Operations Procedure Notices, Special Notices, and General Notices
6) CPUC General Order 143-B, Section 13.04 and 14.03

- Is the SSPP available for reference by employees in this department? Yes

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

BLUE LINE & GREEN LINE TRAIN OPERATOR PERFORMANCE

1. Select 3 of the following Performance Evaluations to be tested by Operations on three different Train Operators of each line:

   - Speed Requirements
   - Radio Communications
   - Certification Compliance
   - Entering/Exiting Mainline
   - Dark or Improperly displayed Interlock Signal
   - Yard Safety
   - Audible Signals
   - Operation at Grade Crossings (Blue line)
   - Yard Operations

2. Review Performance Evaluation records for the past 3 years.
3. Observe on-board operations of not less that two trains each on the Blue and Green Lines between not less than four stations to determine whether or not each train operator is in compliance with the corresponding Rules and Procedures addressed in the Reference Criteria.

Determine whether or not the LACMTA 1998 Triennial Audit recommendations 5 and 6 have been satisfied and are currently being implemented.

RESULTS/COMMENTS

Light rail operations representatives told the auditors, that ROC is responsible for performing light Rail Performance Evaluations. ROC representatives agreed but reported that a lack of resources prevented implementing the program. Light rail operations supervisors, with the concurrence of ROC representatives, agreed to perform a series of train operator performance evaluations, for the auditors, on the Blue Line.

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The first test observed by the auditors involved placing a burning flare adjacent to the main track. According to LACMTA operating rules, the operators of approaching trains should note the flare burning near the track, stop their trains short of that point and, contact the ROC controller for further instruction. The test includes elements of attention to duty, knowledge of rules, train speed control and radio communications. Both train operators tested failed to stop short of the burning flare and continued to the next passenger station. Only one train operator contacted the ROC controller for instructions. The controller's instructions to the train operator were inconsistent with LACMTA procedures. The train operator advised the controller about those discrepancies.

The auditors observed a second test, which involved having a non-LACMTA employee, while under the supervision of the RTOS and without a safety vest, enter the right of way and remain in clear view of an approaching train operator. According to LACMTA procedures, the operators, after seeing the trespasser, should stop their trains and instruct the trespasser to exit the right of way. They should also contact the ROC controller to report the incident. The test includes elements of attention to duty, knowledge of rules, train speed control and radio communications. Two of three train operators failed to stop their trains and instruct the trespasser to exit the right of way. One of the two train operators who failed to stop also failed to contact the ROC controller and report the presence of the trespasser on the right of way. The supervisors conducting the tests were thorough and professional in their approach and performance.

An auditor rode with train operators in the control cabs of two Blue Line trains and two Green Line trains for more than six stations on each train. The auditor identified himself to the train operators and presented an appropriate cab pass. During on-board observations on the Green Line, a shift change was made. None of the five operators, on the four trains, contacted ROC controllers to advise that they had admitted a person with a cab pass into the cab. Four of the train operators expressed different interpretations about how the side-mirror look-back should be performed indicating an absence of understanding in the meaning and application of operating procedures.

The auditors noted that LACMTA has a comprehensive draft Program of Operational Evaluations, Rev 0, and dated January 2001. However, the draft program has not been completed, adopted and implemented and, as a result, there are no formal program records. The auditors found that there was no plan and schedule are in place to complete this project and implement the program. The auditors noted evidence that there have been periodic efforts to implement operations testing programs. The 1998 Triennial Safety Audit Recommendation Number 5 requires that LACMTA expand and strengthen its existing program of operational evaluations to include additional safety related performance activities. The 1998 Triennial Safety Audit Recommendation Number 5 has not been satisfied.

The 1998 Triennial Safety Audit Recommendation Number 6 was reported by light rail operations management representatives to have been addressed. They reported that they had reviewed and re-evaluated the look back procedure for trains leaving the station platform. They concluded that it would be unsafe if the train operator looked in the side rear view mirror after the train began to move since some stations had pedestrian crossings in close proximity and the operator should focus attention on that area.

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However, this issue was also discussed with three train operators. They stated that checking the side rear view mirror, when leaving a station platform was very similar to what was required when driving a bus in that the operator must also be cautious of any hazards ahead of the vehicle while also checking the side rear-view mirrors. Two of those operators noted that it was important to make a look-back after the train started moving to ensure that a late boarding passenger had not slipped into the platform gap or have a piece of clothing caught in a door. One of those operators also noted that as bus drivers leaving a stop, they would have to check both of the side rear-view mirrors while pulling away into traffic. LACMTA did not provide the auditors with a report explaining its analysis of these hazards or what other corrective actions should be taken in response to the 1998 Triennial Safety Audit Recommendation Number 6.

Recommendations:

1. LACMTA should complete, adopt, and implement the draft LACMTA Program of Operational Evaluations in accordance with LACMTA 1998 Triennial Audit Recommendation 5.

2. LACMTA should provide the Commission staff with a report regarding its analysis of the hazards associated with trains departing stations in response to the 1998 Triennial Safety Audit Recommendation Number 6.

CPUC SYSTEM SAFETY AUDIT CHECKLIST FOR THE
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

Checklist No.	**8**	Departments Contacted
Date of Audit	**June 18-21, 2001**	MBL/MGL Rail Division MRL Rail Division Rail Operations Control Rail Signal Maintenance MBL/MGL/MRL Rail Equipment Maintenance
Auditors	**Gary Rosenthal** **Hani Moussa** **Joey Bigornia**	
Department	**Rail Operations and Maintenance**	

REFERENCE CRITERIA

1) CPUC General Order 143-B, Section 12

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

HOURS OF SERVICE – SAFETY SENSITIVE EMPLOYEES

Select a sample from a list of names for the safety sensitive job classifications listed below. Review the "pay package" records prepared during the past 18 months for the selected employees to determine whether or not they complied with the minimum rest requirements in the reference criteria:

- Train Operators
- Rail Transit Operations Supervisor (Includes ROC Controllers & Yard Controllers)
- Maintenance of Way – Signal Maintenance
- Equipment Maintenance Personnel

RESULTS/COMMENTS

The auditor selected six weekly "pay package" records for all Blue and Green Line train operators. Those records were reviewed for compliance with the requirements of the reference criteria. No violations of the reference criteria hours of service or rest requirements were noted.

The auditor selected five weekly "pay package" records for Rail Transit Operations Supervisors. Those records were reviewed at ROC and Metro Red Line. Those records indicated that in one instance, a Red Line Supervisor (Controller) went off-duty at midnight and returned to work only six hours later. The auditor was told that the record was incorrect and that the supervisor had been off duty for eight hours before returning to work. The record may be in error but the auditor was not provided with any evidence that the supervisor had actually been off duty for eight hours before returning to work.

Subsequent to the audit, LACMTA reported to the auditors that it had established hours of service requirements for Heavy Rail operators. The agency also sent the auditors copies of materials to substantiate the establishment of the hours of service rules. The documents were unsigned and undated with no clear evidence of any authority.

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LACMTA also reported that it follows these same standards for supervisors and controllers but those rules have not been finalized. The agency also reported that when labor agreements are finalized, the hours of service policy would be revised to include supervisors and controllers.

The auditors reviewed the time sheets for the period of (1/1/00 - 6/1/01) of Signal Maintenance Personnel:

2 Blue Line Signal Maintenance Personnel
2 Red Line Signal Maintenance Personnel
2 Green Line Signal Maintenance Personnel

The auditors reviewed the deviation sheets of Equipment Maintenance Personnel for the following periods:

4 Blue Line Equipment Maintenance Specialist – (1/1/00 - 6/1/01),
4 Red Line Equipment Maintenance Specialist – (1/1/00 – 6/1/01)
4 Green Line Equipment Maintenance Specialist – (6/19/00 – 4/9/01)*.

*Note: The June 2000 starting point was selected since one work shift existed prior to this date. Three work shifts were created for the Metro Green Line Yard in mid-June 2000.

Time sheets and deviation sheets record: when an employee works over time; takes a vacation day; calls in sick; floating holiday, etc.

The Signal Maintenance & Equipment Maintenance Personnel is in compliance with the Commission's hours of service and minimum rest requirements described in General Order 143-B.

Recommendation:

1. LACMTA should complete development, adopt, and implement hours of service and minimum rest requirements for all Heavy Rail supervisors/train controllers, train operators and other employees performing safety sensitive activities. Also, LACMTA should develop the controls necessary to ensure these requirements are followed.

CPUC SYSTEM SAFETY AUDIT CHECKLIST FOR THE
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

Checklist No.	**9**	Persons Contacted
Date of Audit	**June 19, 2001**	Hector Guerrero – Central Controls Facilities Manager Linda Leone – Sr. Rail Transportation Operations Supervisor
Auditors	**Gary Rosenthal**	
Department	**Rail Operations Control**	

REFERENCE CRITERIA

1) System Safety Program Plan – Operations, Rev. 2, dated 11-25-98, Section 3.2.9 Safety Training
2) Central Control Facility Light Rail Standard Operating Procedures, effective 10-01-96
3) Central Control Facility Manual
4) Training Matrix for Controllers
5) Training Matrix for Senior RTOS
6) CPUC General Order 143-B, Section 13.03 Program of Instruction

- Is the SSPP available for reference by employees in this department? Yes

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

TRAINING & CERTIFICATION OF LIGHT & HEAVY RAIL OPERATIONS CONTROLLERS

Select a random sample of controllers and review their training, certification, and re-certification records to determine whether or not they are in compliance with the Reference Criteria.

Review the current training, certification and re-certification lesson plans for controllers to determine whether or not they are complete and current.

Determine whether or not the LACMTA 1998 Triennial Audit recommendations 9 has been satisfied and are currently being implemented.

RESULTS/COMMENTS

The auditor reviewed training records from 1998 to present for five light rail and heavy rail controllers. Only one of the five controllers had been certified within the past two years. None of the remaining four Controllers had a current Controller certification. The auditor learned that there has been no controller re-certification classes held since 1998. However, all five light rail controllers and four heavy rail controllers had current certifications in the respective light rail and heavy rail train operators' courses.

It was reported to the auditor that following the 1998 Triennial Safety Audit, the LACMTA controller annual re-certification requirement was changed to re-certification once every two years. It was reported to the auditor that annual controller re-certification would again be required by LACMTA. The auditor was not shown any formal document directing the modification of the re-certification requirement.

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The auditor reviewed the training, certification and re-certification lesson plans for controllers with the Division Instructor. Those lesson plans appear to be current and complete. The auditor found there was no control document establishing when training program reviews are required or how those programs would be updated or revised.

The auditor was shown copies of a training matrix for Controllers and a training matrix for Senior Rail Transit Operations Supervisors. The matrices establish who is to be trained, what training modules they should attend and how long each training module should last. However, each matrix is also an informal and uncontrolled document with no date, no revision number and no indication of the authorizing entity.

LACMTA 1998 Triennial Audit recommendation 9 states that: The lesson plans for refresher training and other courses currently under development for rail operations controllers should be completed and put into use on an expedited basis. It also states that, consideration should be given to requiring the Rail Operations Safety Department to review and provide input to these lesson plans before they are issued for use. The auditor did not have the opportunity to confirm that LACMTA 1998 Triennial Audit recommendation 9 has been satisfied. However, training plans are included in LACMTA's configuration management program and any modification to the plans should be subject to agency's change control procedures.

Recommendations:

1. LACMTA should provide a report to the Commission staff explaining why Controllers have not been re-certified since 1998 as required by Commission General Order 143-B. The report should include the corrective action plans and schedules that LACMTA will promptly implement to comply with General Order 143-B, Section 13.03.

2. LACMTA should adopt and implement the Training Matrix or a similar document for controllers and senior transit operations supervisors as a formal, controlled program element to specify the operations training and certification requirements for those employee classifications and to prevent arbitrary and unilateral training program changes.

3. LACMTA should develop, adopt, and implement a formal procedure for the periodic review and updating of the controller and senior transit operations supervisor training and certification programs, including appropriate change controls.

CPUC SYSTEM SAFETY AUDIT CHECKLIST FOR THE
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

Checklist No.	**10**	Persons Contacted
Date of Audit	**July 10, 2001**	Hector Guerrero – Central Controls Facilities Manager
Auditors	**Audrey Ong** **Anton Garabetian** **Gary Rosenthal**	
Department	**Rail Operations Control**	

REFERENCE CRITERIA

1) System Safety Program Plan - Operations, Rev. 2, dated 11-25-98, Sect 2.4.1.1 Rail Facilities
2) Light Rail Operations Rule Book, undated
3) Standard Operating Procedures, Metro Blue Line, Los Angeles/Long Beach Light Rail System
4) Standard Operating Procedures, Metro Green Line, Norwalk/Redondo Beach Light Rail System
5) Light Rail – Rail Operations Bulletins
6) Light Rail – Rail Operations Procedure Notices, Special Notices, and General Notices
7) Central Control Facility Light Rail Standard Operating Procedures, effective 10-01-96

- Is the SSPP available for reference by employees in this department? Yes

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

BLUE LINE & GREEN LINE RAIL OPERATIONS CONTROLLERS ACTIVITIES

Audit the safety related duties and responsibilities of LACMTA personnel assigned to the ROC to determine whether or not they are being properly performed by a combination of the following:

- First hand observations for a minimum of two hours
- One on one interviews with randomly selected Light Rail ROC employees
- Review a random sample of forms, cards, recorded voice tapes, computer files and other documentation prepared during the past six months

A list of specific items to be included in the audit follows:

- Rail Controllers are responsible for maintaining and having their SOPs available while in the performance of duties. Complete knowledge and strict compliance with all SOPs shall be required of all Control Center personnel. (CCF SOP 101.1)
- Unusual Occurrence Reports and the Open Incidents Log for the past six months
- ATP By-Pass activities documented in the ATP By-Pass Log (CCF SOP 103.4 & 104.6)
- Manual Block System Clearance Log (CCF SOP 104.13)
- Wayside Restriction Orders (CCF SOP 104.20)
- Clearance Cards (CCF SOP 104.21)
- Communications with Union Pacific for at the Amoco Line Train Movements. (CCF SOP 107.1)

Determine whether or not the LACMTA 1998 Triennial Audit recommendations 3 and 5 have been satisfied and are currently being implemented.

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RESULTS/COMMENTS

The auditors made observations and interviews with the on-duty Metro Blue Line and Metro Green Line Controllers. This involved asking various questions and presenting scenarios. Each Controller gave an appropriate response as required by the applicable rules and procedures. The LACMTA Controllers presented Rulebooks and SOPs upon the auditors' request.

The auditor reviewed all of the above listed specific items for the past six months. She found discrepancies with the log of clearance cards. Seven clearance cards were found without the issuance of a "Read Back Time". The Rail Operations Control SOP 104.17: Issuance of a Read Back Time and Controller Call Sign authorizes the affected train to proceed. All other logs reviewed were current and properly maintained as required by the Standard Operating Procedures.

In a discussion with the manager regarding this discrepancy, he agreed that the clearance cards were not properly filled out and that this is one area that needs to be corrected. He was unsure whether the clearance cards should have been voided or the read-back time is missing. The Manager suggested a solution by having the Senior on-duty sign off on the log and to verify whether the Controller meant to void the clearance card or violated the SOP.

The auditor requested the multiple channel audio tape recordings of two accidents. Both accidents involved fatalities on the Blue Line in the past six months. In only one of the two tapes reviewed, did the Controller perform according to appropriate rules and SOPs while exercising sound judgment in addressing the incident.

The manager explained that as a follow-up to the LACMTA 1998 Triennial Audit, a new machine is currently in use as a back-up system to the Magnasync. The Dictaphone Freedom recorder provides a digital multiple channel communications recording that can be downloaded for review. This machine has been in place since March 2000. It is currently being used as the back-up system and is being tested for its reliability and capability. A training session is necessary to instruct the senior management personnel on the use of the Dictaphone recorder, however, the auditors were told that the ROC is short staffed with only two instructors and this training is not possible at this time. The forecast is November 2001 for the Dictaphone recorder to be fully on-line.

LACMTA 1998 Triennial Audit Recommendation 3: "Rail Operations Bulletins should be issued in a size and format to facilitate insertion in the Train Operator's individual rule books." This recommendation has been satisfied and is currently being implemented.

LACMTA 1998 Triennial Audit Recommendation 5: "The existing program of operations performance evaluations should be expanded and strengthened to ensure that employees: (a) have up to date rule books and other required equipment in their possessions while on duty, (b) are familiar with and have a correct understanding of the latest rule changes and newly issued bulletins, notices and procedures and (c) communicate information to the Rail Operation's Control Center in strict conformance with the rules and procedures." The program of operational evaluations has not been expanded or strengthened. LACMTA has drafted comprehensive programs of operational evaluations for train operators and controllers. Unfortunately, those programs have not been completed, adopted and implemented.

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Recommendations:

1. LACMTA should establish and implement a training course for the use of the new Dictaphone, multiple-channel communications digital recorder, for all senior management personnel.

2. LACMTA should comply with 1998 Triennial Audit Recommendation 5 by completing the draft programs of operational evaluations, adopting those programs and implementing them.

CPUC SYSTEM SAFETY AUDIT CHECKLIST FOR THE
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

Checklist No.	**11**	Persons Contacted
Date of Audit	**July 10, 2001**	Hector Guerrero – Central Controls Facilities Manager
Auditors	**Audrey Ong** **Anton Garabetian**	
Department	**Rail Operations Control**	

REFERENCE CRITERIA

1) System Safety Program Plan - Operations, Rev. 2, dated 11-25-98, Sect 2.4.1.1 Rail Facilities
2) Heavy Rail Operations Rule Book, undated
3) Heavy Rail Standard Operating Procedures, effective 2-1-98
4) Heavy Rail - Rail Operations Bulletins
5) Heavy Rail - Rail Operations Procedure Notices, Special Notices, and General Notices
6) Central Control Facility Heavy Rail Standard Operating Procedures, effective 2/01/97

- Is the SSPP available for reference by employees in this department? Yes

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

RED LINE RAIL OPERATIONS CONTROLLERS ACTIVITIES

Audit the safety related duties and responsibilities of LACMTA personnel assigned to the ROC to determine whether or not they are being properly performed by a combination of the following:

- First hand observations for a minimum of two hours
- One on one interviews with randomly selected Heavy Rail ROC employees
- Review a random sample of forms, cards, recorded voice tapes, computer files and other documentation prepared during the past six months

A list of specific items to be included in the audit follows:

- Rail Controllers are responsible for maintaining and having their SOPs available while in the performance of duties. Complete knowledge and strict compliance of all SOPs shall be required by all Control Center personnel. (CCF SOP 101.1)
- Unusual Occurrence Reports and the Open Incidents Log for the past six months
- Manual Block System Clearance Log (CCF SOP 104.13)
- Wayside Restriction Orders (CCF SOP 104.19)
- Clearance Cards (CCF SOP 104.20)

Determine whether or not the LACMTA 1998 Triennial Audit recommendations 4, 10 and 11 have been satisfied and are currently being implemented.

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RESULTS/COMMENTS

Observations and interviews conducted with the on-duty Metro Red Line Controllers involved the auditor asking various questions and presenting scenarios. Each Controller gave an appropriate response as required by the applicable rules and procedures. Rulebooks and SOPs were presented upon the auditors' request.

Findings:

1. All of the above listed specific items that were reviewed for the past six months were current and properly maintained as required by the Standard Operating Procedures.

2. LACMTA 1998 Triennial Audit Recommendation 10: The governing procedures for the preparation and distribution of Unusual Occurrence Reports should be revised and strengthened to assure that the Rail Operations Safety Department and others with a need to know receive copies of these reports in a timely manner. This recommendation has been satisfied and is currently being implemented.

3. LACMTA 1998 Triennial Audit Recommendation 11: The Controller's 40 channel tape recorder should be checked out to see if its performance can be improved. In addition, consideration should be given to creating a special log to record the date and time of failures, broken tapes, and tape changes. The LACMTA has chosen to use a new machine. See Checklist No. 10.

4. The SSPP is available for reference by employees; however, the employees are unaware of its purpose and have not read the plan.

No Exceptions were noted.

CPUC SYSTEM SAFETY AUDIT CHECKLIST FOR THE
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

Checklist No.	**12**	Persons Contacted
Date of Audit	**June 19, 2001**	Anton Andersen - Configuration Manager, Systems Engineering John Anaya - Senior Systems Configuration Analyst Facilities Engineering - Construction Vijay Khawani -Director, Rail Operations Safety Office of System Safety & Security
Auditors	**Erik Juul** **Mahendra Patel**	
Department	**System Engineering**	

REFERENCE CRITERIA

1) System Safety Program Plan – Operations, Rev. 2, dated 11-25-98, Sect 4.1.4 Configuration Control Center (CCC)
2) LACMTA Rail Configuration Plan, dated 2-12-01

- Is the SSPP available for reference by employees in this department? Yes

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

CONFIGURATION CHANGE CONTROL

Select a sample of three Change Orders completed or substantially completed during the past year and review the associated configuration change records and drawings to determine whether or not:

1. The required change approval process was correctly implemented.

2. The affected operations and maintenance procedures and training programs were revised to incorporate the changes.

3. The changes were recorded on as-built drawings.

4. The changes were reviewed and accepted by the Operations Safety Dept.

Determine whether or not the LACMTA 1998 Triennial Audit recommendation 12 has been satisfied and is currently being implemented.

RESULTS/COMMENTS

The Configuration Manager gave the Auditors an overview of the configuration control program, including the reorganization and resource allocation of the Rail Configuration Management program since the 1998 Audit. In response to Recommendation 12 of the 1998 Audit, which called for a re-evaluation of the LACMTA's Configuration Management activities and the preparation of a comprehensive corrective action plan, the Configuration Manager has developed the Rail Configuration Plan that was approved by LACMTA Management on February 12, 2001.

The Configuration Manager and the Senior Analyst have made significant progress since the 1998 audit, specifically with the development, approval, and implementation of the Rail Configuration Plan.

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Section 4.1.4 of the System Safety Program Plan (SSPP) needs to be updated to reflect the new Rail Configuration Plan and current Configuration Management process. The Configuration Manager reported that he has drafted proposed changes to the SSPP to reflect the new Plan. The Configuration Manager also reported that, due to the reorganization, some of the committees relating to Configuration Management, as described in Section 4 of the Systems Safety Program Plan, do not reflect the current committee structures.

LACMTA Rail Configuration Plan dated February 12, 2001, Section 1.2 states, "This Rail Configuration Plan applies to all organizational units affecting, or affected by, the LACMTA rail system throughout operations and maintenance phases. It includes all documentation deemed necessary for maintenance and operation of the rail system and all changes to the documentation, physical plant and systems necessary to that system. ..." The configuration Manager reported that not all the departments submit the required documents on a consistent and timely basis.

The Senior Analyst states that he is reviewing all of the change orders from the beginning of the LACMTA system. He is putting these change orders through the requirements of the current Rail Configuration Plan.

Two change orders have been initiated since the Rail Configuration Plan was approved. The first change order is to renumber the stairs and emergency exits on the Red Line. The second change order is the installation of a boom microphone for the Blue Line operators to replace the existing communication equipment. Both of these change orders are currently under review by the members of the System Modification Review Committee (SMRC), formerly known as the Change Review Committee (CRC). The Auditors found that these two change orders are being processed according to the Rail Configuration Plan.

Configuration Management is an important element of the System Safety Program Plan. The American Public Transportation Association (APTA) Manual for the Development of Rail Transit System Safety Program Plans states, "*Configuration Management is a process which ensures, as much as possible, that all property, equipment, systems design elements, etc., are documented as to configuration, accurately and completely. Any changes to an individual subsystem, or a fleet/inventory wide change must be recorded on as-built drawings in a timely and effective manner. The Configuration Management process must include, as a minimum, procedures for authority to make configuration changes, the process for incorporating these changes into all appropriate documentation, and the process for ensuring that all necessary units, including System Safety, are formally made aware of such changes. …*

Configuration Management is much more involved and time-consuming during the design and procurement stages of a transit system life cycle. At that time, tracking of design changes, verification of as-built drawings, and maintenance of the process subsequent to delivery are much more involved processes. However, once the process gets out of control, it is extremely difficult and costly to catch up. It can also produce significant safety hazards, as future changes to the system or individual subsystems could have unknown results. Since most transit systems never get out of the procurement stage of their life cycle, it is important to keep the Configuration Management process under control."

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Findings:

1. The System Safety Program Plan has not been revised to reflect the new Rail Configuration Plan and the current committee structures.

2. Not all the departments submit the required documents on a consistent and timely basis.

Recommendations:

1. LACMTA should revise the System Safety Program Plan to reflect the new Rail Configuration Plan and the current committee structures.

2. LACMTA should ensure that all Departments follow all the requirements of the Rail Configuration Plan, including the timely submittal of the required documents.

CPUC SYSTEM SAFETY AUDIT CHECKLIST FOR THE
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

Checklist No.	**13**	Persons Contacted
Date of Audit	**June 19, 2001**	Albert Nijland – Supervising Engineer, Engineering Dept Vijay Khawani - Director, Rail Operations Safety Office of System Safety & Security
Auditors	**Erik Juul** **Mahendra Patel** **Audrey Ong**	
Department	**Rail Operations Support**	

REFERENCE CRITERIA

1) System Safety Program Plan – Operations, Rev. 2, dated 11-25-98, Sect 4.1.4 Configuration Control Center (CCC)
2) LACMTA Rail Configuration Plan, dated 2-12-01

- Is the SSPP available for reference by employees in this department? Yes

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

CONCRETE INSPECTION - ANNUALLY

Review a randomly selected sample of LACMTA's Concrete Inspection reports prepared during the past 2 years for three separate concrete structures (one for each of the 3 rail lines) to determine whether or not:

1. The required inspections were performed by the Rail Operations and Support Group and documented on the appropriate form.

2. Noted defects were corrected in a timely manner.

Determine whether or not the LACMTA 1998 Triennial Audit recommendation 17 has been satisfied and is currently being implemented.

RESULTS/COMMENTS

The Director reported to the Auditors that the reference criteria do not address the Concrete Inspection element and the correct reference criteria should be the LACMTA Track Maintenance Plan for All Rail Lines. The Director acknowledged that the correct reference criteria should have been identified by LACMTA during the 30-day checklist review period. The Director reported that LACMTA has not performed the required concrete inspections because of a lack of budget and staffing. The triennial audit conducted in 1998 previously revealed that no concrete inspections had been performed.

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In response to Recommendation 17 of the 1998 Audit that called for a controlled scheduling program for specified frequencies for preventive maintenance, testing and inspection including inspection of concrete structures, the supervising engineer has developed a plan (Los Angeles Metro Rail Existing Structures Evaluation and Inspection Manual) to implement the program.

Finding:

1. LACMTA did not implement Recommendation 17 of the 1998 Triennial Audit and has not performed the required concrete inspections.

Recommendation:

1. LACMTA should establish a program to perform the required concrete inspections.

CPUC SYSTEM SAFETY AUDIT CHECKLIST FOR THE
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

Checklist No.	**14**	Persons Contacted
Date of Audit	**June 20, 2001**	Security & Law Enforcement Policy Department Daniel Cowden - Director of Security Dennis Flowers, Jr. - Systems Security Manager John Davis - Transit Security Sergeant Arthur Grant - Senior Security Officer Richard Beardslee - Lieutenant, Training & Records Vijay Khawani – Director, Rail Operations Safety Office of System Safety & Security
Auditors	**Erik Juul** **Mahendra Patel**	
Department	**Security**	

REFERENCE CRITERIA

LACMTA System Security Program Plan, dated 7-22-98

- Is the SSPP available for reference by employees in this department? Yes

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

SECURITY

Through a combination of interviews with the assigned staff as well as by procedure reviews and record checks, for the past three years, determine whether or not:

1. All new hires are given a basic LACMTA training outline and new employees orientation. Pg 42
2. All newly hired Security Officers receive the three phases of training during the one year probation period. Pg 43
3. Weekly staff meetings are held by the Director of Security and Law Enforcement Policy. Review meeting minutes or periodic reports provided by managers. Pg 67
4. Review the Law Enforcement Program Reports and assure that resolution of Identified Threats and Vulnerabilities are made. Pg 88 –89
5. Review the findings of the last progress review by Administration. Pg 90

RESULTS/COMMENTS

The Director gave the Auditors an overview of the LACMTA System Security Program.

The Director presented the Auditors with a binder titled “System Security Program Plan”, dated January 1999. The Director stated that the January 1999 version was identical to the July 22, 1998 version except for minor changes. This January 1999 version of the Security Plan was never submitted to and approved by the Commission staff as required by Section 3.3 of General Order 164-B.

All checklists were circulated to the appropriate departments for their review 30 days prior to the week of the audit. No notification was made to the Commission staff that LACMTA had prepared a draft revision of the System Security Program Plan. The Auditors conducted this audit pursuant to the July 22, 1998 version of the System Security Program Plan.

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Item 1: The Auditors reviewed the basic LACMTA training outline and new employees orientation. This item was found to be satisfactory.

Item 2: The Auditors reviewed the training plans for Security Officers. During the discussion, the Lieutenant of Training and Records told the Auditors that certain items in the Training section (pages 42-44) of the Security Plan did not reflect what the Security Department was actually doing. For example, the section on Firearms Permits is outdated. In addition, the list of training manuals is outdated.

Item 3: The Auditors reviewed the minutes of recent weekly staff meetings held by the Director of Security and Law Enforcement Policy. This item was found to be satisfactory.

Item 4: The Auditors reviewed the Law Enforcement Program Report for the months of February 2001, March 2001, and April 2001. The resolution of Identified Threats and Vulnerabilities were made. This item was found to be satisfactory.

Item 5: The Auditors reviewed the findings of the last progress review by Administration, including the LACMTA Management Action Plan issued at the end of March 2001. This item was found to be satisfactory.

The Auditors found that the System Security Program Plan does not contain a page showing all the appropriate approval signatures.

Finding:

1. A draft revision of the System Security Program Plan was presented to the Auditors at the time of the audit. However, the Commission staff has not approved this draft revision.

Recommendation:

1. LACMTA should review and revise the System Security Program Plan to reflect the existing work practices, including the section on the firearm permits and the list of training manuals. The plan should have a page showing all the appropriate approval signatures with dates. LACMTA should also update and submit the plan to the Commission staff for review and approval.

CPUC SYSTEM SAFETY AUDIT CHECKLIST FOR THE
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

Checklist No.	**15**	Persons Contacted
Date of Audit	**June 19&21, 2001**	Vijay Khawani – Director, Rail Operations Safety Office of System Safety and Security Abdul Zohbi - Manager of System Safety Office of System Safety and Security Ronald Regenor – Safety Specialist, Rail Operations Safety Office of System Safety and Security
Auditors	**Erik Juul Mahendra Patel Audrey Ong**	
Department	**System Safety**	

REFERENCE CRITERIA

1) CPUC General Order 164-B, Sections 5 and 6, dated 12/2/99
2) System Safety Program Plan - Operations, Rev. 2, dated 11-25-98, Section 3.2.16 Accident Investigation
3) LACMTA Rail Accident Investigation Procedures, 9-2-00
4) Code of Federal Regulations CFR 49 Part 659.41 Investigations And Part 659.43 Corrective Actions

- Is the SSPP available for reference by employees in this department? Yes

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

ACCIDENT/INCIDENT REPORTING & INVESTIGATION

Randomly select 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 LACMTA for the selected accidents to determine whether or not:

1. The selected accidents were reported to the CPUC by telephone or FAX within 4-hours, and by written report within 30-days from the last day of the month during which the accidents occurred.
2. An accident investigation report was prepared that identifies:
   a) each item investigated
   b) the investigation findings
   c) the most probable cause
   d) underlying contributing causes
3. The accompanying corrective action plan properly addresses the identified causes and can be expected to minimize the accident from recurring.
4. The implementation schedule has been completed or is up-to-date.

Determine whether or not the LACMTA 1998 Triennial Audit recommendation 14 has been satisfied and is currently being implemented.

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RESULTS/COMMENTS

The Auditors asked the Contacts for a list of reportable accidents involving injuries or fatalities reported to the CPUC during the past 12 months. The Auditors selected three accidents that involved injuries. These three accidents are:

1. Pedestrian, Fatality, Blue Line, Washington and Griffith, April 22, 2001.
2. Left Turn, Injury, Blue Line, Flower, between Pico and Venice, July 18, 2000.
3. Left Turn, Injury, Blue Line, Washington and Olive, May 26, 2000.

The Auditors reviewed monthly folders that contain those accident forms (Form T and Form V) that are required to be submitted to the CPUC on a monthly basis. The Auditors also reviewed separate folders that contain investigative reports such as Rail Transit Operators Supervisors (RTOS) reports and police reports. Rail Operations Safety does not maintain a single folder for each accident that contains all of the reports and forms that relate to that accident. Rail Operations Safety staff only writes an independent report for an accident investigation as required by G.O. 164-B.

The Auditors reviewed the LACMTA Accident Investigation Procedures (AIP), issued on September 29, 2000 and interviewed the Rail Operations Safety staff to determine if they are adhering to requirements of the LACMTA AIP.

Section 3.2.2 of the LACMTA AIP states, “Upon being notified of an accident, the Rail Operations Safety representative will respond and report to the On-Scene Coordinator.” System Safety staff does not respond to all accidents. In fact, Rail Operations Safety staff could recall responding to only three accidents in the past 12 months. Rail Operations Safety staff did not respond to the scenes of two of the three selected accidents.

Section 3.2.3 of the LACMTA AIP states, “The Rail Operations Safety representative is responsible for coordinating Safety activities at the accident scene and assisting the On-Scene Coordinator in recovery of service.” The Auditors find that it is difficult to be responsible for coordinating Safety activities at the accident scene, if the Rail Operations Safety representative does not respond to all accidents. Since they did not respond to the scenes of the two of the three selected accidents, Rail Operations Safety could not coordinate Safety activities at two of the three accident scenes and could not assist the On-Scene Coordinator.

Section 3.2.4 of the LACMTA AIP states, in part, “The Rail Operations Safety Department shall be responsible for providing the CPUC staff an opportunity to participate to the fullest extent possible in all aspects of the investigation. This includes advance notification of any interviews, inspections, examinations and meetings with investigators, consultants, review boards, etc. to review, analyze and draw conclusions regarding accident related information.” After discussions with the Rail Operations Safety, it is clear to the Auditors that the Rail Operations Safety Department does not provide the Commission staff an opportunity to participate to the fullest extent possible in all aspects of accident investigations. This includes advance notification of the accident investigation activities listed in Section 3.2.4 of the LACMTA AIP. For the three selected accidents, Rail Operations Safety did not provide the Commission staff an opportunity to participate to the fullest extent possible in all aspects of the investigation. Specifically, Rail Operations Safety did not provide advanced notification of any interviews, inspections, examinations and meetings with investigators, consultants, review boards, etc. to review, analyze and draw conclusions regarding accident related information.

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As required by Section 3.2.5 of the LACMTA AIP, the Rail Operations Safety Department is responsible for follow-up activities that include a corrective action plan and a schedule to implement the recommendations. However, no direct verification by Operations Safety of actual implementation of the corrective action plan (such as operator will be given a check ride) exists. For the three selected accidents, Rail Operations Safety did not perform a direct verification of actual implementation of the corrective action plans. Specifically, there was no direct verification that the operator was given a ride check.

LACMTA 1998 Triennial Audit recommendation 14 required LACMTA to revise its procedures for investigating accidents to include a requirement that the designated CPUC representative be notified in advance of multi-department meetings convened to address major accidents involving injuries or fatalities. Rail Operations Safety staff stated that, since the implementation of the LACMTA AIP, no accident has warranted the convening of a multi-department meeting.

Subsequent to the audit, LACMTA advised the Commission staff that Section 3.2 of the Accident Investigation Procedures has been revised. Staff has reviewed LACMTA's revisions and finds them unacceptable and not in compliance with GO 164-B, Section 6.

Findings:

1. The Rail Operations Safety Department has not been providing the Commission staff an opportunity to participate to the fullest extent possible, including advance notification of the accident investigation activities listed in Section 3.2.4 of the LACMTA's Accident Investigation Procedures.

2. Accidents are not being investigated as outlined in the LACMTA's Accident Investigation Plan and as required by General Order 164-B, Section 6.

3. The corrective action plans, including check rides, have not been implemented on a timely basis and have not been documented.

Recommendations:

1. LACMTA should provide the Commission staff an opportunity to participate to the fullest extent possible, including advance notification of the accident investigation activities listed in Section 3.2.4 of the LACMTA's Accident Investigation Procedures.

2. LACMTA should adhere to the requirements of the LACMTA Accident Investigation Procedures.

3. LACMTA should ensure that corrective action plans, which include check rides, are implemented on a timely basis and documented. See also Checklist No. 5, Recommendation No. 7.

CPUC SYSTEM SAFETY AUDIT CHECKLIST FOR THE
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

Checklist No.	**16**	Persons Contacted
Date of Audit	**June 18, 2001**	Vijay Khawani – Director, Rail Operatins Safety Office of System Safety and Security
Auditors	**Erik Juul** **Mahendra Patel**	Abdul Zohbi – Manager of System Safety, Office of System Safety and Security
Department	**System Safety**	

REFERENCE CRITERIA

1) System Safety Program Plan - Operations, Rev. 2, dated 11-25-98, Section 3.2.1 Hazard Identification And Resolution And Appendix J, Report Of Unsafe Condition Or Hazard
2) APTA Manual For System Safety Program Plans, 8-20-91, Checklist Item 7 Hazard Identification/Resolution Process

- Is the SSPP available for reference by employees in this department? Yes

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

REPORTING OF HAZARDOUS CONDITIONS

Review the System Safety Department's file of completed Reports of Unsafe Condition or Hazard prepared during the past 12 months to determine whether or not:

1. Employees are encouraged to report unsafe conditions to their department management.
2. All LACMTA employees have been made aware of the program for reporting hazardous conditions and are using the reports accordingly.
3. Reported hazardous conditions have been properly investigated, evaluated, and are resolved in accordance with the requirements in paragraph 3.2.1 of the SSPP.

RESULTS/COMMENTS

The Auditors reviewed the System Safety Department's file of completed Reports of Unsafe Condition or Hazard.

Items 1 and 2: The Managers provided completed employee reports submitted on Form SAFE 7 titled, "Report of Unsafe Condition or Hazard". The Managers reported that employees are made aware of the program and encouraged to submit reports through various LACMTA methods including, distribution of the Form SAFE 7 to the various departments, posting on bulletin boards, tailboard meetings, and classroom training.

Item 3: The employee submits the form to her/his supervisor. If the supervisor cannot resolve the issue, the form is forwarded to the Hazard Resolution Committee (HRC) for evaluation. The HRC meets monthly. The Auditors reviewed the HRC meeting minutes and the HRC Open Action Item Matrix. The Auditors found that the forms are being properly investigated, evaluated, and resolved.

No exceptions were noted.

CPUC SYSTEM SAFETY AUDIT CHECKLIST FOR THE
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

Checklist No.	**17**	Persons Contacted
Date of Audit	**June 18&21, 2001**	Vijay Khawani – Director, Rail Operations Safety Office of System Safety and Security Abdul Zohbi - Manager of System Safety, Office of System Safety and Security Ronald Regenor – Safety Specialist, Rail Operations Safety Office of System Safety and Security
Auditors	**Erik Juul** **Mahendra Patel**	
Department	**System Safety**	

REFERENCE CRITERIA

1) System Safety Program Plan - Operations, Rev. 2, dated 11-25-98. Sect 3.2.11 Safety Data Acquisition Analysis, 4.2.11 Safety Data Acquisition/Analysis, 6.8 Safety Information & Reporting
2) LACMTA Report: Operations Safety Management Statistics

- Is the SSPP available for reference by employees in this department? Yes

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

SAFETY DATA ACQUISITION/ANALYSIS

Through a combination of interviews with Safety Department Personnel, procedure reviews, and documentation checks, for the past three years for the Blue Line system, determine whether or not:

1. Safety related data is collected and analyzed.
2. Trend analysis is performed as a means of identifying causes of accidents and occupational injuries.
3. Analysis addresses roadway/track conditions, equipment type, procedures, human factors, environmental conditions, and other factors.
4. A formal link has been established between the Safety Data Acquisition/Analysis function and Hazard Identification and Resolution Program.
5. Exposure trends and recommendations are reported to LACMTA management.

Determine whether or not the LACMTA 1998 Triennial Audit recommendations 16 have been satisfied and are currently being implemented.

RESULTS/COMMENTS

Item 1: The Manager provided a copy of a document titled, “Summary of Metro Blue Line Train/Vehicle and Train/Pedestrian Accidents (7/90 – 12/00)”, dated February 13, 2001. This document is a quarterly report, produced by the LACMTA Risk Management Department. This document reports safety related accident data from July 1990 to present day. In addition, System Safety collects safety related data, including Daily Logs from Rail Operation Control (ROC), Unusual Occurrence Reports from ROC, and Occupational Injury Reports from Risk Management. The Auditors reviewed samples of each of these reports.

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Item 2: The Managers report that System Safety analyzes the data in the reports noted in Item 1 above. When System Safety identifies a safety-related trend, they prepare a report with recommendations. The Auditors reviewed samples of these reports.

Item 3: The Managers report that they analyze all of the factors listed in Item 3 of this checklist. The auditors reviewed samples of these factors in the reports.

Item 4: The Managers report that they have not established a formal link between the Safety Data Acquisition/Analysis function and Hazard Identification and Resolution Program.

Item 5: The Managers stated that they report exposure trends and recommendations to LACMTA management through Board Reports and memoranda. The auditors confirmed this by reviewing samples of these Board Reports and memoranda.

With respect to the LACMTA 1998 Triennial Audit recommendation 16, the Managers report that System Safety does work with Risk Management to conduct periodic review and analysis of statistical accident data to identify and correct any apparent negative trends. However, no procedures have been established between System Safety and Risk Management.

Finding:

1. No formal link has been established between the Safety Data Acquisition/Analysis function and Hazard Identification and resolution Program. No procedures have been established between the System Safety Department and the Risk Management Department.

Recommendation:

1. LACMTA should comply with 1998 Triennial audit recommendation 16: An appropriate program and procedure to cover the periodic review and analysis of statistical accident data to identify and correct any apparent negative trends should be prepared and put into use.

CPUC SYSTEM SAFETY AUDIT CHECKLIST FOR THE
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Checklist No.	**18**	Persons Contacted
Date of Audit	**June 20, 2001**	Thomas Eng – Manager, Safety Certification, Office of System Safety & Security
Auditors	**Erik Juul** **Mahendra Patel**	
Department	**System Safety**	

REFERENCE CRITERIA

LACMTA Safety Certification Plan For Construction, 9/97, Par. 3.7 Objective 9 Safety Certification Overview And Procedures.

- Is the SSPP available for reference by employees in this department? Yes

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

VEHICLE SAFETY CERTIFICATION

Review the System Safety Department's file of vehicle safety certification records for the P2000 vehicles to determine whether or not:

1. A Vehicle Criteria Conformance Checklist was developed and signed and the supporting documentation is available.
2. A Vehicle Specification Conformance Checklist was developed and signed and the supporting documentation is available.
3. Integrated vehicle test was performed and properly documented, and a Test Conformance Certificate issued.
4. Certificate of Compliance has been issued and signed.
5. The required inspections were properly documented.
6. Noted defects were corrected in a timely manner.
7. Operator training specific to this vehicle has been completed.
8. Maintenance procedures have been developed with specific requirements for the 2000 vehicle.

RESULTS/COMMENTS

Item 1: Auditors reviewed "Design and Performance Criteria" for the P2000 vehicles, dated June 15, 1998. No deficiencies were noted.

Item 2: Auditors reviewed "Safety Certification Program Specification Conformance Checklist" for the P2000 vehicles, dated January 2000. The Manager presented Volume 1 of 5 of "Safety Certification Analysis" as supporting documentation. Auditors selected several items in the Checklist and were able to track them in the Safety Certification Analysis. The Manager did not provide Volumes 2, 3, 4, and 5 to the Auditors. The Manager stated that the volumes could be retrieved from the LACMTA consultant, LTK, for the procurement of the P2000 vehicles.

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Item 3: The Manager reported that integrated vehicle tests were not in his P2000 Vehicle Safety Certification Plan. The Manager stated that these tests were conducted by the Train Control Manager in Systems Engineering. The Manager did not provide the Auditors the documentation for integrated vehicle tests or the Test Conformance Certificate.

Item 4: The Manager stated that two certificates of compliance exist for the P2000 vehicle project. The Auditors reviewed the first certificate, titled "Criteria Conformance Certificate, and found it to be acceptable. The Manager did not provide the second certificate, titled "Specification Conformance Certificate" to the Auditors.

Item 5: The Manager reported that the required inspections (witness points and record reviews) were the responsibility of three other entities, LTK, LACMTA Quality Assurance Department, and LACMTA Engineering Department. The Manager did not provide the inspection documentation to the Auditors.

Item 6: The Manager could not demonstrate to the Auditors that noted defects were corrected.

Item 7: The Manager showed the Auditors an email, dated April 6, 2001; from the LACMTA Training Department indicating operator training for the P2000 vehicle had been completed. The Manager did not provide documentation that the appropriate training had been conducted, including lesson plans, lists of required students, and schedules for training.

Item 8: The Manager reported that maintenance procedures have been developed but were not part of his P2000 Vehicle Safety Certification Plan.

LACMTA did not comply with its own Safety Certification Plan. The Auditors pointed out that the safety certification oversight would be more efficient if all of the elements of Section 9 were centralized in the project's safety certification plan. The Manager agreed to include all of the elements of Section 9 in the safety certification plans of all future procurement projects.

The Auditors asked when the missing documentation noted above would be available to the Auditors. The Manager indicated that most of the documentation was stored in the offices of LTK, the LACMTA consultant for the procurement of the P2000 vehicles, and that the documentation probably could not be retrieved during the audit week.

Finding:

1. LACMTA has not been following its own requirements as identified in the Safety Certification Plan for Construction for all projects including procurement projects. Specifically, LACMTA did not follow its own requirements as identified in Section 9 of the Safety Certification Plan for Construction for the P2000 Vehicle Safety Certification Plan.

Recommendations:

1. LACMTA should provide the Commission staff the Final P2000 Vehicle Safety Certification as required by LACMTA’s Safety Certification Plan for Construction.

2. LACMTA should comply with their own requirements as identified in the Safety Certification Plan for Construction for all projects including procurement projects.

CPUC SYSTEM SAFETY AUDIT CHECKLIST FOR THE
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

Checklist No.	**19**	Persons Contacted
Date of Audit	**June 18, 2001**	Vijay Khawani – Director, Rail Operations Safety Office of System Safety and Security Abdul Zohbi – Manager of System Safety, Office of System Safety and Security
Auditors	**Erik Juul** **Mahendra Patel**	
Department	**System Safety**	

REFERENCE CRITERIA

1) System Safety Program Plan – Operations, Rev. 2, dated 11-25-98, Sect 5.3 Internal Safety/Operational Audits
2) CPUC General Order 164-B, Section 4 – Internal Safety Audit Requirements, dated 12-2-99

- Is the SSPP available for reference by employees in this department? Yes

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

INTERNAL SAFETY AUDIT PROGRAM

Review the status of the current LACMTA internal safety audit program to determine whether or not:

1. Planned and scheduled internal safety audits have been performed annually by LACMTA to evaluate compliance and measure the effectiveness of its system safety program plan.
2. All of the organizational elements described in the Internal Safety Audit Process section of the APTA Guidelines have been included in the scope of the activities to be audited by LACMTA. The APTA Guidelines include the following elements:

- Facilities Inspections
- Maintenance Audits/ Inspections
- Rules/ Procedures Review
- Training and Certification Review/ Audit
- Emergency Response Planning, Coordination, Training
- System Modification Review and Approval Process
- Safety Data Acquisition/ Analysis
- Interdepartmental/ Interagency Coordination
- Configuration Management
- Employee Safety Program
- Hazardous Materials Programs
- Drug and Alcohol Abuse Programs
- Contractor Safety Coordination
- Procurement
- Security

3. The total scope of the APTA Guidelines has been completely covered by the internal safety audits within a 3-year period, and the 3-year period thereafter.
4. LACMTA has prepared a schedule of internal safety audits to be performed during each calendar year. This schedule, including any subsequent changes, has been submitted to the Commission staff before any of the scheduled audits are begun.

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Each internal safety audit has been documented in an annual report that covers the audits performed during each calendar year. The annual report has stated the results of each audit in terms of the adequacy and effectiveness of the system safety program plan. The annual report for the internal safety audits performed during the preceding year has been submitted to the Commission staff prior to the 15th of February each year.

RESULTS/COMMENTS

Item 1: The Auditors reviewed the internal safety audit reports for the years 1998, 1999, and 2000. The audits have been planned, scheduled and have been performed annually.

Items 2 and 3: All of the APTA elements have been audited, except for Security, during the first three-year cycle, 1998, 1999, and 2000. Section 5.3.3 of the SSPP (Reference Criteria 1) does not include the element of Security. System Safety will conduct its second three-year cycle during 2001- 2003.

Item 4: System Safety has prepared a schedule of internal safety audits to be performed during each calendar year. This schedule, including any subsequent changes, has been submitted to the Commission staff before any of the scheduled audits are begun. System Safety has complied with the requirements of filing the annual reports to the Commission staff.

Finding:

1. The APTA Security element was not included in the LACMTA Internal Safety Audit Program.

Recommendation:

1. LACMTA should include the APTA Security element in the Internal Safety Audit Program and System Safety should conduct an internal safety audit for Security during its current 3-year cycle of 2001-2003.

CPUC SYSTEM SAFETY AUDIT CHECKLIST FOR THE
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

Checklist No.	**20**	Persons Contacted
Date of Audit	**June 20, 2001**	Louis Campos - Rail Facilities Maintenance Supervisor (Loc 34) Dan Lindstrom - Rail Communications Supervisor (Location 61) Kent Chow - Rail Communications Inspector (Location 61)
Auditors	**Raed Dwairi**	
Department	**Facilities Maintenance**	

REFERENCE CRITERIA

1) California Administrative Code, Title 19
2) Communications Quarterly Inspection And Maintenance Report - Metro Red Line, undated
3) National Fire Protection Association (NFPA), dated 1992
   - Sect. 25, Chapter 2, Sprinklers, Subsection 2-3.1.1
   - Sect. 25, Chapter 3, Flow Tests, Subsection 3-3.1.1
   - Sect. 25, Chapter 9, Preaction / Deluge Valve, Subsection 9-4.3.2.1
   - Sect. 72, Chapter 7, Station Fire Alarms, Subsection
4) Regulation 4 Test Document (LAFD City Code)
5) System Safety Program Plan - Operations, Rev 2, dated 11-25-98, Sect. 3.2.7, Facility And Equipment Inspections

- Is the SSPP available for reference by employees in this department? Yes

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

BLUE LINE INSPECTIONS

Select Inspection reports for the following equipment for 7th St/Metro Center Station and 2 other Blue Line stations prepared during the past 3 years:

7Th St/Metro Center Station
- Emergency Management Panel and Telephones
- Tunnel Inspection (quarterly)
- Undercar emergency sprinkler system (quarterly)

2 randomly selected Blue Line Stations
- Emergency Management Panel and Telephones
- Standpipes and Associated Pumps
- Station Maintenance

Determine whether or not:

1. The items were inspected and tested at the specified frequency as required by the reference criteria
2. The required inspections and tests were properly documented.
3. Noted defects were corrected in a timely manner

Determine whether or not the LACMTA 1998 Triennial Audit recommendation 17 has been satisfied and is currently being implemented.

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RESULTS/COMMENTS

At Location 34, via interview with the Rail Facilities Maintenance Supervisor and review of records, the following facts were determined:

- 7th Street / Metro Station is inspected as part of the Red Line (see checklist No. 22)
- Station Maintenance inspections are performed on a monthly basis.
- Review of the “Metro Red Line Station Inspection Sheet” showed that no documentation was found for the years 1998 & 1999.
- Year 2000 monthly inspections were not available for the months August & September.
- Year 2001 inspections were performed on the required monthly basis.
- All inspections, when performed, were properly documented.

In many cases, it was difficult to track the repair of the noted defects on the monthly inspection sheets. It was not possible to track the repair of about 60% of the noted defects. The Rail Facilities Maintenance Supervisor pointed out that about 10% of the above defects cannot be tracked to completion due to the absence of any system that documents the transmittal of these items to Traction Power and therefore he does not receive any feedback. The Rail Facilities Maintenance Supervisor stated that these repairs are conveyed to Traction Power verbally or through e-mail. He agreed that a better system needs to be developed to ensure that these defects are transmitted in writing and tracked to completion through appropriate means of documentation between his location (location 34) and that of Traction Power (location 61).

Subsequent to the audit, LACMTA advised the Commission staff that the Rail Facilities Maintenance Department (Location 34) has developed a controlled procedure and tracking mechanism to convey defects noted during their inspections and receive feedback from the Traction Power Department (Location 61) that is responsible for completing the noted defects. This procedure was submitted to Commission staff on August 20, 2001 as part of LACMTA's review and comment on the Preliminary Triennial Audit Report. It utilizes the Facilities Maintenance Information System (FMIS) Trouble Ticket Reports to tack to closure the repair of noted defects so they can be noted on the original inspection reports. LACMTA submitted copies of computer-generated Trouble Tickets (01070038, 01070040, 01070016, and 01070021 all dated 07/02/01), a computer-generated Trouble Ticket Report showing the "Open" status of the above trouble tickets, and a copy of an e-mail message which originated from the Facilities Maintenance Manager (location 34) to the Manager of Traction Power Department (Location 61) showing that the above outstanding Trouble Tickets are being tracked to completion between the two departments.

The auditor selected Grand Station of the Blue Line and examined the “Metro Blue Line Monthly Station Inspection Report” and determined the following:

- For 2001, all monthly inspections were regularly performed and properly documented.
- For 2000, all monthly inspections were performed except for the months of June and September (The Rail Facilities Maintenance Supervisor pointed out that there was a labor dispute with Union Rep. Employees in the month of September)

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- For 1999, The Rail Facilities Maintenance Supervisor stated that the opening of Segment 3 prevented the inspection of stations for the months of February, March, April, May, July, September, and December.
- Again, the noted defects were difficult to track or there was no documentation to suggest that they were ever corrected.

Next, the auditor selected the 9th Street Station on the Blue Line. Results/implications were almost identical to those of Grand Station on the Blue Line.

- The Rail Facilities Maintenance Supervisor told the auditor that Tunnel Inspection does not apply to the Blue Line (no tunnels).
- Standpipe inspections associated with Slauson, Firestone, Del Amo, and Fly-Over Bridge at Main Yard were performed by an outside contractor in May 1998 and are due again in 5 years (May 2003)

The auditor continued Checklist 20 at location 61 and interviewed the Rail Communications Supervisor and the Rail Communications Inspector and determined the following:

- For the 7th Street/Metro Station, the yearly required Undercar Deluge System inspections were performed for the years 1999, 2000, and 2001 as mandated by Regulation 4.
- Emergency Management Panel and Telephones were performed on the required quarterly basis, documented properly, and noted defects were corrected in a timely manner.
- Similar results were obtained upon the review of records pertaining to the arbitrarily selected Artesia & Florence Stations of the Blue Line.

LACMTA 1998 Triennial Audit Recommendation 17 states that, "*An engineering evaluation of the specified frequencies for preventive maintenance, inspection, and testing of material and equipment under the control of the Facilities Maintenance department should be conducted to determine whether or not changes, to more closely reflect actual practices, are justified*."

Based on the above, LACMTA Audit Recommendation 17 is partially closed out as Location 34 still needs to fulfill its responsibility toward performing station inspections per the required frequencies.

Recommendation:

1. LACMTA should develop a mechanism to ensure that all monthly station maintenance inspections are regularly performed by Location 34 personnel and, more importantly, ensure that the noted defects on the monthly inspection forms are closed out in a timely manner. Also, LACMTA should develop a system between Location 34 & 61 to ensure that the noted defects on the inspections performed by Location 34 Personnel that are to be corrected by Location 61 Traction Power personnel are properly transmitted and tracked to completion through appropriate means of documentation. The system developed should alert management when communication fails between the two locations.

CPUC SYSTEM SAFETY AUDIT CHECKLIST FOR THE
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

Checklist No.	**21**	Persons Contacted
Date of Audit	**June 20, 2001**	Louis Campos - Rail Facilities Maintenance Supervisor (Loc 34) Dan Lindstrom - Rail Communications Supervisor (Location 61) Kent Chow - Rail Communications Inspector (Location 61)
Auditors	**Raed Dwairi**	
Department	**Facilities Maintenance**	

REFERENCE CRITERIA

1) California Administrative Code, Title 19
2) Communications Quarterly Inspection And Maintenance Report - Metro Green Line, undated
3) National Fire Protection Association (NFPA) Sect. 25, Chapter 3, Flow Tests, Subsection 3-3.1.1, dated 1992
4) Regulation 4 Test Document (LAFD City Code)
5) System Safety Program Plan - Operations, Rev 2, dated 11-25-98, Sect. 3.2.7, Facility And Equipment Inspections

- Is the SSPP available for reference by employees in this department? Yes

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

GREEN LINE INSPECTIONS

Select Inspection reports for the following equipment for 3 Green Line stations prepared during the past 3 years:

- Emergency Management Panel and Telephones
- Standpipes and Associated Pumps (5 years)
- Station Maintenance

Determine whether or not:

1. The items were inspected and tested at the specified frequency as required by the reference criteria
2. The required inspections and tests were properly documented.
3. Noted defects were corrected in a timely manner

Determine whether or not the LACMTA 1998 Triennial Audit recommendation 17 has been satisfied and is currently being implemented.

RESULTS/COMMENTS

At Location 34, the auditor reviewed records for the Hawthorne and Long Beach Stations, and via interview with the Rail Facilities Maintenance Supervisor, the following facts were determined:

- Year 1999, only the January, June, August, and October monthly inspections sheets were found.

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- Year 2000, all inspections were performed on the required monthly basis and were properly documented.
- Year 2001, only inspection records for the months of January, February, and May were found for both stations.
- All inspections, when performed, were properly documented.
- In many cases, it was difficult to track the repair of the noted defects on the monthly inspection sheets.
- It was not possible to track the repair of a large percentage of the noted defects.
- Standpipe inspections were performed by an outside contractor in December 2000 (contractor's report of standpipe inspections was dated 1/8/01 and submitted to LACMTA).

At location 61, interviewed the Rail Communications Supervisor and the Rail Communications Inspector and determined the following:

- Emergency Management Panel and Telephone inspections were performed on the required quarterly basis, documented properly, and noted defects were corrected in a timely manner for all stations of the Green Line.
- The quality of work done by Rail Communications was impressive. No discrepancies were found.

Based on the above, LACMTA 1998 Triennial Audit Recommendation 17 is partially closed out as Location 34 still needs to fulfill its responsibility toward performing station inspections per the required frequencies.

Subsequent to the audit, LACMTA advised the Commission staff that the Rail Facilities Maintenance Department (Location 34) has developed a controlled procedure and tracking mechanism to convey defects noted during their inspections and receive feedback from the Traction Power Department (Location 61) that is responsible for completing the noted defects. This procedure was submitted to Commission staff on August 20, 2001 as part of LACMTA's review and comment on the Preliminary Triennial Audit Report. It utilizes the Facilities Maintenance Information System (FMIS) Trouble Ticket Reports to tack to closure the repair of noted defects so they can be noted on the original inspection reports. LACMTA submitted copies of computer-generated Trouble Tickets (01070038, 01070040, 01070016, and 01070021 all dated 07/02/01), a computer-generated Trouble Ticket Report showing the "Open" status of the above trouble tickets, and a copy of an e-mail message which originated from the Facilities Maintenance Manager (location 34) to the Manager of Traction Power Department (Location 61) showing that the above outstanding Trouble Tickets are being tracked to completion between the two departments.

Recommendation:

1. LACMTA should develop a mechanism to ensure that all monthly station maintenance inspections are regularly performed by Location 34 personnel and, more importantly, ensure that the noted defects on the monthly inspection forms are closed out in a timely manner. Also, LACMTA should develop a system between Location 34 & 61 to ensure that the noted defects on the inspections performed by Location 34 Personnel that are to be corrected by Location 61 Traction Power personnel are properly transmitted and tracked to completion through appropriate means of documentation. The system developed should alert management when communication fails between the two locations.

Note that the above recommendation is identical to that of Checklist No. 20.

CPUC SYSTEM SAFETY AUDIT CHECKLIST FOR THE
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

Checklist No.	**22**	Persons Contacted
Date of Audit	**June 20, 2001**	Louis Campos - Rail Facilities Maintenance Supervisor (Loc 34) Dan Lindstrom - Rail Communications Supervisor (Location 61) Kent Chow - Rail Communications Inspector (Location 61) Gary Felix - Facilities Maintenance Supervisor, Rail Communications (Location 61)
Auditors	**Raed Dwairi**	
Department	**Facilities Maintenance**	

REFERENCE CRITERIA

1) California Administrative Code, Title 19
2) Communications Quarterly Inspection And Maintenance Report - Metro Red Line, undated
3) National Fire Protection Association (NFPA), dated 1992
   - Sect. 25, Chapter 2, Sprinklers, Subsection 2-3.1.1
   - Sect. 25, Chapter 3, Flow Tests, Subsection 3-3.1.1
   - Sect. 25, Chapter 9, Preaction / Deluge Valve, Subsection 9-4.3.2.1
   - Sect. 72, Chapter 7, Station Fire Alarms, Subsection
4) Regulation 4 Test Document (LAFD City Code)
5) System Safety Program Plan - Operations, Rev 2, dated 11-25-98, Sect. 3.2.7, Facility And Equipment Inspections

- Is the SSPP available for reference by employees in this department? Yes

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

RED LINE INSPECTIONS

Select Inspection reports for the following equipment for 3 Red Line stations prepared during the past 3 years:

- Emergency Management Panel and Telephones
- Gas Analyzer Unit
- Standpipes and Associated Pumps (5 years)
- Station Fire Alarms and Sprinkler Systems
- Station Maintenance
- Tunnel Inspection (quarterly)
- Undercar emergency sprinkler system (quarterly)

Determine whether or not:

1. The items were inspected and tested at the specified frequency as required by the reference criteria
2. The required inspections and tests were properly documented.
3. Noted defects were corrected in a timely manner
4. The LACMTA 1998 Triennial Audit recommendation 17 has been satisfied and is currently being implemented.

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RESULTS/COMMENTS

At Location 34, via an interview with the Rail Facilities Maintenance Supervisor and a review of records for the Union Station and 7th St/Metro Center Station, the following facts were determined:

- The monthly station maintenance program for the above selected Red Line Stations is in parallel with the findings established for the Blue & Green Line Stations in Checklists 20 & 21 in that these inspections are not performed on a regular basis.
- The criteria calls for tunnel inspections to be performed on a quarterly basis. Examination of the "Red Line Quarterly Tunnel Inspection Notes" show that for the selected stations these inspections were performed on 7/23/00, 2/22/01, and 4/2/01. These inspections concentrated on documenting the location and dimensions of cracks in station walls to be submitted to Engineering in order to establish the frequency and details of a grouting program to be performed by an outside contractor. In 1999, quarterly inspections of the Red Line tunnel system were performed in the months of January, April, July, and November. The inspections revealed a number of needed repairs to fans and lighting that were relayed verbally to Traction Power without any system to ensure the proper documentation and tracking of these items. This finding is consistent with those found in Checklists 20 & 21 in that Location 34 does not maintain regular inspection schedule.
- In May 1998 hydro testing was performed on the hoses associated the standpipe system, which resulted in the replacement of these hoses. The testing of standpipes is scheduled to be performed by an outside contractor in July 2001 but as of today the Red Line is out of compliance.
- The Rail Facilities Maintenance Supervisor stated that there are no pumps associated with the operation of the standpipe system of the Red Line. When he was asked to identify the type of pumps maintained by his location, he stated there are about 32-35 Sump Pumps for which he has no formal maintenance program (only turns them On/Off periodically). Additionally, he stated that he maintains Sewage Ejector Pumps/Air Compressors on a monthly basis. A review of the records "Sewage Ejector System PM Checklist – Monthly" verified that these inspections were performed regularly in 1999, 2000, & 2001 and the noted defects were corrected in a timely manner.

The auditor continued the audit of Checklist 22 at location 61 and interviewed the Rail Communications Supervisor, the Rail Communications Inspector, and a Facilities Maintenance Supervisor in Rail Communications and determined the following:

- Emergency Management Panel and Telephones were performed on the required quarterly basis, documented properly, and noted defects were corrected in a timely manner for all stations of the Red Line.
- Undercar Deluge system was performed regularly and documented properly.
- Gas Analyzer Unit inspections are broken up into three segments (Segment 1, 2A, 2B). These are inspected bimonthly and overhauled annually. Examination of Gas Analyzer records show that these inspections were performed regularly, documented properly, and all noted defects repaired in a timely manner. I was impressed with the quality of the Gas Analyzer Unit maintenance program and found Mr. Gary Felix to be very knowledgeable and competent in the subject matter.

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- All Regulation 4 elements (LAFD City Code) were inspected regularly, documented properly, and all noted defects were repaired in a timely manner.
- The quality of work done by Rail Communications was impressive. No discrepancies were found.

Based on the above, LACMTA 1998 Triennial Audit Recommendation 17 is partially closed out as Location 34 still needs to fulfill its responsibility toward performing station inspections per the required frequencies.

Subsequent to the audit, LACMTA advised the Commission staff that the Rail Facilities Maintenance Department (Location 34) has developed a controlled procedure and tracking mechanism to convey defects noted during their inspections and receive feedback from the Traction Power Department (Location 61) that is responsible for completing the noted defects. This procedure was submitted to Commission staff on August 20, 2001 as part of LACMTA's review and comment on the Preliminary Triennial Audit Report. It utilizes the Facilities Maintenance Information System (FMIS) Trouble Ticket Reports to tack to closure the repair of noted defects so they can be noted on the original inspection reports. LACMTA submitted copies of computer-generated Trouble Tickets (01070038, 01070040, 01070016, and 01070021 all dated 07/02/01), a computer-generated Trouble Ticket Report showing the "Open" status of the above trouble tickets, and a copy of an e-mail message which originated from the Facilities Maintenance Manager (location 34) to the Manager of Traction Power Department (Location 61) showing that the above outstanding Trouble Tickets are being tracked to completion between the two departments.

Recommendation:

1. LACMTA should develop a mechanism to ensure that all monthly station maintenance inspections are regularly performed by Location 34 personnel and, more importantly, ensure that the noted defects on the monthly inspection forms are closed out in a timely manner. Also, LACMTA should develop a system between Location 34 & 61 to ensure that the noted defects on the inspections performed by Location 34 Personnel that are to be corrected by Location 61 Traction Power personnel are properly transmitted and tracked to completion through appropriate means of documentation. The system developed should alert management when communication fails between the two locations.

Note that the above recommendation is identical to that of Checklist Nos. 20 and 21.

CPUC SYSTEM SAFETY AUDIT CHECKLIST FOR THE
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

Checklist No.	**23**	Persons Contacted
Date of Audit	**June 18-21, 2001**	George Matejovsky - Manager Rail Signal Marty Maggard - Rail Signal Supervisor Joseph Knapik - Senior Signal Supervisor
Auditors	**Hani Moussa** **Raed Dwairi**	
Department	**Signal Maintenance**	

REFERENCE CRITERIA

1) Wayside Systems – Rail Operations Maintenance Plan, dated 3-98
2) System Safety Program Plan - Operations, Rev 2, dated 11-25-98, Sect. 2.6.4, Rail Signal Maintenance

- Is the SSPP available for reference by employees in this department? Yes

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

MAINLINE SWITCHES INSPECTION - QUARTERLY

Review LACMTA's file of completed Mainline Switch Inspection reports for three randomly selected switches on each of the 3 rail lines for two different quarterly periods during 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 Mainline Switch Inspection Report

3. Noted defects were corrected in a timely manner

RESULTS/COMMENTS

The auditor selected and reviewed the monthly and quarterly switch inspection reports prepared for the year 2000 for the following locations:

- Metro Red Line - Union Station, Wilshire/Western, and North Hollywood
- Metro Blue Line - Willow, Imperial, and Florence

All required monthly as well as quarterly inspections were performed as required and properly documented.

The auditor selected and reviewed the Metro Green Line monthly and bi-annually switch inspection reports for Lynwood, Aviation, and El Segundo prepared for the year 2000. All required monthly as well as bi-annually inspections were performed as required and properly documented.

No exceptions were noted.

CPUC SYSTEM SAFETY AUDIT CHECKLIST FOR THE
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

Checklist No.	**24**	Persons Contacted
Date of Audit	**June 18-21, 2001**	George Matejovsky - Manager Rail Signal Marty Maggard - Rail Signal Supervisor Joseph Knapik - Senior Signal Supervisor
Auditors	**Hani Moussa** **Raed Dwairi**	
Department	**Signal Maintenance**	

REFERENCE CRITERIA

1) Wayside Systems – Rail Operations Maintenance Plan, dated 3-98
2) System Safety Program Plan - Operations, Rev 2, dated 11-25-98, Sect. 2.6.4, Rail Signal Maintenance

- Is the SSPP available for reference by employees in this department? Yes

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

INTERLOCKING TESTS

Randomly select one interlocking on each of the 3 rail lines and review the associated inspection and test reports for the past 4 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 (route locking, time locking, approach locking, etc.) were satisfactorily completed and documented in the appropriate test reports

3. Noted defects were corrected in a timely manner

RESULTS/COMMENTS

The auditor selected and reviewed the interlocking inspection reports at the following locations:

- Metro Red Line – Westlake/MacArthur Park Station
- Metro Blue Line - Florence Avenue
- Metro Green Line - Marine Station

Inspection reports showed that the required testing was performed satisfactorily at the required two-year intervals during the past four years at all locations.

No exceptions were noted.

CPUC SYSTEM SAFETY AUDIT CHECKLIST FOR THE
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

Checklist No.	**25**	Persons Contacted
Date of Audit	**June 18-21, 2001**	George Matejovsky - Manager Rail Signal Marty Maggard - Rail Signal Supervisor Joseph Knapik - Senior Signal Supervisor
Auditors	**Hani Moussa** **Raed Dwairi**	
Department	**Signal Maintenance**	

REFERENCE CRITERIA

1) Wayside Systems – Rail Operations Maintenance Plan, dated 3-98
2) System Safety Program Plan - Operations, Rev 2, dated 11-25-98, Sect. 2.6.4, Rail Signal Maintenance

- Is the SSPP available for reference by employees in this department? Yes

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

VITAL RELAYS

Randomly select two vital relays for each of the 3 rail lines. From a combination of procedure and records review as well as visual inspection of each of the selected items, determine whether or not:

1. The vital relays are properly controlled and calibrated against certified standard 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

The auditor selected and reviewed the Metro Red Line Union Station vital relays test data records prepared for the year 1997. Results of the review showed that the records for the relays were satisfactory without exception.

The auditor selected and reviewed the Metro Green Line Norwalk vital relays test data records prepared for the year 2000. Results of the review showed that the records for the relays were satisfactory without exception.

On May 22, during the inspections made by the FRA certified inspector, four Metro Blue Line grade crossings located at: 41st Street, 55th Street, Century Blvd., and Florence Avenue were inspected. A visual inspection was made at these locations of the vital relays. All vital relays are marked, tagged, or otherwise identified to show their calibration status with no exceptions noted.

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The auditor selected and reviewed the Metro Blue Line 7th & Flower Station vital relays test data records prepared for the year 2000. Results of the review showed that the records for thirteen (13) of the twenty-one (21) relays failed when tested on 3/31/00 & 4/21/00. Eight (8) vital relays are used for switch overload, which protects the switch clutch if an obstruction is detected during the switch throw. One (1) vital relay acts as a vane type relay which detects the loss of 110 V AC-power. The remaining four (4) relays operate in conjunction with the Automatic Train Protection (ATP) system of the Blue Line. If a relay fails to de-energize, a "zero speed code" is sent to the ATP unit on the Blue Line car. The train operator will not be allowed to move the train unless proper authorization is given from the Rail Operations Control Center. The auditor found that failed relays are in use at other locations.

The Rail Operating Maintenance Manual for relay test performance procedures states, "*relays not passing tests and inspections must be replaced and not returned to service until the operating characteristics and conditions are in accordance with GRS (the manufacturer of the relays) specifications*." Senior Signal Supervisor advised that all failed relays have not been replaced as of this audit date.

The Manager is aware of the failed relay problem, and states replacement vital relays have been ordered. Although the relays are indicating a value in the failed range, the relays are still in use, due to the lack of availability of replacement relays.

The Manager has identified several problems and suggested that plans are in-order to resolve these problems. The departments of Quality Assurance, System Safety, Signal, etc. will be involved in the resolution process.

The Signal Department offered the following explanation for usage of failed vital relays:

- Skepticism about the test procedures supplied by GRS because of two reasons. Similar relays on are used on the Red Line but a different test procedure is used. Two different employees testing the same relay can yield two different results.

- Storage room does not have enough relays available for immediate replacement.

Subsequent to the audit, LACMTA advised the Commission staff that the thirteen (13) failed vital relays have been replaced.

Recommendations:

1. LACMTA should evaluate the test procedures of vital relays and establish a range of values that the vital relay must meet in order to pass the test. If a relay fails, LACMTA should replace it immediately. Vital relays need to be readily available in the storage room.

2. LACMTA should develop a training plan, after the test procedures are established, and retrain employees.

CPUC SYSTEM SAFETY AUDIT CHECKLIST FOR THE
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

Checklist No.	**26**	Persons Contacted
Date of Audit	**June 18-21, 2001**	George Matejovsky - Manager Rail Signal Marty Maggard - Rail Signal Supervisor Joseph Knapik - Senior Signal Supervisor
Auditors	**Hani Moussa** **Raed Dwairi**	
Department	**Signal Maintenance**	

REFERENCE CRITERIA

1) System Safety Program Plan - Operations, Rev 2, dated 11-25-98, Sect. 3.2.9, Safety Training

- Is the SSPP available for reference by employees in this department? Yes

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

TRAINING & CERTIFICATION OF SIGNAL INSPECTORS – EVERY TWO YEARS

Obtain a copy of LACMTA's list of qualified signal inspectors for all 3 rail lines. Randomly select two or more inspectors and review each selected person's training and certification file to determine whether or not:

1. Training, certification, and recertification records are in compliance with the reference criteria (every two years)

2. The current training lesson plans and testing for certification/recertification reflects the persons assigned duties

RESULTS/COMMENTS

Signal inspectors receive an initial 6-month training before entering the personal qualification standards (PQS) program. The PQS consist of nine functional areas that represent the signal inspector assigned duties. As each item within the functional area is completed to the satisfaction of the supervisor, the supervisor and the signal inspector will initial the appropriate box and date the occurrence. If a signal inspector is unable to complete the activity to the satisfaction of the supervisor, the activity will remain open until it has been satisfactorily completed. An employee completes the PQS program in a timeframe ranging from 1 –1 ½ years after the initial 6-month training.

The auditor selected and reviewed the PQS records for two signal inspectors on each of the Metro Red, Blue, and Green Lines. Each of the PQS reviewed showed that signal inspectors are being trained on an on-going basis in each of the functional areas.

The only re-certification class required of the signal inspectors is a Hi-rail class. However, the Signal Department does not have any Hi-rail equipment and have decided that employees will not operate such equipment.

No exceptions were noted.

CPUC SYSTEM SAFETY AUDIT CHECKLIST FOR THE
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

Checklist No.	**27**	Persons Contacted
Date of Audit	**June 20, 2001**	George Matejovsky - Manager Rail Signal Joseph Knapik - Senior Signal Supervisor
Auditors	**Hani Moussa**	
Department	**Signal Maintenance**	

REFERENCE CRITERIA

1) Wayside Systems – Rail Operations Maintenance Plan, dated 3-98
2) System Safety Program Plan - Operations, Rev 2, dated 11-25-98, Sect. 2.6.4 Rail Signal Maintenance

- Is the SSPP available for reference by employees in this department? Yes

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

GRADE CROSSING PROTECTION – MONTHLY

Review LACMTA's file of completed grade crossing protection inspection reports for 3 randomly selected Blue Line grade crossings for 3 different one-month periods during the past 12 months to determine whether or not:

1. The grade crossing protection was inspected at the specified frequency as required by the reference criteria

2. The results of the inspection were properly documented

3. Noted defects were corrected in a timely manner

RESULTS/COMMENTS

The auditor selected and reviewed the Metro Blue Line monthly grade crossing inspection reports for Florence Avenue, Imperial Highway, and 103rd Street prepared for the year 2000. All required monthly inspections were performed and properly documented.

No exceptions were noted.

CPUC SYSTEM SAFETY AUDIT CHECKLIST FOR THE
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

Checklist No.	**28**	Persons Contacted
Date of Audit	**June 18-21, 2001**	George Matejovsky - Manager Rail Signal Marty Maggard - Rail Signal Supervisor Joseph Knapik - Senior Signal Supervisor
Auditors	**Hani Moussa** **Raed Dwairi**	
Department	**Signal Maintenance**	

REFERENCE CRITERIA

1) Wayside Systems – Rail Operations Maintenance Plan, dated 3-98
2) System Safety Program Plan - Operations, Rev 2, dated 11-25-98, Sect. 2.6.4 Rail Signal Maintenance

- Is the SSPP available for reference by employees in this department? Yes

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 each signal maintenance department. For each department, randomly select two each of LACMTA's voltmeter, multimeter, oscilloscope, and relay tester. From a combination of procedure and record reviews as well as visual inspection, determine whether or not:

1. The selected items are properly inventoried, controlled and marked, tagged or otherwise identified to show their current calibration status
2. The items are calibrated against certified standards every two years
3. The next scheduled testing/calibration is shown on the item

RESULTS/COMMENTS

The auditor selected two voltmeters, multimeters, oscilloscopes, and one relay tester for review at the Metro Red Line signal maintenance department. The selected items were properly stored, inventoried, marked and tagged. Bi-Annual calibration frequencies were adhered to as specified by the manufacturer. Each selected item was properly labeled with a calibration sticker showing the dates of the last calibration and the next required calibration. No exceptions were noted.

The auditor selected two voltmeters, multimeters, oscilloscopes, and one relay tester for review at the Metro Blue/Green Lines signal maintenance department. The selected items were properly stored, inventoried, marked and tagged. Annual calibration frequencies were adhered to as specified by the manufacturer. Senior Signal Supervisor advised that the relay tester was not subject to calibration testing. Each selected item, except the relay tester, was properly labeled with a calibration sticker showing the dates of the last calibration and the next required calibration.

No exceptions were noted.

CPUC SYSTEM SAFETY AUDIT CHECKLIST FOR THE
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

Checklist No.	**29**	Persons Contacted
Date of Audit	**June 18-21, 2001**	Keith Kranda - Manager Track Wayside Systems / MOW Paul Squires - Heavy Rail Track Supervisor Johnny Padilla - Light Rail Track Supervisor
Auditors	**Anton Garabetian**	
Department	**Track Maintenance**	

REFERENCE CRITERIA

1) Wayside Systems – Rail Operations Maintenance Plan, dated 3-98
2) Code of Federal Regulations (CFR) 49, Part 213.113
3) System Safety Program Plan - Operations, Rev 2, dated 11-25-98, Sect. 2.6.2, Track Maintenance
4) CPUC General Order 143-B, Section 14.05

- Is the SSPP available for reference by employees in this department? Yes

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

VISUAL TRACK & SWITCH INSPECTION

Review a random sample of LACMTA Track Inspection Reports and Turnout Inspection Reports on each rail line for the following types of inspection during the past 3 years

Weekly Frequency
- Mainline track
- curves
- restraining rails

Monthly Frequency
- turnouts and cross-overs
- track crossings
- detailed switch inspection
- yard inspection

Determine whether or not:

1. All mainline track were visually inspected weekly or monthly
2. The required inspections were properly documented on the LACMTA Track Inspection Report or LACMTA Turnout Inspection Report.
3. All noted defects were posted on the Maintenance Log Sheet and corrected in a timely manner

RESULTS/COMMENTS

The CPUC auditor selected and reviewed the following LACMTA track inspection documents:

Red Line
- Biweekly Track Inspection Reports from four different years: June to July 1998, January 1999, December 2000 and May 2001.
- Monthly Detailed Switch and Frog Inspection Reports from the following dates:
- 1998 records for East Union Crossover switches and turnout
- 1999 records for Wilshire/Alvarado Pocket Track turnout and switches

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- 2000 records for North Hollywood Cross-over switches and turnout
- 2001 records for East Union Cross-over switches and turnout
- Weekly Yard Track Inspection Reports from three different years: January 2001, June 2000 and November 1999.
- Monthly Detailed Yard Switch and Frog Inspection Report from 1998, 1999, 2000 and 2001.

Blue Line

- Biweekly Track Inspection Reports from two different years: March 2001 and January 1999.
- Monthly Detailed Switch and Frog Inspection Report from the following dates:
- 1998 records for Artesia crossover switches and turnout
- 2000-2001 records for Imperial pocket turnout and switches
- 2001 Artesia cross-over switches and turnout
- Monthly yard track and switch Inspection Report from 1999, 2000 and 2001.
- Six month yard Detail Switch Inspection Report for 2000-2001 and 1999

Green Line

- Biweekly Track Inspection Reports from two different years: April 2001, April 1998 and April 2000
- Monthly Detailed Switch and Frog Inspection Report for:
- 2001 records for Aviation East switches and turnout
- 1998 records for Norwalk West turnout and switches
- 2001 Norwalk West switches and turnout
- Monthly yard track and switch Inspection Report from 1999, 2000 and 2001.
- Six month yard Detail Switch Inspection Report from 2000, 2001 and 1999

The auditor had in his possession the approved LACMTA Wayside Systems Department Maintenance Plan effective March 1998. LACMTA presented the auditor with a draft copy of the new Maintenance Plan dated January 2001.

Mainline Track, Curves and Restraining Rails:

The auditor reviewed the Track Inspection Reports of the above-mentioned dates for all the lines. The LACMTA track inspectors properly performed the mainline track visual inspections at the required frequency, properly documented them on the Track Inspection Report and corrected the noted defects in a timely manner. LACMTA inspected the curves and restraining rails as part of the biweekly mainline track visual inspection for all the lines

The auditor noticed one discrepancy between the old approved and current draft versions of the Maintenance Plans. The old version requires "a walking inspection of all rail is performed weekly". The new draft version revises this requirement. According to the Track Inspection Reports, LACMTA did not perform weekly walking inspection of all rails.

LACMTA recorded major track maintenance work on the Maintenance Log Sheet. MRL Maintenance of Way (MOW) department has adopted the Maintenance Log Sheet form recently and no recording was posted on the Maintenance Log Sheet yet. The auditor noticed an improvement in documentation of track inspection starting in year 2000.

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Turnouts, Crossovers, Track Crossings, Detailed Switch inspection and Yard Inspection:

Turnouts, crossovers, track crossings and detailed switch inspection are part of the biweekly mainline visual track inspection process. The auditor reviewed the above mentioned dates of LACMTA Monthly Switch and Frog Inspection Reports for all the lines. The LACMTA properly performed the inspections at the required frequency and properly documented them. The auditor noticed that these reports did not require signoff by a supervisor. The MRL MOW department corrected the noted defects in a timely manner and documented them on the same report form. The MBL and MGL MOW department reports noted the defects but did not document if and when the corrections were performed.

The MBL and MGL inspections were performed by walking and by riding the train. The inspector expressed concern about light rail track inspection performed while riding the train. According to FRA Part 213 Track Safety Standards Subpart F Section 213.233, if a vehicle is used for visual inspection, the speed of the vehicle may not be more than 5 miles per hour when passing over track crossings and turnouts. Subsequent to the audit. LACMTA Maintenance of Way Department issued an interoffice memorandum dated August 15, 2001 as part of LACMTA's review and comment on the Preliminary Triennial Audit Report. The letter states that LACMTA track inspectors use the train inspection procedure combined with mandatory walking all switches and track crossings the same day. Also it states that LACMTA normal inspection procedure is to do a walking track inspection by two inspectors over a daily designated assigned area of track.

The existing Maintenance Plan requires "detailed quarterly inspection". The new draft version requires "monthly inspection". According to the Monthly Switch and Frog Inspection Reports, LACMTA performed detailed monthly inspection of the switches and turnouts.

The auditor reviewed the MRL weekly yard main track and monthly yard Switch and Frog Inspection Reports for the above mentioned dates. The MRL MOW department properly performed the inspections at the required frequency, properly documented them and corrected the noted defects in a timely manner. The MBL and MGL MOW department regularly inspected the yard tracks and switches monthly and performed detail inspection every six months. The Light Rail properly performed the inspections at the required frequency and properly documented them. Most of the corrections for the monthly inspections were performed on a timely manner except for few that were still open. The auditor did not find any documentation that the corrections on the yard Switch and Frog Inspection Reports were performed.

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Recommendations:

1. LACMTA should finalize the draft Maintenance Plan and distribute for use. Provide justification why performance of a weekly walking inspection of all rail tracks is revised in the draft Maintenance Plan.

2. LACMTA should require Supervisor signature on the LACMTA Monthly Switch and Frog Inspection Reports.

3. LACMTA should document on the Monthly Switch and Frog Inspection Reports the date that a reported track defect is corrected at the Light Rail Track Department

4. LACMTA should evaluate whether FRA Part 213 Track Safety Standards Subpart F Section 213.233 is being properly implemented at the Light Rail Track Department. LACMTA should review the MBL and MGL track inspection records covering the last six months of operations.

CPUC SYSTEM SAFETY AUDIT CHECKLIST FOR THE
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

Checklist No.	**30**	Persons Contacted
Date of Audit	**June 18-21, 2001**	Keith Kranda - Manager Track Wayside Systems / MOW Paul Squires - Heavy Rail Track Supervisor Johnny Padilla - Light Rail Track Supervisor
Auditors	**Anton Garabetian**	
Department	**Track Maintenance**	

REFERENCE CRITERIA

1) Wayside Systems – Rail Operations Maintenance Plan, dated 3-98
2) Code Of Federal Regulations (CFR) 49, Part 213.7 A & B
3) System Safety Program Plan - Operations, Rev 2, dated 11-25-98, Sect. 3.2.9, Safety Training

- Is the SSPP available for reference by employees in this department? Yes

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

TRACK INSPECTOR QUALIFICATIONS

Obtain a copy of LACMTA's list of qualified Track Foreman and Track Inspectors. Randomly select not less than 2 foremen and 3 inspectors and then review the qualification records (recertification every 2 years) and examination records for those selected to determine whether or not they meet the requirements of the above referenced criteria. Also, use the list of qualified persons when performing the inspection record reviews.

Determine whether or not the LACMTA 1998 Triennial Audit recommendation 18 has been satisified and is currently being implemented.

RESULTS/COMMENTS

The auditor reviewed the personnel qualification and examination records for 2 leaders and 3 inspectors from each Heavy and Light Rail Department. The records for all the personnel were satisfactory. The examination of test records for all the audited personnel were on file. The hi-rail operators were certified every two years by operations and a copy of the nametags with re-certification noted on it were on file. The track Supervisor approved all the operators of rail grinders, tamper and ballast regulators. The Maintenance Plan says that the Personnel Qualification Standards (PQS) are updated from time to time to reflect new systems.

The LACMTA 1998 Triennial Audit recommendation No. 18 which states "The initial testing and certification of all signal inspectors and track inspectors should be completed on an expedited basis." The recommendation has been satisfied as far as initial testing and certification of track inspectors are concerned and the LACMTA is developing a new re-certification program.

No exceptions were noted.

CPUC SYSTEM SAFETY AUDIT CHECKLIST FOR THE
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

Checklist No.	**31**	Persons Contacted
Date of Audit	**June 18-21, 2001**	Keith Kranda - Manager Track Wayside Systems / MOW Paul Squires - Heavy Rail Supervisor Johnny Padilla - Light Rail Track Supervisor
Auditors	**Anton Garabetian**	
Department	**Track Maintenance**	

REFERENCE CRITERIA

1) Wayside Systems – Rail Operations Maintenance Plan, dated 3-98
2) Code Of Federal Regulations (CFR) 49, Part 213.113
3) System Safety Program Plan - Operations, Rev 2, dated 11-25-98, Sect. 2.6.2, Track Maintenance
4) CPUC General Order 143-B, Section 14.05

- Is the SSPP available for reference by employees in this department? Yes

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

TRACK ANNUAL MAINTENANCE

Review a random sample of LACMTA reports of the following inspection/tasks during the past 3 years for all rail lines

- Ultrasonic testing
- Torque on Direct Fixation Bolts – 10% per year
- Floating Slab Inspection

Determine whether or not:

1. Inspections were performed annually
2. Track (including turnouts) are inspected by either inductive or ultrasonic testing capable of revealing internal defects.
3. The required inspections were properly documented.
4. Noted defects were corrected in a timely manner.
5. Rail Inspection records are kept in the office of the Track Maintenance Manager for at least two years and one year after the remedial action has been taken.

Determine whether or not the LACMTA 1998 Triennial Audit recommendation 17 has been satisfied and is currently being implemented.

RESULTS/COMMENTS

A copy of the SSPP and LACMTA Wayside Systems Department Maintenance Plan were available in each of the heavy and light rail supervisor office. The auditor was told that the leaders and the inspectors may not have the SSPP and the Maintenance Plan in their possession but they are aware of their existence and location. These documents are available for reference.

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The auditor had in his possession approved LACMTA Wayside Systems Department Maintenance Plan effective March 1998. LACMTA presented the auditor with a draft copy of the new Maintenance Plan dated January 2001.

LACMTA manager informed the auditor that they have a contract with Herzog Services Inc. to perform yearly ultrasonic test of the tracks. The auditor reviewed the reports provided by Herzog Services Inc. that the ultrasonic test of all the tracks was performed in February 2001. The previous ultrasonic test was performed in September 1999 with a sixteen-month gap in between inspections due to contractor equipment malfunction. Records show that LACMTA maintained all the defects found by Herzog Services Inc. The previous ultrasonic inspection was performed in October 1998.

The LACMTA manager informed the auditor that they are expecting new computerized equipment that will test the bolt torque and document the results. The auditor did not find any records that verify the direct fixation bolt torque has been tested. LACMTA manager informed the auditor that torque on direct fixation bolts is measured frequently but the results are not documented. The auditor noticed one discrepancy between the old approved and current draft versions of the Maintenance Plans. The old version requires "10 percent of bolts are checked monthly". The draft version of maintenance Plan revised this requirement.

According to LACMTA manager, floating slab inspection is part of the biweekly visual track inspection. The auditor did not find any specific records that the floating slabs are inspected. The auditor noticed one discrepancy between the old approved and current draft versions of the Maintenance Plans. The approved Maintenance Plan requires yearly detailed floating slab inspection. The draft version revises this requirement.

The LACMTA 1998 Triennial Audit recommendation No. 17 recommended an engineering evaluation to be conducted for the Maintenance Plan specified frequencies for preventive maintenance, inspection and testing of material and equipment under the control of the Track Maintenance. The LACMTA did not present the auditor such an engineering evaluation but the manager told the auditor that special production crews inspected the tracks and the recommended track inspection frequencies are depicted in the January 2001 version of Maintenance Plan.

Recommendation:

1. LACMTA should finalize the draft Maintenance Plan and distribute for use. Provide justification why the requirements for “Monthly checking of 10 percent of bolts” and “Yearly detailed floating slab inspection” have been revised in the draft Maintenance Plan.

Note that the above recommendation is identical to that of Checklist No. I-2.

CPUC SYSTEM SAFETY AUDIT CHECKLIST FOR THE
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

Checklist No.	**32**	Persons Contacted
Date of Audit	**June 18-21, 2001**	Keith Kranda - Manager Track Wayside Systems / MOW Paul Squires - Heavy Rail Track Supervisor Johnny Padilla - Light Rail Track Supervisor
Auditors	**Anton Garabetian**	
Department	**Track Maintenance**	

REFERENCE CRITERIA

1) Wayside Systems – Rail Operations Maintenance Plan, dated 3-98
2) System Safety Program Plan - Operations, Rev 2, dated 11-25-98, Sect. 2.6.2, Track Maintenance
3) CPUC General Order 143-B, Section 14.05

- Is the SSPP available for reference by employees in this department? Yes

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

RAIL TRACK MAINTENANCE WORK

Review a randomly selected sample of LACMTA's Inspection reports for all 3 rail lines prepared during the past 10 years to determine whether or not:

1. Tamping has been performed at 3-year intervals.

2. Rail Production Grinding has been performed at 3-year intervals.

RESULTS/COMMENTS

The current Maintenance Plan, dated 3-98 requires:

- "Production tamping of all ballasted mainline track is done on a three year cycle".
- "Production rail grinding every three years".

The auditor checked Blue and Green Line records and found that the LACMTA performs both of these inspections on need basis.

The Manager of the Track Department explained that the intervals are in the process of being changed in the new revision of the Maintenance Plan. LACMTA handed the auditor a draft copy of the revised Maintenance Plan dated January 2001. The draft version requires both tasks to be performed on need basis.

Recommendation:

1. LACMTA should finalize and distribute for use the draft Maintenance Plan. Provide justification why the requirement for production tamping and production rail grinding have changed from 3-year intervals to on need basis in the draft Maintenance Plan.

CPUC SYSTEM SAFETY AUDIT CHECKLIST FOR THE
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

Checklist No.	**33**	Persons Contacted
Date of Audit	**June 19&21, 2001**	Armando Almazan - Senior Tractions Power Supervisor Wayside Systems/MOW Leroy Bonifay - Sr Rail Equipment Maintenance Supervisor/MOW
Auditors	**Raed Dwairi**	
Department	**Traction Power Maintenance**	

REFERENCE CRITERIA

1) Wayside Systems – Rail Operations Maintenance Plan, dated 3-98
2) System Safety Program Plan - Operations, Rev 2, dated 11-25-98, Sect. 2.6.3, Traction Power Maintenance
3) CPUC General Order 143-B, Section 14.06

- Is the SSPP available for reference by employees in this department? Yes

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

EMERGENCY TRIP STATIONS

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

1. Each ETS was inspected every 12 months.

2. The required inspections were properly documented

3. Noted defects were corrected in a timely manner

4. Any trouble tickets generated have been closed out.

RESULTS/COMMENTS

The auditor reviewed all available Emergency Trip Stations (ETS) inspection and test reports prepared during the past 3 years. The Senior Supervisor stated that functional tests are performed on an annual basis for all stations on each Line. Review of the test reports revealed:

Metro Blue Line annual functional tests were on 2/12/98 & 3/24/00. No documentation was found for 1999. The supervisor in charge told the auditor that year 2001 tests have not been performed yet due to the ongoing platform extension project.

Metro Green Line annual functional tests were performed on 5/14/98 & 4/16/00. No documentation was found for 1999 & 2001.

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Review of Metro Red Line annual functional test reports at Traction Power (Location 61) showed that no documentation was found for 1999 & 2000. An annual functional test of Segment One (from Yard to Westlake) was performed on 01/21/01 (both AR & AL Tracks). The auditor selected ETS No. R074 at location ALCP B1 of the aforementioned segment and was able to track the completion of the noted defects through the generation and assignment of a Trouble Ticket to a staff of the Traction Power Maintenance Department.

Inspections, when performed, were properly documented and noted defects were corrected in a timely manner. However, when some of these repairs involved the expertise of another department such as Rail Communications, the auditor could not find any documentation of repairs due to the absence of a system that documents the transmission & feedback of information related to these repairs between the two locations.

The auditor was given a copy of a draft Preventative Maintenance Plan for the Traction Power Department dated January 2001 and was told that this plan will soon be finalized and issued for use.

Recommendation:

1. LACMTA should finalize and distribute the Preventative Maintenance Plan. Also, LACMTA should ensure that all required tests and inspections are performed and documented on the required frequencies in a timely manner. The Preventive Maintenance Plan must contain controls to alert management when required inspections are not performed or repairs are not closed out in a timely manner particularly when these require the involvement of more than one location/department.

CPUC SYSTEM SAFETY AUDIT CHECKLIST FOR THE
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

Checklist No.	**34**	Persons Contacted
Date of Audit	**June 19&21, 2001**	Armando Almazan - Senior Traction Power Supervisor Wayside Systems/M.O.W.
Auditors	**Raed Dwairi**	
Department	**Traction Power Maintenance**	Tanzeem Rizvi - Manager Traction Power Group Wayside Systems/M.O.W.

REFERENCE CRITERIA

1) Wayside Systems – Rail Operations Maintenance Plan, dated 3-98
2) System Safety Program Plan - Operations, Rev 2, dated 11-25-98, Sect. 2.6.3, Traction Power Maintenance

- Is the SSPP available for reference by employees in this department? Yes

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

OVERHEAD CATENARY SYSTEM – ANNUALLY

Randomly select 2 separate sections of track (one each from the Blue Line and Green Line) and then review LACMTA's file of completed Overhead Catenary System (OCS) Inspection reports prepared during the past 2 years for the selected sections of track to determine whether or not:

1. 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

The auditor selected and reviewed the following Light Rail OCS Inspection Checklists prepared during the past two years:

Metro Blue Line - 103rd street and Florence area sections
Metro Green Line - Lakewood and Marsh area sections

The checklists pertaining to the Blue Line, revealed that the 1998 annual inspections were performed on 8/21/98 for the Florence Area and on 9/30/98 for the 103rd street area. No documentation was found for the years 1999, 2000, and 2001. Subsequent to the audit, on August 20, 2001, LACMTA submitted as part of their review of Preliminary Triennial Audit Report copies of Light Rail OCS Inspection Checklists showing that MBL (103rd Street & Florence) segment (Tracks 1&2) was inspected for the Year 2000 on 12/27/99 through 01/12/00. These checklists should have been made available to the Commission staff during the audit.

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The Green Line documentation revealed that the Lakewood area was inspected on 7/19/98 and the Marsh Area on 8/2/98. No documentation was found for the years 1999, 2000, and 2001.

Further examination of the Daily Activity Logs of Light Rail Inspectors showed that Preventative Maintenance (PM) inspections & repairs were performed on the Blue & Green Lines suggesting that the discrepancy could be in the "documentation" on the appropriate forms. This was also suggested since some Trouble Tickets came as a result of PM inspections for which repairs were performed in a timely manner. All trouble tickets which originated from Rail Operations Control (ROC) were documented properly and closed out in a timely manner.

The auditor was given a copy of a draft Preventative Maintenance Plan for the Traction Power Department dated January 2001 and was told that this plan will soon be finalized and issued for use.

Recommendation:

1. LACMTA should finalize and distribute for use the Preventative Maintenance Plan. Also, LACMTA should ensure that all required tests and inspections are performed and documented on the required frequencies in a timely manner. The Preventive Maintenance Plan must contain controls to alert management when required inspections are not performed or repairs are not closed out in a timely manner particularly when these require the involvement of more than one location/department.

Note that the above recommendation is identical to that of Checklist No. 33.

CPUC SYSTEM SAFETY AUDIT CHECKLIST FOR THE
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

Checklist No.	**35**	Persons Contacted
Date of Audit	**June 19, 2001**	Tanzeem Rizvi - Manager Traction Power Group Wayside Systems/MOW Leroy Bonifay - Sr Rail Equipment Maintenance Supervisor/MOW
Auditors	**Raed Dwairi**	
Department	**Traction Power Maintenance**	

REFERENCE CRITERIA

1) Wayside Systems – Rail Operations Maintenance Plan, dated 3-98
2) System Safety Program Plan - Operations, Rev 2, dated 11-25-98, Sect. 2.6.3, Traction Power Maintenance

- Is the SSPP available for reference by employees in this department? Yes

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

EMERGENCY VENT FANS – SEMI-ANNUAL

Review LACMTA's file of completed Emergency Vent Fan Inspection reports prepared during the past 2 years for three randomly selected ventilation fans on the Blue Line and/or Red Line subways to determine whether or not:

1. Each emergency vent fan 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

Selected records for the following:

Metro Blue Line 7th & Metro Station - emergency vent fans EF071, EF072, EF082
Metro Red Line Vermont/Beverly Station – emergency vent fans EF181, EF182, EF171

A review of the "Emergency Fan Maintenance Checklist" records showed that these fans were inspected once every 6 months as required by the reference criteria. These inspections were properly documented and noted defects were corrected in a timely manner.

No exceptions were noted.

CPUC SYSTEM SAFETY AUDIT CHECKLIST FOR THE
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

Checklist No.	**36**	Persons Contacted
Date of Audit	**June 19&21, 2001**	Tanzeem Rizvi - Manager, Traction Power Group Wayside System/M.O.W.
Auditors	**Raed Dwairi**	
Department	**Traction Power Maintenance**	Leroy Bonifay - Senior Supervisor, Traction Power Group Wayside System/M.O.W.

REFERENCE CRITERIA

1) Wayside Systems – Rail Operations Maintenance Plan, dated 3-98
2) System Safety Program Plan - Operations, Rev 2, dated 11-25-98, Sect. 2.6.3, Traction Power Maintenance
3) CPUC General Order 143-B, Section 14.06

- Is the SSPP available for reference by employees in this department? Yes

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 each traction power maintenance department. For each department, randomly select three each of the following items:

- High voltage gloves
- Power relays of protect devices
- Relay test equipment

From a combination of procedure and record reviews as well as visual inspection, determine whether or not:

1. The selected items are properly inventoried, controlled, calibrated against certified standards 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

From the list of equipment subject to calibration control by the Traction Power Department, several items were selected which included 5KV Class 0 gloves, 40KV Class 4 gloves, a hot stick, a rubber mat (36" x27"), and power relay. The auditor determined that the items selected were properly inventoried, controlled and calibrated against certified standards by outside contractors. The data contained in the Equipment Status Sheet Report pertaining to the serial numbers, location, test date, and expiration date of calibration matched the data on the items when they were visually inspected in the stock room. The next scheduled calibration was also shown on the items.

No exceptions were noted.

CPUC SYSTEM SAFETY AUDIT CHECKLIST FOR THE
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

Checklist No.	**37**	Persons Contacted
Date of Audit	**June 19-21, 2001**	George Kennedy – MBL Rail Equipment Maintenance Manager Russell Homan – MBL Instructor Glenn Siamau – MBL Supervisor Ed Smith – MGL Rail Equipment Maintenance Manager Tom Lingenfield – MGL Supervisor Brian Rydell – MRL Senior Supervisor Tim Porter – MRL Supervisor Gary Dewater – MRL Rail Equipment Maintenance Instructor Cristobal Medina – Rail Train Operations Supervisor/ MRL Rita Malone – Rail Division Transportation Manager/MRL Duane Martin – Rail Division Transportation Manager/MBL& MGL
Auditors	**Joey Bigornia**	
Department	**Vehicle Maintenance**	

REFERENCE CRITERIA

1) Rail Vehicle Maintenance Plans For Divisions 11, 20, And 22, dated 12-22-97, Sect. IX, Training And Qualification Of Personnel
2) System Safety Program Plan - Operations, Rev 2, dated 11-25-98, Sect. 3.2.9, Safety Training

- Is the SSPP available for reference by employees in this department? Yes

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

<u>TRAINING & CERTIFICATION OF TRANSIT VEHICLE EQUIPMENT MAINTENANCE PERSONNEL – EVERY TWO YEARS</u>

Obtain a copy of LACMTA's list of qualified transit vehicle mechanics, inspectors, and technicians for all 3 rail lines. Randomly select at least two or more 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 with the reference criteria (every two years)

2. The current training lesson plans and testing for certification/recertification reflects the persons assigned duties

Determine whether or not the LACMTA 1998 Triennial Audit recommendation 20 has been satisfied and is currently being implemented.

RESULTS/COMMENTS

Reviewed training course records of:

- 4 Blue Line Maintenance Specialists qualified to work on the Nippon Sharyo vehicles,
- 4 Red Line Maintenance Specialists qualified to work on the Breda vehicles
- 4 Green line Maintenance Specialists qualified to work on the Siemens vehicles

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The exams, certification records, and dates recorded for each employee reviewed matches the master summary list that identifies all employees and their current training record. Also, the CPUC's Recommendation No. 20 from the LACMTA 1998 Triennial Audit has been satisfied and has been implemented at the Red Line Maintenance yard. No exceptions were noted.

The auditor determined that the only recertification requirement of vehicle equipment maintenance personnel occurs for those employees that move vehicles within the Yard Limits. Yard operations training and certification for Vehicle Maintenance employees is addressed in Checklist Nos. 4 and 5.

Recommendation:

See Checklist Nos. 4 and 5.

CPUC SYSTEM SAFETY AUDIT CHECKLIST FOR THE
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

Checklist No.	**38**	Persons Contacted
Date of Audit	**June 19-21, 2001**	George Kennedy – MBL Rail Equipment Maintenance Manager Bill Crocker – MBL Senior Supervisor Glenn Siamau – MBL Supervisor Ed Smith – MGL Rail Equipment Maintenance Manager Tom Lingenfield – MGL Supervisor Brian Rydell – MRL Senior Supervisor
Auditors	**Joey Bigornia**	
Department	**Vehicle Maintenance**	

REFERENCE CRITERIA

1) Rail Vehicle Maintenance Plans For - Division 11, 20, And 22: Dated 12-22-97, Sect. II, Preventive Maintenance Inspections
2) System Safety Program Plan - Operations, Rev 2, dated 11-25-98, Sect. 2.6.1, Vehicle Maintenance

- Is the SSPP available for reference by employees in this department? Yes

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

<u>REVIEW OF PREVENTIVE MAINTENANCE PROGRAM DOCUMENTATION FOR TRANSIT VEHICLES</u>

At each of the 3 maintenance shops, determine whether or not the Maintenance Manuals are being kept up-to-date and whether it is necessary that such maintenance manuals need to be revised.

Select a minimum of 2 vehicles for each type of vehicle (P865 & P2020) at the Blue Line and Green Line shops and 3 base buy vehicles at the Red Line. For each car selected, review the completed Preventive Maintenance Inspection (PMI) reports and other 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 treated as UNSCHEDULED REPAIRS have been properly documented and closed out in a timely manner

RESULTS/COMMENTS

Selected and reviewed the Preventive Maintenance Inspection (PMI) reports of the following vehicles:

- **Blue Line:** Nippon-Sharyo vehicles (car nos. 100 & 149). Reviewed the inspection records dated January – June 2001. The required PMI reports were performed during the required mileage limits, inspection reports were properly documented, and maintenance defects were closed out.

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- **Green Line:** There are currently 10 Nippon-Sharyo (P2020) type vehicles that remain at the Green Line yard. The 10 remaining vehicles and the former fleet previously sent to the Blue Line yard in late 2000, are all being converted for Blue Line revenue service by the end of the year.

  Twelve new Siemens type vehicles (P2000) were "conditionally accepted" for use on the Green Line system in late Fall 2000. The P2000 will ultimately replace the P2020 type vehicles previously used on the Green Line. The auditor reviewed the records for the Siemens (P2000) vehicle type rather than the records for the P2020 fleet.

  The auditor selected two Siemens vehicles (car nos. 203 & 205) and reviewed the inspection records dated January to June 2001. The Green Line Maintenance Plan (dated 6-18-01) identifies Inspection cycles of mileage and time for the P2020 & P2000 type vehicles. The Maintenance Plan will be revised to show only P2000 vehicles when the P2020 vehicles are no longer serviced at the Green Line shops.

  Determined that the P2000 vehicles are being inspected on a "monthly basis" as per the Siemens 2-year conditional warranty (effective date April 2001). Siemens representatives are readily available to inspect a P2000 vehicle if an unscheduled repair or defect occurs. Siemens representatives have established the DRAFT Maintenance Procedure for the P2000 vehicles and have trained a limited number of Maintenance Specialists to perform the inspections. The Heavy Repair & Running Manuals were not available for review; they are scheduled for delivery prior to the final acceptance of the last P2000 vehicle.

- **Red Line:** Selected three "base buy" Breda married-pair vehicles (car nos. 505-506, 507-510 & 523-528) and reviewed the inspection reports dated January 2000 to April 2001.

  The mileage difference of Car Nos. 505-506 B-Inspection dated 3-5-00 (recorded mileage of 316,427) and the next scheduled C-Inspection dated 8-16-00 (recorded mileage of 328,851) indicates a difference of 19,414 miles. This mileage difference exceeds the regularly scheduled maintenance interval of 15,000 miles between the B to C inspection interval by 4,414 miles.

  The mileage difference of Car Nos. 523-528 D-Inspection record dated 7-26-00 (recorded mileage of 338,649) and the next scheduled B-Inspection dated 2-17-01 (recorded mileage of 357,295) indicates a difference of 18,646 miles. This mileage difference exceeds the regularly scheduled maintenance interval of 15,000 miles between the D to B inspection by 3,646 miles.

  All of the other required PMI reports were performed during the required mileage limits. All inspection reports were properly documented, & maintenance defects were closed out.

Recommendation:

1. LACMTA should direct the Red Line Vehicle Maintenance Department to evaluate the vehicle mileage tracking methods currently in use for scheduling preventative vehicle maintenance inspections. The system should be improved to alert vehicle maintenance personnel to take revenue vehicles out of service before the maximum allowable mileage between vehicle inspection intervals are exceeded.

CPUC SYSTEM SAFETY AUDIT CHECKLIST FOR THE
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

Checklist No.	**39**	Persons Contacted
Date of Audit	**June 19-21, 2001**	George Kennedy – MBL Rail Equipment Maintenance Manager Glenn Siamau – MBL Supervisor Ed Smith – MGL Rail Equipment Maintenance Manager Tom Lingenfield – MGL Supervisor Brian Rydell – MRL Senior Supervisor Gary Dewater – MRL Rail Equipment Maintenance Instructor
Auditors	**Joey Bigornia**	
Department	**Vehicle Maintenance**	

REFERENCE CRITERIA

1) Rail Vehicle Maintenance Plans For Divisions 11, 20, And 22, dated 12-22-97, Sect. V, Testing And Calibration
2) System Safety Program Plan - Operations, Rev 2, dated 11-25-98, Sect. 2.6.1, Vehicle Maintenance

- Is the SSPP available for reference by employees in this department? Yes

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 each vehicle maintenance shop. For each shop, randomly select two each of LACMTA's micrometers, dial calipers, torque wrenches, and multimeters. From a combination of procedure and record reviews as well as visual inspection, determine whether or not:

1. The selected items are properly inventoried, controlled, calibrated against certified standards traceable to the National Bureau of Standards 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

Reviewed the calibration lists and selected the following items to review from each of the rail yards:
1. Blue Line: two dial indicators (ID No. 20649-199 and 20649-198), one micrometer (ID No. 20649-61), two digital multimeters (S/N 03993051 and 03993054), and two torque wrenches (ID No. 20649-59 and 20649-60).
2. Green Line: one depth micrometer ((TCGL076), two digital multimeters (S/N 59830160 and 58640871), and two torque wrenches (S/N 1089008589 and 283)
3. Red Line: two dial indicators (S/N 25-141J and 020446), one depth micrometer (No. 52-225-222) two digital multimeters (S/N 95110076 and 95110078), and two torque wrenches (S/N A843356 and A843375).

All items contained a calibration sticker that identified the last calibration date and the next scheduled re-calibration. The calibration dates and serial/identification numbers matched the recorded entries on the Calibration Lists.

No exceptions were noted.