2015
TRIENNIAL SAFETY REVIEW OF SAN FRANCISCO MUNICIPAL TRANSPORTATION AGENCY (SFMTA)

RAIL TRANSIT SAFETY BRANCH
SAFETY AND ENFORCEMENT DIVISION
CALIFORNIA PUBLIC UTILITIES COMMISSION
505 VAN NESS AVENUE
SAN FRANCISCO, CA 94102

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Final Report

Elizaveta Malashenko, Director
Safety and Enforcement Division

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ACKNOWLEDGEMENT

The California Public Utilities Commission's Rail Transit Safety Branch (RTSB) staff conducted this system safety program review. Staff members directly responsible for conducting safety review and inspection activities include:

Daren Gilbert – Program Manager
Stephen Artus – Program & Project Supervisor
Steve Espinal – Senior Utilities Engineer, Supervisor
Jimmy Xia – Utilities Engineer – SFMTA Representative
Raed Dwairi – Utilities Engineer –
Joey Bigornia – Utilities Engineer
Mike Borer –Supervisor
Sherman Boyd – Signal Inspector
Debbie Dziadzio –Operations Inspector
Adam Freeman – Mechanical Inspector
Robert Hansen – Utilities Engineer – AirTrain Representative
Howard Huie – Utilities Engineer – LACMTA Representative
Claudia Lam – Senior Utilities Engineer, Specialist
David Leggett – Senior Utilities Engineer, Specialist
John Madriaga –Track Inspector
James Matus – Mechanical Inspector
Kevin McDonald –Track Inspector
Arun Mehta – Utilities Engineer
Paul Renteria – Bridge Inspector
Rupa Shitole – Utilities Engineer
Yan Solopov – Regulatory Analyst
Colleen Sullivan – Utilities Engineer
Michael Warren – Utilities Engineer

TABLE OF CONTENTS

Page

1. EXECUTIVE SUMMARY 1

2. INTRODUCTION 2

3. BACKGROUND 3

SFMTA MUNI Rail System Description 3

SFMTA 2012 Triennial Review Recommendations Status.....5

4. SAFETY REVIEW PROCEDURE 6

5. FINDINGS AND RECOMMENDATIONS 7

APPENDICES

A. Abbreviations and Acronyms List 24

B. SFMTA 2015 Triennial Safety Review Checklist Index.....27

C. SFMTA 2015 Triennial Safety Review Recommendations List 30

D. SFMTA 2015 Triennial Safety Review Checklists 35

1. EXECUTIVE SUMMARY

The California Public Utilities Commission's (Commission) Safety and Enforcement Division (SED), Rail Transit Safety Branch staff (staff) conducted an on-site system safety program review of San Francisco Municipal Transportation Agency (SFMTA) in October 2015.

The on-site review was preceded by a pre-review conference with SFMTA personnel on October 18, 2015.

Staff conducted the 2015 SFMTA safety review from October 19, 2015 through October 30, 2015. The review focused on verifying the effective implementation of the system safety program plan.

Staff held a post-review conference with SFMTA personnel following the safety review on March 1, 2016. Staff provided SFMTA personnel with a synopsis of the preliminary review findings and preliminary recommendations for corrective actions.

The review results indicate that SFMTA has a comprehensive System Safety Program Plan (SSPP) and has made significant progress in executing that plan. However, staff noted exceptions during the review. These exceptions are described in the Findings and Recommendations sections of each checklist. Of the forty (40) checklists utilized, staff made forty-four (44) recommendations for corrective actions. These are distributed among the following departments: System Safety, Transit Division, and Industrial Safety.

The Introduction for this report is presented in Section 2. The Background, in Section 3, contains a description of SFMTA rail system and a status of the corrective actions resulting from the 2012 safety review recommendations. Section 4 describes the review procedure. The review findings and recommendations are depicted in Section 5. A listing of the Abbreviations and Acronyms is in Appendix A. The 2015 SFMTA Triennial Safety Review Checklist Index and the Recommendations List are included, respectively, in Appendices B and C. The Triennial Safety Review Checklists are presented in Appendix D.

2. INTRODUCTION

The Commission's General Order (GO) 164-D, *Rules and Regulations Governing State Safety Oversight of Rail Fixed Guideway Systems*, and the Federal Transit Administration's (FTA) Rule, Title 49 Code of Federal Regulations (CFR) Part 659, *Rail Fixed Guideway Systems: State Safety Oversight*, require the designated State Safety Oversight Agencies to perform a review of each rail transit agency's system safety program at a minimum of once every three years. The purpose of the triennial review is to verify compliance and evaluate the effectiveness of each rail transit agency's System Safety Program Plan (SSPP) and to assess the level of compliance with GO 164-D as well as other Commission safety requirements. Staff conducted the previous on-site safety review of SFMTA in October 2012.

On September 18, 2015, staff mailed a letter to SFMTA's Director of Transportation, advising that the Commission's safety review had been scheduled for October 19, 2015 through October 30, 2015. The letter included forty safety checklists that served as the basis for the review. Six of the forty safety checklists outlined inspections of track, switches, signals, electric power systems, vehicles, tunnels, and bridges over which SFMTA's LRVs travel over. Five checklists reviewed SFMTA's policies and procedures. The remaining checklists focused on the verification of the effective implementation of the SFMTA SSPP.

The 2015 SFMTA triennial safety review consisted of on-site physical inspections of trackways, switches, signals, grade crossing equipment, vehicles, electric power systems, tunnels, and bridges, observations of the day to day duties performed by SFMTA employees from various job classifications, and records review of SSPP elements, SFMTA standard operating procedures (SOP), and other SFMTA rules during October 19-30, 2015 time period. At the conclusion of each review activity, staff provided SFMTA representatives with a summary of the preliminary findings and discussed any preliminary recommendations for corrective action.

3. BACKGROUND

The San Francisco Municipal Transportation Agency (SFMTA) is the public transportation system of the City and County of San Francisco. The San Francisco Municipal Railway (MUNI), along with the San Francisco Department of Parking and Traffic, became a part of the San Francisco Municipal Transportation Agency on March 1, 2000. A seven-member board, appointed by the mayor, governs SFMTA and the Director of Transportation serves as the agency's senior management officer.

SFMTA MUNI was the first publicly owned streetcar system in a major city of the United States and began operation in 1912. It has a relatively small service area of just 46.7 square miles. However, the combined rail transit modes average more than 179,000 weekday riders. SFMTA MUNI's fleet of rail transit vehicles consists of the subway and surface operating light rail vehicles (LRV), surface operating Historic Streetcars (HSC), and cable cars.

A. SFMTA MUNI Rail System Description

SFMTA MUNI rail transit operations are carried out by the Green Metro and the Cable Car Divisions. The Green Metro Division is responsible for the operation of the LRVs and the HSCs. It operates LRVs on six different lines. The HSCs are operated on the surface and principally on one double track line. Trains in SFMTA MUNI Metro Subway and Twin Peaks Tunnel operate under the control of a fully automated communications-based train control system. The majority of rail operations are on the surface in semi-exclusive and mixed traffic right-of-ways, with up to a seven percent grade in some locations.

The Cable Car Division is responsible for operation of the cable cars. It provides passenger cable car service on three surface lines and traverse grades of up to 21 percent. Operating in mixed traffic, cable cars and vehicular traffic sharing traffic lanes, the cable cars transport an average of over 21,900 riders on weekdays over narrow, congested streets. A moving cable, below the surface of the street, provides propulsion for the cable cars via a mechanical grip, extending from the cable car and down through a continuous slot between the running rails. All onboard propulsion and braking controls for the cable cars are mechanical and are hand or foot-operated by the cable car operator. Cable car operation and equipment has changed little since the late 19th century and relies heavily on human performance and craft.

SFMTA MUNI Cable Car Division Lines

The SFMTA MUNI Cable Car Division operates three lines. They include:

- Powell-Hyde Line
- Powell-Mason Line
- California Street Line

SFMTA MUNI Green Metro Division Lines

The SFMTA MUNI Green Metro Division operates six light rail lines and one line devoted to the operation of HSCs. Those lines include:

- F – Market and Wharves Line, dedicated to HSC operation;
- J – Church Line
- K – Ingleside Line
- L – Taraval Line
- M – Ocean View Line
- N – Judah Line
- T – Third Street Line

SFMTA Muni Metro Third Street Light Rail Extension Phase II, also known as the Central Subway Project

Phase II of SFMTA's Third Street Light Rail extension project, commonly known as the Central Subway Project, will extend SFMTA's T Third Street Line north of the intersection of Fourth Street and King Street to Chinatown on Stockton Street near Washington Street. The project will construct new surface tracks along Fourth Street to a portal structure between Bryant Street and Harrison Street, where two newly excavated precast concrete-lined subway tunnels will carry light rail traffic underneath Fourth Street to Market Street, then continue under Stockton Street. A new surface station is planned at Fourth Street and Brannan Street, and three new subway stations will be constructed at Yerba Buena/Moscone (Fourth Street and Folsom Street), Union Square/Market Street (Stockton Street and Geary Street, with mezzanine-level access to the existing Powell Street BART and Muni Station), and Chinatown (Stockton Street and Washington Street).

SFMTA's Capital Programs and Construction Division has primary responsibility for the planning, design, construction, and testing of this line extension.

B. SFMTA 2012 Triennial Review Recommendations Status

Staff performed the previous triennial safety review in October 2012. Forty (40) checklists were used by staff in that review. Results demonstrated that SFMTA had made significant progress in developing and implementing the major elements of its system safety program since staff's first on-site safety review in 1999. Staff made twenty-four (24) recommendations for corrective action that focused on important details of SFMTA's system safety program plan and its implementation.

CPUC Commission Resolution ST-155 adopted staff's report and ordered SFMTA to develop appropriate corrective action plans and implementation schedules for staff recommendations. Resolution ST-155 also ordered SFMTA to give staff a monthly status report providing the implementation progress of these corrective actions until they are completed.

SFMTA developed and submitted a corrective action plan and schedules to fulfill each of the 49 recommendations. By October 16, 2015, SFMTA reported completion of all of the 49 recommendations ordered by the Commission following the 2012 safety review.

4. SAFETY REVIEW PROCEDURE

Staff conducted the 2015 safety review in accordance with Rail Transit Safety Branch Procedure RTSS-4, Procedure for Performing Triennial Safety and Security Reviews of Rail Transit Systems. Staff developed forty checklists to evaluate the adequacy of SFMTA's system safety program and the efficacy of its implementation. The safety evaluation included the system's various departments, programs, and processes which have system safety functions and responsibilities. It is based on Commission and FTA requirements, SFMTA's System Safety Program Plan, safety related SFMTA documents, and the staff's knowledge of the transit system. A list of the forty safety checklists is contained in Appendix B.

Each checklist identifies safety-related elements and characteristics inspected and/or reviewed by staff. The review consists of applying Commission rules and regulations and SFMTA reference documents and rules and policies in order to substantiate SFMTA's safety program requirements. The completed checklists include staff's findings and recommendations for any findings indicating non-compliance. In addition to recommendations based on specific findings of non-compliance, the completed checklists include staff comments designed to improve SFMTA's system safety program. Finally, the completed checklists also include references to the methods used by staff to evaluate compliance with SFMTA's System Safety Program Plan. The methods used to perform the review include:

- Discussions and interviews with SFMTA management
- Review of rules, procedures, policies, and records
- Observations of operations and maintenance activities
- Interviews with rank and file employees
- Inspections and measurements of equipment and infrastructure

Upon completion of the safety review and inspection activities associated with each checklist, staff reviewed findings and, if appropriate, preliminary recommendations for corrective actions, with the respective SFMTA personnel. This practice not only provides a chance to clear up any misunderstandings about the findings and recommendations, it also provides the SFMTA representative an opportunity to promptly address any necessary safety improvements.

The review checklists concentrated on system safety program requirements that affect the safety of the rail operations, public, employees, and property, and that are important to reducing safety hazards, preventing accidents, and improving safety.

5. FINDINGS AND RECOMMENDATIONS

The SFMTA 2015 Triennial Safety Review was a comprehensive review of SFMTA's system safety program elements and their implementation. To achieve that end, staff interviewed management and rank and file employees, reviewed system safety program elements, examined and evaluated selected program records, inspected selected facilities and equipment, and observed various operations and maintenance activities.

The reviewers and inspectors concluded that the SFMTA rail system has a comprehensive SSPP and is effectively implementing the plan. The reviewers and inspectors, however, did make recommendations to improve the system safety program.

Overall, the review confirms that SFMTA is for the most part in compliance with its SSPP. Staff's findings identify areas where changes shall be made to further improve SFMTA's system safety by bringing SFMTA into full compliance with its SSPP. The review identified 44 recommendations from the 40 checklists.

Listed below, in outline form and in the same order as the checklists, are the SFMTA system safety program's elements which staff reviewed or inspected. Each entry also includes, when appropriate, a brief summary of staff's findings of non-compliant conditions and recommendations to SFMTA for resolution through corrective actions.

1. **Policy Statement and Authority for System Safety Program Plan: Management Involvement and Commitment to Safety**

   No findings of non-compliance; no recommendations.

2. **RSSPP Goals and Objectives**

   No findings of non-compliance; no recommendations.

3. **Overview of Management Structure**

   No findings of non-compliance; no recommendations.

4. **System Safety Program Plan: Control and Update Procedure**

No findings of non-compliance; no recommendations.

5. **System Safety Program Plan: Implementation Activities and Responsibilities**

No findings of non-compliance; no recommendations.

6. **Hazard Management Process**

Findings of Non-Compliance:

- SFMTA Safety Department's request on August 14, 2015 for an "Immediate" speed limit reduction to 10 mph at the Van Ness crossover, due to track right safety hazard concerns was not implemented immediately by SFMTA Operations. They ran the trains at normal speed and waited till almost 20 hours to repair the corroded components.

Recommendations:

1. When SFMTA Safety Department issues a "safety hazard" directive including the aforementioned lower/safer speed limit directive, it shall be instituted by SFMTA Operations.

7. **System Modification**

Findings of Non-Compliance:

- Attendance has been an issue and critical departments in the review and change process do not always attend the Rail Change Control Board (RCCB) meetings. In some cases, quorum was achieved but staff observed absences of key department representatives. Staff believes this is because there is no penalty for not attending.

Recommendations:

2. SFMTA should take the necessary measures to ensure all key departments attend its RCCB meetings as required by SOP A.PR.015. (This recommendation is identical to the one issued in checklist #17.)

8. **Safety Certification**

No findings of non-compliance; no recommendations.

9. Safety Data Collection and Analysis

No findings of non-compliance; no recommendations.

10. Accident/Incident Investigations

Findings of Non-Compliance:

- Vehicle Brake Inspection testing Form/Sheet and Vehicle Running Repair Work Orders are being left blank and not being reviewed and signed off by the appropriate Supervisor.
- Staff requested SFMTA to provide their "post-accident vehicle testing procedures" for review, however, SFMTA System Safety was not aware of the existence of any such formal procedures. Staff suggests SFMTA to ensure that formal procedural steps are in place using best industry practices to conduct "post-accident vehicle testing".

Recommendations:

3. SFMTA should ensure that formal procedural steps are in place using best industry practices to conduct "post-accident vehicle testing" and the testing forms are duly reviewed and signed by the designated personnel.

4. Emergency Management Program

Note: This checklist has been replaced by Checklist #6 of the security portion of the 2015 SFMTA Triennial Safety and Security Review; therefore, this checklist is left blank intentionally
No findings of non-compliance; no recommendations.

5. Internal Safety Audits/Reviews

No findings of non-compliance; no recommendations

6. A. Rules Compliance: Observation and Enforcement:

Findings of Non-Compliance:

a. Currently, there are no SOP's that outline steps that supervisors take for observations and efficiency testing regarding non-compliance of Operating Rules and SOP's. The SOP should include reference to current Union Contracts.
b. The current Rail Operations Inspector Manual (1.MN.002 eff date; 1/15) has a description regarding MRO responsibilities. Staff determined that the MRO's (line supervisors) do not perform the entire section outlined in 3.1 of the Manual.

c. Staff determined that, in reference to SFMTA SSPP 2015, Section 9.0, the Safety Department does not receive results from formal/informal observations and efficiency tests from OCC, Operations, or Maintenance, nor are hazards identified and tracked through the Hazard Management Process.
d. After reviewing several employee records, Staff determined that SFMTA Supervisors are not citing their employees regarding non-compliance of CPUC General Orders, SFMTA Operating Rules and SOP's
e. Maintenance Department currently does not have a formal compliance program.

Recommendations:

4. Create an SOP, which outlines steps that supervisors may take to be compliant with SFMTA discipline policies. The SOP shall be initiated, reviewed, and included in supervisor training per SSPP, Section 3.3.
5. Due to the high amount of reportable accidents and incidents that have occurred on SFMTA property in the past three years, SFMTA shall increase its formal/informal observations and efficiency testing per GO 143-B, Section 13.04. Currently one (1) efficiency test is required yearly. This is performed by Training Dept. All departments, including Operations, shall be involved with rules compliance and enforcement of non-compliance.
6. All results from all departments responsible for formal/informal observations and efficiency testing shall be reported to SFMTA Safety Department who will track trends and perform analysis per SSPP Sections 6.1 and 9.0.
7. SFMTA Management shall train and hold accountable their MRO's (line supervisors) to perform duties as outlined in the Rail Operator Inspector's Manual.

13. <u>B. Rules Compliance: Operations Safety Compliance</u>

Findings of Non-Compliance:

- Staff was advised that Operations Department does not conduct formal observations however, when a non-compliance is observed, OCC is notified. It was revealed to Staff several times that Operations Department Management Team was not aware of SFMTA's SSPP, their numerous SOP's, and CPUC General Orders. There were several instances of conversations regarding SFMTA Operating Rules where SFMTA Operations Department Team was unaware of the severity of non-compliance to operating rules (i.e., red signal violation, RWP violation).
- Operations, MRO, Cable Car formal observation results are not forwarded to Safety Department to allow Safety to track trends and provide analysis.

- Staff observed two instances of non-compliances to GO 172 regarding Personal Electronic Devices.
- These occurred at the cable car turntable at Market and Powell on 10/20/15 (see email from CPUC staff dated 10/20/15)
- Staff observed one instance of non-compliance to GO 175 regarding Roadway Worker Protection.
- This occurred at the Ulloa St and West Portal Ave on 10/28/15 (see email from SFMTA staff dated 11/17/15)

Recommendations:

8. SFMTA Operations Department Management Team shall be familiar with SFMTA's SSPP (Sections 3.3 and 13), SFMTA's own SOP's, Operating Rules and Procedures, and CPUC General Orders. Supervisors shall have additional training to address these issues.
9. All non-compliance of SFMTA's Operating Rules and CPUC's General Orders shall be rectified quickly and efficiently per SSPP, Sections 3.3 and 13.3.5.

13. **C. Rules Compliance: Operator, Controller, and Maintenance Personnel Hours of Service Rules Compliance: Operations Safety Compliance**

Findings of Non-Compliance:

- MRO call-in/out times were frequently incomplete with either an in but no out, or vice versa.
- Multiple instances of MRO's exceeding the 12 hrs. in a 16 hr. period rule.
- Staff found 24 separate instances of SFMTA track department employees being on duty for more than 12 hours in the months of October, November and December of 2014. SFMTA track department timecards did not utilize employee numbers, but rather utilized the employee's name. To protect the identity of the employees, Staff is not listing their names here, but is maintaining the information including the names and time violation details, in case SFMTA has any questions.

Recommendations:

10. SFMTA shall ensure that a mechanism exists to ensure MRO on-duty time is properly documented per General Order 143B, Section 12.04.
11. SFMTA shall ensure that a mechanism exists for safety sensitive employees do not exceed their 12hrs per General Order 143B, Section 12.04.

12. SFMTA shall ensure that safety sensitive employees are not on duty more than 12 hours consecutively per SFMTA SSPP 13.3.2: "limitations on hours worked, fatigue control…" and per General Order 143 b, section 12.04.

13. D. Rules Compliance: Contractor Safety Program

No findings of non-compliance; no recommendations

13. E. Rules Compliance: Operating Rules and Maintenance Procedures Manual and Operations Bulletin Revisions

Findings of Non-Compliance:

- Signals and Track Departments are not represented in the revision process.
- Currently, there is no process to ensure that MRU's that operate on the mainline are receiving or are made aware of current bulletins and notices.
- Bulletins and notices are put into the LRV operator's daily paddles. There is not a process in place to ensure the LRV operators actually receive or read the revisions.
- CPUC Staff has not received revised bulletins and notices for the past 12 months as per GO 143-B, Section 13.02.
- System Safety does not receive compliance check and efficiency test results from MRO's, Training, OCC, Maintenance departments.
- System Safety is not notified of the corrective actions taken for anyone that has violated an operating rule and General Orders.

Recommendations:

13. SFMTA shall institute a process to ensure all pertinent personnel receive revisions regarding operations on the system per General Order 143B, Section 13.01. Furthermore, SFMTA shall ensure all personnel that receive revisions are held accountable to receiving revisions via a sign-in system where the operators acknowledge receiving said revisions.
14. SFMTA shall institute a process to ensure System Safety receives all results for compliance checks and efficiency tests so that trends may be tracked and analyzed per SSPP Sections 6.1 and 9.0.
15. SFMTA shall send copies of new/updated Bulletins to CPUC Staff per General Order 143-B, Section 13.02.

13. F. Rules Compliance: Operating Rules and Maintenance Procedures Manual and Operations Bulletin Revisions

Findings of Non-Compliance:

- There is no documentation (SOP) on how and when to update OCC Manual.
- There is not a separate compliance checklist for Floor Managers.
- When researching OCC, Staff determined that recertification had not occurred for 2013 and 2014 for Controllers and Dispatchers. RWP training had not occurred until 2015. All OCC personnel are now current in recertification and training.

Recommendations:

16. SFMTA must include documentation into when and how the OCC Manual is revised.
17. A training matrix should be in place to ensure all personnel are recertified and trained in the timeframe required by General Order 143-B, Section 13.03 and General Order 175.

14. A. Rules Compliance: Operating Rules and Maintenance Procedures Manual and Operations Bulletin Revisions

No findings of non-compliance; no recommendations

14. B. Facilities and Equipment Inspections: Stations and Emergency Equipment

No findings of non-compliance; no recommendations

14.C. Facilities and Equipment Inspections: Tunnels, Bridges, and Aerial Structures

Findings of Non-Compliance:

- Steel plates in the roadway of the 4th Street Bridge over SF Bay Inlet were missing bolts.
- The diving team informed Staff of some areas of concern at the Third Street Bridge over Islais Creek, including significantly corroded beams under the roadway on the northern bascule and the steel reinforcement in the abutments.

Recommendations:

18. SFMTA shall inspect the 4th Street Bridge and determine whether the bolts need to be replaced.
19. SFMTA shall request and review the Third Street Bridge over Islais Creek inspection reports and conduct repairs if deemed necessary.

14.D. Facilities and Equipment Inspections: GO 95 Right-of-Way Compliance

Findings of Non-Compliance:

- The biennial Circuit Breaker Test and Inspection Reports for the circuit breaker GP3 in the Glen Park substation scheduled in 2013 and circuit breaker SJ-15 in the San Jose substation scheduled in 2015 were missing from the record files.

Recommendations:

20. SFMTA shall maintain complete records of all inspections and performed maintenance for four prior calendar years as dictated in General Order 143-B, part 14.06.

14.E. Facilities and Equipment Inspections: Signal Communication, Train Control, Grade Crossing

Findings of Non-Compliance:

- Defect 236.110.A2 Record of the results of tests was not recorded on the required prescribed form taken for both interlocking's at Carrol and Cargo. Two Year test for FRA 236.377 & 378 for locking test were not recorded.
- Defect taken for FRA 234.0273.A2 Test and inspections not recorded on form or electronically for quarterly test for insulated joints per FRA234.271 on test record from 8/17/15.

Recommendations:

21. SFMTA shall request training on FRA 234 & 236 regulations. SFMTA need to develop form and SOP for the two year interlocking test and then re-test both interlocking's.

14.F. Equipment Maintenance Program: Measurement and Testing Instrumentation

No findings of non-compliance; no recommendations

15.A. Maintenance Audits and Inspections – Surface Signal Communication, and Grade Crossing Safety Inspection-CPUC Signal Inspector

Findings of Non-Compliance:

- SFMTA was found not to be in compliance with FRA 234.0215.A3; Standby power capacity is insufficient to operate highway-rail grade crossing warning system during an interruption of the primary source of power at Carrol MP 2.05 DOT# 754765H.

- Emergency Notification Signs (ENS) at Cargo and Carrol grade crossing have been installed improperly.

Recommendations:

22. SFMTA has ordered batteries to replace the failed set at Carrol Ave on 10/14/15. Batteries expected to arrive in four to six weeks. SFMTA shall ensure the batteries are installed properly.
23. Staff gave SFMTA Signal Supervisor a copy of CPUC memorandum on ENS. SFMTA shall ensure the ENS is installed properly.

15.B. ATCS Maintenance Program and Signal Systems Maintenance Program Including Power Switch Machines (Metro Subway)

Findings of Non-Compliance:

- SFMTA has not performed consistently the required PM for its Portal Intrusion Detection system at the Sunset Tunnel because ATCS is no longer used through the tunnel.
- ATCS Wayside Uninterruptible Power Supply testing and record keeping were not consistent with SFMTA's PM procedure R.S.M.PR.002.
- SFMTA has missed several annual inspections for its ATCS Station Controllers, according to PM procedure R.SM.PR.007. This may be related to insufficient staffing and a high turnover rate of maintenance personnel, which limits the level of training among available personnel.
- R.SM.PR.026 Appendix B indicates PM intervals of 2 and 4 weeks, while R.SM.PR.015 Switch Machines requires check intervals at 2, 4, 12, 26, and 52 weeks.
- SFMTA has failed to perform its semiannual and annual inductive loop cable inspections as required by R.SM.PR.038.
- Platform Emergency Stop Button (ESB) procedure R.SM.PR.003 is not being inspected and tested as dictated in the procedure.
- The vast majority of ATCS Axle Counter Trackside Equipment Preventive Maintenance R.SM.PR.006 was conducted in timely manner and the results were within specifications with exception of Duboce, DR08. Duboce axle counter DR08 was not inspected or tested in 2014 and 2015.

Recommendations:

24. SFMTA shall update R.SM.PR.004 to reflect its abandonment of ATCS through the Sunset Tunnel.

25. SFMTA shall train maintenance personnel on the PM requirements in R.SM.PR.002, and ensure supervisors consistently review test records.
26. SFMTA shall take necessary measures to ensure annual PM procedures are performed according to R.SM.PR.007, which may include hiring sufficient personnel and mitigating turnover.
27. SFMTA shall update R.SM.PR.026 Appendix B to reflect PM intervals required by R.SM.PR.015.
28. SFMTA should contact the ATCS designer and inductive loop cable manufacturer to determine an appropriate inspection schedule, and update R.SM.PR.002 accordingly.
29. SFMTA shall inspect and test according to procedure R.SM.PR.003 or review the actual role the ESB plays and revise the procedure.
30. SFMTA shall conduct ATCS Axle Counter Trackside Equipment Preventive Maintenance on Duboce axle counter DR08.

15.C. Maintenance Audits and Inspections – Metro and Cable Car Tracks, Switch, and Turnout Inspection – Field Inspection by CPUC Track Inspector

Findings of Non-Compliance:

- Finding # 1: Staff discovered a gap of 13/16 (compared to the maximum recommended ¼" per R.TR.PR.001 section 4.15 1) between bolted rail joints in the left heel block of switch V3B west of Van Ness station.
- Finding # 2: Staff discovered a missing cotter pin on a bolt on the left side of the # 1 basket rod of switch V3A west of Van Ness station. SFMTA personnel should replace the missing cotter pin per R.TR.PR.001 section 4.20: "All hardware associated with switches shall be present…" and per General Order 143-b section 14.05 and per CFR 49 213.133 (a): "In turnouts and track crossings, the fastenings shall be intact and maintained so as to keep the components securely in place."
- Finding # 3: Staff discovered that 6 out of 7 direct fixation plates between switches V3B and V9 were loose and metal plates and rubber elastomeric coatings were corroded. SFMTA personnel should replace corroded and deteriorated direct fixation plates and rubber coatings per R.TR.PR.001 sections 4.10.1.1, 4.10.2.1, 4.10.2.4: "Fasteners shall be considered ineffective if…a plate or pad is corroded, deteriorated or broken where rail fasteners or anchor bolts no longer provide lateral or vertical support;"
- Finding # 4: Staff discovered 11 defective direct fixation plates in a row on the outbound track, west of switch V9, west of Van Ness station.
- Finding # 5: Staff observed the track supervisor stand upon the track with one, then both feet at switch V1A west of Van Ness station.

Recommendations:

31. SFMTA shall strictly follow their Track Maintenance and Inspection SOP, R.TR.PR.001 and inspect and repair any defects found during inspections in a timely manner. SFMTA should immediately repair the defects found by the CPUC Auditors in the "Findings" section above and inspect the tracks thoroughly for any additional potential defects in the remaining tracks.
32. SFMTA shall emphasize in Safety Trainings that personnel shall never walk upon the rail, per SFMTA rule book section 9.3.2: "Employees shall not step, stand, sit or walk on any part of the rail structure unless necessary in the performance of duty. When required to perform duties in track areas, walking on or crossing the rails must be done on cross-ties and ballast only. Never step or stand in the track switches or their components."

15.D. Metro Track and Cable Car Track and Cable Maintenance Programs – Records Review

Findings of Non-Compliance:

- Staff discovered that 16 track inspections of the MMT by two SFMTA inspectors were improperly documented. These track inspections errors occurred 12/26/12-4/29/15 as well as 4/12/15 to 8/24/15 (see below). These track inspections were documented on the SFMTA "double point switch inspection form" and are required to be conducted twice monthly. The form has 17 items of inspection for each switch.

  Item # 1 for each switch on the form is "Clamped". This requires the inspector to state whether the switch in question has been clamped or not clamped. The only acceptable answer is yes, no, or does not apply (N/A). Both inspectors simply marked "OK". Without mentioning specific names, one inspector did so eleven times and the other inspector five times.

  In each of these 16 inspections, the inspector marked "OK" under item # 1 "clamped:" This answer does not accurately show the condition of the switch. The repeated pattern of simply marking "OK", under this item, over and over again, for several months in a row renders the answer meaningless.

- Track supervisors or superintendent's failed to "manage and oversee (c) track maintenance records documentation", per R.TR.PR.001 section 3.2. Track supervisors and superintendents also failed to "review and initial after that review, each track inspection report…" per R.TR.PR.001 section 3.4 (f).

  Track supervisors, or track superintendents should have known that finding # 1 was occurring, as SFMTA document R.TR.PR.001, section 3.2 states: "The Track Supervisor (a) manages and oversees implementation and compliance of the SOP, (b) track

maintenance employees field activity, (c) track maintenance records documentation…" Additionally, section 3.4 f states: "The Track Superintendent shall …review and initial after that review, each track inspection report…"

There was no record that Track supervisors and superintendents are reviewing track inspections and signing off on them.

- The SFMTA Deputy Director of Maintenance of Way acknowledged to staff that SFMTA had not conducted an ultrasonic inspection (internal rail defect) since 2007. SFMTA's "Track Inspection and Maintenance" manual, R.TR.PR.001, section 4.6, d) states: "Ultrasonic inspection/Internal Defect Detection" inspection shall be conducted "Once every year for non-embedded track in the subways and tunnels only."

  The effect of not conducting internal rail defect inspections per SFMTA's policy is to create uncertainty as to the structural integrity of SFMTA's subway and tunnel track. Annual internal rail defect inspections discover defects that visual inspections cannot find.

Recommendations:

33. Track inspector training shall include an emphasis on accurate record documentation and forms must be completed in the proper manner."
34. SFMTA track supervisors and superintendents shall ensure that inspectors are accurately recording track conditions per R.TR.PR.001, section 3.2 and 3.4 (f) and General Order 143 (b) section 14.05. Track supervisors and superintendents should be signing off on track inspection records per R.TR.PR.001, section 3.2 and 3.4 (f).
35. SFMTA should conduct ultrasonic or internal rail defect inspections according to their own internal policy R.TR.PR.001, section 4.6 d) and per General Order 143-b, section 14.05.

15.E. Maintenance Audits and Inspections – Light Rail Vehicle, Cable Car, and Historic Streetcar Inspection – Field Vehicle Inspection by CPUC Equipment Inspector

No findings of non-compliance; no recommendations

15.F. LRV, Historic Streetcar, Cable Car, and Hi-Rail Vehicles Maintenance Programs – Records Review

Findings of Non-Compliance:

- Hi-rail vehicle maintenance records need to be documented and retained for the 90 day bit inspection program. Hi-rail vehicle #73500022 was without records of inspection for years 2014 and 2015.

Recommendations:

36. Hi-rail vehicle maintenance records shall be documented and retained for the 90 day bit inspection program .

15.G. Maintenance Audits and Inspections – Traction Power System (Overhead Catenary System) Inspections

No findings of non-compliance; no recommendations

16.A. Training and Certification Programs: Operators, Controllers, and Foremen

Findings of Non-Compliance:

- General Order 175 (Roadway Worker Protection) went into effect on October 31, 2013. Most of the GO 175 training records for all the different types of employees CPUC staff reviewed took place in 2015. This training was over one year late.
- General Order 172 (Personal Electronic Devices) training for most employees is missing. CPUC staff could not find evidence of most of these records.
- Most of the refresher training for the Light Rail Vehicle and Historic Street Car Train Operators were one to four months past due.
- Most of the recertification training for Train Controllers was six months to 15 months past due. All of the compliance testing/certification for the Train Controllers were past due. There were no compliance training records found for the years 2013 and 2014.
- There were no training records for Light Rail Supervisors found prior to the year 2013.
- Most of the requalification training records for Cable Car Grip Persons and Cable Car Conductors were two to seven months past due.

Recommendations:

37. SFMTA shall train its entire staff appropriately and timely in the following areas including: refresher, recertification, requalification, compliance testing, General Orders 172 and 175.

16.B. Training and Certification Programs: Maintenance Employees and Contractors

Findings of Non-Compliance:

- SFMTA's procedure R.TR.PL.012, requiring on-On-Track & Trackside Safety Training every three years does not reflect SFMTA's procedure SY.PL.003 Roadway Worker Protection Plan Section 8 which requires retraining every 24 months.
- All Track Maintenance Department employees reviewed were delinquent on On-Track Safety Training according to procedure SY.PL.003.
- SFMTA's procedure W.OL.PR.017 Overhead Line Department does not reflect SFMTA's current practice of contracting out Overhead Line Maintenance training to TTI, Inc.
- SFMTA's training department did not provide documentation to verify that all required training modules indicated in Appendix A of procedure W.OL.PR.017 are satisfactorily addressed through their current training program provided by TTI, Inc.

Recommendations:

38. SFMTA shall update procedure R.TR.PL.012 to reflect the requirements of its Roadway Worker Protection Plan, procedure SY.PL.003.
39. SFMTA shall review the training records and schedules for all Track Department Maintenance personnel and ensure compliance with the Roadway Worker Protection training requirements in procedure SY.PL.003.
40. SFMTA shall update or replace procedure W.OL.PR.017 to reflect the current training practices for Overhead Line Maintenance.
41. SFMTA shall ensure that all 12 modules listed in Appendix A of procedure W.OL.PR.017 are satisfactorily addressed and documented through the current training practices for Overhead Line Maintenance.

17. Configuration Management and Control

Findings of Non-Compliance:

- SFMTA representatives presented staff with a list of change requests but these were processed starting in the 4th quarter of 2014. It appears that SFMTA allowed the Configuration Management Program to lapse prior to around August, 2014.
- Attendance has been an issue and critical departments in the review and change process do not always attend. In some cases, quorum was achieved but staff observed absences of key department representatives. Staff believes this is because there is no penalty for not attending.

Recommendations:

2. SFMTA shall take the necessary measures to ensure all key departments attend its RCCB meetings as required by A.PR.015. (This recommendation is identical to the one issued in checklist #7 as recommendation 2.).

18. Local, State, and Federal Requirements: Employee Safety Program

Findings of Non-Compliance:

- The incident cited above in Activities 6 was notified to the CPUC on October 14, 2015. However, SFMTA's Industrial Safety and Environmental Compliance (ISEC) staff was not made aware of this worker safety incident Staff brought it up during the audit (eight days later).

Recommendations:

42. SFMTA Operations, particularly, Central Controls shall report all worker safety incidents to the Industrial Safety and Environmental Compliance (ISEC) department in a timely manner.

19. Hazardous Materials Program

No findings of non-compliance; no recommendations

20. Drug and Alcohol Program

No findings of non-compliance; no recommendations

21. Procurement Process

No findings of non-compliance; no recommendations

22. CPUC GO 172 – Personal Electronic Device Prohibitions/In-cab Cameras

Findings of Non-Compliance:

- SFMTA Deputy Director, Transit Management, advised CPUC Staff that she was unaware of GO172 and had not seen any verbiage regarding the General Order. Staff ensured that SFMTA Deputy Director, Transit Management, would be provided a copy of General Order 172.

Recommendations:

43. SFMTA executive management should ensure that its Management Staff especially the Transportation Operations staff are trained in all requirements of CPUC General Order 172.

23. CPUC GO 175 – Rules and Regulations Governing Roadway Worker Protection Provided by Rail Transit Agencies and Fixed Guideway Systems

Findings of Non-Compliance:

- Staff determined that Cable Car Operators # 1047 and # 0759 have not received any training in Roadway Worker Protection.

Recommendations:

44. SFMTA shall ensure that all relevant employees including Cable Car Operators # 1047 and # 0759 receive Roadway Worker Protection training class at the earliest dates available. SFMTA shall ensure that all workers who are required to take Roadway Worker Protection training do in fact receive that training every 24 months.

APPENDICES

A. Abbreviations and Acronyms List

B. SFMTA 2015 Triennial Safety Review Checklist Index

C. SFMTA 2015 Triennial Safety Review Recommendations List

D. SFMTA 2015 Triennial Safety Review Checklists

APPENDIX A

ABBREVIATIONS and ACRONYMS LIST

Abbreviation / Acronym	Description
APTA	American Public Transportation Association
ATCS	Automatic Train Control System
CAP	Corrective Action Plan
CCB	Change Control Board
CCSF	City and County of San Francisco
CFR	Code of Federal Regulations
Commission	California Public Utilities Commission
CPSD	Consumer Protection and Safety Division
CPUC	California Public Utilities Commission
CSO	Chief Safety Officer
CTS	Chinatown Station
DAMIS	Drug and Alcohol Management Information System
DEM	Department of Emergency Management
DHS	Department of Homeland Security
DT	Department of Technology
EDSC	Executive Director's Safety Committee
EOC	Emergency Operations Center
EOP	Emergency Operations Plan
ERP	Emergency Response Planning
ET	Emergency Telephone
FLSC	Fire Life Safety Committee
FTA	Federal Transit Administration
GO	General Order
H&S	Health and Safety
HAWG	Hazard Analysis Work Group

HOS	Hours of Service
HSC	Historic Streetcar
ICS	Incident Command System
IIPP	Injury and Illness Prevention Program
ISA	Internal Safety Audit
LRV	Light Rail Vehicle
MME	Muni Metro East
MMT	Muni Metro Turn Back
MOS	Moscone Station
MRO	Metro Rail Operations
MTC	Metropolitan Transportation Commission
MUNI or Muni	San Francisco Municipal Railway
NIMS	National Incident Management System
OCC	Operations Control Center
OCS	Overhead Catenary System
OEHU	Occupational & Environmental Health Unit
OEM	Original Equipment Manufacturer
OES	Office of Emergency Services
OHA	Operational Hazards Analysis
OII	Order Instituting Investigation
OSRC	Operations Safety Review Committee
OTEO	On Track Equipment Operator
OTS	On Track Safety
PCC	Presidential Conference Committee Car
PHA	Preliminary Hazard Analysis
PM	Preventive Maintenance
PMI	Preventive Maintenance Inspection
PU Code	Public Utilities Code
RCCB	Rail Change Control Board
ROSB	Railroad Operations Safety Branch
RPC	Rules and Procedures Committee

RSSPP	Rail System Safety Program Plan
RTSB	Rail Transit Safety Branch
SAP	Substance Abuse Professional
SCVR	Safety Certification Verification Report
SED	Safety and Enforcement Division
SFFD	San Francisco Fire Department
SFMTA	San Francisco Municipal Transportation Agency
SFPD	San Francisco Police Department
SMSC	Senior Management Safety Committee
SOP	Standard Operating Procedure
SRC	Safety Review Committee
SSCP	Safety and Security Certification Plan
SSCRC	Safety and Security Certification Review Committee
SSMP	Safety and Security Management Plan
SSP	System Security Plan
SSPP	System Safety Program Plan
Staff	Safety and Enforcement Division personnel
TESS	Time & Entry Scheduling System
TOSB	Transit Operations Safety Branch
TS	Transit Safe database
TSA	Transportation Security Administration
TSI	Transportation Safety Institute
TSS	Transportation Safety Specialist
TVA	Threat & Vulnerability Analysis
UMS	Union Square / Market Street Station
UPS	Uninterruptible Power Supply
VETAG	Vehicle Tagging System

APPENDIX B

2015 SFMTA TRIENNIAL SAFETY REVIEW CHECKLIST INDEX

Checklist No.	Element / Characteristic	Checklist No.	Element / Characteristic
1	Policy Statement and Authority for System Safety Program Plan: Management Involvement and Commitment to Safety	11	Emergency Management Program
2	RSSPP Goals and Objectives	12	Internal Safety Audits/Reviews
3	Overview of Management Structure	13-A	Rules Compliance: Observation and Enforcement
4	System Safety Program Plan: Control and Update Procedure	13-B	Rules Compliance: Operations Safety Compliance
5	System Safety Program Plan: Implementation Activities and Responsibilities	13-C	Rules Compliance: Operator, Controller, and Maintenance Personnel Hours of Service
6	Hazard Management Process	13-D	Rules Compliance: Contractor Safety Program
7	System Modification	13-E	Rules Compliance: Operating Rules and Maintenance Procedures Manual and Operations Bulletin Revisions
8	Safety Certification	13-F	Rules Compliance: Operations Control Center & SCADA
9	Safety Data Collection and Analysis	14-A	Facilities and Equipment Inspections: Non-Revenue Facilities and Wayside
10	Accident/Incident Investigations	14-B	Facilities and Equipment Inspections: Stations and Emergency Equipment

Checklist No.	Element / Characteristic	Checklist No.	Element / Characteristic
14-C	Facilities and Equipment Inspections: Tunnels, Bridges, and Aerial Structures	15-G	Maintenance Audits and Inspections – Traction Power System (Overhead Catenary System) Inspections
14-D	Facilities and Equipment Inspections: GO 95 Right-of-Way Compliance	16-A	Training and Certification Programs: Operators, Controllers, and Foremen
14-E	Facilities and Equipment Inspections: Signal Communication, Train Control, Grade Crossing	16-B	Training and Certification Programs: Maintenance Employees and Contractors
14-F	Equipment Maintenance Program: Measurement and Testing Instrumentation	17	Configuration Management and Control
15-A	Maintenance Audits and Inspections – Surface Signal Communication, and Grade Crossing Safety Inspection-CPUC Signal Inspector	18	Local, State, and Federal Requirements: Employee Safety Program
15-B	ATCS Maintenance Program and Signal Systems Maintenance Program Including Power Switch Machines (Metro Subway)	19	Hazardous Materials Program
15-C	Maintenance Audits and Inspections – Metro and Cable Car Tracks, Switch, and Turnout Inspection – Field Inspection by CPUC Track Inspector	20	Drug and Alcohol Program
15-D	Metro Track and Cable Car Track and Cable Maintenance Programs – Records Review	21	Procurement Process
15-E	Maintenance Audits and Inspections – Light Rail Vehicle, Cable Car, and Historic Streetcar Inspection – Field Vehicle Inspection by CPUC Equipment Inspector	22	CPUC GO 172 – Personal Electronic Device Prohibitions/In-cab Cameras
15-F	LRV, Historic Streetcar, Cable Car, and Hi-Rail Vehicles Maintenance Programs – Records Review	23	CPUC GO 175 – Rules and Regulations Governing Roadway Worker Protection Provided by Rail Transit Agencies and Fixed Guideway Systems

APPENDIX C

2015 SFMTA TRIENNIAL SAFETY REVIEW RECOMMENDATIONS LIST

No.	Recommendation	Checklist No.
1	When SFMTA Safety Department issues a "safety hazard" directive including the aforementioned lower/safer speed limit directive, it shall be instituted by SFMTA Operations.	6
2	SFMTA should take the necessary measures to ensure all key departments attend its RCCB meetings as required by SOP A.PR.015.	7, 17
3	SFMTA should ensure that formal procedural steps are in place using best industry practices to conduct "post-accident vehicle testing" and the testing forms are duly reviewed and signed by the designated personnel.	10
4	Create an SOP, which outlines steps that supervisors may take to be compliant with SFMTA discipline policies. The SOP shall be initiated, reviewed, and included in supervisor training per SSPP, Section 3.3.	13-A
5	Due to the high amount of reportable accidents and incidents that have occurred on SFMTA property in the past three years, SFMTA shall increase its formal/informal observations and efficiency testing per GO 143-B, Section 13.04. Currently one (1) efficiency test is required yearly. This is performed by Training Dept. All departments, including Operations, shall be involved with rules compliance and enforcement of non-compliance.	13-A
6	All results from all departments responsible for formal/informal observations and efficiency testing shall be reported to SFMTA Safety Department who will track trends and perform analysis per SSPP Sections 6.1 and 9.0.	13-A
7	SFMTA Management shall train and hold accountable their MRO's (line supervisors) to perform duties as outlined in the Rail Operator Inspector's Manual.	13-A
8	SFMTA Operations Department Management Team shall be familiar with SFMTA's SSPP (Sections 3.3 and 13), SFMTA's own SOP's, Operating Rules and Procedures, and CPUC General Orders.	13-B

No.	Recommendation	Checklist No.
	Supervisors shall have additional training to address these issues.	
9	All non-compliance of SFMTA's Operating Rules and CPUC's General Orders shall be rectified quickly and efficiently per SSPP, Sections 3.3 and 13.3.5.	13-B
10	SFMTA shall ensure that a mechanism exists to ensure MRO on-duty time is properly documented per General Order 143B, Section 12.04.	13-C
11	SFMTA shall ensure that a mechanism exists so safety sensitive employees do not exceed their 12hrs per General Order 143B, Section 12.04.	13-C
12	SFMTA shall ensure that safety sensitive employees are not on duty more than 12 hours consecutively per SFMTA SSPP 13.3.2: "limitations on hours worked, fatigue control…" and per General Order 143 b, section 12.04.	13-C
13	SFMTA shall institute a process to ensure all pertinent personnel receive revisions regarding operations on the system per General Order 143B, Section 13.01. Furthermore, SFMTA shall ensure all personnel that receive revisions are held accountable to receiving revisions via a sign-in system where the operators acknowledge receiving said revisions.	13-E
14	SFMTA shall institute a process to ensure System Safety receives all results for compliance checks and efficiency tests so that trends may be tracked and analyzed per SSPP Sections 6.1 and 9.0.	13-E
15	SFMTA shall send copies of new/updated Bulletins to CPUC Staff per General Order 143B, Section 13.02.	13-E
16	SFMTA must include documentation into when and how the OCC Manual is revised.	13-F
17	A training matrix should be in place to ensure all personnel are recertified and trained in the timeframe required by General Order 143-B, Section 13.03 and General Order 175.	13-F
18	SFMTA shall inspect the 4th Street Bridge and determine whether the bolts need to be replaced.	14-C
19	SFMTA shall request and review the Third Street Bridge over Islais Creek inspection reports and conduct repairs if deemed necessary.	14-C

No.	Recommendation	Checklist No.
20	SFMTA shall maintain complete records of all inspections and performed maintenance for four prior calendar years as dictated in General Order 143-B, part 14.06.	14-D
21	SFMTA shall request training on FRA 234 & 236 regulations. SFMTA need to develop form and SOP for the two year interlocking test and then re-test both interlocking's.	14-E
22	SFMTA has ordered batteries to replace the failed set at Carrol Ave on 10/14/15. Batteries expected to arrive in four to six weeks. SFMTA shall ensure the batteries are installed properly.	15-A
23	Staff gave SFMTA Signal Supervisor a copy of CPUC memorandum on ENS. SFMTA shall ensure the ENS is installed properly.	15-A
24	SFMTA shall update R.SM.PR.004 to reflect its abandonment of ATCS through the Sunset Tunnel.	15-B
25	SFMTA shall train maintenance personnel on the PM requirements in R.SM.PR.002, and ensure supervisors consistently review test records.	15-B
26	SFMTA shall take necessary measures to ensure annual PM procedures are performed according to R.SM.PR.007, which may include hiring sufficient personnel and mitigating turnover.	15-B
27	SFMTA shall update R.SM.PR.026 Appendix B to reflect PM intervals required by R.SM.PR.015.	15-B
28	SFMTA should contact the ATCS designer and inductive loop cable manufacturer to determine an appropriate inspection schedule, and update R.SM.PR.002 accordingly.	15-B
29	SFMTA shall inspect and test according to procedure R.SM.PR.003 or review the actual role the ESB plays and revise the procedure.	15-B
30	SFMTA shall conduct ATCS Axle Counter Trackside Equipment Preventive Maintenance on Duboce axle counter DR08.	15-B
31	SFMTA shall strictly follow their Track Maintenance and Inspection SOP, R.TR.PR.001 and inspect and repair any defects found during inspections in a timely manner. SFMTA should immediately repair the defects found by the CPUC Auditors in the "Findings" section above and inspect the tracks thoroughly for any additional potential defects in the remaining tracks.	15-C
32	SFMTA shall emphasize in Safety Trainings that personnel shall never walk upon the rail, per SFMTA rule book section 9.3.2:	15-C

No.	Recommendation	Checklist No.
	"Employees shall not step, stand, sit or walk on any part of the rail structure unless necessary in the performance of duty. When required to perform duties in track areas, walking on or crossing the rails must be done on cross-ties and ballast only. Never step or stand in the track switches or their components."	
33	Track inspector training shall include an emphasis on accurate record documentation and forms must be completed in the proper manner.	15-D
34	SFMTA track supervisors and superintendents shall ensure that inspectors are accurately recording track conditions per R.TR.PR.001, section 3.2 and 3.4 (f) and General Order 143 (b) section 14.05. Track supervisors and superintendents should be signing off on track inspection records per R.TR.PR.001, section 3.2 and 3.4 (f).	15-D
35	SFMTA should conduct ultrasonic or internal rail defect inspections according to their own internal policy R.TR.PR.001, section 4.6 d) and per General Order 143-b, section 14.05.	15-D
36	Hi-rail vehicle maintenance records shall be documented and retained for the 90 day bit inspection program.	15-F
37	SFMTA shall train its entire staff appropriately and timely in the following areas including: refresher, recertification, requalification, compliance testing, General Orders 172 and 175.	16-A
38	SFMTA shall update procedure R.TR.PL.012 to reflect the requirements of its Roadway Worker Protection Plan, procedure SY.PL.003.	16-B
39	SFMTA shall review the training records and schedules for all Track Department Maintenance personnel and ensure compliance with the Roadway Worker Protection training requirements in procedure SY.PL.003.	16-B
40	SFMTA shall update or replace procedure W.OL.PR.017 to reflect the current training practices for Overhead Line Maintenance.	16-B
41	SFMTA shall ensure that all 12 modules listed in Appendix A of procedure W.OL.PR.017 are satisfactorily addressed and documented through the current training practices for Overhead Line Maintenance.	16-B
42	SFMTA Operations, particularly, Central Controls shall report all worker safety incidents to the Industrial Safety and Environmental Compliance (ISEC) department in a timely manner.	18

No.	Recommendation	Checklist No.
43	SFMTA executive management should ensure that it's Management Staff especially the Transportation Operations staff are trained in all requirements of CPUC General Order 172.	22
44	SFMTA shall ensure that all relevant employees including Cable Car Operators # 1047 and # 0759 receive Roadway Worker Protection training class at the earliest dates available. SFMTA shall ensure that all workers who are required to take Roadway Worker Protection training do in fact receive that training every 24 months.	23

APPENDIX D

2015 SFMTA TRIENNIAL SAFETY REVIEW CHECKLISTS

2015 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR SAN FRANCISCO MUNICIPAL TRANSPORTATION AGENCY (SFMTA)

Checklist No.	**1**	**Element**	**Policy Statement and Authority for System Safety Program Plan: Management Involvement and Commitment to Safety**
Time	10:00 a.m. – 4:00 p.m.	**Location**	1 SVN 7th Floor DOT Conference Room
Date of Audit	October 19, 2015	**Department(s)**	SFMTA Senior Management
Auditors/ Inspectors	Daren Gilbert Stephen Artus Steve Espinal Mike Borer Raed Dwairi	**Persons Contacted**	Ed Reiskin (Director of Transportation) Melvyn Henry (Chief Safety Officer)

REFERENCE CRITERIA

1. CPUC General Order 164-D
2. SFMTA System Safety Program Plan (SSPP), Revision 6, dated 2/11/2015

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

Policy Statement and Authority for System Safety Program Plan:
SFMTA Senior Management Involvement and Commitment to Safety

Interview SFMTA's Executive and Senior Management to discuss:

1. Source, frequency, and depth of safety information provided to Senior Management, whether safety is included as a regular topic at SFMTA Senior Management meetings, and how safety information is communicated.
2. Methods and incentives included in the management performance system to facilitate a system safety culture within the organization.
3. Formal meetings held and attended by SFMTA Senior Management to discuss safety performance, such as ongoing evaluation of goals and targets.
4. The Executive Management's awareness of high priority safety issues related to operations and capital projects.
5. The Executive Management's awareness of the status of all corrective actions generated by the System Safety Department through internal safety and security audits, the hazard management process, accident/incident investigations, or other channels.
6. The System Safety Department's reporting relationship with SFMTA's executive and senior management, and management's participation in safety activities.
7. Which individuals and departments are involved in making safety decisions and to what degree senior management is involved?

8. Scope of senior management's involvement, coordination, and communication in developing SSPP revisions.
9. Whether safety is included as a regular topic at SFMTA Board Meetings, and whether SFMTA's Executive Management provides updates and concerns.
10. The process for the periodic review of the resources devoted to safety by SFMTA Executive Management Team.
11. The inclusion of safety responsibilities in job evaluations for managers, supervisors, and employees.
12. Whether the Executive Management routinely visits the Operations Control Center, Maintenance Facility, and WP&S Facility and speaks with rank and file employees to discuss their safety concerns.

FINDINGS AND RECOMMENDATIONS

Activities:
Staff interviewed the SFMTA's Executive Management Team and found the following in summary:

1. The Director of Transportation meets with the Executive Team once a week including Safety. The Safety Management Steering Committee meets once a month.
2. There is a real time reporting from Central Control on incidents and E-mails are generated daily on safety & security incidents.
3. Strategic Plan was adopted in 2012 and based on the key performance indicators (KPIs), the goals and objectives are updated and the Management Performance Plan is the basis on how managers are evaluated. Safety is reviewed on daily and ongoing basis.
4. The Director of Transportation receives monthly progress safety certification reports and SFMTA is working with the CPUC on Automatic Train Control System as well as and other projects.
5. The Director of Transportation reviews copies of anything going out to CPUC and is aware of the status of all corrective actions including those remaining from previous triennial audit conducted by CPUC staff.
6. The Chief Safety Officer has a direct reporting relationship to the Director of Transportation.
7. Department subject matter experts propose corrective actions and prepare responses to safety issues which are subsequently reviewed by the Safety Department.
8. The Safety Department prepares a summary of changes to the SSSP and forwards it to the Director of Transportation for review.
9. Policy & Governance Committee reviews KPIs and safety goals and presents at the Board Meetings.
10. Employees are recognized for significant contributions to safety and the Director of Transportation participates in the operator of the month to induce and encourage a positive safety culture.
11. The Director of Transportation talks with operators and mechanics every Tuesday morning and attends operator recognition ceremonies. He also meets with union leaders and rides the system to talk to operators.

Findings:
No exceptions were noted.

Comments:
None

Recommendations:
None

2015 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR SAN FRANCISCO MUNICIPAL TRANSPORTATION AGENCY (SFMTA)

Checklist No.	**2**	**Element**	**RSSPP Goals and Objectives**
Time	10:00 a.m. – 4:00 p.m.	**Location**	1 SVN 7th Floor DOT Conference Room
Date of Audit	October 19, 2015	**Department(s)**	SFMTA Senior Management
Auditors/ Inspectors	Daren Gilbert Stephen Artus Steve Espinal Mike Borer Raed Dwairi	**Persons Contacted**	Ed Reiskin (Director of Transportation) Melvyn Henry (Chief Safety Officer)

REFERENCE CRITERIA

1. CPUC General Order 164-D
2. SFMTA System Safety Program Plan (SSPP), Revision 6, dated 2/11/2015

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

System Safety Program Plan: Goals and Objectives

Interview SFMTA Senior Management and review appropriate records to:

1. Determine whether SFMTA is making significant progress towards the ongoing goals and objectives identified in the SSPP.
2. Obtain examples of at least 3 safety-related goals SFMTA is actively pursuing. Identify how these goals are being evaluated (metrics and measures) and review documentation used to track and measure SFMTA's activities to meet the goals and objectives. For example, if SFMTA has set a goal of reducing incidents by 10%, has this been achieved? How are such metrics tracked and reported?
3. Determine how safety performance is reported to the Executive and Senior Management (i.e. monthly or annual safety reports, quarterly view graph presentations, etc.).
4. Determine whether the safety information provided to the Executive Management is adequate in order to further its stated safety goals. Are rule violations and other key safety metrics being regularly tracked and reported to the Senior Management?
5. Determine whether the stated goals and objectives should be revised.
6. Determine whether management's responsibilities in regards to tracking and pursuing safety goals and objectives are adequately identified.

FINDINGS AND RECOMMENDATIONS

Activities:

Staff interviewed the Executive Management Team and noted the following in summary:

1. The SSPP documents dictates how SFMTA implements its Strategic Plan and is continuously enhancing the safety culture through changing awareness of its recognition program.
2. The Director of Transportation receives rule violations reports if trends are identified. However the Director isn't alerted to each and every rules violation at SFMTA.
3. SFMTA tracks collisions and has not been able to reduce accidents by 10% a year. According to SFMTA management, one third of all accidents at SFMTA are preventable.

Findings:
No exceptions were noted.

Comments:
None

Recommendations:
None

2015 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR SAN FRANCISCO MUNICIPAL TRANSPORTATION AGENCY (SFMTA)

Checklist No.	**3**	**Element**	**Overview of Management Structure**
Time	10:00 a.m. – 4:00 p.m.	**Location**	1 SVN 7th Floor DOT Conference Room
Date of Audit	October 19, 2015	**Department(s)**	Safety Division
Auditors/ Inspectors	Daren Gilbert Stephen Artus Steve Espinal Mike Borer Raed Dwairi	**Persons Contacted**	Ed Reiskin (Director of Transportation) Melvyn Henry (Chief Safety Officer)

REFERENCE CRITERIA

1. CPUC General Order 164-D
2. SFMTA System Safety Program Plan (SSPP), Revision 6, dated 2/11/2015
3. Hazard Analysis, SY.PR.042
4. Senior Management Safety Committee, SY.PR.053
5. Muni Division Safety Committees, OS.PR.005

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

Overview of Senior Management Structure

Interview SFMTA Senior Management and review appropriate records to:

1. Discuss SFMTA's process for integrating safety into its operations and maintenance activities.
2. Solicit opinions regarding the effectiveness of the organization and request a few examples of how the organization has worked to resolve identified safety issues.
3. Identify any specific issues and/or concerns held by SFMTA's Senior Management about the safety program due to limitations in personnel or resources. For example, discuss any difficulties in maintaining schedules for SSPP updates, completing Internal Safety and Security Audits, or performing Accident/Incident Investigations.
4. Review Senior Management Safety Committee Meeting agendas and minutes from the past twelve months to verify that the meetings were held in accordance with the requirements in SSPP Section 3.5.3 (Safety Review Process).
5. Does the Safety Department have personnel resources allocated to support interdepartmental coordination on safety issues and concerns?
6. Have SFMTA's Safety Department's personnel and resources been cut or increased disproportionately with SFMTA's overall budget over the last three (3) years?

FINDINGS AND RECOMMENDATIONS

Activities:
Staff interviewed the Chief Safety Officer and System Safety Manager and learned the following in summary:

1. Safety is integrated into operations and maintenance activities through the Performance Plan and during the monthly Division Safety Meetings.
2. Examples to resolve identified safety issues include building safety features in new LRVs to reduce operators' injuries. SFMTA cited the following examples on incorporating safety in to the day to day operations including: line of sight for the Operators, configurational improvements at various locations and adjusting T-stick pressure to prevent Operator injuries. Other improvements include standardization of the signal system.
3. No issues or concerns were identified that affect maintaining schedules or limit the completion of safety-related activities.
4. Senior Management Safety Committee meetings were held as required by the SSPP.
5. SFMTA added positions and invested in maintenance and other programs.

Findings:
No exceptions were noted.

Comments:
None

Recommendations:
None

2015 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR SAN FRANCISCO MUNICIPAL TRANSPORTATION AGENCY (SFMTA)

Checklist No.	**4**	**Element**	**System Safety Program Plan: Control and Update Procedure**
Time	10:00 a.m. – 4:00 p.m.	**Location**	1 SVN 7th Floor DOT Conference Room
Date of Audit	October 19, 2015	**Department(s)**	Safety Division
Auditors/ Inspectors	Daren Gilbert Stephen Artus Steve Espinal Mike Borer Raed Dwairi	**Persons Contacted**	Melvyn Henry (Chief Safety Officer) Michael Kirchanski (System Safety Manager) Joern Kroll (Transportation Safety Specialist)

REFERENCE CRITERIA

1. CPUC General Order 164-D
2. SFMTA System Safety Program Plan (SSPP), Revision 6, dated 2/11/2015
3. SOP Development and Approval, A.PR.002

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

System Safety Program Plan: Control and Update Procedure
Interview SFMTA System Safety Department and review appropriate records to:

1. Ensure that SFMTA's Safety Department understands and is implementing the procedure requirements in SSPP Section 4.
2. Verify that the required annual SSPP review process is being implemented according to the approved process specified in the SSPP, Element 6. Review past correspondence and records for the last 3 years.
3. Review responsibility for SSPP reviews and comments, and verify that SSPP reviews and changes progress according to internal timeframes, are comprehensive in scope, and are signed-off by the designated staff.

FINDINGS AND RECOMMENDATIONS

Activities:
Staff interviewed SFMTA management and reviewed documentation and determined the following in summary:

1. SFMTA reviews regulations changes, internal organization, and SOP changes on a yearly basis.
2. When all changes are identified, the Safety department drafts the SSPP and sends it for comments and final approval.
3. Documentation demonstrates that SSPP review and changes were conducted in accordance

to required timeframes and signed-off as appropriate.

Findings:
No exceptions were noted

Comments:
None

Recommendations:
None

2015 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR SAN FRANCISCO MUNICIPAL TRANSPORTATION AGENCY (SFMTA)

Checklist No.	**5**	**Element**	**System Safety Program Plan: Implementation Activities and Responsibilities**
Time	10:00 a.m. – 4:00 p.m.	**Location**	1 SVN 7th Floor DOT Conference Room Other locations for document review
Date of Audit	October 19, 2015	**Department(s)**	Safety Division
Auditors/ Inspectors	Daren Gilbert Stephen Artus Steve Espinal Mike Borer Raed Dwairi	**Persons Contacted**	Melvyn Henry (Chief Safety Officer) Michael Kirchanski (System Safety Manager) John Haley (Director of Transit)

REFERENCE CRITERIA

1. CPUC General Order 164-D
2. SFMTA System Safety Program Plan (SSPP), Revision 6, dated 2/11/2015

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

System Safety Program Plan: Implementation Activities and Responsibilities
Interview SFMTA System Safety Department and review appropriate records to:

1. Verify that each manager, department, and contractor is charged with the responsibility and accountability for SSPP implementation, enforcement, and effectiveness.
2. Identify any challenges each manager, department, and contractor has in performing tasks relating to the SSPP or general safety.
3. Verify management's accountability for the performance of safety-related activities, and, if serious or potentially serious deficiencies are found, expand the review to include additional and/or related activities.
4. Select, at random, at least 3 activities performed by the safety function and 3 activities performed by other SFMTA departments, and review the associated documents.

FINDINGS AND RECOMMENDATIONS

Activities:
Interviewed the SFMTA representatives in charge of SSPP implementation and reviewed relevant documentation and noted the following in summary:

1. SSPP defines the responsibilities of each department in terms of implementing the SSPP.

2. No preventative challenges were identified in performing tasks relating to implementing the SSPP.
3. Management is held accountable for the performance of safety-related activities.
4. For the activities selected from the required SSPP elements all were completed as required.

Findings:
No exceptions were noted

Comments:
None

Recommendations:
None

2015 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR SAN FRANCISCO MUNICIPAL TRANSPORTATION AGENCY (SFMTA)

Checklist No.	**6**	**Element**	**Hazard Management Process**
Time	1:30 – 4:30 p.m.	**Location**	1 SVN 7th Floor Noe Valley Conference Room
Date of Audit	October 19, 2015	**Department(s)**	Safety Division Industrial Safety (ISEC) Transit Management Transit Services
Auditors/ Inspectors	Claudia Lam Steve Espinal Arun Mehta	**Persons Contacted**	Michael Kirchanski Sarita Britt Michelle Eciso Jim Kelley Gerald Williams

REFERENCE CRITERIA

1. CPUC General Order 164-D
2. SFMTA System Safety Program Plan (SSPP), Revision 6, dated 2/11/2015
3. Hazard Analysis, SY.PR.042
4. Muni Division Safety Committees, OS.PR.005
5. Accident Incident Investigation & Reporting SY.PR.044
6. Emergency Notifications, R.OC.PR.007

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

Hazard Management Process

Interview SFMTA representatives and review appropriate records to determine whether:

1. SFMTA is identifying hazards through the sources described in the SSPP. Sources may include, but are not limited to:
   a. Reports and complaints from passengers, field or management personnel;
   b. Data mining of SFMTA control center logs and maintenance systems;
   c. Monitoring of special orders and speed restrictions;
   d. Reports from operators and supervisors;
   e. Review of Unusual Occurrence Reports;
   f. Safety statistics reports;
   g. Annual internal safety audits;
   h. Facility inspections;
   i. Rules Compliance Program, including results from efficiency testing;

j. Results from CPUC Triennial Reviews;
k. Results from accident investigations and trend analysis.

2. The Safety Division maintains a mechanism to capture and track identified hazards through analysis and resolution.
3. The System Safety Manager, Deputy Director of Transit Management, Safety Officer of ISEC and their subordinates are reviewing operational hazards to assess their severity, and reporting unacceptable hazards to CPUC as specified by the SSPP.
4. SFMTA has a specified process for reporting hazard resolution activities to CPUC as required by General Order 164-D, Sections 6e and 6f.
5. Identified hazards are being evaluated according to the methods established in the SSPP.
6. Corrective actions are developed to address identified hazards, and identify the individual or department responsible for implementation and a schedule for completion.
7. The System Safety Department follows up on outstanding corrective actions to mitigate or resolve hazards.
8. Review records related to past 3 years to:
   a. Ensure that the CPUC is being notified of identified hazards as specified in the SSPP.
   b. Verify that the appropriate entities are performing hazard evaluation/categorization activities (Safety Committee meetings, etc.)
   c. Verify that the Safety Department follows up on resolution of identified hazards

FINDINGS AND RECOMMENDATIONS

Activities:
Staff interviewed the SFMTA safety and transit representatives and reviewed relevant documentation and noted the following:

1. According to SFMTA's safety manager, SSPP Section 10.10.5 "Corrective Action Resulting From Accident Investigation" is obsolete. SFMTA will revise its SSPP to reflect better analysis and evaluation of the hazard management process.
2. Safety department put together a training program "System Safety Hazard Training" that teaches hazard management and the training is offered to staff handling hazard related activities. This training was initiated in July 2015 and is given as necessary to the relevant people.
3. The Transit Management representative present stated she never saw the Hazard Management checklist before. Rail operators, rail supervisors, track maintenance personnel are required to take the hazard training. SFMTA tracks the training using Transit Safe and it is part of supervisor and rail operators' curriculum. Beginning in 2016, SFMTA will update its SOP to require recertification program to include hazard analysis every two years.
4. The monthly Division safety meeting, the weekly System Safety staff meeting, the monthly Senior management meeting included safety personnel who discussed and tracked the hazards to completion. Staff randomly selected meeting agendas and minutes which demonstrated

hazardous topics being discussed. However, CPUC staff has not been invited to any of these hazard meetings.

5. SFMTA uses preliminary hazards form to report hazard (similar to a Form R), and sends an updated/revised version later to CPUC. The safety Department utilizes TransitSafe to track identified hazards. SFMTA provided a list of hazard printout from TransitSafe which revealed nine rail related hazards which were identified since 2012. SFMTA also stated that new software Inteles will replace TransitSafe in 2016.
6. SFMTA has corrected the recommendation issued in 2012 regarding hazard management.
7. Staff randomly selected from the list of nine Hazards and reviewed the hazard analysis performed and confirmed the identified hazards selected were evaluated according to procedures.
8. Staff noted that on August 14, 2015, during a Tunnel Ventilation Inspection, CPUC Inspector identified a "Track Safety Hazard" due to corroded track components at a curved track approximately 250 feet west of the Van Ness crossover. SFMTA Safety Department requested SFMTA Operations for an "Immediate" speed limit of 10 mph due to safety hazard concerns at the curved track due to potential "off gage concerns" .

Findings:

1. SFMTA Safety Department's request on August 14, 2015 for an "Immediate" speed limit reduction to 10 mph at the Van Ness crossover, due to track right safety hazard concerns was not implemented immediately by SFMTA Operations. They ran the trains at normal speed and waited till almost 20 hours to repair the corroded components.

Comments:

1. SFMTA Safety Department acted promptly by requesting a safe speed limit request once a track hazard was identified by the CPUC Inspector on August 1, 2015.
2. The Transit Management representative stated she never saw the Hazard Management checklist before. This is obviously puzzling to the staff and SFMTA must make efforts to educate its transit management staff.

Recommendations:

1. When SFMTA Safety Department issues a "safety hazard" directive including the aforementioned lower/safer speed limit directive, it shall be instituted by SFMTA Operations.

2015 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR SAN FRANCISCO MUNICIPAL TRANSPORTATION AGENCY (SFMTA)

Checklist No.	**7**	**Element**	**System Modification**
Time	9 AM – 12 PM	**Location**	I SVN 7th Floor Noe Valley Conference Room
Date of Audit	October 20, 2015	**Department(s)**	Safety Division
Auditors/ Inspectors	Raed Dwairi Yan Solopov	**Persons Contacted**	Michael Kirchanski Joern Kroll

REFERENCE CRITERIA

1. CPUC General Order 164-D
2. SFMTA System Safety Program Plan (SSPP), Revision 6, dated 2/11/2015
3. SFMTA SOP Development & Approval, A.PR.002
4. SFMTA Rail Change Control Board, A.PR.015
5. Central Subway Safety and Security Certification Plan SY.PL.002
6. ATCS SMC Platform Upgrade Safety and Security Certification Plan

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

System Modification

Interview SFMTA representatives and review appropriate records to verify the following:

1. The SSPP and referenced or supporting procedures ensure that a process exists for addressing safety issues and concerns in system modifications.
2. The Safety Department is involved in assessing/ensuring safety concerns identified as resulting from system modifications. For example, this could be done by analyzing testing or inspection documentation, or observing work sites. Review a list of all system modification projects implemented in last 3 years and select three projects at random, to:
   a. Verify that this process was consistent with SSPP requirements and included an evaluation of potential hazards that the modification could pose to the system.
   b. Verify that potential hazards, when identified, were addressed (i.e., emails, meeting minutes, sign-offs, inspection checklists, etc.).
   c. Verify that any changes made as a result of a system modification are now reflected in final as-built drawings for the facility and/or specifications for the vehicle and/or equipment.
   d. Verify that SFMTA's configuration management process has been followed to address system modification, and that no unauthorized modifications were implemented.

FINDINGS AND RECOMMENDATIONS

Activities:
Staff interviewed the SFMTA representatives in charge of the System Modification Program and reviewed relevant program documentation.

1. Staff learned that SFMTA reviews those items not requiring safety certification through the Rail Change Control Board (RCCB) – a committee of numerous departments' representatives, and therefore differing disciplines. Staff learned that prior to August 2015, SFMTA automatically updated all SOPs every 3 years. Around August, 2015, SFMTA started updating SOPs on an as–needed basis and dropped off the requirement of updating SOPs every 3 years. This change streamlined the process since SOP review by the next review date did not work well and created a bottleneck in the process. SFMTA is considering extending the scope of the RCCB by adding SOP reviews to its duties or recreating the Rules & Procedures Committee (RPC) and bringing SOP review under its umbrella.
2. Staff requested a list of change requests from SFMTA going back 3 years, but these were not fully available because the current review process was non-existent prior to August 2014. SFMTA representatives presented staff with a list of change requests but these started getting processed only since the 4th quarter of 2014. It appears that SFMTA allowed the review process to lapse prior to around August 2014. SFMTA was able to give an approximate count of change requests – around 70-90 SOP changes have occurred in the past 3 years, and 7 projects were processed by the RCCB. Staff attended a RCCB meeting held on October 21, 2015, and are satisfied that its aim is to address potential hazards arising from change requests. However, Staff learned that attendance is often an issue at RCCB meetings, and critically important department representatives involved in the review and change process do not always attend. A quorum (required number of attendees) was established, but many RCCB members still do not attend each meeting.

Findings:

1. Attendance has been an issue and critical departments in the review and change process do not always attend the Rail Change Control Board (RCCB) meetings. In some cases, quorum was achieved but Staff observed absences of key department representatives. Staff believes this is because there is no penalty for not attending.

Comments:
SFMTA abandoned the "Change Request Review" process in 2012, 2013 and the first part of 2014, and only resumed the practice starting in August 2014. SFMTA should ensure that this review process is maintained going forward.

Recommendations:

1. SFMTA should take the necessary measures to ensure all key departments attend its RCCB meetings as required by SOP A.PR.015.

2015 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR SAN FRANCISCO MUNICIPAL TRANSPORTATION AGENCY (SFMTA)

Checklist No.	**8**	**Element**	**Safety Certification**
Time	9:00 a.m. - 12:00 p.m.	**Location**	1 SVN, South Beach Conference Room (6042)
Date of Audit	October 20, 2015	**Department(s)**	Safety Division Capital Programs & Construction
Auditors/ Inspectors	Rupa Shitole Robert Hansen	**Persons Contacted**	Vince Harris, Capital Programs and Construction Nancy Dock, Transportation Safety Specialist Albert Ho, Central Subway, Deputy Director Trinh Nguyen, Project Manager, New Vehicle Procurement Kartik Shah, Transportation Safety Specialist Kenny Ngan, Project Manager, ATCS Upgrade

REFERENCE CRITERIA

1. CPUC General Order 164-D
2. SFMTA System Safety Program Plan (SSPP), Revision 6, dated 2/11/2015
3. SFMTA Safety & Security Certification Plan - Central Subway Project
4. ATCS SMC Platform Upgrade Safety and Security Certification Plan

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

Safety and Security Certification

Interview the SFMTA representative(s) involved in the Safety Certification Program and review the records of all minor/major projects to determine whether:

1. A formal SCP has been submitted by SFMTA for Central Subway, ATCS Upgrade, and New LRV Procurement Projects and has been approved by the Commission.
2. Each submitted SCP was consistent with General Order 164-D, the SSPP, and applicable reference documents.
3. There has been effective communication with CPUC staff throughout the lives of current and planned projects, including the Preliminary Engineering Design Phase.
4. All design and construction changes were properly coordinated and addressed in the Safety Certification process.
5. All identified hazards have been eliminated or controlled as required under the SCPs.
6. All certifiable elements for Safety Certified projects if complete during the past three years were identified for the Safety Certification Verification Report and submitted to CPUC as required by General Order 164-D.

7. Review documentation for Central Subway, ATCS Upgrade, and New LRV Procurement Projects to determine if a process is in place to identify and mitigate any safety hazards. Ensure that the following are being addressed:
   a. Address safety certification management, including organizational authority and responsibilities.
   b. Identify the process used to verify and document conformance with safety requirements during the design, construction, testing, and operational phases of projects.
   c. Has a certification committee been created?
   d. Has a certifiable items list been created?
   e. Are design changes and Non-Conformance Reports (NCRs) analyzed for safety impacts? Have these been thoroughly documented?
   f. Have training programs been updated as necessary and have all employees been trained?
   g. Has a testing program been developed and administered?
   h. Are Safety Division personnel involved in the certification of SFMTA New Starts and major projects? Review documentation to verify.
   i. Conduct interviews with SFMTA project staff involved in New Starts and major projects to discuss how safety concerns were addressed and the level of staff interaction with the Safety Division.

FINDINGS AND RECOMMENDATIONS

Activities: Staff interviewed SFMTA representatives in charge of the Safety and Security Certification Program for different projects and noted the following:

Central Subway Project:

1. A Safety and Security Certification Plan (SSCP) for the Central Subway Project was submitted to CPUC on February 12, 2009 along with a letter requesting Commission review and approval. Commission meeting on March 26, 2009, approved SFMTA's SSCP for the Central Subway Project under the Resolution ST-102. This resolution states that the SSCP is consistent with the CPUC GO 164-D and other required SFMTA reference documents. A revised SSCP for the Central Subway Project (Revision 1) was submitted to CPUC on January 9, 2012 as required. As per FTA circular 5800.1, SFMTA has prepared a Safety and Security Management Plan (SSMP) document Revision 2 dated February 18, 2014. Refer to checklist #8 from 2012 SFMTA Triennial Review conducted in October 2012 for more details.
2. The SSCP was in accordance to GO 164-D requirements, the SFMTA SSPP and other applicable reference documents.
3. SFMTA holds monthly meetings and these meetings are attended by CPUC assigned representative to this project.
4. This is a FTA funded project with more than 65% funding provided by FTA. The design and construction changes are being properly coordinated and addressed in the SSCP and also are discussed at regular meetings.

5. The PHA and the TVA under this SSCP identify all hazards and are being eliminated or controlled as required.
6. The Safety Certification Verification Report is still in progress.
7. The SSCP describes the organizational authority and responsibilities for this project. The process to verification and documentation is also described in the SSCP. The Safety and Security Certification Review Committee (SSCRC) has been established and meet monthly. Staff reviewed some of the SSCRC meeting minutes provided by SFMTA. Certifiable items list has been created and there has been no change in the final construction phases therefore no NCRs were issued. Safety Division is involved and is a member of the SSCRC. The Project Management Plan (PMP) is updated and provided to FTA (New Starts Program) on a as need basis.

ATCS SMC Platform Upgrade Project:

1. A Safety and Security Certification Plan (SSCP) dated September 27, 2013 for the ATCS SMC Platform Upgrade Project was submitted to CPUC on October 11, 2013 requesting Commission review and approval.
2. The CPUC resolution ST-157 dated December 5, 2013 states that the SSCP is consistent with the CPUC GO 164-D and other required SFMTA reference documents.
3. CPUC has been involved in the process ongoing throughout the ATCS project. The system has been in place for 30 years. The computing and operating systems are in the process of being updated from OS-2 to Windows 7 including features such as: double stopping, destination on the fly, and central fallback function. Double stopping and route problems are being currently discussed with CPUC. Communications has been taking place in the form of letters and meeting with CPUC and SFMTA related to the project.
4. SFMTA submitted ATCS project binders, Volume 1 and Volume 2 dated October 20, 2014. The volume 1 had the introduction, system overview, functional description and equipment, system monitoring, normal operations, failure management, operations bulletin, training records details. All manuals related to Wayside and Equipment was also included. Volume 2 had PHA & TVA assessment, summary of test reports and results, certificates of conformances, SCVR dated October 16, 2014 and letter requesting intent to operate from CPUC related to ATCS Upgrade- Revenue 1.
5. The PHA and TVA open items were either closed or workarounds were identified.
6. The SCVR along with Certificate of Conformances was submitted to CPUC on October 14, 2014 as required by GO 164-D requirements.
7. The SSCP describes the organizational authority and responsibilities for this project. The process to verification and documentation is also described in the SSCP. The Safety and Security Certification Review Committee (SSCRC) has been established and meet monthly. Staff reviewed some of the SSCRC meeting minutes provided by SFMTA. Certifiable items list has been created and SFMTA stated that the design has been thoroughly discussed and documented. Training programs have been updated. Safety Division is involved and is a member of the SSCRC.

Vehicle Procurement Project:

1. This project is in the Design Phase (DP). No SSCP has been submitted to CPUC. SFMTA

is working on submitting a SSCP for this project soon. Last year this project was awarded to Siemens. SFMTA is procuring approximately 251 vehicles and the first vehicles will be delivered by the end of 2016. Vehicles will also be delivered in 2018 and 2019. Phase 2 will have approximately 150 vehicles delivered starting in 2021 through 2028. Safety is included in the DP and all ongoing meetings. SFMTA is working with Siemens on their needs and changing the design as per SFMTA system needs. SFMTA and Siemens hold Design meetings every month or two (no set schedule). This project is discussed briefly at the FTA Quarterly Progress Review meetings.

Findings:
None

Comments:
CPUC has not been involved in SFMTA's New Vehicle Procurement Project process. SFMTA will reduce the potential for project changes and delays by including its own Safety Department and CPUC Staff early in the planning process and continuously through all phases, including Planning, Preliminary Engineering, and Design phases.

Recommendations:
None

2015 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR SAN FRANCISCO MUNICIPAL TRANSPORTATION AGENCY (SFMTA)

Checklist No.	**9**	**Element**	**Safety Data Collection and Analysis**
Time	1:30 to 4:30 PM	**Location**	1 SVN 7th Floor Union Square Conference Room
Date of Audit	October 20, 2015	**Department(s)**	Safety Division Technology & Performance Transit Services Transit Management ISEC
Auditors/ Inspectors	Claudia Lam Raed Dwairi	**Persons Contacted**	Travis Fox Sarita Britt Gerald Williams Ed Cobean Carol Wolther Terrance Fahey Michael Kirchanski Aaron Lampkin Nancy Dock Josh Sadorra

REFERENCE CRITERIA

1. CPUC General Order 164-D
2. SFMTA System Safety Program Plan (SSPP), Revision 6, dated 2/11/2015
3. Hazard Analysis, SY.PR.042
4. Accident Incident Investigation and Reporting, SY.PR.044

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

Safety Data Collection and Analysis

Interview the SFMTA representative(s) responsible for safety data acquisition and analysis, and review the safety data acquisition and analysis program requirements to determine whether:

1. The data collected includes, at a minimum: information concerning SFMTA accidents and incidents, employee performance failures, equipment failures, and procedural deficiencies.
2. The safety data is supplied by, and collected from, all departments, including Transit Services and Transit Management Risk Management, and Rail Vehicle and Cable Car Maintenance, Maintenance of Way, Facilities Maintenance, as appropriate.
3. The safety data collected is analyzed and incorporated into SFMTA's Hazard Identification and Resolution Process as necessary.
4. The safety data and analyses are made available to SFMTA departments for use in planning

their safety-related activities.

5. Periodic reporting regarding the results of the safety data analysis is provided to the SFMTA Senior Management as appropriate.
6. Verify that the safety data sources identified in the SSPP are being used, and that data analysis and distribution are being implemented as described in the SSPP.
7. Interview SFMTA Senior Management regarding their use of safety data:
   a. Ask the representatives to explain how they receive safety-related information from other departments, including the operations and maintenance departments.
   b. Ask the Safety Division representatives to provide examples of how information received from the Transit and Maintenance departments are used to support safety data collection and analysis activities.
   c. Ask the SFMTA Safety Division representatives to explain how they collect information on derailments and rules violations in SFMTA's yards.
   d. Ask the SFMTA Safety Division how it ensures the quality and integrity of collected safety data.
   e. Ask the SFMTA Safety Division representatives to explain how SFMTA reports to FTA's National Transit Database (NTD).

FINDINGS AND RECOMMENDATIONS

Activities:

Staff interviewed the SFMTA safety representatives, reviewed relevant safety data acquisition, analyzed documentation, and noted the following:

1. SFMTA Safety Department utilizes TransitSafe software as the database to acquire and analyze safety data. According to safety manager, SFMTA will be deploying a new software called Inteles to replace TransitSafe in 2016.
2. Staff randomly selected some examples from TransitSafe electronic files and verified that SFMTA has been collecting and analyzing safety data from a variety of sources.
3. Staff randomly selected several SFMTA's weekly meeting minutes which showed that SFMTA staff from several departments participated in the meetings to discuss and analyze the identified hazard and analyze trends. For example, SFMTA has nine Transportation Safety Specialists (TSS) performing frequent inspections to identify hazards. Any identified hazards are brought up during Hazard Analysis Workgroup meetings.
Hazards identified are independent from accident investigations. Some are collected from hotline 311 complaints. Data is reviewed by safety department to identify hot spots and trends. Weekly meetings are conducted which allow employees to report hazards.
4. Monthly statistical reports include analysis of TransitSafe hazards and safety data analysis, and staff verified that these reports regarding the results of the safety data analysis are provided periodically to the Executive Leadership team.
5. Staff verified that safety data sources identified in the SSPP are being evaluated and safety data analysis and distribution is being implemented as required.

Findings:

None. No exceptions were noted.

Comments:
N/A

Recommendations:
None.

2015 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR SAN FRANCISCO MUNICIPAL TRANSPORTATION AGENCY (SFMTA)

Checklist No.	**10**	**Element**	**Accident/Incident Investigations**
Time	9:00 AM to 12 PM	**Location**	1 SVN 7th Floor Noe Valley Conference Room
Date of Audit	October 21, 2015		Transit Services Central Control Safety Division
Auditors/ Inspectors	Rupa Shitole Steve Espinal	**Persons Contacted**	Michael Kirchanski, System Safety Manger Jeff Chapell, Senior Operations Manger Sabrina Suzuki, Transit Operations Aaron Lampkin, Senior Administrative Analyst

REFERENCE CRITERIA

1. Code of Federal Regulations, Title 49 Part 659.33 – Accident Notification, 659.35 – Investigations, Part 659.37 – Corrective Action Plans
2. CPUC General Order 164-D
3. CPUC General Order 172
4. SFMTA System Safety Program Plan (SSPP), Revision 6, dated 2/11/2015
5. SFMTA Accident/Incident Investigation & Reporting, SY.PR.044
6. SFMTA Emergency Notifications, R.OC.PR.007

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

Accident/Incident Investigations

Interview the SFMTA representative(s) responsible, and randomly select at least four CPUC-reportable accidents and/or incidents involving an injury or fatality to determine whether:

1. All accidents and incidents were reported to CPUC according to the requirements in General Order 164-D.
2. All accidents and incidents were reported within two hours of occurrence, as required by General Order 164-D, Sections 7.1 and 7.2.
3. All immediately reportable accident or incident notifications to CPUC contained all of the information required by General Order 164-D, Section 7.3.
4. All accidents and incidents were investigated in compliance with the requirements of General Order 164-D, Section 8.
5. Video recordings from forward-facing and inward-facing in-cab cameras are reviewed under the required conditions listed in General Order 172, Section 4.3.
6. Ascertain whether FRA (on joint corridor), NTSB, and NTD notifications are made as applicable depending on the incident reporting threshold. Review several relevant

records to verify this.

7. Review at least two reports of accidents which resulted from non-compliance of rules/procedures and verify whether appropriate Corrective Action Plans (CAPs) were implemented in response. If so, verify what steps were taken to correct these issues (i.e., employee retraining, suspension, dismissal, etc.).
8. Verify whether a final report was submitted for each accident or incident according to the requirements in General Order 164-D.
9. Each final report includes identification of:
    a. All evidence processed during the investigation;
    b. Findings of the most probable cause(s);
    c. Findings of contributory cause(s);
    d. Corrective Action Plans to address the identified causes with the goal of minimizing the probability of recurrence;
    e. A schedule for implementing the CAPs, including completion date or plan for monitoring progress on an on-going basis.

FINDINGS AND RECOMMENDATIONS

Activities:

Staff interviewed the SFMTA representative(s) responsible for accident/incident investigation and noted the following:

1. SFMTA's Accident Investigation Procedure (AIP) dated July 2015 has all the reporting criteria as per GO 164-D requirements. SFMTA has been reporting all incidents/accidents as required by GO 164-D.
2. SFMTA System Safety Manager stated that 95% of all accidents/incidents have been reported to CPUC in a timely manner within the 2 hour reporting window as per GO 164-D requirements. SFMTA Safety Department reviews Operations Control Center logs daily to confirm all incidents have been reported to CPUC as per GO 164-D. Even if the 2 hour window is not met by SFMTA, SFMTA safety department will eventually report the incident to the CPUC later after determining a reportable incident had occurred. On- going training is conducted with new controllers to report these in a timely manner. The internal notification at SFMTA is via phone call, text, and then e-mail. Ongoing effort is in place to report all incidents within 2 hours to the CPUC.
3. SFMTA notifies CPUC of all required initial incident information for immediately reportable incidents as per GO 164-D section 7.3 requirements. Currently, SFMTA submits an SFMTA Initial Report to CPUC for every immediately reportable incident.
4. All accidents and incidents were investigated by SFMTA in compliance with GO 164-D section 8. Staff reviewed the following SFMTA accident/incident reports:
    - April 12, 2013 Market Street and Sanchez Street (Major incident report) - The following documents were included in the file (as well as provided later): Operator report, SF Police Report, Supervisor Report, Incident History for Employee, Repair Estimate, Post-Accident Brake Test (Supervisor signature missing on Form), Employee Hours of Service report, Photos, Transit Safe Report, Field Notes, Form R submitted to CPUC, Post Drug & Alcohol test was conducted, CAP completion

date 7/10/2013 (Transit Safe ID 4532).

- June 25, 2013 O/B Market at Guerrero Street (Major incident report) - The following documents were included in the file: Operator report, SF Police Report, Supervisor Report, Incident History for Employee, Repair Estimate, Post-Accident Brake Test (Supervisor signature missing on Form), Employee Hours of Service report, Absence history record, Logistics report, Vehicle Maintenance work orders, Photos, Transit Safe Report, Field Notes, Form R submitted to CPUC, DVD, Post Drug & Alcohol test was conducted, CAP completion (Transit Safe ID 4872 completed 8/9/13 & Training Dept. ID 154688 completed)

- September 8, 2014 Third Street and Carroll Avenue (Major incident report) - The following documents were included in the file (as well as provided later): Operator report, SF Police Report, Supervisor Report, Incident History for Employee, Repair Estimate, Post-Accident Brake Test was conducted (Release Authorization Form was reviewed), Employee Hours of Service report, Photos, Transit Safe Report, NTD Major Incident Report ID 9015, Field Notes, Form R submitted to CPUC, DVD, Post Drug & Alcohol was conducted, CAP could not be completed as the operator left SFMTA.

- October 11, 2014 19th Avenue and Juniper Serra Blvd. (Major incident report) - The following documents were included in the file (as well as provided later): Form R submitted to CPUC, Post Drug &Alcohol was conducted, Operator report, Supervisor Report, Incident History for Employee, NTD Major Incident Report ID 9015, Employee Hours of Service report, Photos, Transit Safe Report, Field Notes, Post-Accident Brake Test was conducted (Release Authorization Form was reviewed), CAPs completed (Transit Safe ID 5413, 5412, 5414, 5415).

- July 30, 2015 I/B Embarcadero and Harrison Street (Major incident report) - The following documents were included in the file (as well as provided later): Operator report, SF Police Report, Supervisor Report, Incident History for Employee, Repair Estimate, Post-Accident Brake Test (Supervisor signature missing on Form), Employee Hours of Service report, Photos, Transit Safe Report, Field Notes, Form R submitted to CPUC, DVD, Post Drug & Alcohol was conducted, CAP completion (Transit Safe ID 5774). Staff used the new provided SFMTA Report Checklist by the System Safety Manager for this incident and found the following missing from the file: Operator Class History, OCC Log, and Logistics Report.

5. As per requirements of GO 172 section 4.3, SFMTA have being reviewing videos from forward-facing and inward-facing in-cab cameras onboard the vehicle. Staff reviewed the video related to the incident on 8/26/2015. The System Safety Manager stated that all accidents/incident videos are reviewed that are reported to CPUC. It was stated that both the inside in-cab cameras and forward facing cameras were reviewed by the Transit Safety Specialist (TSS) investigating that particular incident/accident. All videos are kept in each individual files.

6. SFMTA have been reporting as required to the NTD and NTSB. There is no FRA reporting since no joint corridor exists. Refer to above reviewed accidents/incidents. Additionally, Staff reviewed the following:
    - NTD reporting – 8/26/2015 ID 87 , 8/14/2015 ID 85, 8/1215 ID 84
    - NTSB reporting – NRC ID 116294 5/12/2014 (San Jose and Lake Fill incident)
7. Refer to above reviewed accidents/incidents under Item 4. The CAPs for non-compliance of rules/procedures was reviewed and verified.
8. SFMTA has submitted final accident reports for each of the above reviewed incident/accident by Staff. Refer to 4.
9. Based on the above review of accident reports, SFMTA has included in their final reports all evidence processed during the investigation, probable cause, contributory cause, and CAPs if necessary. Additionally, every two weeks SFMTA and CPUC discuss the CAP's in meetings. The information is updated every 2 weeks. Some of the CAPs are broad and long term projects.
10. Monthly Form V was discussed and SFMTA has filed the required monthly Form V until August 2015. The section C is still not being updated due to discrepancies between Staff and SFMTA agreeing on the number of CAPs open and closed. SFMTA could not match up the data from the database and on file. Additionally, the numbers were not matching and therefore a defined process needs to be in place from both parties to resolve these data discrepancies. Staff reviewed records for CY 2015 for the months of May, June, July, and August. July 2015 and August 2015 Section B was left blank during the first submission therefore they were resubmitted again after completion of section B. Reviewed July and August 2014 reports.

Findings:

1. Vehicle Brake Inspection testing Form/Sheet and Vehicle Running Repair Work Orders are being left blank and not being reviewed and signed off by the appropriate Supervisor.
2. Staff requested SFMTA to provide their "post-accident vehicle testing procedures" for review, however, SFMTA System Safety was not aware of the existence of any such formal procedures. Staff suggests SFMTA to ensure that formal procedural steps are in place using best industry practices to conduct "post-accident vehicle testing".

Comments:

1. During Staff's review, SFMTA accident/incident files were missing some documents from their checklist but the System Safety Manager searched those documents and printed them out for review and then filed them accordingly in each file. Moving forward SFMTA should review each file thoroughly and make sure all pertaining records are on file in order to save time searching for those documents on the web during CPUC review.

Recommendations:

1. SFMTA should ensure that formal procedural steps are in place using best industry practices to conduct "post-accident vehicle testing" and the testing forms are duly reviewed and signed by the designated personnel.

2015 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR SAN FRANCISCO MUNICIPAL TRANSPORTATION AGENCY (SFMTA)

Checklist No.	**11**	**Element**	**Emergency Management Program**
Time		**Location**	1455 Market 7th Floor TMC Conference Room
Date of Audit		**Department(s)**	Security, Enforcement, and Investigations Safety Division Rail Operator Training Transit Services Operations Control Center
Auditors/ Inspectors	Howard Huie Rupa Shitole	**Persons Contacted**	Chris Grabarkiewtcz Scarlett Lam Jim Kelly Wes Valaris Michael Kirchanski Melvyn Henry Ken Anderson Barry Chown

REFERENCE CRITERIA

1. CPUC General Order 164-D
2. SFMTA System Safety Program Plan (SSPP), Revision 6, dated 2/11/2015
3. SFMTA System Security Plan SC.PL.008 (SSI)
4. Emergency Operations and Recovery Plan 2014-2015

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

Emergency Management Program

Conduct the necessary interviews regarding SFMTA's emergency planning, training, and drill/exercise program and review appropriate records prepared during the last three years to:

1. Verify that a drill/exercise schedule has been created and followed. Determine if SFMTA has conducted at least one drill/exercise every year for the last three years as required by the SSP and when each drill/exercise was performed. Was an after action report developed? Was the after action report used to make changes to SFMTA's Emergency Operation and Recovery Plan (EORP) and/or procedures? If so, have these changes been implemented and disseminated to the pertinent SFMTA personnel?
2. Verify that all recommendations from the Emergency Drills for SFMTA are tracked unto completion.

3. Determine whether SFMTA has held periodic Fire Life Safety meetings, whether emergency response agency familiarization activities have occurred as scheduled, and if corrective actions have been implemented.
4. SFMTA emergency response training:
    a. Review training programs to verify that they contain training curriculums for emergency response procedures and activities appropriate for each job classification.
    b. Review training programs to verify the frequency of employee emergency response training.
    c. Randomly select six (6) employees from the following safety sensitive job classifications and review their emergency response training records to determine who has been trained and to verify that training has been properly documented:
        a. Train Operators
        b. Rail Supervisors
        c. Rail Controllers

Note: This checklist has been replaced by Checklist #6 of the security portion of the 2015 SFMTA Triennial Safety and Security Review; therefore, this checklist is left blank intentionally.

FINDINGS AND RECOMMENDATIONS

Note: This checklist has been replaced by Checklist #6 of the security portion of the 2015 SFMTA Triennial Safety and Security Review; therefore, this checklist is left blank intentionally

Activities:

Findings:

Comments:

Recommendations:

2015 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR SAN FRANCISCO MUNICIPAL TRANSPORTATION AGENCY (SFMTA)

Checklist No.	**12**	**Element**	**Internal Safety Audits/Reviews**
Time	1:30 PM – 4:30 PM	**Location**	1 SVN 7th Floor Noe Valley Room
Date of Audit	October 26, 2015	**Department(s)**	Safety Division
Auditors/ Inspectors	Steve Espinal Robert Hansen	**Persons Contacted**	Fred Orantes Michael Kirchanski

REFERENCE CRITERIA

1. CPUC General Order 164-D
2. SFMTA System Safety Program Plan (SSPP), Revision 6, dated 2/11/2015
3. SFMTA Internal Safety Audit Program, SY.PR.036
4. SFMTA's Audit Schedule 2012-2015

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

Internal Safety Audits/Reviews

Interview the SFMTA representatives involved in Internal Safety Audits (ISAs), and review appropriate records to:

1. Determine if a three-year internal audit schedule was developed and submitted to the CPUC as required by GO 164-D.
2. Verify that all required 21 elements of the SSPP were evaluated within the past three years.
3. Verify that the CPUC was notified 30 days in advance of the scheduled audit via a letter and or an email and that a draft checklist was submitted in advance.
4. Verify that audits have been properly documented including the SFMTA departments, the safety-related activities are being addressed, the reference criteria for the audit, and notes to support findings and recommendations.
5. Determine whether the ISAs adequately addresses interdepartmental and interagency communication issues, and whether SFMTA has a process for addressing and overcoming departments' non-responsiveness and failure to implement audit recommendations.
6. Determine how expertise for auditing SFMTA staff is for specific functions, and how personnel are assigned per the SSPP to ensure ISA quality. An example of specified qualifications is signal inspections.
7. Verify that Annual Reports are accompanied by letters from the Director of Transportation stating SFMTA's compliance status with its SSPP and Corrective Action Plans for elements determined not to be in compliance. Review CPUC RTSB Checklists for reviewing and approving SFMTA's Annual Reports.

8. Verify that Corrective Actions to address Findings from the internal safety audit process were scheduled, tracked, and implemented.

FINDINGS AND RECOMMENDATIONS

Activities:

1. SFMTA provided Staff with a copy of the three year schedule of the SFMTA Internal Safety Audit (ISA) program.
2. The order of the checklists is changed and adjusted depending on Findings from previous years.
3. SFMTA consistently notifies CPUC 30 days in advance of ISA activities.
4. SFMTA's ISA reports are detailed, and include audit elements, locations, methods of verification, Findings, Recommendations, and Corrective Action Plans (CAPs). CAPs are tracked by SFMTA through its centralized TransitSafe database.
5. SFMTA's head ISA auditor indicated there are some difficulties regarding interdepartmental cooperation; however, a checklist was developed to overcome these difficulties. All division standard operating procedures (SOP) are reviewed to verify compliance with the applicable CPUC General Orders.
6. A Safety Specialist reviews all SOPs and determines whether the SAID departments are in compliance. ISA auditors are trained in auditing practices and the SSPP.
7. CPUC receives a formal correspondence annually to document completion of the year's ISA activities.
8. SFMTA personnel indicated the SFMTA's procedure SY.PR.033 needs to be updated and distributed. SFMTA is working on a revision.

Findings:
None.

Comments:
Staff reviewed the list of Corrective Action Plans (CAPs) generated through ISAs, which indicated 12 CAPs have been closed, while 221 CAPs remained open at the time of the triennial review. Closing the 221 open CAPs should be a priority.

Recommendations:
None.

2015 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR SAN FRANCISCO MUNICIPAL TRANSPORTATION AGENCY (SFMTA)

Checklist No.	**13-A**	**Element**	**Rules Compliance: Observation and Enforcement**
Time	8:00 am to 4:30 p.m.	**Location**	1SVN 7th Union Square Conference Room OCC for records review Green Metro Training records review Cable Car Division records review 700 Pennsylvania MOW records review
Date of Audit	October 20, 2015	**Department(s)**	Safety Division Transit Services Transit Management OCC Transit Management Rail Vehicle Maintenance Cable Car Maintenance
Auditors/ Inspectors	Debbie Dziadzio Mike Warren	**Persons Contacted**	Jeff Conley Jeff Chapell Sarita Britt Mannie Enriquez Terrance Fahey Carol Wolther Brent Jones York Kwan

REFERENCE CRITERIA

1. CPUC General Order 164-D
2. CPUC General Order 172
3. SFMTA System Safety Program Plan (SSPP), Revision 6, dated 2/11/2015
4. SFMTA Rail Rule Book, Revised: September 2009 & Revised September 2015
5. Rail Vehicle Transit Operator Compliance Program, TN.MO.PR.019
6. OCC Compliance Check Program R.OC.PR.028
7. SFMTA Efficiency Testing Plan 2014
8. SFMTA Zero Tolerance Policy

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

Rules Compliance: Observation and Enforcement Records Review:
Interview the appropriate SFMTA representatives and review appropriate records to:

1. Review documentation and verify that SFMTA performs formal and informal

observations/efficiency testing of the following employees for compliance with safety rules, procedures, and/or practices:

a. Rail Controllers (OCC)
b. Rail Vehicle Operators
c. Cable Car Operators
d. Rail Vehicle Maintenance Employees
e. Cable Car Maintenance Employees
f. Maintenance of Way Employees

2. Verify that non-compliant employees are cited for rule violations by their supervisors.
3. Verify that the Senior Management Safety Committee receives reports from Operations and Maintenance Departments regarding rules compliance assessment and testing. Verify that hazards identified from the Rules Compliance Process are reported to the Committee and tracked through the Hazard Management Process.

FINDINGS AND RECOMMENDATIONS

Activities:
Staff reviewed SFMTA's current SSPP and SOP's regarding observations, efficiency testing and interviewed appropriate SFMTA personnel.

Findings:

1. Currently, there are no SOP's that outline steps that supervisors take for observations and efficiency testing regarding non-compliance of Operating Rules and SOP's. The SOP should include reference to current Union Contracts.
2. The current Rail Operations Inspector Manual (1.MN.002 eff date; 1/15) has a description regarding MRO responsibilities. Staff determined that the MRO's (line supervisors) do not perform the entire section outlined in 3.1 of the Manual.
3. Staff determined that, in reference to SFMTA SSPP 2015, Section 9.0, the Safety Department does not receive results from formal/informal observations and efficiency tests from OCC, Operations, or Maintenance, nor are hazards identified and tracked through the Hazard Management Process.
4. After reviewing several employee records, Staff determined that SFMTA Supervisors are not citing their employees regarding non-compliance of CPUC General Orders, SFMTA Operating Rules and SOP's
5. Maintenance Department currently does not have a formal compliance program.

Comments:

1. The Maintenance Department has originated a compliance program that is in accordance with CPUC requirements. Currently the program is in the review process and will be implemented as soon as the process is complete.

Recommendations:

1. Create an SOP, which outlines steps that supervisors may take to be compliant with SFMTA discipline policies. The SOP shall be initiated, reviewed, and included in supervisor training per SSPP, Section 3.3.
2. Due to the high amount of reportable accidents and incidents that have occurred on SFMTA property in the past three years, SFMTA shall increase its formal/informal observations and efficiency testing per GO 143-B, Section 13.04. Currently one (1) efficiency test is required yearly. This is performed by Training Dept. All departments, including Operations, shall be involved with rules compliance and enforcement of non-compliance.
3. All results from all departments responsible for formal/informal observations and efficiency testing shall be reported to SFMTA Safety Department who will track trends and perform analysis per SSPP Sections 6.1 and 9.0.
4. SFMTA Management shall train and hold accountable their MRO's (line supervisors) to perform duties as outlined in the Rail Operator Inspector's Manual.

2015 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR SAN FRANCISCO MUNICIPAL TRANSPORTATION AGENCY (SFMTA)

Checklist No.	**13-B**	**Element**	**Rules Compliance: Operations Safety Compliance**
Time	8:00 a.m.- 4:30 p.m.	**Location**	MME, Green, Cameron Beach, 700 Pennsylvania, OHL, random field locations include observations of vehicles in check
Date of Audit	October 21, 2015	**Department(s)**	Safety Division, Rail Vehicle Operations & Maintenance, Cable Car Operations & Maintenance, OCC, Maintenance of Way (Track, OHL, Signals)
Auditors/ Inspectors	Debbie Dziadzio Michael Warren	**Persons Contacted**	Sarita Britt Brent Jones Jeff Chapell Jeff Conley Terrance Fahey

REFERENCE CRITERIA

1. CPUC General Order 164-D
2. SFMTA System Safety Program Plan (SSPP), Revision 6, dated 2/11/2015
3. SFMTA Rail Rule Book, Revised: September 2009 and September 2015
4. Rail Vehicle Transit Operator Compliance Program, TN.MO.PR.019
5. OCC Compliance Check Program, R.OC.PR.028
6. SFMTA Efficiency Testing Program

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

Rules Compliance: Operations Safety Compliance
Interview SFMTA representatives responsible for Operations Safety, perform random observations and operations inspections, and review appropriate records to determine whether:

1. Rail Vehicle Maintenance Employees including MRU and ERU
   a. Know and understand applicable wayside safety rules;
   b. Know and understand the rules and procedures for mainline operations.
2. Cable Car Maintenance Employees
   a. Know and understand applicable wayside safety rules;
   b. Know and understand the rules and procedures for mainline operations.
3. Maintenance of Way, including Track, Overhead Lines, and Signal Maintenance
   a. Know and understand applicable wayside safety rules;
   b. Comply with the PED Rules when performing any duties on or near railways;
   c. Know and understand the rules and procedures for mainline operations.

4. LRV, HSC, and Cable Car Operators:
    a. Are in compliance with the applicable rules and procedures ;
    b. Comply with PED Rules while inside operator cabins;
    c. Are properly trained and knowledgeable in handling accident/incidents and emergency response situations, and coordinating with OCC during the same.
5. Controllers:
    a. Are properly preparing and maintaining records, reports, and logs;
    b. Perform duties in accordance with standard operating procedures, rule books, and bulletins;
    c. Are trained and knowledgeable in dealing with accidents/incidents and emergency response situations, and coordinating with SFMTA personnel and other agencies.

Field Inspections:

1. At random, select several operating procedures (4 or 5) and ride the system to verify that these rules are being followed (such as adherence to proper procedures, any speed restrictions, or end of line vehicle inspections, etc.).
2. Interview operations and maintenance supervisory staff to determine their familiarity with rules and procedures as well as and how they monitor employee compliance with rules and procedures.
3. Conduct random interviews of operators and mechanics to verify how often they receive training on rules and procedures and how the transit agency monitors their compliance with rules and procedures.
4. Conduct a random sample inspection of transit operators to determine if they are carrying their rulebook, if they have the proper safety equipment in their cabs, and if their radios are functioning.

Accompany a light rail supervisor during compliance checks and assess how these checks are conducted and ensure that final reporting matches the findings in the field.

Randomly select 10% controllers, 10 % LRV/HSC operators, 10% Cable Car operator and 10% Rail Vehicle maintenance personnel, 10% Cable car maintenance personnel, 1: MOW personnel and perform ride-along or on-site inspections to verify their compliance with applicable rules, that they have the proper safety equipment, that their radios are functioning, and that they are complying with the personal electronic device policy.

FINDINGS AND RECOMMENDATIONS

Activities:

Staff interviewed SFMTA Personnel from Operations regarding LRV Operators, Cable Car Personnel regarding Cable Car Operators and OCC Personnel regarding OCC Controllers and Dispatchers. Staff reviewed training and (re)certification records. Staff performed 40 field observations from 10/19/15 – 10/30/15, during all hours of SFMTA operations. Staff went to OCC to observe practices and procedures performed by Controllers, Dispatchers, and OCC Floor

Managers.

Findings:

1. Staff was advised that Operations Department does not conduct formal observations however, when a non-compliance is observed, OCC is notified. It was revealed to Staff several times that Operations Department Management Team was not aware of SFMTA's SSPP, their numerous SOP's, and CPUC General Orders. There were several instances of conversations regarding SFMTA Operating Rules where SFMTA Operations Department Team was unaware of the severity of non-compliance to operating rules (i.e., red signal violation, RWP violation).
2. Operations, MRO, Cable Car formal observation results are not forwarded to Safety Department to allow Safety to track trends and provide analysis.
3. Staff observed two instances of non-compliances to GO 172 regarding Personal Electronic Devices.
    a. These occurred at the cable car turntable at Market and Powell on 10/20/15 (see email from CPUC staff dated 10/20/15)
4. Staff observed one instance of non-compliance to GO 175 regarding Roadway Worker Protection.
    a. This occurred at the Ulloa St and West Portal Ave on 10/28/15 (see email from SFMTA staff dated 11/17/15)

Comments:

1. CPUC expects their General Orders to be observed and enforced.
2. Staff observed that Operations Department did not rely on CPUC General Orders for enforcement of non-compliance to operating rules, but instead took a lack-luster attitude to these non-compliances, advising that lack of enforcement was due to the Union Contract.

Recommendations:

1. SFMTA Operations Department Management Team shall be familiar with SFMTA's SSPP (Sections 3.3 and 13), SFMTA's own SOP's, Operating Rules and Procedures, and CPUC General Orders. Supervisors shall have additional training to address these issues.
2. All non-compliance of SFMTA's Operating Rules and CPUC's General Orders shall be rectified quickly and efficiently per SSPP, Sections 3.3 and 13.3.5.

2015 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR SAN FRANCISCO MUNICIPAL TRANSPORTATION AGENCY (SFMTA)

Checklist No.	**13-C**	**Element**	**Rules Compliance: Operator, Controller, and Maintenance Personnel Hours of Service**
Time	10:30 a.m. to 5:30 p.m.	**Location**	1 SVN 6th Floor Payroll Site visits for Payroll Records at OCC, MME, 700 Pennsylvania, and Scott
Date of Audit	October 19, 2015	**Department(s)**	Safety Division Finance Division – Payroll Rail Operator Training Transit Services OCC Transit Management Maintenance of Way Cable Car Division Non-Revenue (Scott Division)
Auditors/ Inspectors	Debbie Dziadzio Michael Warren James Matus John Madriaga Kevin McDonald	**Persons Contacted**	Mike Keohane

REFERENCE CRITERIA

1. CPUC General Order 164-D
2. General Order 143-B, Rule 12.04 Hours of Service-Safety Sensitive Employees
3. SFMTA System Safety Program Plan (SSPP), Revision 6, dated 2/11/2015
4. SFMTA Rail Rule Book, Revised: September 2009 and September 2015
5. Rail Vehicle Transit Operator Compliance Program, TN.MO.PR.019

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

Rules Compliance: Operator, Controller, and Maintenance Personnel Hours of Service
Select at least 10% safety-sensitive employees at random from each of the following classifications:

- Train Controller
- Train Operator
- Supervisors or Managers (MRO)
- Substation Maintenance
- Overhead Maintenance

- Facilities Maintenance
- Track Maintenance
- Signals Maintenance
- Revenue Vehicle Maintenance
- Non-Revenue Vehicle Maintenance
- Flagger
- Employees in Charge (EIC)

Inspect the employees' time cards for a three-month period during the past 18 months to determine whether:

1. Shifts were in compliance with the requirements that safety-sensitive employees may not remain on duty for more than 12 consecutive hours, or for more than 12 hours in any 16 hour period.
2. Each initial on-duty status was preceded by eight consecutive hours of off-duty status.

FINDINGS AND RECOMMENDATIONS

A. Transportation Department

Activities:

Staff interviewed Transit Management and reviewed timesheets and determined the following:

Operators sign-in for work when they receive their daily detail (paddle). MRO's call OCC at start and end of duty. Controllers track and enter in their own time.

Reviewed timesheets for 22 rail operators, 8 cable-car operators, October, November, December of 2014; no defects found.
Reviewed timesheets for 3 OCC Floor Managers, and 2 OCC Controllers and 1 OCC Dispatcher during November and December, 2014 and January 2015; no defects found.

Reviewed timesheets for all MRO's during October, November, December of 2014 and noted the following:

- Frequent instances of incomplete time records.
- 11/6/2014 – MRO 1 worked from 0500-1710 (12hrs 10mins)
- 12/13/2014 – MRO 2 worked from 1100-2305 (12hrs 5mins)
- 12/16/2014 – MRO 3 worked from 0500-2100 (16hrs)
- 10/4/2014 – MRO 4 worked from 1200 – 2546 (13hrs 46mins)

1. Staff found 4 instances of safety sensitive employees exceeding their hours of service and out of compliance with General Order 143B.
2. See Activities #1.

Findings:

1. MRO call-in/out times were frequently incomplete with either an in but no out, or vice versa.
2. Multiple instances of MRO's exceeding the 12 hrs. in a 16 hr. period rule.

Comments:
None.

Recommendations:
1. SFMTA shall ensure that a mechanism exists to ensure MRO on-duty time is properly documented per General Order 143B, Section 12.04.
2. SFMTA shall ensure that a mechanism exists so safety sensitive employees do not exceed their 12hrs per General Order 143B, Section 12.04.

B. Wayside Department

Activities:

Staff interviewed the SFMTA Deputy Director of Maintenance of Way and reviewed timecards for SFMTA Track Department employees for the months of October, November and December of 2014.

Findings:
Staff found 24 separate instances of SFMTA track department employees being on duty for more than 12 hours in the months of October, November and December of 2014. SFMTA track department timecards did not utilize employee numbers, but rather utilized the employee's name. To protect the identity of the employees, Staff is not listing their names here, but is maintaining the information including the names and time violation details, in case SFMTA has any questions.

Comments:
The effect of safety sensitive employees working more than 12 hours has been documented in numerous studies. Potential outcomes are fatigue, poor judgment, low productivity, equipment injuries, roadway worker injuries or fatalities.

Recommendations:
1. SFMTA shall ensure that safety sensitive employees are not on duty more than 12 hours consecutively per SFMTA SSPP 13.3.2: "limitations on hours worked, fatigue control…" and per General Order 143 b, section 12.04.

2015 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR SAN FRANCISCO MUNICIPAL TRANSPORTATION AGENCY (SFMTA)

Checklist No.	**13-D**	**Element**	**Rules Compliance: Contractor Safety Program**
Time	8:00 a.m. – 4:30 p.m.	**Location**	Oct 23: 1 SVN, South Beach Conference Room (6042) Site Visits by CPUC Personnel As Needed
Date of Audit	October 23, 2015	**Department(s)**	Transit Division Safety Division ISEC Capital Programs & Construction Maintenance Training Dept
Auditors/ Inspectors	Debbie Dziadzio Michael Warren	**Persons Contacted**	Gerald Williams Michael Kirchanski Vince Harris

REFERENCE CRITERIA

1. CPUC General Order 164-D
2. CPUC General Order 143-B
3. SFMTA System Safety Program Plan (SSPP), Revision 6, dated 2/11/2015
4. Roadway Worker Protection Plan (RWP) SY.PL.003
5. Contractor Safety Program SY.PR.034
6. SFMTA Rail Rule Book Sept 2009 and Sept 2015

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

Rules Compliance: Contractor Safety Program

Interview the SFMTA representative responsible for the Contractor Safety Program and review SFMTA's relevant program documentation to determine whether:

1. SFMTA has developed and implemented a control document clearly establishing its responsibilities and requirements for the contractor safety program, including:
   a. Training and certification for contractors and their employees.
   b. The rules, regulations, and procedures applicable to contractors and their employees.
2. SFMTA's procedures and practices clearly identify that SFMTA is ultimately in charge of its system, and that contractors and their employees must comply with all established safety rules and procedures.
3. SFMTA procedures require regular internal audits and inspections of construction sites to monitor compliance with its safety requirements.
4. SFMTA procedures establish the range of activities for monitoring Contractors and

their employees, and enforcing compliance with safety requirements through regular unscheduled and unannounced compliance checks, as well as by scheduled periodic audits and inspections.

5. The Safety Division, Industrial Safety and Environmental Compliance, Capital Programs and Construction have reviewed construction plans, performed site inspections, reviewed and approved contractor safety plans, and ensured contractors operate in compliance with SFMTA's Roadway Worker Protection Plan, contractor's safety plan, and SFMTA Rail Rule Book.
6. SFMTA's monitoring and enforcement activities are properly recorded, distributed, and filed.
7. There is sufficient interagency coordination among various contractors regarding safety issues.

FINDINGS AND RECOMMENDATIONS

Activities:
Staff interviewed pertinent SFMTA personnel and determined that contractors and their employees are trained in RWP per General Order 175 and SFMTA SY.PL.003. All contractors (& their employees) receive a sticker that expires in 2 years. The sticker is required to be attached to their hardhats utilized in SFMTA work zones. Construction work sites are inspected approximately once/month via the Construction Safety Checklist. The RWP Safety Checklist is performed approximately 2 times per month, however, anytime SFMTA management appears at the work site, SFMTA management performs RWP inspections. Regular internal safety audits are performed by Safety Department and construction site inspections are performed by ISEC.

Findings:
None

Comments:
Upon review of the Contractor RWP power point, Staff noticed that verbiage in the training material went back and forth from "RWP" to "On-Track and Trackside Safety". The latter is past policy. Staff suggested that the current contractor training material refer to "RWP" only, to eliminate confusion from past policies.

Staff reviewed current contracts and suggested that all SFMTA RWP training expectations for Contractors and their employees be listed in the contract verbiage.

Staff reviewed Technical Specifications and observed under section, "Regulatory Requirements" that CFR214 is referenced instead of General Order 175 which is what governs California's light rail systems.

Recommendations:
None.

2015 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR SAN FRANCISCO MUNICIPAL TRANSPORTATION AGENCY (SFMTA)

Checklist No.	**13-E**	**Element**	**Rules Compliance:** **Operating Rules and Maintenance Procedures Manual and Operations Bulletin Revisions**
Time	Oct 22 8:00 a.m. – 4:30 p.m.	**Location**	1 SVN 3rd Floor Civic Center Conference Room
Date of Audit	October 22, 2015	**Department(s)**	Transit Division Transit Management Transit Services Cable Car Division Safety Division
Auditors/ Inspectors	Debbie Dziadzio Michael Warren (Transportation) --- Kevin McDonald (Wayside)	**Persons Contacted**	Michael Kirchanski Sarita Britt Brent Jones York Kwan Nancy Dock Jeff Chapell

REFERENCE CRITERIA

1. CPUC General Order 164-D
2. CPUC General Order 143-B
3. SFMTA System Safety Program Plan (SSPP), Revision 6, dated 2/11/2015
4. SFMTA Rail Rule Book, Revised: September 2009 and September 2015
5. Rail Vehicle Transit Operator Compliance Program, TN.MO.PR.019
6. Bulletins, Orders and Notices A.PR.003
7. SOP Development and Approval A. PR.002
8. SFMTA Efficiency Testing Program

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

Rules Compliance:
Operating Rules and Maintenance Procedures Manual and Operations Bulletin Revisions
Interview SFMTA representative responsible for operations rules and procedures, maintenance procedures, and review necessary documentation to determine whether:

1. The Standard Operating Procedures, the Maintenance Procedures and all active Operating Bulletins are reviewed, revised systematically and distributed to the relevant personnel. Discuss the process used to review and update rules and procedures.
2. The results of each review of the Standard Operating Procedures, the Maintenance

Procedures and Operating Bulletins are documented in a memorandum to file, providing a summary of the results and the appropriate manager's determination whether revisions are needed.

3. All Operating Bulletins are approved by the Chief Operating Officer with the concurrence of affected departments.
4. Operating Bulletins are issued in a timely manner and provided to affected personnel.
5. A record is maintained of all Operating Bulletins issued, and employees receiving the bulletins.
6. Active Operating Bulletins are posted in specified locations, and inactive bulletins are removed in a timely manner.
7. All new operating rules and bulletins were distributed to CPUC Staff during the past 12 months, and the rule/bulletin distribution process has been tracked.
8. Does SFMTA Safety Division conduct assessments to evaluate safety-related impacts to rules changes and bulletins?
9. Interview SFMTA Safety Division representatives to determine when rules and procedures were last reviewed (certain rules and procedures should be reviewed after accidents) and revised.
10. Conduct interviews with SFMTA Safety Division representatives to discuss their role in ensuring that safety concerns are addressed in SFMTA's rules compliance program.
11. Determine if Safety Division representatives support any rules compliance activities?
12. Determine if Safety Division representatives receive reports from the SFMTA's operations and maintenance departments regarding the performance of rules checks, assessments, and testing?
13. Are hazards identified from the rules compliance process and reported to SFMTA Safety Division and managed through the hazard management process?

FINDINGS AND RECOMMENDATIONS

A. Transportation Department

Activities:

Staff interviewed all pertinent SFMTA personnel regarding the process and flow of revisions of rules, manuals, and operations bulletins. Review of rules, manuals and bulletins occur every 3 years. The reviewing staff consists of a representative from OCC, System Safety, Operations, Training, Maintenance, and Administration. Currently, there is one person assigned to archive notices, bulletins, SOP's. These are physically put into binders.

Maintenance bulletins are posted in Maintenance facilities. Prior to their being instituted, they are reviewed by System Safety, Administration, Training, and Maintenance.

Operating revisions are placed inside the LRV operators paddle.

Findings:

1. Signals and Track Departments are not represented in the revision process.

2. Currently, there is no process to ensure that MRU's that operate on the mainline are receiving or are made aware of current bulletins and notices.

3. Bulletins and notices are put into the LRV operator's daily paddles. There is not a process in place to ensure the LRV operators actually receive or read the revisions.

4. CPUC Staff has not received revised bulletins and notices for the past 12 months as per GO 143-B, Section 13.02.

5. System Safety does not receive compliance check and efficiency test results from MRO's, Training, OCC, Maintenance departments.

6. System Safety is not notified of the corrective actions taken for anyone that has violated an operating rule and General Orders.

Comments:
SFMTA is currently in the process of instituting a Rules & Procedures Committee that will periodically review all Operating Rules, Manuals, SOP's, and Bulletins/Notices. This committee will review policies, procedures, manuals, bulletins, etc., more frequently than the previously stated 3 year policy. Training Department should be represented on this Committee.

The Deputy Director, Transit Management, Senior Operations Manager, Transit Management, and Acting Superintendent, Green Metro Division, personnel advised that they were not aware of SFMTA's SSPP, CPUC General Orders and their requirements. Staff finds this derelict to the safety of SFMTA employees and the general public.

SFMTA currently creates Bulletins to "remind" operators of existing operating rules. Staff has advised SFMTA that Bulletins are more commonly used only for changes to operating rules so as not to confuse operators into thinking that the rule expires with the Bulletin. Staff advised SFMTA to instead utilize their "Rule of the Week" for this purpose.

System Safety has agreed to generate a standardized form that Operations can use to notify System Safety of corrective actions taken for those that violate operating rules and General Orders.

Recommendations:
1. SFMTA shall institute a process to ensure all pertinent personnel receive revisions regarding operations on the system per General Order 143B, Section 13.01. Furthermore, SFMTA shall ensure all personnel that receive revisions are held accountable to receiving revisions via a sign-in system where the operators acknowledge receiving said revisions.
2. SFMTA shall institute a process to ensure System Safety receives all results for compliance checks and efficiency tests so that trends may be tracked and analyzed per SSPP Sections 6.1 and 9.0.
3. SFMTA shall send copies of new/updated Bulletins to CPUC Staff per General Order 143-

B, Section 13.02.

B. Wayside Department

Activities:

Staff interviewed the SFMTA Deputy Director of Maintenance of Way, Track Supervisor and Safety personnel to determine if the Track Department *Maintenance Procedures* are being reviewed and/or revised systematically and being distributed to relevant personnel.

Findings:

None

Comments:

Staff determined that SFMTA Maintenance Procedures are being reviewed and/or revised and being made available to the appropriate personnel.

However, SFMTA's Maintenance Procedures are based on CFR 49 part 213, which is under nearly constant review by the Federal Railroad Administration. The results of these ongoing and constant reviews are available on the FRA's website under the "e-library" compliance manual section. The title is: "Track and Rail Infrastructure Integrity Compliance Manual: volume II-Chapter 1-Track Safety Standards-Classes 1 through 5." This online track compliance manual represents the most current track safety standards and track geometry inspection techniques. Staff recommends that SFMTA Deputy Director of Maintenance of Way and Track Supervisors regularly visit this online database to ensure that SFMTA Maintenance Procedures are in fact the most current procedures available.

Recommendations:

None.

2015 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR SAN FRANCISCO MUNICIPAL TRANSPORTATION AUTHORITY (SFMTA)

Checklist No.	**13-F**	**Element**	**Rules Compliance: Operations Control Center & SCADA**
Time	9 AM – 12 PM	**Location**	OCC – 355 Lennox Way
Date of Audit	October 27, 2015	**Department(s)**	Safety Division Transit Services OCC
Auditors/ Inspectors	Debbie Dziadzio	**Persons Contacted**	Wes Valaris Jeff Chapell

REFERENCE CRITERIA

1. CPUC General Order 164-D
2. CPUC General Order 143-B
3. SFMTA System Safety Program Plan (SSPP), Revision 6, dated 2/11/2015
4. SFMTA Rail Rule Book, Revised: September 2009 and September 2015
5. Rail Vehicle Transit Operator Compliance Program, TN.MO.PR.019
6. OCC Compliance Check Program R.OC.PR.028
7. OCC General Duties and Responsibilities R.OC.PR.001
8. OCC Activity Guidelines and Standards R.OC.PR.002

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

Rules Compliance: Operations Central Control & SCADA
Interview SFMTA representatives responsible for operations rules and procedures and review necessary documentation to determine whether:

1. The OCC Manual is reviewed and revised, as necessary, on an as needed basis.
2. Revisions to the OCC Manual are made either through Operating Bulletins, or other written documents signed by the appropriate Department Managers.
3. Review Unusual Occurrence Logs and verify if properly maintained.
4. Perform review records to determine whether SCADA has been maintained as required, and that all preventative and corrective maintenance practices comply with the applicable reference criteria.
5. Review SCADA reports/logs related to intrusion alarms, false presence, and others associated with SCADA monitoring.

FINDINGS AND RECOMMENDATIONS

Activities:
Staff interviewed OCC Management and learned that the OCC Manual is reviewed and signed off

by appropriate personnel and physically updated when revisions (bulletins) come into OCC. Anyone who has access to SOP's can make suggestions. Training Department uses OCC Manual as part of training for Controllers and Dispatchers.

Staff reviewed Train Orders, OCC Clearance Book; CC Tags (unusual occurrence logs). Both a hard and a soft copy are maintained. For CC Tags, the hard copy is thrown out after being input into computer system.

Findings:
There is no documentation (SOP) on how and when to update OCC Manual.

There is not a separate compliance checklist for Floor Managers.

When researching OCC, Staff determined that recertification had not occurred for 2013 and 2014 for Controllers and Dispatchers. RWP training had not occurred until 2015. All OCC personnel are now current in recertification and training.

Comments:
SFMTA should create a separate checklist for OCC superintendent to evaluate the performance of the OCC Floor Managers. This checklist should differ from what floor managers utilize when observing controllers and dispatchers.

Recommendations:
1. SFMTA must include documentation into when and how the OCC Manual is revised.
2. A training matrix should be in place to ensure all personnel are recertified and trained in the timeframe required by General Order 143-B, Section 13.03 and General Order 175.

2015 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR SAN FRANCISCO MUNICIPAL TRANSPORTATION AGENCY (SFMTA)

Checklist No.	**14-A**	**Element**	**Facilities and Equipment Inspections: Non-Revenue Facilities and Wayside**
Time	9 a.m. - 12 p.m.	**Location**	700 Pennsylvania, Main Conference Room
Date of Audit	October 22, 2015	**Department(s)**	Maintenance of Way, Motive Power, Facilities Maintenance, Overhead Lines, and Signals Maintenance
Auditors/ Inspectors	Raed Dwairi James Matus Mike Borer	**Persons Contacted**	Terrance Fahey Young Laolagi Leo Martinez David Harbin Alvino Garcia Doug Lee George Louis Kartik Shah

REFERENCE CRITERIA

1. CPUC General Order 164-D
2. CPUC General Order 143-B
3. SFMTA System Safety Program Plan (SSPP), Revision 6, dated 2/11/2015
4. SFMTA Fire Protection System Inspection and Maintenance, W.BG.PR.014
5. Subway Emergency Telephone Preventive Maintenance, R.SM.PR.010
6. Subway Emergency Egress Door Inspection and Maintenance, W.BG.PR.008
7. Subway Emergency Ventilation Fan System Inspection & Maintenance, W.BG.PR.006
8. Subway Station Emergency Egress Lighting Inspection and Maintenance, W.BG.PR.008
9. Facilities Emergency Response, R.OC.PR.010
10. Battery Back-Up Power Subway Signaling System PM, R.SM.PR.021

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

Facilities and Equipment Inspections: Non-Revenue Facilities and Wayside
Interview SFMTA representatives and review appropriate records for past 3 years to determine whether:

1. Required inspections were performed as per supporting references.
2. Inspections were properly documented and noted, and discrepancies were corrected in a timely manner.
3. Potential hazards found during inspections were tracked, from Recommendation, to Corrective Action Plans, to implementation.

4. Check a sample of records documenting hazards identified during inspections to ensure that they are immediately reported, documented, and tracked through resolution.
5. Check a sampling of Corrective Action Plans to determine timeliness of resolution and ensure follow-up activities are performed, hazard resolution has taken place, a measure of the effectiveness of implemented hazard controls has taken place and that documented as well as noted discrepancies were corrected in a timely manner.

FINDINGS AND RECOMMENDATIONS

Activities:
Staff interviewed SFMTA representatives and reviewed relevant program documentation and noted the following in summary:

1. For the Work Orders selected from Fire Protection System (ventilation fan system, under train deluge, emergency lighting, fire alarm, fire extinguisher, wet standpipe, fire sprinkler, and emergency egress) were closed out in a timely manner.
2. Selected Castro and Church from the Subway Emergency Telephone Maintenance. For the records selected (Oct. 2014-present) all PMs were properly documented.
3. Battery Backup Power was audited by CPUC Inspector with no issues or concerns reported.
4. Facilities Emergency Response and call ins are recorded by Central Control and handled and tracked to completion (Email alerts from Central Control and electronic updates are generated until the system is restored)

Findings:
No exceptions were noted.

Comments:
None

Recommendations:
None

2015 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR SAN FRANCISCO MUNICIPAL TRANSPORTATION AGENCY (SFMTA)

Checklist No.	**14-B**	**Element**	**Facilities and Equipment Inspections: Stations and Emergency Equipment**
Time	1:00 PM – 4:30 PM	**Location**	700 Pennsylvania, Main Conference Room
Date of Audit	October 22, 2015	**Department(s)**	Maintenance of Way, Motive Power, Facilities Maintenance, Overhead Lines and Signals Department
Auditors/ Inspectors	Mike Borer Raed Dwairi James Matus	**Persons Contacted**	Melvyn Henry Michael Kirchanski Terrance Fahey Charles Drane Leo Martinez Michael Johnson Nancy Dock

REFERENCE CRITERIA

1. CPUC General Order 164-D
2. CPUC General Order 143-B
3. SFMTA System Safety Program Plan (SSPP), Revision 6, dated 2/11/2015
4. SFMTA Fire Protection System Inspection and Maintenance, W.BG.PR.014
5. Subway Emergency Telephone Preventive Maintenance, R.SM.PR.010
6. Subway Emergency Egress Door Inspection and Maintenance, W.BG.PR.008
7. Subway Emergency Ventilation Fan System Inspection & Maintenance, W.BG.PR.006
8. Subway Station Emergency Egress Lighting Inspection and Maintenance, W.BG.PR.008
9. Facilities Incident Response, R.OC.PR.0101
10. Battery Back-Up Power Subway Signaling System PM, R.SM.PR.021

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

Facilities and Equipment Inspections: Stations and Emergency Equipment
Interview SFMTA representatives and review appropriate records to determine whether:
1. Required inspections described in the referenced materials were performed.
2. Inspections were properly documented and noted discrepancies were corrected in a timely manner.
3. Potential hazards found during inspections were tracked from Recommendation, to Corrective Action Plans, to implementation.

FINDINGS AND RECOMMENDATIONS

Activities:
Staff interviewed SFMTA representatives and reviewed relevant program documentation and noted the following in summary:

1. For the Work Orders selected from Fire Protection System (ventilation fan system, under train deluge, emergency lighting, fire alarm, fire extinguisher, wet standpipe, fire sprinkler, and emergency egress) were closed out in a timely manner.
2. Selected Castro and Church from the Subway Emergency Telephone Maintenance. For the records selected (Oct. 2014-present) all PMs were properly documented.
3. Battery Backup Power was audited by CPUC Inspector with no issues or concerns reported.
4. Facilities Emergency Response and call ins are recorded by Central Control and handled and tracked to completion (Email alerts from Central Control and electronic updates are generated until the system is restored)

Findings:
None.

Comments:
None.

Recommendations:
None.

2015 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR SAN FRANCISCO MUNICIPAL TRANSPORTATION AGENCY (SFMTA)

Checklist No.	**14-C**	**Element**	**Facilities and Equipment Inspections: Tunnels, Bridges, and Aerial Structures**
Time	9:00 AM to 4:30 PM	**Location**	Oct 27 & 28: 1 SVN, North Beach Conference Room (3072)
Date of Audit	October 27, 2015 October 28, 2015	**Department(s)**	Capital Programs and Project (CP& C) Safety Division Maintenance of Way
Auditors/ Inspectors	Paul Renteria David Leggett Robert Hansen	**Persons Contacted**	Vince Harris Nancy Dock

REFERENCE CRITERIA

1. CPUC General Order 164-D
2. CPUC General Order 143-B
3. SFMTA System Safety Program Plan (SSPP), Revision 6, dated 2/11/2015
4. Inspection records for 4th Street Bridge, Islais Creek Bridge, Third Street/ US 101 Overpass, San Jose/I280 Overpass, Highland Bridge over San Jose Ave.; Richland Bridge over San Jose Ave.
5. Inspection records for Tunnels: Records for Twin Peaks Tunnel, Sunset Tunnel, Muni Market Street Tunnel(BART), Muni Metro Turnaround (MMT)

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

Facilities and Equipment Inspections: Tunnels, Bridges, and Aerial Structures
Interview SFMTA representatives and review appropriate records to determine whether:

1. Required structures inspections as described in the referenced materials were performed by CalTrans/BART/SFMTA depending upon their jurisdiction and responsibility.
2. Inspections were properly documented and noted, and discrepancies were corrected in a timely manner.
3. Potential hazards found during inspections were tracked until resolution. Pay special attention to hazards such as saltwater leakage and corrosive accumulation found in tunnels which fall under the responsibility of SFMTA.
4. The System Safety Department is aware of all safety hazards pertaining to civil structures.

FINDINGS AND RECOMMENDATIONS

Activities:
Staff met with SFMTA representatives to determine which of SFMTA's structural assets are of

interest to RTSB. Following the meeting, SFMTA provided an inventory of all aerial and underground assets currently in operation, including stations, bridges (both rail/mixed traffic and pedestrian), and tunnels. The inventory includes both bridges carrying rail over another feature—waterway or highway—and bridges carrying non-rail traffic over the railway. The spreadsheet also indicates which entity owns and maintains each asset.

Staff then performed inspections of four bridges in the inventory, all of which carry rail traffic:

1. Fourth Street Bridge over SF Bay Inlet
    a. The bridge was originally an overhead-counterweighted single-leaf bascule constructed in 1917. The bridge was retrofitted to place the counterweight underneath the roadway, as described below.
    b. San Francisco Department of Public Works (SFDPW) owns and maintains this bridge.
    c. The rails run within the automobile right-of-way.
    d. The bridge carries three lanes of traffic, with the rail traffic running along the northernmost and central lanes, and sidewalks allow pedestrian access on either side of the roadway. This results in eccentric loading over time.
    e. Maintenance workers from SFPWD were coincidentally present at the time of Staff's inspection, and were responsive to Staff's questions.
    f. SFPWD representatives informed Staff that the concrete counterweight above the roadway is a fiberglass and plaster replica of the original, and does not function as a counterweight for the current bridge—the actual counterweight is housed in a large underground mechanical room extending approximately 30 feet below the roadway and 20 feet below the water surface.
    g. Staff was allowed to tour the underground mechanical room and the control tower.
    h. Although aging, the bridge structure (painted steel truss) appeared in good condition.
    i. Several steel plates attached to the rails and embedded in the roadway were apparently missing bolts. SFPWD representatives indicated the plates are maintained by SFMTA, and said they would inquire about them.
2. Third Street Bridge over Islais Creek
    a. The bridge is a double-leaf bascule constructed in 1945.
    b. SFDPW owns and maintains this bridge.
    c. The rails run within an exclusive median with posted speed restrictions in either direction.
    d. Staff noted numerous patches in the bridge's metal grid roadway, indicating significant wear.
    e. Staff observed peeled paint and corrosion due to water ponding on the dividers between vehicle and pedestrian traffic on both sides of the bridge.
    f. A team of diving inspectors contracted by Aecom for the City and County of San Francisco were present during Staff's visit.
    g. The bridge is undergoing inspections in preparation for re-opening the bridge to waterway traffic—the bascule mechanisms haven't been used in several years, and the US Coast Guard requested making the inlet accessible for firefighting boats.

h. The diving team informed Staff of some areas of concern, including significantly corroded beams under the roadway on the northern bascule and the steel reinforcement in the abutments.

3. Third Street Bridge over US-101
    a. This bridge is a four-span steel stringer bridge constructed for the T Third line which began operation in 2007.
    b. Caltrans owns and maintains the bridge.
    c. The bridge carries southbound automobile traffic from Third Street to Bayshore Boulevard, while rail traffic crosses in both directions in an exclusive median.
    d. The bridge is relatively new and appeared to be in good condition.
    e. Staff noted considerable vibrations as LRVs and larger trucks crossed the bridge.
    f. Staff noted transverse cracking in the concrete roadbed on the southern end of the bridge.
    g. The rail lines follow a series of abrupt horizontal and vertical curves to the north of the bridge, as the right-of-way transitions from the new bridge to the old grade of Third Street, limiting rail vehicle speed.
4. San Jose Bridge over I-280 at Mount Vernon Avenue
    a. This bridge is a two-span concrete box girder causeway carrying rail and automobile traffic. Staff has not determined the bridge's age.
    b. Caltrans own and maintains this bridge.
    c. The bridge carries rail and automobile as well as pedestrian traffic in both directions and parallel parking is permitted along the eastern shoulder next to the pedestrian sidewalk.
    d. Rail traffic appeared to reduce speed across the bridge.
    e. Staff did not observe any deficiencies in the bridge.

Because SFMTA does not own or maintain any of the bridges on which its rail vehicles operate, Staff obtained inspection and maintenance records through Caltrans for all the listed bridges it owns and operates.

Findings:

1. Steel plates in the roadway of the 4th Street Bridge over SF Bay Inlet were missing bolts.
2. The diving team informed Staff of some areas of concern at the Third Street Bridge over Islais Creek, including significantly corroded beams under the roadway on the northern bascule and the steel reinforcement in the abutments.

Comments:

None.

Recommendations:

1. SFMTA shall inspect the 4th Street Bridge and determine whether the bolts need to be replaced.
2. SFMTA shall request and review the Third Street Bridge over Islais Creek inspection reports and conduct repairs if deemed necessary.

2015 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR SAN FRANCISCO MUNICIPAL TRANSPORTATION AGENCY (SFMTA)

Checklist No.	**14-D**	**Element**	**Facilities and Equipment Inspections: GO 95 Right-of-Way Compliance**
Time	1:00 p.m. to 4:30 p.m.	**Location**	2502 Alameda Street, San Francisco
Date of Audit	October 27, 2015 & October 28, 2015	**Department(s)**	Maintenance of Way, Motive Power, Overhead Lines and Signals Maintenance
Auditors/ Inspectors	Steve Espinal Yan Solopov Jimmy Xia	**Persons Contacted**	Charles Drane (Superintendent, Motive Power Unit) Joshua Sadorra (Transportation Safety Specialist)

REFERENCE CRITERIA

1. CPUC General Order 95
2. CPUC General Order 164-D
3. CPUC General Order 143-B
4. SFMTA System Safety Program Plan (SSPP), Revision 6, dated 2/11/2015
5. Overhead Lines and Traction Power R.OC.PR.019
6. Overhead Lines Inspection W.OL.PR.008
7. Motive Power Inspection & Maintenance Manual W.MP.PR.101

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

Facilities and Equipment Inspections: GO 95 Right-of-Way Compliance
Select at least five (5) mainline or yard track sections at random from SFMTA's LRV and Historic Streetcar lines, review appropriate records, and perform visual inspections and measurements to determine whether, for each track section:

1. Right-of-Way inspection and maintenance standards and programs are compliant with General Order 95.
2. The required monthly, semi-annual, and annual inspections were performed during the past 3 years as required by the referenced procedure.
3. Inspections were properly documented and noted, and discrepancies were corrected in a timely manner.
4. Potential hazards found during inspections were tracked from Recommendation, to Corrective Action Plans, to Implementation.
5. All right-of-way components are in compliance with the applicable reference criteria, or variances were submitted properly and approved by CPUC.

FINDINGS AND RECOMMENDATIONS

Activities:

Staff reviewed the following documentation related to motive power inspection and maintenance:

1. Circuit Breaker Test and Inspection Reports for the following substations from the last three years:
    a. Glen Park Substation
        i. The inspection reports for the following circuit breakers were reviewed:
            1. GP1: 7/1/14
            2. GP2: 7/2/14
            3. GP3: 2/11/15
            4. GP52, GP72: 6/18/14
    b. Judah Substation
        i. The inspection reports for the following circuit breakers were reviewed:
            1. JU-1: 11/19/12, 6/5/14
            2. JU-2: 11/19/12, 6/5/14, 11/24/14
            3. JU-3: 5/21/12, 11/14/14
            4. JU-72, JU-152: 5/15/13
    c. San Jose Substation
        i. The inspection reports for the following circuit breakers were reviewed:
            1. SJ-11, SJ-12, SJ-13: 9/24/14
            2. SJ-14: 3/25/15
            3. SJ-15: 10/1/15
            4. SJ-16: 11/16/12, 9/25/14
            5. SJ-17: 12/29/14
    d. Taraval Substation
        i. The inspection reports for the following circuit breakers were reviewed:
            1. T-1: 6/20/14
            2. T-2, T-3: 12/30/14
            3. T-52, T-72:: 4/26/14
    e. Eureka Gap Breaker
        i. The inspection reports for the following circuit breakers were reviewed:
            1. CHL-2 & CHL-1: 7/21/15, CH22.1:8/5/15 & LH 23.1: 4/29/15
            2. CHL-2 & CHL-1:6/28/12, CH22.1 & LH-23.1: 9/11/12
    f. Forest Hill Gap Breaker
        i. The inspection reports for the following circuit breakers were reviewed:
            1. LWP-2 8/28/15: LWP-2 & LWP-1: 1/28/15
            2. LWP-1 & LWP-2: 7/17/12
    g. Justin Herman Substation
        i. The inspection reports for the following circuit breakers were reviewed:
            1. DK-1: 8/20/15, DK-2 & DK1: 1/16/15
            2. DK-2 & DK-1: 2/9/12
            3. DK-2: 3/14/08
            4. DK-2:4/17/07
    h. Phelps Substation
        i. The inspection reports for the following circuit breakers were reviewed:

1. P-5: 7/2/15, P-1: 1/23/15, P-4: 6/9/15, P-6 & P-7: 6/10/15
2. P-2: 11/7/14, P-3: 9/26/14
3. S-2: 2/20/13
4. P-3: 2/24/12. P-2: 9/17/12, P-5, P-6, P-7, P-4: 9/19/12

2. San Francisco Municipal Railway Weekly Tests and Readings reports for the following substations from the last three years:
    a. Taraval Substation
        i. Reports from May to October 2015 were reviewed.
    b. Randolph Substation
        i. Reports from May to October 2015 were reviewed.
    c. Bernal Substation
        i. Reports from May to October 2015 were reviewed.
    d. Marina Substation
        i. Reports from May to October 2015 were reviewed.

Staff inspected the following five substations for cleanliness and maintenance:
1. Church substation
2. West Portal substation
3. 3rd and Keith substation
4. 3rd and Phelps substation
5. 2nd and King substation

All substations were clean. All battery levels maintained. Functioning eyewash and fire extinguisher were present. Transformer winding temperatures were at safe levels. Also, all maintenance was recorded in detail in the logbook of each substation. The substations operated quietly with minimal vibrational noise and were well preserved.

3. SFMTA provided staff with a large list of all performed maintenance and inspections from its computerized database. Staff used this list as a reference to identify, track, and review circuit breaker tests and inspection report documentation, which was stored in physical form in boxes. The above list contained records of over 1000 closed work orders, with brief descriptions of work done, as well as the opened and closed dates. The vast majority of the items listed were repaired on the same day the problem was documented. There were only four items listed as being open at the time of the audit.

Findings:
1. The biennial Circuit Breaker Test and Inspection Reports for the circuit breaker GP3 in the Glen Park substation scheduled in 2013 and circuit breaker SJ-15 in the San Jose substation scheduled in 2015 were missing from the record files.

Comments:
Based on review of the corrective maintenance records. Repairs are being conducted consistently in a timely manner. Also, weekly substation inspections are being conducted and documented in

both the substation log book and inspections records as dictated in procedure.

Recommendations:

1. SFMTA shall maintain complete records of all inspections and performed maintenance for four prior calendar years as dictated in General Order 143-B, part 14.06.

2015 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR SAN FRANCISCO MUNICIPAL TRANSPORTATION AGENCY (SFMTA)

Checklist No.	**14-E**	**Element**	**Facilities and Equipment Inspections: Signal Communication, Train Control, Grade Crossing**
Time	1:00 PM to 4:30 PM	**Location**	700 Pennsylvania
Date of Audit	October 21, 2015	**Department(s)**	Maintenance of Way, Track, and Signals Maintenance
Auditors/ Inspectors	Sherman Boyd Kevin McDonald John Madriaga	**Persons Contacted**	Terrance Fahey Young Laolago David Harbin Leo Martinez Nancy Dock

REFERENCE CRITERIA

1. CPUC General Order 164-D
2. CPUC General Order 143-B
3. CPUC General Order 75-D
4. SFMTA System Safety Program Plan (SSPP), Revision 6, dated 2/11/2015
5. Battery Back-Up Power Subway Signaling System PM, R.SM.PR.021
6. Track Inspection and Maintenance R.TR.PR.001
7. Track Switch Inspection and Maintenance R.TR.PR.002
8. Highway – Railroad Grade Crossings and Light Rail-to-Freight Rail Crossing Interlockings Inspection and Maintenance R.SM.PR.027
9. Model 55 E Electric Switch Machine Preventative Maintenance R.SM.PR.032
10. Model 5F Electric Switch Machine Preventive Maintenance R.SM.PR.033
11. Model T-3 (Girder Rail)Electric Operated Switch Machine Preventive Maintenance R.SM.PR.023
12. Vital Rely Testing R.SM.PR.019
13. Rail Transit Track Switch Control and Signal Interlocking (Surface Streets) R.SM.PR.017

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

Facilities and Equipment Inspections: Signal Communication, Train Control, Grade Crossing

Interview SFMTA's representative responsible for Wayside Maintenance, and randomly select Preventative Maintenance (PM) records from the past 3 years and determine whether:

1. SFMTA's Track and Turnout and Crossing Maintenance staff:
   a. Perform detailed inspections of the mainline switches and crossing's components to determine whether or not they are in compliance with the applicable reference criteria.

b. Inspect the UP/Muni grade crossings at Third and Carroll and Third and Cargo
c. Properly document all required PM activities on standardized inspection report forms.
d. Note and track all defects and non-compliances from Recommendation, to Corrective Action Plan through Implementation.

2. Vital Relays Preventative Maintenance staff:
   a. Keep proper records of scheduled and unscheduled maintenance activities for vital relays. Determine if inspections were performed at the required frequencies as specified in the reference criteria.
   b. Properly document and correct problems in a timely manner.
   c. Properly implement the acceptable limits for voltage and amperage readings. Review vital relay inspection records to verify.

FINDINGS AND RECOMMENDATIONS

Activities: Reviewed the test records for:
1. Battery Back-Up Power Subway Signaling System PM, R.SM.PR.021
2. Highway – Railroad Grade Crossings and Light Rail-to-Freight Rail Crossing Interlocking's Inspection and Maintenance R.SM.PR.027
3. Model 55 E Electric Switch Machine Preventative Maintenance R.SM.PR.032
4. Model 5F Electric Switch Machine Preventive Maintenance R.SM.PR.033
5. Model T-3 (Girder Rail)Electric Operated Switch Machine Preventive Maintenance R.SM.PR.023
6. Vital Rely Testing R.SM.PR.019
7. Rail Transit Track Switch Control and Signal Interlocking (Surface Streets) R.SM.PR.017

Findings:
1. Defect 236.110.A2 Record of the results of tests was not recorded on the required prescribed form taken for both interlocking's at Carrol and Cargo. Two Year test for FRA 236.377 & 378 for locking test were not recorded.
2. Defect taken for FRA 234.0273.A2 Test and inspections not recorded on form or electronically for quarterly test for insulated joints per FRA234.271 on test record from 8/17/15.

Comments:
Two-Year interlocking test was last done on 1/9/14 in conjunction with CPUC & FRA inspectors. SFMTA failed to record this test and does not have a SOP for this test.

Recommendations:
1. SFMTA shall request training on FRA 234 & 236 regulations. SFMTA need to develop form and SOP for the two year interlocking test and then re-test both interlocking's.

2015 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR SAN FRANCISCO MUNICIPAL TRANSPORTATION AGENCY (SFMTA)

Checklist No.	**14-F**	**Element**	**Equipment Maintenance Program: Measurement and Testing Instrumentation**
Time	8:00 a.m. to 4:30 p.m.	**Location**	700 Pennsylvania, Main Conference Room
Date of Audit	October 23, 2015	**Department(s)**	Fleet Engineering, Maintenance of Way, Motive Power, Overhead Lines and Signals Maintenance
Auditors/ Inspectors	James Matus Raed Dwairi	**Persons Contacted**	Charles Drane, Emmanuel Enriquez Michael Johnson, Jeffrey Conley Lou Maffei Elson Hao Josh Sadorra

REFERENCE CRITERIA

1. CPUC General Order 164-D
2. CPUC General Order 143-B
3. SFMTA System Safety Program Plan (SSPP), Revision 6, dated 2/11/2015
4. Calibration of Test Instruments Signals and Communications Maintenance Unit R.SM.PR.013

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

Facilities and Equipment Inspections: Measurement and Testing Instrumentation
Interview responsible SFMTA representatives from each department, review appropriate records, inspect equipment storage facilities, and inspect no fewer than eight measuring or testing instruments to determine whether:

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

FINDINGS AND RECOMMENDATIONS

Activities:
Staff interviewed responsible SFMTA representatives and appropriate records regarding the testing and calibration of the selected tools. Staff accurately determined whether SFMTA had the proper procedures put in place to test and calibrate selected tools. Furthermore, tools that were tested and calibrated were reviewed to see if they were accurately marked with the tools identification number and date of calibration.

1) Tools are sent out in a systematic order for yearly testing and calibration. Half of the tools are sent out at a time to prevent a shutdown without calibrated tools.
2) Tools are sent out to a private contractor for testing and calibrating. The company that does the testing is Micro Precision Calibration.
3) SFMTA and Micro Precision Calibration track work to completion and type of tools, including calibration date as well as work orders.
4) Defective tools are tagged and categorized as out of service. The defective tools tracked by work orders which are sent out for repair.
5) Tools that are lost or unable to be repaired are put on a separate sheet for documentation.
6) Tools are kept in locked tool rooms throughout facilities.
7) Staff inspected multi-meters, caliper, air gauges, and torque wrenches to verify proper documentation with identification number and calibration date. All tools inspected were within calibration date.
8) Staff also had SFMTA locate and identify tools randomly selected from a working tool list to show their ability to locate and inventory tools in an efficient manner. All tools selected were produced for verification.
9) Staff discussed the importance of a master list of all tools combined for easier tracking. For example, master list would include all tools as either in service, out of service, lost, stolen, damaged beyond repair, and date of purchase.

Findings:
None.

Comments:
Combine all tools on a master list.

Recommendations:
None

2015 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR SAN FRANCISCO MUNICIPAL TRANSPORTATION AGENCY (SFMTA)

Checklist No.	**15 - A**	**Element**	**Maintenance Audits and Inspections – Surface Signal Communication, and Grade Crossing Safety Inspection-CPUC Signal Inspector**
Time	12:30 a.m. to 3:30 a.m.	**Location**	UP/Muni crossings of Third Street
Date of Audit	October 21, 2015	**Department(s)**	Transit Division Maintenance of Way, Track Maintenance, Signal Maintenance
Auditors/ Inspectors	Sherman Boyd Kevin McDonald John Madriaga	**Persons Contacted**	Young Laolagi David Harbin Jeff Conley Terrance Fahey

REFERENCE CRITERIA

1. General Order 164-D
2. General Order 127
3. General Order 75-D
4. Code of Federal Regulations CFR 49, Part 234, Grade Crossing Signal System Safety
5. SFMTA System Safety Program Plan (SSPP), Revision 6, dated 2/11/2015
6. Track Inspection and Maintenance R.TR.PR.001
7. Highway–Railroad Grade Crossing & Light Rail-to-Freight Rail Crossing Interlockings Inspection & Maintenance, R.SM.PR.027 (only applies to the UP/Muni crossings of Third Street)
8. SFMTA Vital Relays Testing, R.SM.PR.019
9. Rail Transit Vehicle Tagging System (VETAG) Preventative Maintenance, R.SM.PR.029
10. Track Switch Inspection & Maintenance R.TR.PR.002
11. Rail Transit Track Switch Control & Signal Interlocking (Surface Streets), R.SM.PR.017

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

Maintenance Audits and Inspections - Signal Communication, Train Control and Grade Crossing Safety Inspection-CPUC Signal Inspector

1. SFMTA's Track and Turnout and Crossing Maintenance
   a. Randomly select 10 percent of the switches for each line, (Muni grade crossings are for the most part traffic-signal controlled). Perform detailed inspections of the

mainline switches and crossings' components to determine whether or not they are in compliance with the applicable reference criteria.

FINDINGS AND RECOMMENDATIONS

Activities:

Staff performed inspection related to "Highway–Railroad Grade Crossing & Light Rail-to-Freight Rail Crossing Interlocking's Inspection & Maintenance, R.SM.PR.027" (only applies to the UP/Muni crossings of Third Street).

Staff inspected and reviewed tests related to "SFMTA Vital Relays Testing, R.SM.PR.019".

Findings:

1. SFMTA was found not to be in compliance with FRA 234.0215.A3; Standby power capacity is insufficient to operate highway-rail grade crossing warning system during an interruption of the primary source of power at Carrol MP 2.05 DOT# 754765H.
2. Emergency Notification Signs (ENS) at Cargo and Carrol grade crossing have been installed improperly.

Comments:

None

Recommendations:

1. SFMTA has ordered batteries to replace the failed set at Carrol Ave on 10/14/15. Batteries expected to arrive in four to six weeks. SFMTA shall ensure the batteries are installed properly.
2. Staff gave SFMTA Signal Supervisor a copy of CPUC memorandum on ENS. SFMTA shall ensure the ENS is installed properly.

2015 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR SAN FRANCISCO MUNICIPAL TRANSPORTATION AGENCY (SFMTA)

Checklist No.	**15 - B**	**Element**	**ATCS Maintenance Program and Signal Systems Maintenance Program Including Power Switch Machines (Metro Subway)**
Time	1:00 PM to 4:30 PM	**Location**	700 Pennsylvania, Main Conference Room
Date of Audit	October 22, 2015	**Department(s)**	Transit Division Transit Services OCC Maintenance of Way Track Maintenance Signal Maintenance
Auditors/ Inspectors	Sherman Boyd Robert Hansen Steve Espinal	**Persons Contacted**	Jim Kelly Young Laolagi David Harbin Steve Newman

REFERENCE CRITERIA

1. General Order 164-D
2. General Order 143-B, Section 14.05
3. General Order 27
4. SFMTA System Safety Program Plan (SSPP), Revision 6, dated 2/11/2015
5. Automatic Train Control System (ATCS) Wayside Equipment Preventive Maintenance, R.SM.PR.026
6. Subway Wayside Signal Head Preventive Maintenance, R.SM.PR.030
7. ATCS Station Controller Subsystem Preventive Maintenance, R.SM.PR.007
8. ATCS Inductive Loop Cable Preventive Maintenance, R.SM.PR.038
9. ATCS Wayside Platform Emergency Stop Buttons Preventative Maintenance, R.SM.PR.003
10. ATCS Wayside Portal Intrusion Detection System Preventive Maintenance, R.SM.PR.004
11. ATCS Wayside Uninterruptible Power Supply (UPS) PM, R.SM.PR.002
12. ATCS Axle Counter Trackside Equipment Preventive Maintenance, R.SM.PR.006

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

ATCS Maintenance Program and Signal Systems Maintenance Program Including Power Switch Machines

Interview SFMTA's representative(s) responsible for ATCS maintenance and interlocking plant

maintenance and review appropriate records for the following programs:

1. Train Signal Control & Communication Inspection
    a. Perform detailed inspections of the train control and communication systems and components to determine whether or not they are in compliance with the applicable reference criteria.
    b. Randomly select at least one section for each line.
2. ATCS Maintenance Program
    a. A standard operating procedure describing SFMTA's comprehensive preventive maintenance program for the ATCS is current, approved, and implemented;
    b. The ATCS was inspected and tested at the specified frequencies during the past 36 months;
    c. The required PM activities were documented on standardized inspection report forms;
    d. Defects and non-compliances noted on the inspection report forms were corrected and signed off in a timely manner and;
    e. All ATCS safety related anomalies identified have been rectified.
3. Signal Systems Maintenance Program Including Power Switch Machines
    a. A standard operating procedure or other directive describing SFMTA's preventive maintenance program for interlocking plants is current, has been approved, and is being implemented;
    b. The SFMTA Metro subway interlocking plants were inspected and tested at the specified frequencies during the past 36 months;
    c. The required PM activities were documented on standardized inspection report forms and;
    d. Defects and non-compliances noted on the inspection report forms were corrected and signed off in a timely manner.

FINDINGS AND RECOMMENDATIONS

Activities:
Staff met with SFMTA personnel at 700 Pennsylvania Avenue to discuss ATCS maintenance and interlocking plant maintenance, and review related Preventative Maintenance (PM) inspection and test records for the past 3 years. Staff reviewed the records generated by the PM procedures listed in Appendix B of R.SM.PR.026 – ATCS Wayside Equipment, PM:

1. R.SM.PR.003 – ATCS Platform Emergency Stop Button, PM
   Platform Emergency Stop Button Preventive Maintenance procedure states inspection and testing every 12 weeks. The preventative maintenance records for Embarcadero, Montgomery, Powell, Civic Center, Van Ness and Church stations were reviewed. However for Embarcadero, Montgomery, Powell and Civic Center operational testing was not conducted in 2015 on various test periods. According to Signal and Communication Maintenance staff the emergency stop buttons are locked while testing is not conducted.

SFMTA should determine the role of the emergency stop button and develop a testing program appropriate relative to usage.

2. R.SM.PR.004 – ATCS Portal Intrusion Detection, PM
    a. The procedure requires inspections every 4 weeks at each location.
    b. Staff reviewed PM records for Sunset Tunnel. Records were sparse, and several records included the notes "No inspection due to construction" and "Sunset Station Controller not communicating." SFMTA personnel explained that the portal intrusion detection system at Sunset is not functioning and ATCS has been deactivated through the tunnel, with no plans for reactivation. The current construction activities include installation of camera systems with video processing motion detection.
    c. Staff reviewed PM records for Duboce Portal (DL), and MMT 2 (TR). One record was missing for October, 2014. SFMTA personnel explained the missing record most likely indicates a skipped PM.
3. R.SM.PR.005 – Uninterruptible Power Supply (UPS), PM
    a. Several records were improperly completed, indicating the SFMTA personnel had not been adequately trained in the PM and the supervisor had not properly reviewed the work.
4. R.SM.PR.006 – ATCS Axle Counter Wayside Equipment, PM
   The preventative maintenance activities for the Axle Counter shall have a periodicity of 52 weeks. CPUC staff reviewed Axle Counter inspection records at Castro, West Portal and Duboce. The vast majority of inspections were conducted in a timely manner and no voltage measurements were out of acceptable ranges.
5. R.SM.PR.007 – ATCS Station Controller Subsystem PM
    a. The procedure requires annual inspections.
    b. Staff reviewed all records, at all locations, for the past three years:

Location	2015	2014	2013	2012
MMT 1	[none]	04/28	05/24	02/02
MMT 2	[none]	08/28	[none]	02/02
Embar.	08/14	[none]	[none]	[none]
Van Ness	[none]	10/01	10/30	10/06
Duboce	02/14	[none]	02/06	02/21
Castro	03/19	02/20	04/06	03/07
West Portal	01/05	10/02	11/01	10/07

    c. With the exception of the annual inspection at Van Ness for 2015 which was not yet due at the time of the records review, the missing records are out of compliance with the PM procedure.
    d. SFMTA personnel expressed that one potential contributing factor to missed

inspections is inadequate staffing and high turnover rate in maintenance personnel.

6. R.SM.PR.015 – Switch Machine Model 55E PM
    a. Procedure R.SM.PR.026 indicates only 2- and 4-week check intervals, while R.SM.PR.015 includes check intervals at 2, 4, 12, 26, and 52 weeks.
    b. Only MMT switches, because of high use, are inspected every 2 weeks—all other switches are checked every 4 weeks. All switches require the higher intervals procedures, as well.
    c. Staff reviewed records from switch machine checks at two locations: MMT T-5A and Castro C-3A, both for 2014 and 2015.
    d. Staff noted there was no 26-week PM listed for MMT T-5A in 2015, and the 4 week check performed on February 20, 2015 was performed 6 days late.
    e. No discrepancies were noted for Castro C-3A.
7. R.SM.PR.019 – Vital Relay, Test
   SFMTA has multiple locations where Vital Relays reside, each with many different relays, often of different types and requiring unique testing procedures. SFMTA personnel informed Staff that some types of relays are no longer available from any vendor and, though tested, cannot be replaced—these will be phased out as the ATCS becomes less reliant on traditional track circuits for train localization. Vital Relays require testing every 2 years according to the procedure, thus Staff reviewed the past two inspections for multiple locations and noted the following:
    a. St. Francis Circle Vital Interlocking Processor – All relays passed tests in the two most recent records.
    b. Civic Center Subway Signal System
        i. Relay WF PD-1 #P12504 is unique and annotated differently from other relays. This led Staff to confusion as an inspection on October 27, 2014 appeared to indicate a non-compliant drop-away voltage. The SFMTA supervisor explained both the pull-up and drop-away voltages were consistent with specifications for the relay in question.
        ii. Relay E14TR PD-1 #P1007 indicated a drop-away voltage of 0.51V when tested on February 2, 2013. This is below the minimum drop-away voltage of 0.67V.
        iii. All other relays passed tests in the two most recent records.
    c. Embarcadero Subway ATCS – All relays passed tests in two most recent records, with one relay, though compliant, warranting further investigation:
        i. Timer Relay EI-3TE ST 451000 was tested on June 19, 2013, and April 22, 2015.
        ii. The relay has a maximum pull-up voltage of 16.00V and a minimum drop-away voltage of 9.6V. The tested values from 2013 were 3.48V and 10.00V, respectively; for 2015, the values were nominal.
        iii. Staff observed the peculiarity of a lower tested drop-away than pull-up voltage.
        iv. SFMTA personnel investigated the testing procedures and manufacturers specifications to determine that testers have not been performing the tests correctly and may lack the equipment to do so.

v. SFMTA personnel believe that the timer relays will either be removed or locked into one state when the conventional train control system is removed and fully replaced by the coexistent ATCS.
vi. SFMTA personnel reviewed the manufacture's documentation and confirmed that testers have been performing the field testing procedure correctly, although the 3.48V reading in 2013 was erroneous and not properly reported or addressed. The nominal readings in 2015 suggest that the relay was in fact in good condition.

8. R.SM.PR.038 – ATCS Inductive Loop Cable, PM
   a. This procedure specifies three levels of inspection, to take place on quarterly, semiannual, and annual bases.
   b. The records reviewed for this PM, summarized below, indicate SFMTA consistently failed to perform the semiannual and annual level inspections:

Location	Date of PM	PM Frequency
West Portal	October 5, 2015	Quarterly
	July 26, 2015	Quarterly
	March 29, 2015	Quarterly
	January 17, 2015	Quarterly
	September 25, 2014	Semiannual
	July 19, 2014	Quarterly
	October 10, 2014	Quarterly
	June 15, 2013	Annual
	March 10, 2013	Quarterly
	December 14, 2012	Quarterly
Van Ness	August 11, 2015	Quarterly
	May 28, 2015	Quarterly
	March 14, 2015	Quarterly

   c. The inspections on September 25, 2014, and June 15, 2013, were labelled as semiannual and annual inspections, respectively, but did not indicate the additional procedures had been performed beyond the quarterly PM.
   d. After establishing SFMTA has not been performing semiannual or annual inspections, Staff searched specifically for any examples of such inspections. Among all locations, only 2 semiannual records were found: July15, 2014 at MMT2, and February 17, 2011 at West Portal.
   e. Staff discussed the lack of semiannual and annual inspections with SFMTA personnel and agreed that the requirements in R.SM.PR.038 were unreasonable and unnecessary for the installed equipment. SFMTA agreed to contact the ATCS designer and the loop cable manufacturer to determine an appropriate inspection schedule to include in an updated PM procedure.

Findings:

1. SFMTA has not performed consistently the required PM for its Portal Intrusion Detection

system at the Sunset Tunnel because ATCS is no longer used through the tunnel.
2. ATCS Wayside Uninterruptible Power Supply testing and record keeping were not consistent with SFMTA's PM procedure R.S.M.PR.002.
3. SFMTA has missed several annual inspections for its ATCS Station Controllers, according to PM procedure R.SM.PR.007. This may be related to insufficient staffing and a high turnover rate of maintenance personnel, which limits the level of training among available personnel.
4. R.SM.PR.026 Appendix B indicates PM intervals of 2 and 4 weeks, while R.SM.PR.015 Switch Machines requires check intervals at 2, 4, 12, 26, and 52 weeks.
5. SFMTA has failed to perform its semiannual and annual inductive loop cable inspections as required by R.SM.PR.038.
6. Platform Emergency Stop Button (ESB) procedure R.SM.PR.003 is not being inspected and tested as dictated in the procedure.
7. The vast majority of ATCS Axle Counter Trackside Equipment Preventive Maintenance R.SM.PR.006 was conducted in timely manner and the results were within specifications with exception of Duboce, DR08. Duboce axle counter DR08 was not inspected or tested in 2014 and 2015.

Comments:
N/A

Recommendations:
1. SFMTA shall update R.SM.PR.004 to reflect its abandonment of ATCS through the Sunset Tunnel.
2. SFMTA shall train maintenance personnel on the PM requirements in R.SM.PR.002, and ensure supervisors consistently review test records.
3. SFMTA shall take necessary measures to ensure annual PM procedures are performed according to R.SM.PR.007, which may include hiring sufficient personnel and mitigating turnover.
4. SFMTA shall update R.SM.PR.026 Appendix B to reflect PM intervals required by R.SM.PR.015.
5. SFMTA should contact the ATCS designer and inductive loop cable manufacturer to determine an appropriate inspection schedule, and update R.SM.PR.002 accordingly.
6. SFMTA shall inspect and test according to procedure R.SM.PR.003 or review the actual role the ESB plays and revise the procedure.
7. SFMTA shall conduct ATCS Axle Counter Trackside Equipment Preventive Maintenance on Duboce axle counter DR08.

2015 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR SAN FRANCISCO MUNICIPAL TRANSPORTATION AGENCY (SFMTA)

Checklist No.	**15 - C**	**Element**	**Maintenance Audits and Inspections – Metro and Cable Car Tracks, Switch, and Turnout Inspection – Field Inspection by CPUC Track Inspector**
Time	12:30 a.m. – 4:30 am	**Location**	Cable Car Barn & Tracks, Green Metro Yard, MME, Satellite Yard 6th & King
Date of Audit	October 22, 2015	**Department(s)**	Transit Division Maintenance of Way Track Maintenance Cable Car
Auditors/ Inspectors	John Madriaga Kevin McDonald	**Persons Contacted**	Melvyn Henry Terrance Fahey Young Laolagi Ed Cobean Rigo Hernandez

REFERENCE CRITERIA

1. General Order 164-D
2. General Order 143-B
3. SFMTA System Safety Program Plan (SSPP), Revision 6, dated 2/11/2015
4. Code of Federal Regulations CFR 49, Part 213, Track Safety Standards
5. SFMTA Track Maintenance and Inspection SOP, R.TR.PR.001
6. SFMTA Cable Car Roadway Track Inspection & Maintenance, C.PR.002
7. Track Switch Inspection & Maintenance, R.TR.PR.002
8. Curve Track Rail Lubrication, R.TR.PR.004

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

Maintenance Audits and Inspections - Track, Switch, and Turnout Inspection – Field Inspection by CPUC Track Inspector

1. Randomly select at least three sections of the mainline track, three switches, two crossovers, and one turnout on the mainline from each line including the J, K, L, M, N, and T LRV lines, and California St, Powell and Hyde, and Powell and Mason cable car lines.
2. Perform detailed visual and dimensional inspections/measurements of sample sections of mainline tracks, switches, crossovers, and turnouts to determine if the selected

components are in compliance with the applicable reference criteria.

3. Select and inspect a representative sample of yard turnouts, as well as curved and tangent sections of track. Yard inspections will include: (1) Green Division, (2) the satellite yard near King St and 6th St, and (3) the SFMTA MUNI Metro East (MME) facility.

FINDINGS AND RECOMMENDATIONS

Activities:

Staff conducted a walking, visual inspection of SFMTA subway track west of Van Ness station, including switches V1A, V1B, V3A, V3B and V9. Track geometry measurements were taken of the gauge, guard check gauge and guard face gauge. Staff also compared the difference between stock rails and point rails. Staff also inspected direct fixation plates, crossties, fasteners and concrete supports.

Staff then conducted a walking, visual inspection of cable car tracks, diamonds and crossovers at the intersection of California and Powell Street's and at Washington and Powell. Measurements of cable car track gauge were taken at multiple points.

Findings:

Finding #1: Staff discovered a gap of 13/16 (compared to the maximum recommended ¼" per R.TR.PR.001 section 4.15 1) between bolted rail joints in the left heel block of switch V3B west of Van Ness station.

Finding #2: Staff discovered a missing cotter pin on a bolt on the left side of the # 1 basket rod of switch V3A west of Van Ness station. SFMTA personnel should replace the missing cotter pin per R.TR.PR.001 section 4.20: ***"All hardware associated with switches shall be present…"*** and per General Order 143-b section 14.05 and per CFR 49 213.133 (a): ***"In turnouts and track crossings, the fastenings shall be intact and maintained so as to keep the components securely in place."***

Finding #3: Staff discovered that 6 out of 7 direct fixation plates between switches V3B and V9 were loose and metal plates and rubber elastomeric coatings were corroded. SFMTA personnel should replace corroded and deteriorated direct fixation plates and rubber coatings per R.TR.PR.001 sections 4.10.1.1, 4.10.2.1, 4.10.2.4: ***"Fasteners shall be considered ineffective if…a plate or pad is corroded, deteriorated or broken where rail fasteners or anchor bolts no longer provide lateral or vertical support;"***

Finding #4: Staff discovered 11 defective direct fixation plates in a row on the outbound track, west of switch V9, west of Van Ness station.

Finding #5: Staff observed the track supervisor stand upon the track with one, then both feet at switch V1A west of Van Ness station.

Comments:
Staff wishes to note the exceptional level of organization and effectiveness of the Cable Car division under its current Senior Operations Manager. Cable car supervisors, track workers and powerhouse employees were extremely knowledgeable about the cable car division's past and present condition.

Recommendations:

1. SFMTA shall strictly follow their Track Maintenance and Inspection SOP, R.TR.PR.001 and inspect and repair any defects found during inspections in a timely manner. SFMTA should immediately repair the defects found by the CPUC Auditors in the "Findings" section above and inspect the tracks thoroughly for any additional potential defects in the remaining tracks.
2. SFMTA shall emphasize in Safety Trainings that personnel shall never walk upon the rail, per SFMTA rule book section 9.3.2: *"Employees shall not step, stand, sit or walk on any part of the rail structure unless necessary in the performance of duty. When required to perform duties in track areas, walking on or crossing the rails must be done on cross-ties and ballast only. Never step or stand in the track switches or their components*."

2015 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR SAN FRANCISCO MUNICIPAL TRANSPORTATION AGENCY (SFMTA)

Checklist No.	**15 - D**	**Element**	**Metro Track and Cable Car Track and Cable Maintenance Programs – Records Review**
Time	2:00 PM – 4:30 PM	**Location**	700 Pennsylvania for LRV/HSC track records Cable Car Barn for Cable Car track records
Date of Audit	October 20, 2015	**Department(s)**	Transit Division Maintenance of Way Track Maintenance Cable Car Division
Auditors/ Inspectors	Kevin McDonald	**Persons Contacted**	Melvyn Henry Ed Cobean Terrance Fahey Young Laolagi Rigo Hernandez Josh Sadorra

REFERENCE CRITERIA

1. General Order 164-D
2. General Order 143-B
3. SFMTA System Safety Program Plan (SSPP), Revision 6, dated 2/11/2015
4. Track Inspection and Maintenance, R.TR.PR.001
5. Cable Car Roadway Track Inspection and Maintenance, C.PR.002
6. Cable Splicing & Maintenance, C.PR.015
7. Track Switch Inspection and Maintenance R.TR.PR.002

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

Metro Track and Cable Car Track and Cable Maintenance Programs – Records Review

Interview the SFMTA representatives responsible for metro track and cable car track and cable maintenance and review the track maintenance program, procedures, records, and standards to determine if:

1. A current standard operating procedure or program manual, describing SFMTA's preventive maintenance program for mainline track and a comprehensive set of track standards with inspection and measurement acceptance criteria have been prepared, approved, and issued for use;
2. All Metro and cable car surface mainline track and special work was inspected at the

specified frequencies required by SFMTA's standards during the past twelve months;

3. All mainline tracks in the SFMTA Metro subway were inspected at the specified frequencies during the past 12 months as required by SFMTA's standards;
4. The required inspections were documented on standardized track inspection report forms;
5. All repairs to correct defects and non-compliances noted on the track inspection report forms were completed and closed in a timely manner and;
6. SFMTA is ensuring that the track maintenance crews are given adequate nighttime access and resources to complete their work.
7. SFMTA conducts routine ultrasonic testing as specified in their procedures. Review the ultrasonic testing records. What corrective action work has been conducted based on the ultrasonic testing results.

FINDINGS AND RECOMMENDATIONS

Activities:
Staff interviewed the SFMTA Deputy Director of Maintenance of Way and reviewed track inspection records for the MMT section of subway track for the period October 2014 to October 2015. Staff also reviewed inspection records for ultrasonic testing over the last triennial period: October of 2012 to October of 2015.

Findings

1. Staff discovered that 16 track inspections of the MMT by two SFMTA inspectors were improperly documented. These track inspections errors occurred 12/26/12-4/29/15 as well as 4/12/15 to 8/24/15 (see below). These track inspections were documented on the SFMTA "double point switch inspection form" and are required to be conducted twice monthly. The form has 17 items of inspection for each switch.

   Item # 1 for each switch on the form is "Clamped". This requires the inspector to state whether the switch in question has been clamped or not clamped. The only acceptable answer is yes, no, or does not apply (N/A). Both inspectors simply marked "OK". Without mentioning specific names, one inspector did so eleven times and the other inspector five times.

   In each of these 16 inspections, the inspector marked "OK" under item # 1 "clamped:" This answer does not accurately show the condition of the switch. The repeated pattern of simply marking "OK", under this item, over and over again, for several months in a row renders the answer meaningless.

2. Track supervisors or superintendent's failed to "manage and oversee (c) track maintenance records documentation", per R.TR.PR.001 section 3.2. Track supervisors and superintendents also failed to "review and initial after that review, each track inspection report…" per R.TR.PR.001 section 3.4 (f).

Track supervisors, or track superintendents should have known that finding # 1 was occurring, as SFMTA document R.TR.PR.001, section 3.2 states: *"The Track Supervisor (a) manages and oversees implementation and compliance of the SOP, (b) track maintenance employees field activity,* ***(c) track maintenance records documentation…"*** Additionally, section 3.4 f states: "The Track Superintendent shall …***review and initial after that review, each track inspection report…"***

There was no record that Track supervisors and superintendents are reviewing track inspections and signing off on them.

3. The SFMTA Deputy Director of Maintenance of Way acknowledged to staff that SFMTA had not conducted an ultrasonic inspection (internal rail defect) since 2007. SFMTA's "Track Inspection and Maintenance" manual, R.TR.PR.001, section 4.6, d) states: "Ultrasonic inspection/Internal Defect Detection" inspection shall be conducted "***Once every year*** for non-embedded track in the subways and tunnels only."
   The effect of not conducting internal rail defect inspections per SFMTA's policy is to create uncertainty as to the structural integrity of SFMTA's subway and tunnel track. Annual internal rail defect inspections discover defects that visual inspections cannot find.

Recommendations:

1. Track inspector training shall include an emphasis on accurate record documentation and forms must be completed in the proper manner."
2. SFMTA track supervisors and superintendents shall ensure that inspectors are accurately recording track conditions per R.TR.PR.001, section 3.2 and 3.4 (f) and General Order 143 (b) section 14.05. Track supervisors and superintendents should be signing off on track inspection records per R.TR.PR.001, section 3.2 and 3.4 (f).
3. SFMTA should conduct ultrasonic or internal rail defect inspections according to their own internal policy R.TR.PR.001, section 4.6 d) and per General Order 143-b, section 14.05.

2015 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR SAN FRANCISCO MUNICIPAL TRANSPORTATION AGENCY (SFMTA)

Checklist No.	**15 - E**	**Element**	**Maintenance Audits and Inspections – Light Rail Vehicle, Cable Car, and Historic Streetcar Inspection – Field Vehicle Inspection by CPUC Equipment Inspector**
Time	9:00 a.m. to 12:00 p.m. Cable Car 2:00 p.m. to 4:30 p.m. MME	**Location**	Cable Car Barn MME
Date of Audit	October 22, 2015	**Department(s)**	Transit Division Rail Vehicle Maintenance Cable Car Maintenance
Auditors/ Inspectors	Michael Borer Adam Freeman James Matus	**Persons Contacted**	Melvyn Henry Lee Summerlott Emmanuel Enriquez Ed Cobean Carol Wolther Michael Kirchanski Josh Sadorra

REFERENCE CRITERIA

1. General Order 164-D
2. General Order 143-B
3. SFMTA System Safety Program Plan (SSPP), Revision 6, dated 2/11/2015
4. SFMTA Rail Vehicle Preventive Maintenance & Inspection Scheduling, L.PR.017
5. SFMTA Cable Car Preventative Maintenance Inspection Schedules, C.PR.001
6. SFMTA Cable Car Defect Card, C.PR.004
7. LRV Maintenance Meet & Greet "01" Defect Card, L.PR.004

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

Maintenance Audits and Inspections – Light Rail Vehicle, Cable Car, and Historic Streetcar Inspection – Field Vehicle Inspection by CPUC Equipment Inspector

1. Randomly select at least 8 LRV cars and 3 Cable Cars from the available trains in the maintenance shop and perform detailed inspections to determine if SFMTA is properly and adequately maintaining (Apply whatever is applicable):
   a. Traction motors

b. Propulsion controller assemblies and components
c. Truck, axle, and wheel assemblies
d. Brake systems
e. Lighting
f. Coupler and drawbar assemblies
g. Passenger doors and step assemblies
h. Passenger component and safety appliances
i. Operator cab and appurtenances
j. Pantograph assemblies and related traction power components for LRV
k. Public address and intercom systems
l. Trolley pole assemblies and related traction power components for historic streetcar
m. For cable cars inspect the following list of components for compliance with minimum maintenance requirements: grip assembly, truck, slewing, axle and wheel assemblies; friction, track and slot braking systems; lighting; coupler and drawbar assemblies; stanchions, and; glazing and doors.

2. Based on the review and the inspections, determine whether or not the selected cars are in compliance with the applicable reference criteria.

FINDINGS AND RECOMMENDATIONS

Activities:
Staff Performed detailed inspections at SFMTA's Cable Car and MME maintenance locations. Inspections were completed on at least 8 LRV'S and 3 Cable Cars.
The inspections performed included both visual and component operational performance checks. All component checks resulted in compliance with SSPP'S and all applicable General Orders.
The following are some examples of the randomly selected components that were tested:

- Passenger Side Doors
- Interior/Exterior Lighting
- Public Address and Intercom Systems
- Emergency Brake and Friction Brake
- Windshield wipers and visors

The following components were visually inspected:

- Interior/Exterior car body safety appliances
- Wheel, Truck and axle assemblies
- Propulsion components
- Disc Rotors and Brake systems
- Coupler assemblies
- Pantograph assemblies
- Traction Motors

- Lighting
- Operator compartment decals, fire extinguishers, windshield wipers, side view mirrors, speedometer, seats, visors, etc.
- Interior passenger stanchions/handholds, seats, emergency instruction decals, etc.
- Windshields and side windows

Based on the detailed inspection CPUC staff concludes that the LRV'S, Cable Cars and Historic Streetcars are in compliance with all applicable reference criteria.

Findings:
None

Comments:
While performing LRV inspections and interviewing transit shop supervisors, CPUC Staff recognized a strong effort by management to provide sufficient resources to ensure compliance and a very proactive maintenance effort to minimize equipment and component failures.

Recommendations:
None

2015 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR SAN FRANCISCO MUNICIPAL TRANSPORTATION AGENCY (SFMTA)

Checklist No.	**15 - F**	**Element**	**LRV, Historic Streetcar, Cable Car, and Hi-Rail Vehicles Maintenance Programs – Records Review**
Time	9:00 a.m. to 12: 00 p.m. MME 1:30 p.m. to 4:30 p.m. Cable Car	**Location**	MME and Cable Car Barn
Date of Audit	October 21, 2015	**Department(s)**	Transit Division
Auditors/ Inspectors	Michael Borer James Matus	**Persons Contacted**	Melvyn Henry Lee Summerlott Emmanuel Enriquez Ed Cobean Carol Wolther Josh Sadorra

REFERENCE CRITERIA

1. General Order 164-D
2. General Order 143-B
3. SFMTA System Safety Program Plan (SSPP), Revision 6, dated 2/11/2015
4. Rail Vehicle Preventive Maintenance & Inspection Scheduling, L.PR.017
5. Cable Car Preventive Maintenance Inspection & Scheduling, C.PR.001

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

LRV, Historic Streetcar, Cable Car, and Hi-Rail Vehicles Maintenance Programs – Records Review

Randomly select the following vehicles:

a. At least five LRVs
b. At least two Milan cars, two PCC cars, and two other historic cars
c. At least three California Street cable cars and three Powell Street cable cars
d. At least two Hi-Rail Vehicles

Review the respective preventive maintenance, inspection, and repair records prepared during the past six or more months to determine if:

1. The required inspections and other maintenance activities were performed at the specified frequencies;
2. The responsible maintenance workers properly documented the inspection and maintenance activities;
3. Defects and non-compliances identified during the PM inspections were properly documented, corrected, and closed out in a timely manner and;
4. No trains with safety defects were returned to service until all safety defects were repaired.

FINDINGS AND RECOMMENDATIONS

Activities:
Staff reviewed preventative maintenance records for SFMTA LRV's, Milan cars, PCC cars, California street cable cars, Powell street cable cars, and hi-rail vehicles.

1) Staff noted that defects found during PM inspections were addressed in a systematic manner and the crew had applied work orders to the PM and also to the specific defects.
2) Once defects are repaired, they are combined with the work order to close both the PM and the work order out. Maintenance facilities have a continuous ordering program for specific parts so that they are always in stock at the appropriate facilities.
3) PM's and work orders are addressed in a timely manner.
4) LRV preventative maintenance program is calculated by a mileage based system. PM's are done at 10K, 20K, 30K, and 40K. Cable car's system is done on a 15 day and a 60 day inspection time frame.
5) Hi-Rail equipment is maintained by Muni personnel and maintenance records are documented in a 90 day bit program. In this particular case, two hi-rail vehicles were inspected for record documentation and maintenance practices. On one hi-rail vehicle, it was found without 90 day bit documentation for the years 2014-2015.
6) Maintenance records for all LRV's indicate that repairs were made, documented correctly, and not returned to service until all repairs were made. In compliance with G.O. 143-B 14.04.

Findings:
Hi-rail vehicle maintenance records need to be documented and retained for the 90 day bit inspection program. Hi-rail vehicle #73500022 was without records of inspection for years 2014 and 2015.

Comments:
Staff noted that operator's daily inspection sheets shall to be more detailed in their description of defects. Operators name, date, and route shall be clearly and legibly documented..

Recommendations:
1. Hi-rail vehicle maintenance records shall be documented and retained for the 90 day bit inspection program.

2015 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR SAN FRANCISCO MUNICIPAL TRANSPORTATION AGENCY (SFMTA)

Checklist No.	**15 - G**	**Element**	**Maintenance Audits and Inspections – Traction Power System (Overhead Catenary System) Inspections**
Time	9 a.m. - 12 p.m.	**Location**	2502 Alameda Street
Date of Audit	October 20, 2015	**Department(s)**	Transit Division Maintenance of Way Overhead Lines
Auditors/ Inspectors	Steve Espinal Jimmy Xia	**Persons Contacted**	Manuel Gonzales (General Foreman) Michael Johnson Fred Orantes (Transportation Safety Specialist)

REFERENCE CRITERIA

1. General Order 164-D
2. SFMTA System Safety Program Plan (SSPP), Revision 6, dated 2/11/2015
3. CPUC General Order 95
4. CPUC Resolution E-1492 Authorizing Deviation from Rule 37 of General Order 95
5. SFMTA Overhead Lines Inspection, W.OL.PR.008
6. Non-Scheduled Work on Overheard Line Wires (4-Digit Lockout Code), W.MP.PR.158

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

Maintenance Audits and Inspections – Traction Power System (Overhead Catenary System) Inspections

1. Inspect a minimum of four separate overhead catenary system (OCS) segments to determine if they are in compliance with SFMTA standards and if the OCS wires are in a state of good repair or not.

FINDINGS AND RECOMMENDATIONS

Activities:

Staff interviewed SFMTA representative and reviewed the following documents:

1. Overhead Lines Department LRV Overhead Annual Inspection Report dated 10/19/15
2. Overhead Lines Department Line Overhaul & Inspection Completion Reports for the following lines from the last three years:

a. F Line
    i. Inspection reports dated 8/2/13, 9/15/14, and 8/14/15
b. J Line
    i. Inspection reports dated 1/9/14, 10/3/14, and 2/18/15
c. K/T Line
    i. Inspection reports dated 5/24/13 and 9/18/14
d. L Line
    i. Inspection reports dated 4/12/13, 6/18/14, and 8/28/15

3. Overhead Lines Department Daily Overhaul Inspection and Defect Reports for the T Line from November 2012 through June 2015

Staff conducted a walking inspection of the T, F, K, and J lines. Staff inspected the systems for General Order 95 violations and had SFMTA's OCS maintenance staff measure conductor height.

T-Line inspection at 3rd St and South St: Conductor Height 18 ft
Conducted a walking inspection on 3rd St from South St to 20th St

F-Line inspection at Mission St and Steuart St: Conductor Height is 17' 10"
Conducted a walking inspection from Mission St and Steuart St to Embarcadero and Washington St

K-Line inspection at Ocean Ave and Lee Ave: Conductor Height 18.5 ft
Conducted a walking inspection on Ocean Ave from Lee Ave to Plymouth Ave

J-Line inspection at San Jose Ave and Baden Ave: Conductor Height 18.4 ft
Conducted a walking inspection on San Jose Ave from Baden Ave to Tingley St

Review Results:

1. Overhead Catenary System Records Review

    a. The required yearly inspections for all the lines staff selected were performed during the past 3 years as required by the referenced procedure.

    b. In general, inspections were documented and noted on the inspection forms and discrepancies found during inspections were corrected in a timely manner.

2. Overhead Catenary System Inspections

    a. The four separate OCS segments that staff inspected are in compliance with SFMTA standards and these OCS wires are currently in a state of good repair.

Findings:

N/A

Comments:

1. The closure of inspections is not documented on the Overhead Lines Department Daily Overhaul Inspection and Defect Reports for those where the job completed field was marked with “No”.

2. Regarding inspection reports if both inbound and outbound lines have been inspected document as inspected. Currently the route travel for inspection is documented not the actual lines that have been inspected.

Recommendations:

N/A

2015 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR SAN FRANCISCO MUNICIPAL TRANSPORTATION AGENCY (SFMTA)

Checklist No.	**16-A**	**Element**	**Training and Certification Programs: Operators, Controllers, and Foremen**
Time	9:00 a.m. – 4:30 p.m.	**Location**	**Green Metro Division, OCC, MME, Cable Car Barn**
Date of Audit	October 23, 2015	**Department(s)**	**Green Metro Rail Training Operations Control Center Maintenance Training Department**
Auditors/ Inspectors	**Colleen Sullivan Arun Mehta**	**Persons Contacted**	Jeffrey Conley Barry Chown Wes Valaris Brent Jones Jeffrey Chapell York Kwan Paul Petersen George Louie Russell Stanton Pedro Ramos

REFERENCE CRITERIA

1. CPUC General Order 164-D
2. CPUC General Order 143-B
3. SFMTA System Safety Program Plan (SSPP), Revision 6, dated 2/11/2015
4. Metro Rail Operations Training Program Plan I.PL.001
5. 2015 LRV Operator's Training Manual
6. Rail Car Operations Training Program Plan, TN.MO.PL.025
7. LRV Maintenance Operator Training Program Plan, TN.MT.PL.018
8. On-Track Equipment Operator Training Program Plan, TN.MT.PL.013
9. Rail Car Maintenance Train the Trainer Training Program Plan, TN.MT.PL.014
10. Cable Car Guide Book, TN.CC.MN.004
11. LRV Maintainer Training Program Plan, L.PL.021
12. OCC Training Program Plan, R.OC.PL.026
13. Roadway Worker Protection Plan
14. Track Maintenance Unit Training Program Plan, R.TR.PL.012
15. Signal & Communications Maintenance Unit Training Program Plan, R.SM.PL.001
16. Motive Power Unit Training Program Plan, W.MP.PR.157
17. PCC and Historic Streetcar Maintainer Training Program Plan, TN.MT.PL.024

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

Training and Certification Programs: Operators, Controllers, and Foremen

1. Select at least five (5) employees at random in each of the following classifications:
   - Train Operator
   - Train Controller
   - Light Rail Supervisor
   - Way, Power and Signal workers
   - Motormen/Conductors of Historic Streetcars
   - Mechanics
2. Review training, certification, and recertification records of the selected employees related to RWP, PED, and other specific job required training to determine whether:
3. All personnel successfully completed initial training programs, and any discrepancies were addressed and resolved.
4. All personnel have been retrained and recertified at the correct frequency and are currently certified to perform their duties according to the procedures.
5. Verify that a process for maintaining and accessing employee training records is in place.
6. Verify that categories of safety-related work requiring training and certification have been identified.
7. Verify that employee and contractor job classifications requiring initial and refresher training and certification have been identified.
8. Verify that SFMTA has a process is in place to assess compliance with its training and certification requirements.
9. Verify that corrective actions taken to discipline employees and contractors for failure to follow established procedures once trained and certified are established and consistent.
10. Verify that contractor training requirements are specified in contract documents.

FINDINGS AND RECOMMENDATIONS

Activities:
Staff met and interviewed SFMTA managers at the Green Yard, Muni Metro East (MME) Yard, Cable Car Barn and the Operations Control Center (OCC) and noted the following:

Staff asked questions about the initial training program, refresher training program, recertification training program, and remedial training (as necessary) program. Staff reviewed training, refresher, recertification, and remedial records of the selected employees related to Roadway Worker Protection (RWP), Personal Electronic Devices (PEDs), and other specific job required training. Staff selected five employees at random from each discipline as required in the checklist requirements and reviewed the records. The audit results are based upon CPUC GO 164-D and 143-B, SFMTA's System Safety Program Plan, and SFMTA's Training Program Plan Standard Operating Procedures (SOPs) as shown in the above reference criteria.

All of the departments audited by Staff had a program for its employees involving initial training, refresher training, recertification training, and remedial training as necessary. SFMTA has contractor training requirements that are specified in contract documents. SFMTA has a program

in place which utilizes corrective actions (progressive discipline) to discipline employees and contractors for failure to follow established procedures once trained and certified.

Train Operator (Light Rail Vehicle and Historic Street Car Train Operators):
Light Rail Vehicle (LRV) Train Operators are required to complete a 60-day initial training certification program. Historic Street Car (HSC) Train Operators are required to complete a 45-day initial training certification program. This certification training is a combination of classroom time and field operation. There is a process in place for accessing employee training records. The Train Operators are required to have a refresher training every two years involving an eight hour training consisting of both classroom and field training. In addition, each Train Operator is required to have annual compliance testing/ certification. Employee training records are maintained in TransitSafe. The SFMTA management has an Excel spreadsheet of the training program that provides details about when staff is required to have refresher training. This is called Compliance Check Refresher Records (CCRR). This is what SFMTA uses to flag when training is due. If a Train Operator has been away from his job for more than two years, he is required to complete the entire certification program again. As long as a Train Operator (T/O) is doing his job continuously, he is required to complete eight hours of refresher training every two years. The refresher training is a combination of classroom time and road operation. If a T/O is involved in an accident, retraining is required. In addition, if there is a new line added to the system, there is retraining required.

LRV Train Operators:

1. Employee # 2311 – His initial certification training was completed on 10/14/2010. His next refresher training was completed on 11/4/2011. His most recent refresher training was completed on 12/3/2013. This refresher training was nearly one month past due. His compliance testing/certification was completed on 7/5/2012, 5/8/2013, 4/6/2014, and 3/10/2015,
2. Employee # 3480 – His initial certification training was completed on 7/8/2013. His refresher training was completed on 9/1/2015. This was nearly two months past due. His compliance testing/certification was completed on 8/10/2012, 7/23/2013, 7/10/2014, and 6/25/2015.
3. Employee # 1117 – His initial certification training was completed on 9/16/2008. His most recent refresher was completed on 6/5/2012. His refresher training is past due. There were no compliance testing/certification records found for this employee. SFMTA staff told CPUC staff this employee has been out on leave for a long time.
4. Employee, #2143 – His initial certification training was completed on 5/23/2013. His next refresher training was completed on 2/25/2014 and his most recent refresher training was completed on 10/8/2015. His compliance testing/certification was completed on 4/12/2012, 3/9/2013, 36/2014, and 2/25/2015.
5. Employee #3487 – His initial certification training was completed on 2/24/2015. No refresher training is due for him at this time. His compliance testing/certification was completed on 8/23/2012, 8/8/2013, 6/5/2014, and 5/24/2015.

Historic Street Car Train Operators:

1. Employee #3901 – His initial certification training was completed on 7/23/2015. No certification training is due for him at this time. There were no compliance testing/certification records found. He completed Roadway Worker Protection (RWP) training on 6/25/2015.
2. Employee #2815 – His initial certification training was completed on 5/4/2009. His refresher training was completed on 12/3/2012 and 12/2/2014. His compliance testing/certification was completed on 7/22/2011, 1/23/2012, 12/20/2013, and 11/25/2014. His refresher training was completed on 12/3/2012 and 12/2/2014.
3. Employee #1751 – His initial certification training was completed on 1/19/2006. His refresher training was completed on 9/14/2012 and 12/9/2014. This latest refresher training was nearly three months past due. His compliance testing/certification was completed on 7/18/2012, 5/10/2013, 5/8/2014, and 4/6/2015.
4. Employee #1141 – His initial certification training was completed on 3/14/2014. No refresher training is due for him at this time. His compliance testing/certification was completed on 12/9/2013, 3/14/2014, and 4/13/2015.
5. Employee #1630 – His initial certification training was completed on 7/31/2010. His refresher training was completed on 8/15/2012 and 12/4/2014. This refresher training was nearly four months past due. His compliance testing/certification was completed on 7/22/2011, 7/10/2013, 7/16/2014, and 6/19/2015.

Train Controllers:

Train controllers are required to complete an initial training certification that is four months in duration. The recertification training is required every two years. Compliance testing/certification is required each year.

1. Employee Dispatch #77 – His initial certification training was completed on 12/7/2000. He completed recertification training on 12/4/2012 and 6/6/2015. This recertification training was six months late. His compliance testing/certification was completed on 12/4/2012 and 6/6/2015. His compliance testing/certification was past due. This testing/certification should be done on a yearly basis. He did not have compliance testing/certification in the years 2013 and 2014. He completed GO 172 training on 5/23/2015 and GO 175 training on 9/25/2015.
2. Employee Dispatch #79 – Her initial certification training was completed on 6/20/2011. She completed recertification training on 6/17/2013 and 6/7/2015. She had compliance testing/certification on 9/30/2012 and 5/13/2015. Her compliance testing/certification was past due. This training should be done on a yearly basis. She did not have compliance checks in the years 2013 and 2014. She completed GO 175 training on 10/21/2014. There were no records found for GO 172 training.
3. Employee Dispatch #58 – His initial certification training was completed on 9/12/2002. He completed recertification training on 12/18/2010 and 12/30/2013. This recertification training was over a year late. He had compliance testing/certification on 9/23/2012 and 5/13/2015. He did not have compliance checks in the years 2013 and 2014. His compliance training was past due; it should have been done on a yearly basis. There were no records found for neither GO 172 nor GO 175 training.

4. Employee Dispatch # 83 – His initial certification training was completed on 4/14/2011. He completed his recertification training on 6/14/2015. There were no records found between these dates. He was missing a recertification training in 2013. His compliance testing/certification was completed on 8/21/2012 and 4/21/2015. His compliance testing/certification was past due; it should be done on a yearly basis. He did not have compliance training in the years 2013 and 2014. He completed GO 175 training on 9/23/2015. There were no records found for GO 172 training.
5. Employee Dispatch #20 – Her initial certification training was completed on 2/6/2009. She completed her recertification training on 3/2/2012 and 6/7/2015. Her recertification training was over 15 months past due. She had compliance testing/certification on 4/25/2014 and 4/30/2015. There were no records found for compliance training in the year 2013. She completed GO 172 training on 5/25/2015 and GO 175 training on 10/21/2014.

Light Rail Supervisors (Metro Rail Operations, MRO):
Light Rail Supervisors are required to complete a 40 day certification program. Recertification training is three days in length and is required to occur every two years. The Superintendent of the Light Rail Supervisors told CPUC Staff that when we came into this position in late 2012, there were no recertification records. Because of this, the Superintendent decided to recertify all of the Light Rail Supervisors.

1. Employee Star #822 – He was initially certified on 1/11/2013. He completed recertification training on 1/14/2014. He is not due for his recertification training yet. He completed GO 172 and GO 175 training on 5/14/2015.
2. Employee Star # 635 – He was initially certified on 1/17/2014. He is not required to be recertified training yet. He completed GO 172 and GO 175 training on 1/17/2014.
3. Employee Star # 599 – There were no records for his certification or recertification training. He completed GO 172 and GO 175 training on 3/11/2015.
4. Employee Star # 923 – He was initially certified on 9/11/2014. He is not due for his recertification training yet. He completed GO 172 and GO 175 training on 4/27/2015.
5. Employee Star #714 – He was initially certified on 9/29/2014. He is not due for his recertification training yet. He completed GO 172 and GO 175 training on 3/24/2015.

Way, Power, and Signal Workers and Mechanics:
These were covered in Checklist #16-B.

Cable Car Grip Persons:
Cable Car Grip Persons are provided 7 days of classroom training and 20 days of line training. Recertification training is called requalification training and is required every two years. Compliance checks are required on an annual basis. The Cable Car Training Supervisors utilize an Excel spreadsheet to prompt them when retraining is required.

1. Employee #1983 – His initial certification training was completed on 6/29/2002. He completed requalification training on 9/14/2011 and 12/7/2013. This requalification training was nearly two months past due. His compliance testing/certification was

completed on 2/19/2013, 1/28/2014, and 1/20/2015.
2. Employee #722 – His initial certification training was completed on 1/07/1991. He completed requalification training on 9/15/2011 and 2/27/2014. This requalification training was over five months past due. His compliance testing/certification was completed on 2/12/2013, 1/5/2014, and 1/18/2015.
3. Employee #2118 – His initial certification training was completed on 3/13/2001. He completed requalification training on 9/4/2012 and 9/2/2014. His compliance testing/certification was completed on 3/5/2013, 2/15/2014, and 2/4/2015.

Cable Car Conductors:

Cable Car Conductors are given 5 days of classroom training and 15 days of line training. Recertification training is called requalification training and is required every two years. Compliance checks are required on an annual basis. The Cable Car Training Supervisors utilize an Excel spreadsheet to prompt them when retraining is required.

1. Employee #720 – His initial certification training was completed on 9/16/2005. He completed requalification training on 11/3/2011 and 1/7/2014. This requalification training was two months past due. His compliance testing/certification was completed on 10/23/2012, 12/12/2013, and 11/21/2014. The compliance testing/certification in 2013 was a month and half past due.
2. Employee # 420 – His initial certification training was completed on 6/8/1992. He completed requalification testing on 6/25/2011 and 1/3/2014. This requalification testing was nearly seven months past due. His compliance testing/certification was completed on 5/9/2013, 3/28/2014, and 3/11/2015.

Findings:

1. General Order 175 (Roadway Worker Protection) went into effect on October 31, 2013. Most of the GO 175 training records for all the different types of employees CPUC staff reviewed took place in 2015. This training was over one year late.
2. General Order 172 (Personal Electronic Devices) training for most employees is missing. CPUC staff could not find evidence of most of these records.
3. Most of the refresher training for the Light Rail Vehicle and Historic Street Car Train Operators were one to four months past due.
4. Most of the recertification training for Train Controllers was six months to 15 months past due. All of the compliance testing/certification for the Train Controllers were past due. There were no compliance training records found for the years 2013 and 2014.
5. There were no training records for Light Rail Supervisors found prior to the year 2013.
6. Most of the requalification training records for Cable Car Grip Persons and Cable Car Conductors were two to seven months past due.

Comments:

1. SFMTA needs a better computer flagging system in place to prompt management when training is due. SFMTA staff told CPUC staff they are currently working with SFMTA IT staff to accomplish this utilizing the Trapeze system.

2. CPUC staff considers training the most important aspect of safe rail operations. Only after CPUC's inspector's findings and citation in April 2015, the Superintendent of OCC made an effort to get the Train Controllers compliant in their recertification training, compliance training, General Order 172 (PED) training, and General Order 175 (RWP) training.

Recommendations:

1. SFMTA shall train its entire staff appropriately and timely in the following areas including: refresher, recertification, requalification, compliance testing, General Orders 172 and 175.

2015 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR SAN FRANCISCO MUNICIPAL TRANSPORTATION AGENCY (SFMTA)

Checklist No.	**16-B**	**Element**	**Training and Certification Programs: Maintenance Employees and Contractors**
Time	8:00 a.m. - 12:00 p.m.	**Location**	**Muni Metro East Maintenance Facility**
Date of Audit	October 21, 2015	**Department(s)**	**Maintenance Training Department, Green Metro Rail Training, Maintenance of Way, Track Maintenance, Signal Maintenance, Rail Vehicle Maintenance**
Auditors/ Inspectors	Robert Hansen Colleen Sullivan	**Persons Contacted**	David Chan Tom Curran Nancy Dock George Louie Rory O'Neill Young Laolagi

REFERENCE CRITERIA

18. CPUC General Order 164-D
19. CPUC General Order 143-B
20. SFMTA System Safety Program Plan (SSPP), Revision 6, dated 2/11/2015
21. W.OL.PL.017 Overhead Line Unit Training Program Plan
22. W.MP.PL.157 Motive Power Training Program Plan
23. L.PL.021 LRV Maintainer Training Program Plan
24. TN.CC.PL.015 Cable Car Inspector Training Program Plan
25. R.TR.PL.012 Track Maintenance Unit Training Program Plan
26. TN.MT.PL.013 On-Track Equipment Operations Training Program Plan
27. TN.MT.PL.014 Rail Car Maintenance Worker Train-the-Trainer Training Program Plan
28. TN.MT.PL.018 LRV Maintenance Operator Training Program Plan
29. R.SM.PL.001 Signal & Communications Maintenance Unit Training Program Plan
30. SY.PL.003 Roadway Worker Protection Plan
31. Internal Audit Annual Reports 2012-2014

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

Training and Certification Programs: Maintenance Employees and Contractors

1. Verify that SFMTA has a process in place to assess compliance with its training and certification requirements.
2. The training program standards and course implementation are reviewed and modified as necessary to meet the requirements of the reference criteria.
3. Select at least three (3) SFMTA employees or contractor employees at random in each of

the following categories:

- Vehicle Mechanics
- Track Maintenance Personnel
- Overhead Lines Personnel
- Motive Power Maintenance Personnel
- Signal and Communications Maintenance Personnel
- Maintenance Contractors

4. Review the selected employees' training and certification records for the last three years to determine whether:
   a. The employee or contractor has received the required training to perform his/her duties
   b. Documents are on-file to show that the employee or contractor is qualified and certified to perform his/her duties
   c. The employee or contractor has been re-certified at the required frequency
5. Review any corrective actions taken in response to employees or contractors failing to comply with rules or procedures, and verify the actions satisfactorily address the noncompliance and are consistent among similar infractions.

FINDINGS AND RECOMMENDATIONS

Activities:

1. Staff interviewed SFMTA Training Department personnel to assess whether the Rail division has processes for verifying employee compliance with training and certification requirements. SFMTA provides scheduled training and recertification for each of the employee classes with periodic requirements. Employees are recertified either once every two years or once every three years, depending on their classification. When employees are observed performing outside or contrary to their training, a supervisor has options for discipline and retraining.
   The Safety Department provides training for external entities working on SFMTA property, including contractors. Maintenance contractors receive training as needed, according to the type of work to be performed.
   All training records are retained for at least 4 years according to SFMTA's standard procedures.
2. The training SOPs included as the reference criteria for this checklist are continuously reviewed and routinely revised, typically on a 2-3 year cycle. The Training Department incorporates comments and corrective actions from the Maintenance Departments when revising training curriculum and procedures. Additionally, system configuration changes, including new equipment and system extensions, trigger revisions to the applicable training programs.
3. The table below item 4 summarizes Staff's review of 6 categories of SFMTA maintenance employees. Further observations regarding the training records and procedures are provided below:

a. Staff noted that procedure R.TR.PL.012 Track Maintenance Unit Training Program Plan Section 4.10.2 effective January 15, 2015, requiring on-On-Track & Trackside Safety Training every three years does not reflect SFMTA's procedure SY.PL.003 Roadway Worker Protection Plan, Section 8, which requires retraining every 24 months. The Track Department Maintenance Training Matrix provided to Staff lists the most recent On-Track & Trackside Safety Training for each employee and indicates all three employees reviewed are delinquent on retraining per procedure SY.PL.003.
b. Staff observed that procedure W.OL.PR.017 Overhead Line Department Training Program Plan, revised October 16, 2012, was rendered obsolete soon after issuance when SFMTA contracted with NTT, Inc. to provide 16-hour NFPA 70E Arc Flash Electrical Safety Training. The provided course outline from NTT, Inc. which is used at all locations where the courses are held does not address all 12 Modules in the original Training Program Plan. SFMTA personnel explained the training contractor coordinates with SFMTA to provide agency-specific training, including several Modules not covered in the base course. SFMTA was unable to provide documentation to verify course equivalence to satisfy the requirements of Appendix A of procedure W.OL.PR.017. The 2012 revision of the procedure prescribes a 2-year recertification period for Overhead Line Maintenance classes, contrary to previous versions of the program and current practice, which required retraining every 3 years. SFMTA personnel expressed belief that the requirement text is errant. The document is currently undergoing revisions which will incorporate the new training program.

4. The following table indicates:
   a. Original training dates,
   b. Date of most recent certification,
   c. Date of prior certification

   Several of the randomly selected employees were either new hires or transferred from other departments within SFMTA. Employee #58663 had the unique complication of having been originally trained for Overhead Line Maintenance Rail in 2009, then transferring to Presidio Division (Trolley) and returning to Green Division in 2014. Between transferring and receiving recertification as an Electrical Transit System Mechanic, Employee #58663 worked under certified Mechanics.

Vehicle Maintenance

MME

Employee #:	Classification:	Original Certification:	Previous Certification:	Latest Certification:
48891	7371 Electrical Transit System Mechanic	2014-08-11[1] 2014-03-14[2] 2014-02-26[3]	N/A	2014-08-11[1] 2014-03-14[2] 2014-02-26[3]
33609	7318 Electrical Maintenance Technician	2013-05-20[1] 2011-05-23[4]	2013-05-20[1] 2011-05-23[4]	2015-06-09[1] 2015-02-03[4]
58663	7371	2009-05-26[1]	N/A	2015-04-01[1]

		Electrical Transit System Mechanic	2015-08-25[2] Incomplete[3]		2015-08-25[2] 2015-10-20[3]
Track Maintenance	160416	7371 Electrical Transit System Mechanic	2014-07-18[1] 2015-04-28[2] 2014-10-09[3]	N/A	2014-07-18[1] 2015-04-28[2] 2014-10-09[3]
	36474 [Dennis Callahan]	7540 Track Maintenance Worker	< 2004-10-27[5]	2012-09-05[5]	2014-10-29[5] 2011-03-05[6]
	47172 [Pablo Castro]	7514 General Labor	2008-06-25[5]	2012-09-05[5]	2014-10-29[5] 2011-08-31[6]
	36612 [Franklin Lee]	7251 Track Maintenance Supervisor	2008-06-25	2012-09-05[5]	2014-10-30[5] 2013-01-23[6]
Overhead Line Maintenance	163919 (New Hire)	7432 Electrical Line Helper	2014-10-22[7]	N/A	2014-10-22[7]
	164768 (New Hire)	7432 Electrical Line Helper	2014-05-12[7]	N/A	2015-05-12[7]
	020939	7366 Electrical Line Worker	2009-06-12[8]	Incomplete	2014-10-29[8]
Motive Power Maintenance	014569 [Charles Drane]	Motive Power Maintainer (Superintendent)	< 2002[9]	2012[9]	2015-02-17[9] 2014-01-17[6]
	35588 [Jim O'Leary]	Motive Power Maintainer	< 2002[9]	2012[9]	2015-02-17[9] 2013-08-27[6]
	36520 [Jane Watanabe]	Motive Power Maintainer	2005[9]	2012[9]	2015-02-17[9] 2007-01-04[6]
Maintenance	042176 [Kent Wu]	7318 Electronics Maintenance Technician	2011-05-23	2011-05-23	2014-05-05

	28291 [Warren Leong]	7318 Electronics Maintenance Technician	2014-05-05	N/A	2014-05-05
	63234 [Brian Petersen]	7318 Electronics Maintenance Technician	N/A	N/A	2014-05-09

[1]LRV Maintenance Operator Training & Certification, required every 2 years
[2]LRV Door and Step Repair, Inspection & Troubleshooting Training, required every 3 years
[3]LRV Brake Repair, Inspection & Troubleshooting Training, required every 3 years
[4]LRV ATCS Repair, Inspection & Troubleshooting Training, required every 3 years
[5]Track Maintenance Training per R.TR.PL.012 Appendix B, required every 2 years
[6]On-Track & Trackside Safety Program Training (Roadway Worker Protection) Training, required every 3 years
[7]NFPA 70E Arc Flash Electrical Safety Training provided by NTT, Inc., required every 3 years
[8]Twelve Module Overhead Line Department Training Program, required every 3 years
[9]Motive Power Unit Recertification, required every 3 years

5. SFMTA produced an example of a rule violation observed by the Operations Department which resulted in two LRV Maintenance personnel receiving retraining. The Maintenance personnel failed to comply with a "Red-over-Red" aspect indication within the Metro tunnel, requiring full stop, and received refresher training on manual operations in the tunnel. The refresher training included quizzes from the certification training for LRV maintenance operators and culminated in an observed train operation for both employees.

Findings:

1. SFMTA's procedure R.TR.PL.012, requiring on-On-Track & Trackside Safety Training every three years does not reflect SFMTA's procedure SY.PL.003 Roadway Worker Protection Plan Section 8 which requires retraining every 24 months.
2. All Track Maintenance Department employees reviewed were delinquent on On-Track Safety Training according to procedure SY.PL.003.
3. SFMTA's procedure W.OL.PR.017 Overhead Line Department does not reflect SFMTA's current practice of contracting out Overhead Line Maintenance training to TTI, Inc.
4. SFMTA's training department did not provide documentation to verify that all required training modules indicated in Appendix A of procedure W.OL.PR.017 are satisfactorily addressed through their current training program provided by TTI, Inc.

Comments:
None.

Recommendations:

1. SFMTA shall update procedure R.TR.PL.012 to reflect the requirements of its Roadway Worker Protection Plan, procedure SY.PL.003.
2. SFMTA shall review the training records and schedules for all Track Department Maintenance personnel and ensure compliance with the Roadway Worker Protection

training requirements in procedure SY.PL.003.

3. SFMTA shall update or replace procedure W.OL.PR.017 to reflect the current training practices for Overhead Line Maintenance.
4. SFMTA shall ensure that all 12 modules listed in Appendix A of procedure W.OL.PR.017 are satisfactorily addressed and documented through the current training practices for Overhead Line Maintenance.

2015 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR SAN FRANCISCO MUNICIPAL TRANSPORTATION AGENCY (SFMTA)

Checklist No.	**17**	**Element**	**Configuration Management and Control**
Time	1:30 p.m. to 5:00 p.m.	**Location**	1 South Van Ness – System Safety, 7th Floor
Date of Audit	October 21, 2015	**Department(s)**	System Safety Department
Auditors/ Inspectors	Raed Dwairi Rupa Shitole	**Persons Contacted**	Joern Kroll Michael Kirchanski

REFERENCE CRITERIA

1. CPUC General Order 164-D
2. CPUC General Order 143-B
3. SFMTA System Safety Program Plan (SSPP), Revision 6, dated 2/11/2015
4. SFMTA SOP Development and Approval, A.PR.002
5. SFMTA Rail Change Control Board, A.PR.015

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

Configuration Management and Control

1. Randomly select two SFMTA system modifications or design changes during the last 3 years to ensure configuration management documentation was properly updated to include at minimum:
   a. Engineering Design Peer Review;
   b. Design and Analysis Review by the System Safety Department;
   c. SFMTA Rail Change Control Board (RCCB) Approval
   d. Design and Analysis Review by CPUC if required;
2. Randomly select two Project Concept submitted to the RCCB and verify that:
   a. Configuration Change Request Forms were used;
   b. Potential Hazard Checklist was used
   c. Forms were circulated to the RCCB for approval;
   d. The System Safety Department performed a review, analysis, and approval of the Modification and Change Request Forms for the project;
   e. The modification or change was reviewed and approved by RCBB and authorized by executive management.
   f. The modification or change was circulated to the proper departments prior to implementation;
   g. All necessary parties or contract employees within or outside the agency were properly notified of the modification or change.
   h. As-Built or In-Service Drawings are updated accordingly and filed properly

FINDINGS AND RECOMMENDATIONS

Activities:
Staff interviewed SFMTA representatives in charge of the Configuration Management Program and reviewed relevant program documentation and found the following in Summary:

1. For the Change Requests reviewed all Configuration Management Program requirements have been updated and included documentation showing that System Safety reviewed the proposed change and conducted hazard analyses as required. SFMTA Rail Change Control Board (RCCB) approval was shown for all the Change Requests selected.
2. For the Project Concept submitted by BART Construction (Change Request No. 2015-002) to install a new Key Stop ADA inside Green Metro Revenue Loop, all relevant program requirements were met and BART initial design & construction plans were revised to meet SFMTA requirements. This Project Concept has been recently authorized.
3. Staff attended a RCCB meeting on October 21, 2015 and witnessed the proper implementation of the Configuration Management Program.
4. SFMTA representatives presented staff with a list of change requests but these were processed starting in the 4th quarter of 2014. It appears that SFMTA allowed the Configuration Management Program to lapse prior to around August, 2014.

Findings:
1. Attendance has been an issue and critical departments in the review and change process do not always attend the Rail Change Control Board (RCCB) meetings. In some cases, quorum was achieved but staff observed absences of key department representatives. Staff believes this is because there is no penalty for not attending.

Comments:
None

Recommendations:
1. SFMTA shall take the necessary measures to ensure all key departments attend its RCCB meetings as required by A.PR.015.

NOTE: This recommendation is identical to the one issued in checklist #7.

2015 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR SAN FRANCISCO MUNICIPAL TRANSPORTATION AGENCY (SFMTA)

Checklist No.	**18**	**Element**	**Local, State, and Federal Requirements: Employee Safety Program**
Time	9 a.m. to 12 p.m.	**Location**	1 SVN 6th Floor Candlestick Conference Room
Date of Audit	October 22, 2015	**Department(s)**	Industrial Safety
Auditors/ Inspectors	Arun Mehta Steve Espinal	**Persons Contacted**	Gerald Williams, Manager, Industrial Safety & Environmental Compliance Franklin Johnson, Safety Analyst, Worker Compensation

REFERENCE CRITERIA

1. CPUC General Order 164-D
2. CPUC General Order 143-B
3. SFMTA System Safety Program Plan (SSPP), Revision 6, dated 2/11/2015
4. Injury and Illness Prevention Program IIPP, IS.13.00.001
5. Hazard Communication Program – Chemical Product Approval, Use & Training, OS.PR.100

SFMTA Division Safety Committees, OS.PR.005

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

Local, State, and Federal Requirements: Employee Safety Program

Interview SFMTA personnel and review appropriate records for last 3 years:

1. Randomly review Senior Management Safety Committee Meetings Minutes.
2. The Senior Management Safety Committee appropriately responds to employees' complaints regarding safety problems.
3. An appropriate procedure and reporting form is being implemented, and is distributed to all employees to effectively report safety hazards in the work place.
4. Employees are aware of the Employee Safety Program and comfortable utilizing it.
5. Appropriate corrective actions regarding employee safety have either been satisfactorily completed or are being actively tracked and documented.
6. Has SFMTA had any problems complying with local, state, or federal requirements? Review documentation of any such problems and assess how the issue was handled and resolved.
7. Verify that construction projects have specific procedures in place to ensure worker protection and public safety by fostering an awareness and concern for safety on the job site.

8. Verify that implementation of these procedures is the responsibility of the contractor organization performing the work and SFMTA.
9. Verify that SFMTA's operating and maintenance safety rules and procedures are included in construction contracts to bind contractors and employees to fulfilling their roles and responsibilities safely.
10. Verify that appropriate forms of disciplinary action are taken consistently to correct employees and contractors who have not followed established safety rules and procedures.

FINDINGS AND RECOMMENDATIONS

Activities:

1. Staff interviewed and held discussions with the Manager of Industrial Safety & Environmental Compliance (ISEC) at SFMTA with regard to its Local, State and Federal Requirements. Staff reviewed records pertaining to the elements specified above and came up with the following:
2. Staff reviewed Minutes of four Senior Management Safety Committee (SMSC) meetings spanning from January, 2014 to October, 2015. Staff verified that the employee safety concerns are discussed, addressed, and corrective actions are tracked and completed in a timely fashion.
3. Staff reviewed several Division Safety Committees Meeting minutes from the Cable Car and Metro Green Divisions and concluded that the Division was identifying, tracking and correcting hazards in a timely and systematic manner.
4. All employees are trained on employee safety program when they start their employment. Further, there is open communication pertaining to industrial safety and health hazards on SFMTA bulletin boards. In addition, any of the Industrial Safety personnel can be contacted by e-mail or phone by any employee to report industrial safety hazards using informal e-mails or phone calls. The Injury and Illness Prevention Program SOP No. IS.13.00.001 revised in January 2015, has a set of Forms including the Employee Hazard Identification Form A to aid the employees in reporting safety hazard(s) to their supervisors.
5. The State of California's OSHA (Cal-OSHA) rules are more stringent than the Federal OSHA rules and these are the ones that SFMTA follows and complies with. In the past 3 years, SFMTA ISEC has received a few Informal Complaint inquiry letters (D-Letters) from Cal-OSHA, inquiring about employee safety complaints and its status. ISEC Manager stated that these have been addressed and resolved with Cal-OSHA.
6. Recently Cal OSHA issued a citation to SFMTA for violation of employee safety during a 2015 incident where a cable car brakeman was injured when a car overtaking a cable car hit him while working on a switch in front of the cable car. SFMTA ISEC Department discussed the case with Cal-OSHA and got the citation reduced to a non-monetary corrective action on the grounds that the accident was caused by an illegal overtaking action by the car. The corrective action involved involving better employee training and use of hand held stop sign by the cable car employee while working on switches in front of parked cable cars. Since then, the Cable Car Division has worked on coming out with

preventive options including educating employees and tourists through pamphlets issued to Rental Car Companies emphasizing NOT TO PASS a "stopped" cable car. They are also working on developing signs to be put on the back of cable cars asking cars not to pass stopped cable cars.

7. Staff discussed another incident with the ISEC Manager which CPUC was notified on October 14, 2015. A maintenance worker was working beneath an out-of-service train, performing emergency repairs under Blue Signal Protection, when another train rolled back and coupled into the train, while the maintainer was under the LRV. Staff was surprised to learn from the ISEC Manager, that Industrial Safety staff was not made aware of this incident until a later date. SFMTA staff went on to state they are not contacted by SFMTA OCC directly when rail workers are subject to reportedly serious hazardous conditions .
8. Staff noticed that the SFMTA ISEC department reports to SFMTA Human Resources (HR) Division Director. Although they are represented in the SFMTA Senior Management Safety Committee and Division Safety Committee meetings; there appears to be a disconnect with the Operations Division especially with the OCC notification process for reporting employee related incidents such as the LRV maintainer subjected to hazardous condition mentioned above, in a timely manner.

Findings:
The CPUC was notified of the incident cited above in Activity 6 on October 14, 2015. However, SFMTA's Industrial Safety and Environmental Compliance (ISEC) staff was not made aware of this worker safety incident until Staff brought it up during the audit (eight days later).

Comments:
Staff noticed that Central Control alerts do not include ISEC. Staff feels that SFMTA Operations Division, Central Controls in particular, needs to have a closer working and communication relationship with the ISEC to improve further on a good Employee Safety program.

Recommendations:
1. SFMTA Operations, particularly, Central Controls shall report all worker safety incidents to the Industrial Safety and Environmental Compliance (ISEC) department in a timely manner.

2015 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR SAN FRANCISCO MUNICIPAL TRANSPORTATION AGENCY (SFMTA)

Checklist No.	**19**	**Element**	**Hazardous Materials Program**
Time	1:30 PM to 4:30 PM	**Location**	1 SVN, 6th Floor, Candlestick Room
Date of Audit	October 28, 2015	**Department(s)**	Industrial Safety
Auditors/ Inspectors	Yan Solopov Jimmy Xia Steve Espinal	**Persons Contacted**	Gerald Williams Don Ellison Franklin Johnson Carina Kouyoumji

AREFERENCE CRITERIA

1. CPUC General Order 164-D
2. CPUC General Order 143-B
3. SFMTA System Safety Program Plan (SSPP), Revision 6, dated 2/11/2015
4. Hazard Communication Program (identification and control of hazardous materials), OS.PR.100

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

Hazardous Materials Program

1. Select at random at least six SFMTA employees responsible for handling hazardous materials, and verify that they have received specific training for reporting requirements, product release or spill, and spill incident response and clean-up.
2. Verify that hazardous materials discharge/spill reports for incidents in the past 3 years have been prepared and filed properly. Randomly review records.
3. Verify that all MSDSs are available to all personnel who handle hazardous materials.
4. Verify that a hazardous materials (HazMat) program is documented in a hazardous materials plan or procedure.
5. Verify that SFMTA has developed an OSHA or state equivalent compliant HazMat program (if applicable).
6. Verify that the program includes a process to familiarize the employees with the hazards presented by materials used in the work place and the Employee Safety Program.
7. Verify the program assigns roles and responsibilities to specific departments and personnel for reviewing and approving materials used or to be purchased and used on transit agency property.
8. Verify that follow-up activities are performed to verify field use of approved materials to ensure that safe and proper use, handling, storage, and disposal methods are employed.
9. Interview SFMTA Safety Department representatives to discuss SFMTA's hazardous materials program and the role of the SFMTA Safety Department in enforcing this program.

Be sure to discuss the following:

a. The procurement process for insecticides, herbicides, chemicals, and solvents.
b. If a MSDS for each hazardous material is on file with the System Safety Department.
c. If the approved MSDSs have been entered into an MSDS filing system for tracking.

FINDINGS AND RECOMMENDATIONS

Activities:

1. SFMTA did not have on hand a list of all staff handling hazardous materials, so RTSB did not select six random employees to check whether training records exist. However, SFMTA did present staff with roll-call sheets documenting the names of staff which had already received training, including signatures, staff ID's, training dates, and subjects covered. RTSB reviewed a Power Point presentation entitled 'Hazard Communication for Mechanics', which is utilized to train SFMTA staff, and determined that it covers all topics required by Question 1.
2. RTSB interviewed SFMTA staff and learned that no hazardous spills have occurred within the past 3 years. As such, no hazardous materials discharge/spill reports were required to have been written.
3. RTSB interviewed SFMTA staff and learned that binders with MSDSs are available to all staff, at all locations where hazardous materials may be used. Binders are updated whenever new chemicals are introduced.
4. SFMTA provided RTSB with a copy of their hazardous materials plan, entitled the 'Hazardous Materials and Hazardous Waste Emergency Response Plan – Core Plan'. Additionally, RTSB was shown a 'Management Plan' – a HazMat plan modified to serve a specific facility.
5. RTSB interviewed SFMTA staff and determined that the Hazardous Materials and Hazardous Waste Emergency Response Plan complies with OSHA standards.
6. RTSB interviewed SFMTA staff and learned that training classes utilizing the previously mentioned Power Point training materials are held whenever a new process or chemical are introduced. Additionally, there is a specific training in Hazardous Materials tailored for new hires.
7. RTSB interviewed SFMTA staff and determined the roles, responsibilities, and process for dealing with Hazardous Materials approval, purchase, and use. Specifically, a Chemical Material Control Form is utilized to detail all pertinent information about new chemicals. This is submitted by a manager and reviewed by technical staff. Following the review, the form is resubmitted to the manager, and then sent to the Purchasing department. When issues with new chemicals arise, they are reported by staff to their immediate manager, who then addresses the issues.
8. RTSB interviewed SFMTA staff and learned that the use of new chemicals is reviewed through the Monthly Facility Safety Inspection checklist. This is a larger process dealing with numerous issues, but it also encompasses a review of the proper use, storage, and disposal of all chemicals, including new ones.
9. RTSB interviewed SFMTA staff and learned that SFMTA maintains a Chemical Library – a computerized filing system tracking the procurement process for all chemicals, as well as

MSDS's for each one.

Findings:
None

Comments:
SFMTA is compliant with all Hazardous Materials checklist requirements. In the future, regarding Question 1, a list of all staff who needs to be trained in dealing with hazardous materials should be made available to auditors.

Recommendations:
None

2015 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR SAN FRANCISCO MUNICIPAL TRANSPORTATION AGENCY (SFMTA)

Checklist No.	**20**	**Element**	**Drug and Alcohol Program**
Time	9 AM – 12 PM	**Location**	1 SVN 6th Floor Reggie Smith's Office
Date of Audit	October 28, 2015	**Department(s)**	Drug and Alcohol Program
Auditors/ Inspectors	Raed Dwairi Rupa Shitole	**Persons Contacted**	Reggie Smith Don Ellison

REFERENCE CRITERIA

1. Code of Federal Regulations, Title 49 Part 655 – Prevention of Alcohol Misuse and Prohibited Use in Transit Operations
2. CPUC General Order 164-D
3. CPUC General Order 143-B
4. SFMTA System Safety Program Plan (SSPP), Revision 6, dated 2/11/2015
5. Policy and Procedures Handbook August 2013

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

Drug and Alcohol Program

Interview SFMTA representatives and review appropriate records prepared in the past 3 years to:

1. Verify that the number of employees in safety-sensitive positions who tested non-negative or refused to take the test was reported accurately.
2. Verify that the Substance Abuse Program meets current FTA requirements.
3. Verify that SFMTA has a policy for managing the use of over-the-counter drugs.
4. Select at random at least two safety-sensitive employees who tested non-negative for drugs or alcohol in the past 3 years. Determine whether:
   a. The employee was evaluated and released to duty by a Substance Abuse Professional (SAP);
   b. The employee was administered a return-to-duty test with verified negative results;
   c. Follow-up testing was performed as directed by the SAP according to required follow-up testing frequencies in the reference documents after the employee returned to duty.
5. Verify that consequences for repeat offenders were carried out as required in the reference.
6. Assess whether SFMTA has ever undergone a federal or state audit of its drug and alcohol program?
   a. If so, what were the outcomes?
   b. Have all findings or recommendations been addressed?
7. Review training program curriculums to verify SFMTA is training all employees regarding its

drug and alcohol policy.
8. Confirm that this information was accurately reported to FTA through the RTA's annual submission to the Drug and Alcohol Management Information System (DAMIS).

FINDINGS AND RECOMMENDATIONS

Activities:
Interviewed SFMTA representatives in charge of the Drug & Alcohol Program and reviewed relevant documentation and found the following in summary:

1. Files were organized. Reviewed DOT Form 1385 (Drug & Alcohol Testing MIS Data Collection Form) for the Years 2012, 2013, and 2014. The number of employees in safety-sensitive positions who tested non-negative or refused to take the test was properly reported.
2. The Drug & Alcohol Program at SFTMA was found to be in compliance with the federally-mandated Drug & Alcohol Testing Program following a 2013 FTA audit which was conducted January 7-9, 2013. A letter of compliance was issued by FTA to SFMTA on August 14, 2013.
3. SFMTA has a policy for managing the use of over-the-counter drugs which is covered in Section 7.0 titled "Legally Prescribed & Over the Counter Drugs.
4. For the employees selected who test non-negative for drugs or alcohol from the Positive Follow-Up Testing Log for the Calendar Years 2012, 2013, 2014, and 2015 , all were evaluated and released to duty by a Substance Abuse Professional, administered a return-to-duty test with verified negative results, and follow-up testing was performed as required.
5. Repeat offenders within 5 years are separated from SFMTA.
6. Reviewed SFMTA Substance Abuse Policy Training binder which includes sign in sheets for employees who attended the training.
7. Reviewed records from the database which SFMTA uses to track training.

Findings:
No exceptions were noted.

Comments:
None

Recommendations:
None

2015 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR SAN FRANCISCO MUNICIPAL TRANSPORTATION AGENCY (SFMTA)

Checklist No.	**21**	**Element**	**Procurement Process**
Time	1:30 p.m. to 4:30 p.m.	**location**	1 SVN 6th floor
Date of Audit	October 28, 2015	**Department(s)**	Contract and Procurement Section
Auditors/ Inspectors	Robert Hansen Rupa Shitole	**Persons Contacted**	Ashish Patel Michael Kirchanski

REFERENCE CRITERIA

1. CPUC General Order 164-D
2. SFMTA System Safety Program Plan (SSPP), Revision 6, dated 2/11/2015
3. Purchasing Materials and Supplies M.PR.001
4. Change Control Board A.PR.015

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

Procurement Process

Interview SFMTA representatives and review appropriate documentation for the past 3 years to:

1. Verify that the SSPP contains a description of the basic procurement processes that must be followed by SFMTA to assure that safety concerns and issues are addressed.
    a. Is the procurement process tied to SFMTA's hazard management process?
    b. Are procurements of new equipment and material first reviewed by the safety department, engineering, operations, and/or maintenance staff to verify the new equipment or materials won't present a hazard to the existing system?
    c. Do all procurement processes for hazardous materials address all appropriate rules and regulations?
2. Verify that the SSPP and any referenced or supporting procedures include a description of the process used by SFMTA to ensure that safety issues and concerns are addressed in the procurement process. Ensure that any updated rules relevant to SFMTA procurement process are communicated appropriately.
3. Determine that adequate procedures and controls are in place to preclude the introduction of defective or deficient equipment into the SFMTA System.
4. Determine that adequate procedures are in place to mitigate or replace defective or deficient equipment in the event that such equipment is introduced into the System.
5. Interview SFMTA personnel responsible for procurement to verify that they are aware of, and are following, SFMTA's procurement procedures.
6. Interview Safety Department representatives and have them explain the procurement process and how they ensure that safety issues are identified, assessed, and resolved.

a. How are safety issues addressed in the procurement process for new equipment and materials?
b. How are safety issues addressed when equipment or materials are found to be defective or deficient?

7. Review a sample of recent procurement projects to verify that SFMTA personnel are following applicable procurement and quality assurance policies and procedures, and ensure safety issues and concerns are addressed in the procurement process.

FINDINGS AND RECOMMENDATIONS

Activities:

Staff interviewed SFMTA Contract and Procurement Section personnel, inspected Materials Service Request forms, and reviewed the provided procedures to assess the integration of their procurement program with the Safety Department and hazard management processes.

1. The RSSPP §21.0 describes the procurement process, and refers to the Procurement (Materials & Contracts) unit's procedure M.PR.001 Purchasing Materials and Supplies. Different types of orders, defined in this procedure, undergo different approval processes.
2. According to the RSSPP, all new and modified materials and equipment requested are processed through Change and Review Board before undergoing testing and analysis through the requesting department's engineering sections. The Health and Safety Division, as part of the Safety Department, provides further oversite for new orders.
3. SFMTA has processes to ensure that changes to purchases, including new materials or equipment, switching vendors, or out-of-production part codes are thoroughly reviewed and tested by the Change Review Board, the requesting department, appropriate engineering groups prior to placing an order. Upon receipt, materials are delivered to stock rooms at various locations until use. Staff could not establish that SFMTA has a formal process to ensure incoming shipments of materials and equipment are tested for quality prior to usage or installation. Per a conversation between staff and an SFMTA representative from the Safety Department, SFMTA recently established a Quality Assurance Department which primarily performs vehicle maintenance, although its scope may broaden in the future.
4. The Manager of the Contract & Procurement Section explained that vendors generally replace stock if defective merchandise is discovered. SFMTA displayed how an individual part can be tracked through the SHOPS inventory database from receipt, to the stock room, to the work order until the part is installed. Through this tracking, a defective batch of products can be located and removed after installation.
5. The manager of the Contract, Purchasing, and Inventory Management Department was very knowledgeable in their procedure M.PR.001 Purchasing Materials and Supplies, and capable of explaining SFMTA's procurement process for both new and routine purchases.
6. Staff interviewed representatives from the Contract, Purchasing, and Inventory Management Department to determine whether the Department is aware of safety issues and their resolutions.
    a. New equipment must be approved through the Rail Change Control Board, and then designs are generated and tested by the requesting department's engineering

group. The Safety Department develops a Hazard Analysis Report to assess the new equipment's effect on the entire system. Once designs are finalized, purchase orders are generated and must be approved by multiple supervisors and managers.

b. Defective parts are removed from the system and tracked through Work Orders, the applicable inventory database, and Materials Service Request Forms. If a set of parts are deemed defective, they can be located with Work Orders of their location on the system and promptly removed.

7. Staff observed as SFMTA searched their SHOPS database for various types of equipment. Upon request, SFMTA personnel were able to produce the authorizing signature sheets for recent purchases. Staff found no instances where procedures were not followed.

Findings:
None.

Comments:

1. Although SFMTA has a Quality Assurance Department, neither it nor any other group within the agency performs testing of incoming parts and equipment prior to usage or installation. CPUC has observed at other RTAs that reliance on manufacturers' quality assurance processes can result in the receipt and installation of defective equipment, potentially resulting in hazardous conditions or accidents.

Recommendations:
None.

2015 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR SAN FRANCISCO MUNICIPAL TRANSPORTATION AGENCY (SFMTA)

Checklist No.	**22**	**Element**	**CPUC GO 172 – Personal Electronic Device Prohibitions/In-cab Cameras**
Time	8:00 a.m. to 10:00 a.m. MME 10:30 a.m. to 12:30 p.m. 1455 Market	**Location**	MME 1455 Market 7th Floor
Date of Audit	October 29, 2015	**Department(s)**	Rail Vehicle Maintenance Security, Investigation & Enforcement Video Recovery
Auditors/ Inspectors	Debbie Dziadzio	**Persons Contacted**	Neil Popp Sarita Britt Michelle Enciso Nancy Dock Shahin Shaikh Chris Grabarkiewctz

REFERENCE CRITERIA

1. CPUC General Order 172
2. SFMTA System Safety Program Plan (SSPP), Revision 6, dated 2/11/2015
3. SFMTA Zero Tolerance Policy

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

Interview SFMTA representatives to determine GO 172 Compliance:

1. Verify that in-cab cameras are installed on all required vehicles.
2. Verify that in-cab camera recordings are being reviewed in response to reportable accidents and incidents.
3. Verify that a zero-tolerance policy for personal electronic device usage is in-place, and that employees who violate this policy are being properly disciplined by SFMTA.
4. Verify that SFMTA is conducting periodic operational evaluations and inspections for potential GO 172 violations, and that records of these activities are being properly retained and documented.
5. Ask SFMTA to describe the functionality of their inward-facing cameras:
   a) Which types of vehicles are fitted with cameras, and any exemptions currently in place for any of the RTA vehicles?
   b) SFMTA's program of inspection of in-cab camera systems for failures or any that are not functioning properly.

c) Determine whether cameras conduct continuous recordings that cover at least eight (8) continuous days of operation.

FINDINGS AND RECOMMENDATIONS

Activities:
Staff interviewed the appropriate SFMTA personnel and was advised that all SFMTA vehicles are equipped with in-cab cameras. The equipment includes all PCC's, Milans, LRVs, and Cable Cars. This General Order 172 requirement was complete by October 2014. An outside contractor installed the equipment and the process was verified by SFMTA Maintenance Department and the Project Management team.

When an accident/incident occurs, OCC notifies Operations Inspectors (MRO's) and System Safety. MRO's initiate accident report, request video, and determine if Operator has D&A testing. The accident report from MRO's is sent to Division Superintendent. The report is required to be sent in approximately 2-3 days after incident, however, more recently it's taking approximately 10 days. When System Safety is advised of an incident, a Safety Inspector (TSS) goes to the site, initiates a report, and relays the required 2-hr notification to CPUC (& NTSB if necessary) per 164-D, Section 7.1, and System Safety requests a copy of the in-cab camera video.

Staff reviewed several random compliance checks regarding GO 172, Section 6.2, which are performed by System Safety.

Findings:
1. SFMTA Deputy Director, Transit Management, advised CPUC Staff that she was unaware of GO172 and had not seen any verbiage regarding the General Order. Staff ensured that SFMTA Deputy Director, Transit Management, would be provided a copy of General Order 172.

Comments:
N/A

Recommendations:
1. SFMTA executive management should ensure that its Management Staff especially the Transportation Operations staff are trained in all requirements of CPUC General Order 172.

2015 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR SAN FRANCISCO MUNICIPAL TRANSPORTATION AGENCY (SFMTA)

Checklist No.	**23**	**Element**	**CPUC GO 175 – Rules and Regulations Governing Roadway Worker Protection Provided by Rail Transit Agencies and Fixed Guideway Systems**
Time	9:00 a.m. to 4:30 p.m.	**Location**	1 SVN
Date of Audit	October 30, 2015	**Department(s)**	Transit Division – Maintenance of Way Safety Division Capital Programs and Construction
Auditors/ Inspectors	Kevin McDonald Steve Espinal	**Persons Contacted**	Terrance Fahey Young Laolagi Michael Johnson David Harbin Nancy Dock Napoleon Khalilnaji Michael Kirchanski

REFERENCE CRITERIA

1. CPUC General Order 175
2. SFMTA System Safety Program Plan (SSPP), Revision 6, dated 2/11/2015
3. SFMTA Roadway Worker Protection Plan (2014)

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

Part 1: General Topics

1. Ask SFMTA to describe their program(s) aimed at ensuring roadway worker protection is in accordance with G.O. 175.

2. Verify that the SFMTA has created a separate dedicated manual excerpting all necessary roadway worker safety procedures and rules from its rule book(s), and that this manual is freely available to its roadway workers when they are performing job functions.

3. Verify that the SFMTA's compliance testing program includes Roadway Worker Protection (RWP) rules, and that these rules are tested to assess the degree of compliance, as well as changed when necessary to enhance compliance. Determine if these are included in the manual described in question 2.

4. Determine whether SFMTA uses flag protection to provide roadway worker safety, and if so, determine whether it has established written flag protection procedures. Determine if

these are included in the manual described in question 2.

5. Review the SFMTA's safety equipment requirements for their staff. Verify that all employees who access the track zone are required to wear high visibility clothing (safety vests or jumpsuits).

6. Verify that SFMTA requires anyone with access to the track zone (by request, easement, or other form of permission) to either complete the required RWP training, or be escorted by a RWP-trained employee.

Part 2: Job Safety Briefings

1. Verify, by collecting sign-in sheets, that SFMTA requires the employee in charge (EIC) of each roadway work site to provide a safety briefing prior to commencement of work within the right-of-way. Verify that the briefings are required to include the following aspects, when applicable:
   a) The general work plan
   b) The hazards involved, and the means by which safety will be provided. Considerations must include presence of roadway maintenance vehicles, adjacent tracks, and any need to widen track zone
   c) Personal protective equipment requirements
   d) Identification and location of key personnel, such as the watch person and EIC.
   e) Flag use and placement
   f) A predetermined "place of safety," where workers can move to within 15 seconds before rail vehicles moving at maximum speed authorized on that track can pass their previous location on the track. Considerations such as visibility, noise interference, and time required to get to the place of safety must be discussed.
   g) The means of communication amongst roadway workers to be used
   h) Acknowledgement that each employee understands the rules to be used
   i) If a watchperson is used, they and all other employees must receive a review of their duties – specifically, to provide a warning in compliance with the aforementioned 15-second rule, and to refrain from performing or assisting in any other type of work.

2. Verify that it is SFMTA's practice to conduct follow-up safety briefings, in cases where the crew or scope of work changes after initial safety briefing.

3. Verify that it is SFMTA's practice to conduct safety briefings through a discussion between the roadway worker and employee providing authorization to enter the roadway, which includes the protection to be used, in cases of an individual roadway worker moving from one location to another, or performing a minor task.

Part 3: Roadway Worker Protection Training

1. Verify that SFMTA has adopted a Roadway Protection (RWP) training program aimed at

educating workers about the hazards of working along the right-of-way, as well as the methods to safely work on the right-of-way.

a) Request that SFMTA describe their RWP training program.
b) Ensure that the training program includes classroom training
c) Ensure that the training program includes experience in a representative field-setting.
d) Ensure that the training program covers SFMTA's rules and procedures.

2. Ensure that no employees whose duties are those of a rail worker are required to perform work without training.
   a) Request a list of job types/classifications of the utility's employees which are required to attend RWP training.
   b) Request that SFMTA provide roll call sheets or any other documentation verifying the attendance of staff at RWP training/re-training sessions, for the time period of three years ago to the present.
   c) Select several employees at random, preferably with different job classifications, and confirm their attendance a RWP training course at intervals of 24 months, or more frequently.
   d) Verify that records of training are retained by the utility for at least 3 years.

3. Ensure that the RWP training courses entail checks or tests to ensure the ability to comply with RWP instructions given by persons performing or responsible for, on-track safety and RWP functions.
   a) Ask for details regarding completion certificates and the extent of testing (if any) required to receive them.
   b) For the random employees selected in section 2(c), request copies of completion certificates for each training session completed.

4. Ask whether RWP training courses provide an opportunity for trainees to raise and discuss issues regarding the effectiveness of the program.

5. Ensure that the RWP training courses educate employees about the functions of various persons involved with RWP procedures.

Part 4: Near-Miss Reporting Programs and Record Keeping

1. Request that SFMTA describe, its program for reporting and recording near-misses regarding roadway worker protections

2. Verify that SFMTA retains near-miss records for a period of 3-years or more, and that they are available to CPUC staff on demand

3. Verify that SFMTA's near-miss program includes:
   a) A policy statement supporting the near-miss program signed by the CEO
   b) A process to encourage and allow roadway workers to report near-misses

c) Methods to store, easily access, and track near-misses and corrective actions
d) Analysis to identify primary and contributory causal factors, and implementation of corrective actions

4. Verify that SFMTA periodically reviews the effectiveness of its near-miss program, and adjusts it in response to changes in industry practices

Part 5: Compliance with Minimum Controls / Limitations Prescribed in G.O. 175

1. When performing the following types of work, at track other than that at its yard(s) and end-of-line storage track, verify that SFMTA always utilizes the specific minimum controls and limitations outlined in Sections 6.1 through 6.3 of General Order 175:
   a) Moving from one location to another – Requirements described in Section 6.1
   b) Performing minor tasks – Requirements described in Section 6.2
   c) Performing visual inspections, maintenance, and repairs. Using hand tools, machines, or equipment. All other roadway worker / crew activities not covered in Sections 6.1 and 6.2 – Requirements described in Section 6.3

Verify that SFMTA complies with its yard and end-of-line storage track RWP.

FINDINGS AND RECOMMENDATIONS

Activities:
Staff audited an SFMTA Roadway Worker Protection training class for SFMTA employees. SFMTA personnel verified Part 3 of the Element/Characteristics and Method of Verification.

CPUC Operating Practices staff interviewed Cable Car Operators # 1047 and # 0759.

Staff interviewed SFMTA representatives in regards to their Roadway Worker Protection Plan to ensure compliance with General Order 175. Staff has worked continuously with SFMTA since 2014 as they've adopted their RWP plan. Consequently, staff is very familiar with SFMTA's RWP plan. Through interviews, staff verified the General Topics in Part 1. Staff has verified Parts 2 and 5 through ongoing field inspections with SFMTA personnel.

Finally, in regards to Part 4, SFMTA personnel stated that since implementing their RWP plan, there have been no near misses reported. SFMTA does in fact have a near miss reporting program.

Findings:
1. Staff determined that Cable Car Operators # 1047 and # 0759 have not received any training in Roadway Worker Protection.

Comments:

None

Recommendations:

1. SFMTA shall ensure that all relevant employees including Cable Car Operators # 1047 and # 0759 receive Roadway Worker Protection training class at the earliest dates available. SFMTA shall ensure that all workers who are required to take Roadway Worker Protection training do in fact receive that training every 24 months.