2018
TRIENNIAL ON-SITE
SYSTEM SAFETY REVIEW OF
San Francisco Municipal Transportation Agency
(SFMTA)

RAIL TRANSIT SAFETY BRANCH
RAIL SAFETY DIVISION
CALIFORNIA PUBLIC UTILITIES COMMISSION
505 VAN NESS AVENUE
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Final Report
March 27, 2020

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2018 TRIENNIAL ON-SITE SYSTEM SAFETY REVIEW OF SAN FRANCISCO MUNICIPAL TRANSPORTATION AGENCY

ACKNOWLEDGEMENT

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

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EXECUTIVE SUMMARY

The California Public Utilities Commission's Safety and Enforcement Division (SED) (now Rail Safety Division), Rail Transit Safety Branch (RTSB) staff (Staff) conducted an on-site system safety program review of the San Francisco Municipal Transportation Agency (SFMTA) from September 10 through October 17, 2018. The review focused on verifying SFMTA's implementation of its System Safety Program Plan (SSPP), as well as SFMTA's compliance with State and Federal rules and regulations. This report details staff's investigatory actions, findings, and recommendations. The review revealed areas of non-compliance, as discussed below.

An opening conference meeting between SFMTA personnel and Staff immediately preceded the initial on-site review activities, which began on Monday, September 17, 2018. The review continued through October 17, 2018. On September 19, 2019, Staff held a post-review conference meeting, where Staff provided SFMTA personnel with a summary of all findings. Staff identified 66 findings of non-compliance. From these findings, Staff issued 48 recommendations for corrective actions.

Section 2 of this report, titled Introduction, provides a summary of the authority under which the California Public Utilities Commission (CPUC or Commission) performs the triennial reviews and presents a brief chronology of the review. Section 3, Background, includes a description of the SFMTA system. Section 4, Safety Review Procedure, explains the procedures used by Staff during the System Safety Review. Staff's 66 findings of non-compliance and 4 recommendations are presented in Section 5, Findings and Recommendations, organized by source checklist numbers. Finally, the Appendices include a list of abbreviations and acronyms used in the report and checklists, tabulated findings and recommendations, and the complete set of the 40 review checklists with summaries of all review activities and the original comments, findings, and recommendations. This report reflects Staff's triennial safety review of SFMTA. The SFMTA on-site triennial security review report is contained in a separate Report and is brought before the Commission for approval in a separate Resolution. [1]

[1] Staff's security review and report, "2018 Triennial Security Review of San Francisco Municipal Transportation Agency," is being brought before the Commission concurrently in Resolution ST-230.

INTRODUCTION

The Commission's General Order (GO) 164-E, *Rules and Regulations Governing State Safety Oversight of Rail Fixed Guideway Systems*, and the Federal Transit Administration's (FTA's) Rule, Title 49 Code of Federal Regulations (CFR) Part 674, *Rail Fixed Guideway Systems: State Safety Oversight*, require designated State Safety Oversight Agencies (SSOAs) to perform a review of each of their state's rail transit agencies' system safety program at minimum once every three years. The purpose of the Triennial Review is to verify compliance and evaluate the effectiveness of each rail transit agency's SSPP, and to assess the level of compliance with GO 164-E and other Commission and regulatory safety requirements. Staff concluded the previous On-Site System Safety Review of SFMTA on October 18, 2015.

On August 3, 2018, Staff advised the SFMTA's Director of Transportation (DOT) of the pending review for scheduling purposes and held an opening conference meeting with SFMTA's management on September 17, 2018. At the conclusion of each review activity, Staff provided SFMTA personnel with a verbal summary of their preliminary findings and discussed potential recommendations for corrective actions.

On September 19, 2019, following the triennial safety review's conclusion, Staff conducted a post-review exit meeting with SFMTA's DOT and department managers. Staff provided the attendees with a summary of the findings of non-compliance derived from the 40 checklists used to guide the review and discussed the need for corrective actions where applicable.

BACKGROUND

SFMTA MUNI Rail System

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.

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

System Expansions and Capital Projects

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.

SFMTA LRV4 Procurement to Expand and Replace the Rail Fleet

SFMTA has initiated a new light rail vehicle procurement to acquire up to 264 vehicles over a period of 15 years (LRV4 project). The scope of the LRV4 project will include the design, manufacture, delivery, and test of up to 260 light rail vehicles together with associated services, spare parts, special tools, training, and documentation. The base quantity is 175 vehicles including an initial delivery of 24 cars, scheduled for delivery beginning in 2018, to supplement the fleet when the Third Street Phase 2 (Central Subway) extension opens. A

further 151 LRV4s are projected for the replacement of the existing 151 light rail vehicles supplied by Siemens, with deliveries starting 2021, and projected completion in 2028. SFMTA has issued Contract Modifications for an additional 44 vehicles, bringing the total fleet size to 219. An option for an additional 45 vehicles may be issued in the future.

The LRV4s are expected to have a 30-year life, which includes a mid-life overhaul. The new vehicles will operate on all lines of the system within the current system constraints. The Procurement will be funded through a number of different sources including federal funds. The Procurement will follow FTA regulations.

Summer 2014	SFMTA awarded a contract to Siemens
January 2017	First vehicle delivered to SFMTA property
Fall 2017	First vehicle in revenue service
Fall 2018	Operator familiarization complete, systemwide deployment of LRVs
Summer 2020	Complete expansion phase (Phase I)
Fall 2021	Initiate replacement phase (Phase II)
Late 2028	Complete procurement of replacement phase (Phase II)

SFMTA's 2015 Triennial Review Recommendations Status

Staff performed the previous triennial on-site safety review in 2015. Staff utilized 40 separate checklists to guide that review and made 43 recommendations for corrective actions.

CPUC Resolution ST-195, adopted December 15, 2016, granted approval of Staff's final report and its recommendations, ordering SFMTA to develop appropriate corrective action plans and an implementation schedule. Resolution ST-195 also ordered SFMTA to submit monthly status reports tracking the implementation of these corrective actions through full completion.

SFMTA developed and submitted corrective action plans and an implementation schedule to fulfill each of the recommendations. All Corrective Action Plans (CAP's) related to the 2015 Triennial Safety Review have been corrected, field verified by Staff, and closed out.

SAFETY REVIEW PROCEDURE

Staff conducted the 2018 safety review in accordance with the Rail Transit Safety Branch Procedure RTSB-4, *Procedure for Performing a Triennial On-Site System Safety and Security Reviews of a Rail Transit Agency*. Staff developed forty (40) checklists to cover various aspects of system safety responsibilities, based on Commission and FTA requirements, SFMTA SSPP, safety-related SFMTA documents, and the knowledge Staff has of SFMTA's operations. A list of the 40 checklists is contained in Appendix B. The completed checklists are included in Appendix D of this report.

Each checklist identified safety-related elements and characteristics that were either inspected directly by Staff or by reviewing reports and records. The checklists reference criteria include Commission general orders, SFMTA rules and SOPs, and other documents that establish the safety program requirements. The completed checklists include the staff's findings and recommendations corresponding to non-compliant findings with SFMTA's SSPP, its procedures, or Commission regulations. The methods used to perform the review included:

- Discussions and interviews with SFMTA's management
- Reviews 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

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

FINDINGS AND RECOMMENDATIONS

The reviewers and inspectors who participated in the On-Site System Safety Review identified 66 findings of non-compliance and made 48 recommendations to improve SFMTA's system safety program. Review findings identify areas where changes should be made to adhere to their SSPP and improve the SFMTA system safety program. The review results are derived from activities observed, documents reviewed, issues discussed with management, and field inspections. These findings and recommendations are listed below and are grouped by checklist number.

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**

   No findings of non-compliance; no recommendations.

7. **System Modification**

   No findings of non-compliance; no recommendations.

8. **Safety and Security Certification**

   Findings of non-compliance:

1. Staff found SSCRC approved conformance checklist items while some of them did not meet safety requirements. Although the subject checklists are being tracked by CSP project management, the items are still in fact being approved by SSCRC while not meeting safety requirements. Staff found CSP did not follow its SCP's safety certification steps in certifying the project.

Recommendation:

1. SFMTA Central Subway Project should create a log that tracks checklist items that are still pending on follow-up actions or documents; the log should describe what are the remaining actions or documents in meeting safety requirements. SSCRC should continue to provide CPUC conformance checklist items' supportive documents for early review, although they may be incomplete. SSCRC should only approve conformance checklist items meeting all safety requirements.

9. Safety Data Collection and Analysis

Findings of non-compliance:

1. SFMTA SOP SY.PR.037 Safety Data Acquisition & Analysis Section 4.0 Procedure should include a description of all hazard data acquisition processes.
2. Examples from TransitSafe files for Unacceptable Incidents are not properly tracked. Staff found an example of unacceptable hazard record was entered in Incident Module and another Unacceptable Hazard has no CAP created in TransitSafe.

Recommendations:

2. SFMTA should include a description of all hazard data acquisition processes under its SOP SY.PR.037.
3. SFMTA should clean up its TransitSafe Hazard and Incident Module to ensure safety data are tracked properly.

10. Accident/Incident Investigations

No findings of non-compliance; no recommendations.

11. Emergency Management Program

No findings of non-compliance; no recommendations.

12. Internal Safety Audits/Reviews

Findings of non-compliance:

1. SY.PR.036 revised procedure section 4.9.1 CAPs and Senior Management Safety Committee (SMSC) Referral has not yet been implemented. SFMTA has failed to conduct Senior Management Safety Committee meetings as required to review old CAPs from 2016-2018 and resolve them in a timely manner.
2. SFMTA needs to close out CAPs in a timely manner by providing supporting documentation for each individual CAP to SFMTA System Safety department. Refer SY.PR.036 revised procedure section 4.9.2 CAP Resolution.

Recommendations:

5. SFMTA should adhere to its procedure SY.PR.036 sections 4.9.1 and 4.9.2.

13-A. <u>Rules Compliance: Observation and Enforcement</u>

Findings of non-compliance:

1. CPUC Staff reviewed Rail Vehicle Transit Operator Compliance Program (TN.MO.PR.019 eff date 7/1/18). Section 6 relates to Records and their retention and advises to maintain all hard and/or electronic files for compliance checks for at least two (2) years. CPUC General Order 143-B, Section 14.03, mandates record retention for 4 years.
2. System Safety is not following the Efficiency Testing Plan with monthly tests and are not conducting re-testing on failures as per the Efficiency Testing Plan outline.
3. SFMTA Efficiency Testing Plan is lacking a document control or revision number.

Recommendations:

5. Ensure all efficiency and compliance test records, both hard and soft copies, are maintained for a minimum of 4 years.
6. Ensure SFMTA System Safety complies with the Efficiency Testing Plan and ensure efficiency tests are conducted as outlined in a monthly basis with proper follow up re-testing.
7. Ensure SFMTA Efficiency Testing Plan go through the process as outlined in SFMTA SOP Development and Approval A.PR.002 to receive an official documentation number.

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

Findings of non-compliance:

1. While conducting field observations, CPUC Staff observed SFMTA Operators on the K, L, M, N, and T Lines not sounding the gong/bell in accordance to SFMTA Rail

Rule Book, Rule 5.2.1. When CPUC Staff interviewed the Operator, it was determined that SFMTA personnel had the Rule of the Week that specifically addressed Rule 5.2.1 in their possession. Train ID and Operator information was recorded then given to SFMTA Operations Supervisor for further assessment.

2. While conducting field observations at the Turntable located at Hyde St and Beach St, CPUC Staff observed two Conductors using their Personal Electronic Device (PED) in violation of CPUC General Order 172. SFMTA System Safety was notified, and information was turned over to SFMTA Transportation Supervisor on sight.
3. While conducting field observations on the SFMTA F Line at the Jones St and Beach St (#135184) and the SFMTA Embarcadero Station (#16692), CPUC Staff observed Operators leaving their Historical Cars and PCC's unsecured in violation of SFMTA Rail Rule Book, Rule 4.24.6.
4. CPUC Staff observed multiple SFMTA Conductors sitting in the Cable-Car passenger compartment while the Gripmen operated the Cable-Cars down the Hyde St and Beach St decline and then onto the turntable. Per SFMTA Rail Rule Book, Rule 10.30.1
5. At Embarcadero Station, CPUC Staff and SFMTA System Safety observed three infractions of SFMTA Rules 4.24.5 and 4.24.6., unattended rail vehicles. In each occurrence, SFMTA Operators exited the LRV and leaving all doors open without proper relief. This could allow the public to walk from the platform, onto the LRV, and into the unattended cab with no obstruction.

Recommendations:

8. SFMTA Transportation Supervisors should be conducting efficiency tests to ensure Operators are familiar with and following SFMTA Rules as outlined in the SFMTA Rail Rule Book. Efficiency Tests should be forwarded to SFMTA System Safety so that and negative trends can be tracked. This would allow SFMTA System Safety to compile the data and suggest improvements in either Training or Operation Divisions.
9. SFMTA should enforce General Order 172 and SFMTA Rule 2.15.4 throughout the SFMTA System. PED violations are a systemic problem on SFMTA and the numerous violations should be addressed at the top levels of Management.
10. SFMTA should enforce SFMTA Rule 4.24.6 throughout the system concerning unsecured rail vehicles. Operators who were interviewed concerning SFMTA Rule 4.24.6 were either unaware of the rule or seemed insouciant to the reason the rule exists in the first place.
11. SFMTA Cable-Car Conductors should be attentive to their respective duties and SFMTA Management should enforce SFMTA Rule 10.30.1.

12. SFMTA Transportation Supervisors should ensure SFMTA Operators are not leaving their LRV unless properly relieved and enforce SFMTA Rules 4.24.5 and 4.24.6.

13-C. <u>Rules Compliance: Operator, Controller, and Maintenance Personnel Hours of Service</u>

Findings of non-compliance:

1. CPUC Staff found Central Control Operations Division Time Records are missing 'Approver Signature' on multiple documents. The 'Approver Signature' verifies the Controller time record for each week.

Recommendations:

13. SFMTA should follow proper document instructions and fill out all required signature lines to verify legality of document control.

13-D. <u>Rules Compliance: Contractor Safety Program</u>

Findings of non-compliance:

1. SFMTA Industrial Safety is not conducting required visits to work zones per SFMTA Contractor Safety Program SFMTA SY.PR.034 Section 4.3 and 6.2. The Safety Analyst shall visit the work zone regularly during the project and determine if the contractor and his/her employees are complying with Cal OSHA regulations.

Recommendations:

14. SFMTA Industrial Safety must follow SFMTA Contractor Safety Program SY.PR.034 to ensure any contractor safety violations are mitigated.

13-E. <u>Rules Compliance: Operating Rules and Maintenance Procedures Manual and Operations Bulletin Revisions</u>

Findings of non-compliance:

1. CPUC Staff visited SFMTA OCC at 355 Lenox Way and found that SFMTA General Notice Bulletins posted are not up to date and expired. The oldest General Notice posted is dated back to 2014.
2. CPUC Staff learned SFMTA System Safety is not notified from Operations or Maintenance Departments regarding the performance of rules checks, assessments, and testing that is done in the field.

Recommendations:

15. SFMTA Supervision should follow SOP A.PR.003 and insure all General Notices, Division Bulletins, and Order Bulletins are up to date and ensure expired documents are removed.
16. SFMTA Operations and Maintenance should include System Safety in all performance of rules checks, assessments, and testing that is enforced in the field. This will allow SFMTA System Safety to properly track trends and conduct thorough Hazard Analysis.

13-F. Rules Compliance: Operations Control Center & SCADA

No findings of non-compliance; no recommendations.

14-A. Facilities and Equipment Inspections: Non-Revenue Facilities and Wayside

Findings of non-compliance:

1. Facility and equipment inspections were not performed as per supporting reference criteria.
   No records were available to ensure the monthly and quarterly fire protection inspections are being completed as required by SFMTA Fire Protection System Inspection and Maintenance procedure # W.BG.PR.014.
2. SOP's were found to be in draft form for an extended period, or beyond next specified review dates.

Recommendations:

17. SFMTA should perform Preventative Maintenance (PM) inspections per supporting reference material (SOPs). PM inspections should be completed in the time frame specified by the SOP or manufacturers' recommendations.
18. SFMTA should review, update, and approve SOP's within accordance with SFMTA policy and procedures.

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

Findings of non-compliance:

1. W.BG.PR.008 subway emergency egress door inspection and maintenance.
   - CPUC noted at Montgomery Station 2, multiple inspection outside of the 4-week intervals prescribed in SOP. Dates are 5-4-18 to 7-9-18 and 7-10-18 to 8-21-18 for egress door inspections.

- CPUC noted at Powell, Montgomery, and Castro with multiple PM's beyond the 4-week intervals within the previous 3 years. Example: Montgomery 7-8-17 to 9-6-17, Powell 5-21-18 to 7-27-18.

2. R.SM.PR.021 battery backup power subway signaling system.
   - CPUC noted at Van Ness bank #2 on 11-5-17 was noted by SFMTA inspectors was bad and in need of replacement.

Recommendations:

19. W.BG.PR.008 subway emergency egress door inspection and maintenance.
    - SFMTA shall perform PMs within 4-week schedule.
20. R.SM.PR.021 battery backup power subway signaling system.
    - SFMTA shall streamline procurement process so vital equipment is replaced without undue delay.

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

Findings of non-compliance:

1. According to American Public Transportation Association (APTA) Standard of Rail Transit Fixed Structures Inspection and Maintenance (RT-FS-S-001-02), tunnels should be inspected at an interval of 24 months. Staff noted the interval between the last two tunnel inspection was about 6 years. SFMTA did not follow industry standard on inspecting its tunnels.

   For bridge and aerial structures under SFPWD/Caltrans jurisdiction, SFMTA was not knowledgeable of their inspection cycles and findings, as SFMTA does not have inspection records from the authorities.

2. SFMTA documented findings on the tunnel inspection reports, however, no scheduled completion dates were assigned. Therefore, staff was not able to verify if discrepancies were corrected in a timely manner.

   Since SFMTA does not have inspection records of bridge and aerial structures from SFDPW/Caltrans, Staff is not able to verify if the bridge and aerial structural discrepancies were corrected in a timely manner.

3. For the repairs that fall under CP&C, Mr. Matthew Fong uses a matrix tracking the repair status of identified structure deficiencies, but they are not assigned a scheduled completion date. Also, the matrix does not have the deficiencies findings from the latest 2018 report. Mr. Fong indicated all structural deficiencies repairs

should be tracked by MOW; Mr. Terrance Fahey of MOW indicated he does not have a tracking mechanism. However, Staff learned Mr. Fong somehow tracks all repair items, but he does not always receive notifications when work is being done by MOW. The matrices are also not being shared outside of CP&C.

Staff found SFMTA did not have a proper tracking mechanism that tracks all structure deficiencies found during an inspection until resolution.

4. Staff noted System Safety Department is not aware of safety hazards found from the 2018 tunnel inspection.

Recommendations:

21. Using but not limited to AREMA, FRA 49 CFR 237, APTA RT-FS-S-001-02 Rev 1 and FHWA National Highway and Rail Transit Tunnel Inspection Manual (2005 Edition) as standard industry guidelines, create a structures inspection and maintenance SOP, and reference the SOP in Section 15 of RSSPP. The SOP should include but not limited to the following:
    a) A process to obtain outside agency inspection dates, results of the inspection, and action plan for correcting noted conditions found during inspections;
    b) A process to communicate with outside agencies regarding structures during emergencies and SFMTA asset issues related to these structures;
    c) A process to ensure that SFMTA owned structure inspections occur in the specified time frame;
    d) A process to communicate potential hazards and noted conditions to the Safety Department;
    e) A process to track noted conditions found during inspections until corrected;
    f) A process to ensure that noted conditions found during inspections are corrected within the timeframe specified by the responsible Engineer.
22. Create a structural inspection and maintenance database per APTA RT-FS-S-001-02 Rev 1, Section 3.2.1 and 4.4. Assign designated personnel to maintain this database.
23. Complete all Type I deficiencies from tunnel inspections with open status repair as soon as possible. Provide CPUC a work plan with estimated completion dates for such repairs.

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

No Findings of non-compliance; no recommendations.

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

No Findings of non-compliance; no recommendations.

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

Findings on non-compliance:

1. CPUC staff found that the rail vehicle maintenance department is not properly calibrating its measurement and testing instrumentation. There is no calibration program for the light rail vehicle maintenance. The only calibration program available for review was Signal & Communications maintenance (R.SM.PR.013).
2. Rail vehicle maintenance does not have a master tool list available and personnel responsible to oversee and ensure all tools are properly calibrated within the prescribed scheduled intervals, each tool should have a tool identification number and a standard calibration date decal. CPUC staff observed tools with a number of different calibration date decals, some hand-written (hard to read) and some computer printed.
3. CPUC staff found the following randomly selected tools to be out of calibration: (torque wrench #0035 11/22/2017), (torque wrench #DJ4374 06/12/2018), (torque wrench #0037 08/02/2017), (torque wrench #DD6489 06/08/2018), (torque wrench #dd8437 08/02/2017), (HVAC vacuum gauge), (HVAC scales), (brake control unit gauges 06-12-18). Staff could not locate 2017 calibration certificates.
4. CPUC staff found that the records showed signal meters were up to date. CPUC noted while in the field with the signal crew, there was no calibration verification stickers on grounds meter and fluke meters. SFMTA R.SM.PR.013.4.1F

Recommendations:

24. Each DMM and EETI in the Calibration Program shall have an up-to-date calibration "due-date" sticker permanently affixed.
25. SFMTA rail vehicle maintenance should develop a procedure/program that ensures all tools that are used for measurement and testing of rail vehicles is being properly calibrated at the prescribed intervals, the tools are being properly inventoried and being tracked by an assigned employee. This program should include a standard calibration status identification sticker that is affixed to each tool, identifying the last calibration date, tool identification number, and the next calibration date due. The method used to label each tool so that the next scheduled testing/calibration due date can be observed on each tool. The program should also identify procedures related to tools that are found to be defective or tools found to be out of calibration by rail vehicle maintenance personnel. The procedure should address the inspection of each tool before use, up to date calibration date, as well as the record retention related to each tool calibration certificate.

The program should include any rail vehicle personnel training on the program requirements.

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

Findings of non-compliance:
Staff noted:

- Outbound walkway at Ferry Portal outbound entrance, rusted diamond plated walk way rusted to a point that rust has crated holes in it. GO 143-B, 9.05
- CPUC noted within the portal and interlocking areas, signal vital relay cabinets are not properly secured. GO 127, 3.12
- Switch #7, liquid tight is broken with conductors exposed. CFR 234.211, GO 127, 3.12
- Switch #13B missing permanent labels. CFR 236.76.
- Walkway T534+00 is loose and unstable. GO 143-B, 9.05
- Reflective missing striping on back of x bucks at 3rd and Carrol crossing. MUTCD 8B.03
- Flashers are out of alignment at 3rd and Carrol crossing. CFR 234.253
- Bell on West side not working at 3rd and Carrol.
- Flashers out of alignment at 3rd and Cargo.
- W-10 missing at 3rd and Cargo.

Recommendations:
26. Walkways shall be maintained. Per GO 143B, 9.05
27. SFMTA shall secure all equipment. Per GO 127, 3.12
28. SFMTA shall ensure all conductors are properly labeled. Per CFR 236.76
29. SFMTA shall install striping on back side of all x bucks. Per MUTCD 8B.03
30. SFMTA shall align flashers. Per CFR 234.253

15-B. <u>ATCS Maintenance Program and Signal Systems Maintenance Program Including Power Switch Machines (Metro Subway)</u>

Findings of non-compliance:
R.SM.PR.002 ATCS wayside uninterruptible power supply

1. CPUC noted PM form not correctly filled out for Montgomery, Civic Center, Castro, Powell, and MMT. Missing signatures and dates.

R.SM.PR.003 ATCS platform emergency stop button, PM

2. CPUC noted SFMTA is in the process of removing this PM stating that the emergency platform buttons are locked due to continuous false alarms from patrons.

R.SM.PR.030 subway wayside signal head, PM

3. CPUC noted signal head as of the date of this inspection were all past due ranging 2 weeks to 5 weeks. It was noted when SFMTA switched over to EAM system the dates were improperly entered.

R.SM.PR.038 ATCS inductive loop cable, PM

4. CPUC noted SFMTA has stopped conducting the 52-week inspection. SFMTA has stated that the manufacturer's recommendation is too taxing and did not think it was necessary to continue such a regimented inspection interval based on verbal recommendations from the manufacturer.

Recommendations:

31. R.SM.PR.002 ATCS wayside uninterruptible power supply
    8. SFMTA should insure all forms are properly completed.
32. R.SM.PR.030 subway wayside signal head, PM
    9. SFMTA should conduct PM's immediately.
33. R.SM.PR.038 ATCS inductive loop cable, PM
    10. SFMTA should continue its 52-week inspections until manufacturer recommendations have been submitted in writing.

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

Findings of non-compliance:

1. Switch 13 missing cotter pin on detector rod. (CFR 213.133 0133A7)
2. Switch 15-B right hand point chipped. (CFR 213.135 0135H1)
3. Switch 13-A Left hand point chipped and worn. (CFR 213.135 0135H1)
4. Switch 11-B improper fastening on heal block. (Used double washers on heal block bolt.) (CFR 213.121)
5. Frog tread portion showing wheel wear. (CFR 213.137)
6. Switch 5-B right hand point chipped and worn. (CFR 213.135 0135H1)
7. Switch 5-A chipped point, frog worn and chipped, walk platform unsecured/unstable is a falling/tripping hazard. (CFR 213.135 0135H1)
8. Switch T-7 frog heal joint welded across the top (CFR 213.233 D)

Recommendations:

34. SFMTA should ensure all switch maintenance and defective items are noted and proper remedial action taken in a timely manner. SFMTA shall make proper repairs; utilize current track maintenance standards, including manufacturer's recommended material and follow General Orders and CFR's. SFMTA R.TR.PR.002 part 6.0, R.TR.PR.009 rev1

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

No Findings of non-compliance; no recommendations.

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

Findings of non-compliance:

1. CPUC staff found that the hub odometers used on the Historic PCC cars and LRV 2/3's are not accurately and effectively providing a means for ensuring Running Repair 2.5k & Major PMI 10k inspections are being completed at the required intervals. Hub odometers are inspected and found to be defective frequently between inspection intervals. Hub odometers on the Historic PCC cars and LRV 2/3's that are being used by SFMTA have been known to be unreliable for years and continue to be used as a way of tracking mileage between inspection intervals.

Recommendations:

35. SFMTA performs Preventive Maintenance Inspections (PMI) at mileage-based intervals and for this reason, SFMTA should source a more reliable means to track mileage of Historic PCC cars and LRV 2/3's to ensure preventive maintenance inspections are being completed at the required scheduling intervals.

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

Findings of non-compliance:

1. CPUC staff found repeated vehicle mileage log audits between inspection intervals that identified defective Hub Odometers. The mileage tracking system used on the Historic PCC cars and LRV 2/3's very difficult to determine if inspections are being completed at the required intervals. CPUC staff observed Historic PCC streetcar

mileage tracking is not accurate for Preventative Maintenance tracking. 2.5k inspections need to be tracked with current mileage to ensure 2.5k inspections are completed at the required intervals.

Recommendations:

36. Non-revenue hi-rail vehicle procedure #D.04.00.002 should be reviewed and updated, last revision 03/02/1998. 90-day BIT inspections should include detailed repair reports to identify defects found and corrective action taken for each defect.

15-G. Maintenance Audits and Inspections – Traction Power System

Findings of non-compliance:

1. CPUC found that SFMTA has 100+ defective items past their respective priority time limits.

Recommendations:

37. SFMTA should close all existing past due open items within a timely manner. SFMTA should comply with their SOP's and ensure all open items are taken care of within their respective time frames.

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

Findings of non-compliance:

1. LRV4 Line Trainers "Expert Operators":
   #1974 was 9 days late in required 12-18 month compliance ride (10/18/16, 4/27/18)
   #3262 was training LRV4 Operators while RWP certification was expired one month (8/5/16, 9/5/18)
2. CPUC Staff reviewed LRV Operators for efficiency test records during checklist 13-A and noted inconsistencies from SFMTA Employee files on CPUC 143-B, Section 13.03, which requires training every two years on SFMTA's operating rules. CPUC regulated training requirement on SFMTA Operating Rules is deficient within their training and recertification tests relate to equipment and route (i.e. PCC, Milan, F Line, E Line) are not in the SFMTA Operating Rule Book.
3. While reviewing MRO training files, CPUC Staff found several document control discrepancies. The Module Waiver Form states 'This form is invalid without the signature of the Senior Operations Manager of Transit Services below'. The Module Waiver Form is not signed on a consistent basis by the Senior Operations Manager, making those without signatures invalid.

Along with the Module Waiver Form, CPUC Staff viewed multiple MRO Rail Training Evaluations without Employee and/or MRO signatures required for validation of training.

4. CPUC Staff found SFMTA Train Operator, Train Controller, and Light Rail Supervisor training files deficient in General Order 172, Section 5.3. SFMTA has not properly trained employees on PED Zero-Tolerance nor has SFMTA provided a refresher course as outlined in General Order 172, Section 5.3.

Recommendations:

38. Ensure all required training, including compliance rides occur in the mandated timeline.
39. Ensure all LRV Operators are trained, at a minimum, every two years on SFMTA Operating Rules.
40. SFMTA MRO Personnel are to verify document control to properly document training of employees and ensure that the form is completely filled out including signatures.

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

No findings of non-compliance; no recommendations.

17. Configuration Management and Control

No findings of non-compliance; no recommendations.

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

Finding of non-compliance:

1. SFMTA General Manager requires mandatory Supervisor training involving Employee Safety, but it is not being implemented in its entirety. ISEC has experienced push back from transit management department.
2. Based on Contractor Safety Program SOP SY.PR.034 and SSPP, the ISEC unit should be in the System Safety Division reporting to the Chief Safety Officer. Furthermore, the Safety Department is in charge of changes to SOP's which the ISEC unit is in charge of supporting and enforcing. Contractor Safety Program SY.PR.034 SOP 3.1, indicating the Chief Safety Officer is responsible for review and updating the SOP.

Recommendations:

41. The ISEC should have the full cooperation from the whole of SFMTA.

42. The Industrial Safety and Environmental Compliance based on procedures should be a part of the safety department.

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

Findings of non-compliance:

1. Based on interview and the email dated 11/1/18 from System Safety Manager, it confirms that SFMTA does not have adequate procedure(s) documented to reflect their current practices. There is no procedure documenting how Engineering department gets involved in Approved Equal Parts for MOW. Engineering department safety assurance for any part procurement related to SFMTA System was lacking evidence.
2. There are no adequate procedures in place to mitigate or replace defective or deficient material/equipment if such material/equipment is introduced into the SFMTA System.

Recommendations:

43. SFMTA Engineering department should provide safety assurance for approved equal parts related to MOW as well as Railcars.
44. SFMTA should document in its procedures how to mitigate or replace defective or deficient material/equipment if such material/equipment is introduced into the SFMTA System.

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

Findings of non-compliance:

1. The SFMTA General Notice 2018-028 Zero Tolerance Policy was broken into two separate disciplinary matrixes. The first Matrix covers the use of a PED while operating and the Second Matrix covers employee PED ON and in his/her possession while operating.

2. SFMTA General Notice 2018-GN-047 supersedes General Notice 2018-28, which SFMTA no longer has a written policy for discipline as outlined in General Order 172 Section 2.11.

Recommendations:

45. SFMTA should write a General Notice that is clearly defined under one matrix to avoid confusion and follows General Order 172 Zero Tolerance Policy. This Finding is CLOSED per SFMTA General Notice 2018-GN-047.
46. SFMTA must follow General Order 172 Section 2.11 and define SFMTA consequences to a staff member who does not comply with the PED use prohibitions of this General Order.

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

Findings of non-compliance:

1. CPUC Staff determined SFMTA does not conduct RWP field exercises as outlined and required in CPUC General Order 175A Section 9.5(b).
2. CPUC Staff discovered SFMTA does not have a Near Miss Reporting Program as required and fully outlined in CPUC General Order 175A Section 10.

Recommendations:

47. SFMTA shall include CPUC General Order 175A Section 9.5(b) in its RWP Program Instruction and ensure each class has training experience in a representative field setting. All training shall be conducted by a Trainer who has experience and knowledge of effective training techniques as outlined in CPUC General Order 175A Section 9.6(a).
48. SFMTA shall create and institute a Near Miss Reporting Program, ensure it conforms to CPUC General Order 175A Section 10, and include it in the SFMTA RWP Program.

APPENDICES

APPENDIX A

ABBREVIATION and ACRONYM LIST

Abbreviation / Acronym	Description
SFMTA	San Francisco Municipal Transportation Agency
CAP	Corrective Action Plan
CFR	Code of Federal Regulations
Commission	California Public Utilities Commission
SED	Safety and Enforcement Division
CPUC	California Public Utilities Commission
FTA	Federal Transit Administration
GO	General Order
HOS	Hours of Service
IIPP	Injury and Illness Prevention Program
ISSA	Internal Safety and Security Audit
OCC	Operations Control Center
PHA	Preliminary Hazard Analysis
PM	Preventive Maintenance
RSD	Rail Safety Division
RTSB	Rail Transit Safety Branch
RTOSS	Rail Transit Operations Safety Section
RTSS	Rail Transit Safety Section
RWP	Roadway Worker Protection
SAP	Substance Abuse Professional
SCP	Safety Certification Plan
SCVR	Safety Certification Verification Report
SSP	System Security Plan
SSPP	System Safety Program Plan
Staff	Rail Safety Division personnel

APPENDIX B

2018 SFMTA TRIENNIAL SAFETY REVIEW CHECKLIST INDEX

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

13-F	Rules Compliance: Operations Control Center & SCADA
14-A	Facilities and Equipment Inspections: Non-Revenue Facilities and Wayside
14-B	Facilities and Equipment Inspections: Stations and Emergency Equipment
14-C	Facilities and Equipment Inspections: Tunnels, Bridges, and Aerial Structures
14-D	Facilities and Equipment Inspections: GO 95 Right-of-Way Compliance
14-E	Facilities and Equipment Inspections: Signal Communication, Train Control, Grade Crossing
14-F	Equipment Maintenance Program: Measurement and Testing Instrumentation
15-A	Maintenance Audits and Inspections – Surface Signal Communication, and Grade Crossing Safety Inspection-CPUC Signal Inspector
15-B	ATCS Maintenance Program and Signal Systems Maintenance Program Including Power Switch Machines (Metro Subway)
15-C	Maintenance Audits and Inspections – Metro and Cable Car Tracks, Switch, and Turnout Inspection – Field Inspection by CPUC Track Inspector
15-D	Metro Track and Cable Car Track and Cable Maintenance Programs – Records Review
15-E	Maintenance Audits and Inspections – Light Rail Vehicle, Cable Car, and Historic Streetcar Inspection – High Rail Equipment Inspection by CPUC Equipment Inspector
15-F	LRV, Historic Streetcar, Cable Car, and Hi-Rail Vehicles Maintenance Programs – Records Review
15-G	Maintenance Audits and Inspections – Traction Power System
16-A	Training and Certification Programs: Operators, Controllers, and Foremen
16-B	Training and Certification Programs: Maintenance Employees and Contractors
17	Configuration Management and Control

18	Local, State, and Federal Requirements: Employee Safety Program
19	Hazardous Materials Program
20	Drug and Alcohol Program
21	Procurement Process
22	CPUC GO 172 – Personal Electronic Device Prohibitions/In-cab Cameras
23	CPUC GO 175 – Rules and Regulations Governing Roadway Worker Protection Provided by Rail Transit Agencies and Fixed Guideway Systems

APPENDIX C

2018 SFMTA TRIENNIAL SAFETY REVIEW RECOMMENDATIONS LIST

No.	Recommendation	Checklist No.
1	SFMTA Central Subway Project should create a log that tracks checklist items that are still pending on follow-up actions or documents; the log should describe what are the remaining actions or documents in meeting safety requirements. SSCRC should continue to provide CPUC conformance checklist items' supportive documents for early review, although they may be incomplete. SSCRC should only approve conformance checklist items meeting all safety requirements.	8
2	SFMTA should include a description of all hazard data acquisition processes under its SOP SY.PR.037.	9
3	SFMTA should clean up its TransitSafe Hazard and Incident Module to ensure safety data are tracked properly.	9
4	SFMTA should adhere to its procedure SY.PR.036 sections 4.9.1 and 4.9.2.	12
5	Ensure all efficiency and compliance test records, both hard and soft copies, are maintained for a minimum of 4 years.	13-A
6	Ensure SFMTA System Safety complies with the Efficiency Testing Plan and ensure efficiency tests are conducted as outlined in a monthly basis with proper follow up re-testing.	13-A
7	Ensure SFMTA Efficiency Testing Plan go through the process as outlined in SFMTA SOP Development and Approval A.PR.002 to receive an official documentation number.	13-A
8	SFMTA Transportation Supervisors should be conducting efficiency tests to ensure Operators are familiar with and following SFMTA Rules as outlined in the SFMTA Rail Rule Book. Efficiency Tests should be forwarded to SFMTA System Safety so that and negative trends can be tracked. This would allow SFMTA System Safety to compile the data and suggest improvements in either Training or Operation Divisions.	13-B
9	SFMTA should enforce General Order 172 and SFMTA Rule 2.15.4 throughout the SFMTA System. PED violations are a systemic problem on SFMTA and the numerous violations should be addressed at the top levels of Management.	13-B

10	SFMTA should enforce SFMTA Rule 4.24.6 throughout the system concerning unsecured rail vehicles. Operators who were interviewed concerning SFMTA Rule 4.24.6 were either unaware of the rule or seemed insouciant to the reason the rule exists in the first place.	13-B
11	SFMTA Cable-Car Conductors should be attentive to their respective duties and SFMTA Management should enforce SFMTA Rule 10.30.1.	13-B
12	SFMTA Transportation Supervisors should ensure SFMTA Operators are not leaving their LRV unless properly relieved and enforce SFMTA Rules 4.24.5 and 4.24.6.	13-B
13	SFMTA should follow proper document instructions and fill out all required signature lines to verify legality of document control.	13-C
14	SFMTA Industrial Safety must follow SFMTA Contractor Safety Program SY.PR.034 to ensure any contractor safety violations are mitigated.	13-D
15	SFMTA Supervision should follow SOP A.PR.003 and insure all General Notices, Division Bulletins, and Order Bulletins are up to date and ensure expired documents are removed.	13-E
16	SFMTA Operations and Maintenance should include System Safety in all performance of rules checks, assessments, and testing that is enforced in the field. This will allow SFMTA System Safety to properly track trends and conduct thorough Hazard Analysis.	13-E
17	SFMTA should perform Preventative Maintenance (PM) inspections per supporting reference material (SOPs). PM inspections should be completed in the time frame specified by the SOP or manufacturers' recommendations.	14-A
18	SFMTA should review, update, and approve SOP's within accordance with SFMTA policy and procedures.	14-A
19	W.BG.PR.008 subway emergency egress door inspection and maintenance. • SFMTA shall perform PMs within 4-week schedule.	14-B
20	R.SM.PR.021 battery backup power subway signaling system. • SFMTA shall streamline procurement process so vital equipment is replaced without undue delay.	14-B
21	Using but not limited to AREMA, FRA 49 CFR 237, APTA RT-FS-S-001-02 Rev 1 and FHWA National Highway and Rail Transit Tunnel Inspection Manual (2005 Edition) as standard industry guidelines, create a structures inspection and maintenance SOP, and reference the SOP in Section 15 of RSSPP. The SOP should include but not limited to the following: a) A process to obtain outside agency inspection dates, results of the inspection, and action plan for correcting noted conditions found during inspections;	14-C

	b) A process to communicate with outside agencies regarding structures during emergencies and SFMTA asset issues related to these structures; c) A process to ensure that SFMTA owned structure inspections occur in the specified time frame; d) A process to communicate potential hazards and noted conditions to the Safety Department; e) A process to track noted conditions found during inspections until corrected; f) A process to ensure that noted conditions found during inspections are corrected within the timeframe specified by the responsible Engineer.	
22	Create a structural inspection and maintenance database per APTA RT-FS-S-001-02 Rev 1, Section 3.2.1 and 4.4. Assign designated personnel to maintain this database.	14-C
23	Complete all Type I deficiencies from tunnel inspections with open status repair as soon as possible. Provide CPUC a work plan with estimated completion dates for such repairs.	14-C
24	Each DMM and EETI in the Calibration Program shall have an up-to-date calibration "due-date" sticker permanently affixed.	14-F
25	SFMTA rail vehicle maintenance should develop a procedure/program that ensures all tools that are used for measurement and testing of rail vehicles is being properly calibrated at the prescribed intervals, the tools are being properly inventoried and being tracked by an assigned employee. This program should include a standard calibration status identification sticker that is affixed to each tool, identifying the last calibration date, tool identification number, and the next calibration date due. The method used to label each tool so that the next scheduled testing/calibration due date can be observed on each tool. The program should also identify procedures related to tools that are found to be defective or tools found to be out of calibration by rail vehicle maintenance personnel. The procedure should address the inspection of each tool before use, up to date calibration date, as well as the record retention related to each tool calibration certificate. The program should include any rail vehicle personnel training on the program requirements.	14-F
26	Walkways shall be maintained. Per GO 143-B, 9.05	15-A
27	SFMTA shall secure all equipment. Per GO 127, 3.12	15-A
28	SFMTA shall ensure all conductors are properly labeled. Per CFR 236.76	15-A
29	SFMTA shall install striping on back side of all x bucks. Per MUTCD 8B.03	15-A
30	SFMTA shall align flashers. Per CFR 234.253	15-A

31	R.SM.PR.002 ATCS wayside uninterruptible power supply • SFMTA should insure all forms are properly completed.	15-B
32	R.SM.PR.030 subway wayside signal head, PM • SFMTA should conduct PM's immediately.	15-B
33	R.SM.PR.038 ATCS inductive loop cable, PM • SFMTA should continue its 52-week inspections until manufacturer recommendations have been submitted in writing.	15-B
34	SFMTA should ensure all switch maintenance and defective items are noted and proper remedial action taken in a timely manner. SFMTA shall make proper repairs; utilize current track maintenance standards, including manufacturer's recommended material and follow General Orders and CFR's. SFMTA R.TR.PR.002 part 6.0, R.TR.PR.009 rev1	15-C
35	SFMTA performs Preventive Maintenance Inspections (PMI) at mileage-based intervals and for this reason, SFMTA should source a more reliable means to track mileage of Historic PCC cars and LRV 2/3's to ensure preventive maintenance inspections are being completed at the required scheduling intervals.	15-E
36	Non-revenue hi-rail vehicle procedure #D.04.00.002 should be reviewed and updated, last revision 03/02/1998. 90-day BIT inspections should include detailed repair reports to identify defects found and corrective action taken for each defect.	15-F
37	SFMTA should close all existing past due open items within a timely manner. SFMTA should comply with their SOP's and ensure all open items are taken care of within their respective time frames.	15-G
38	Ensure all required training, including compliance rides occur in the mandated timeline.	16-A
39	Ensure all LRV Operators are trained, at a minimum, every two years on SFMTA Operating Rules.	16-A
40	SFMTA MRO Personnel are to verify document control to properly document training of employees and ensure that the form is completely filled out including signatures.	16-A
41	The ISEC should have the full cooperation from the whole of SFMTA.	18
42	The Industrial Safety and Environmental Compliance based on procedures should be a part of the safety department.	18
43	SFMTA Engineering department should provide safety assurance for approved equal parts related to MOW as well as Railcars.	21

44	SFMTA should document in its procedures how to mitigate or replace defective or deficient material/equipment if such material/equipment is introduced into the SFMTA System.	21
45	SFMTA should write a General Notice that is clearly defined under one matrix to avoid confusion and follows General Order 172 Zero Tolerance Policy. This Finding is CLOSED per SFMTA General Notice 2018-GN-047.	22
46	SFMTA must follow General Order 172 Section 2.11 and define SFMTA consequences to a staff member who does not comply with the PED use prohibitions of this General Order.	22
47	SFMTA shall include CPUC General Order 175A Section 9.5(b) in its RWP Program Instruction and ensure each class has training experience in a representative field setting. All training shall be conducted by a Trainer who has experience and knowledge of effective training techniques as outlined in CPUC General Order 175A Section 9.6(a).	23
48	SFMTA shall create and institute a Near Miss Reporting Program, ensure it conforms to CPUC General Order 175A Section 10, and include it in the SFMTA RWP Program.	23

APPENDIX D

2018 SFMTA TRIENNIAL SAFETY REVIEW CHECKLISTS

CPUC develops a series of checklists prior to each triennial safety review of California Rail Transit Agencies. These checklists are based on the 21 elements that are required to appear in each agency's SSPP by 49 CFR Part 659 and are customized according to the SSPP and the unique features of the agency under review. Additional checklists for evaluating compliance with Commission General Orders 172 and 175-A are also included.

SFMTA received a draft version of these checklists, showing only the Reference Criteria and Element/Characteristics and Method of Verification fields 30 days prior to the audit start. Although each checklist provides guidance for the activities, CPUC reviewers are authorized to inquire about and inspect any aspect of the SFMTA system they determine to be relevant to system safety and the checklist in question.

CPUC reviewers provided immediate feedback to SFMTA representatives regarding any initial findings and potential recommendations following each checklist's activities. The reviewers then revise the checklist document to include a summary of their review, findings of non-compliance, recommendations for corrective action, and any additional comments. The complete checklists are provided below.

2018 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	11:00 am – 1:00 pm	**Location**	1 SVN 7th Floor DOT Conference Room #7023
Date of Audit	September 17, 2018	**Department(s)**	SFMTA Senior Management
Auditors/ Inspectors	Daren Gilbert Stephen Artus Steve Espinal Mike Borer Jason Dixon Jimmy Xia	**Persons Contacted**	Ed Reiskin (Director of Transportation) Melvyn Henry (Chief Safety Officer) John Haley (Director of Transit) Michael Kirchanski (System Safety Manager)

REFERENCE CRITERIA

1. CPUC General Order 164-D
2. CPUC General Order 164-E
3. SFMTA Rail System Safety Program Plan (RSSPP), Revision 6, dated 2/11/2015
4. SFMTA Rail System Safety Program Plan (RSSPP), Revision 7, dated 2/11/2016
5. SFMTA Rail System Safety Program Plan (RSSPP), Revision 8, dated 2/15/2017
6. SFMTA Rail System Safety Program Plan (RSSPP), Revision 9, dated 2/15/2018

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

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

Interview SFMTA's Executive and Senior Management to discuss:

1. What is the frequency and depth of safety information provided to the Director? Is safety included as a regular topic at SFMTA Senior Management meetings, and how is safety information communicated? Are yearly accident, injury and fatalities and multi-year trends provided to the Director?
2. Is Executive Management aware of high priority safety issues related to operations, maintenance, and ongoing capital or improvement projects?
3. Is 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, inspections, or other channels?

4. What is System Safety Department's reporting relationship with SFMTA's executive and senior management, and management's participation in safety activities. Is safety included as a regular topic at SFMTA Board Meetings, and whether SFMTA's Executive Management provides updates and concerns to the board? Are periodic reviews of the resources devoted to safety conducted by SFMTA Executive Management Team?
5. Are safety responsibilities included in job evaluations for Director of Operations, managers, supervisors and employees?
6. Does the Director and/or the Executive Management routinely visit the Operations Control Center, Maintenance Facility, WP&S Facility and speak 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. SFMTA established years ago a dashboard system. Collision data is inputted into the data warehouse. Data is made is available to all staff. Their internal system is called Transdat, a data system to track transit safety. It allows SFMTA to review data on a continuous basis. SFMTA staff shares the data with the Board of Directors and the San Francisco city board on a monthly basis. The number one goal of the Policy and Governance Committee is transit system safety.

   SFMTA has more than one means to review trends in their system, which they use to focus their efforts. SFMTA has added the collision prevention unit. The collision prevention unit generates quarterly reports on transit hot spots.

   SFMTA is in the process of replacing TransitSafe. They are in process of implementing the successor, which is called Intelex. They anticipate in early 2019 the data migration will be complete.
2. SFMTA's Director of Transportation (DOT), meets with their Director of Transit and Director of Safety individually on a regular basis. They have monthly meetings with Transit, HR, and Safety divisions, where they review systematic issues.

   It is through the aforementioned regular meetings and forums that bring managers from various units together who bring up high priority safety issues related to operations, maintenance, and ongoing capital or improvement projects.

The DOT is aware that CPUC has many cellphone violations and recommends citations. SFMTA has been conducting campaigns at platforms and disseminating bulletins to clarify rules. They focus on employees actively using cellphones on the ROWs. The DOT stated that SFMTA will focus on communicating proper policies to their Operators.

A CPUC Inspection Supervisor stated that there has been over 200% increase in the past year of cellphone use violations by SFMTA employees. The Director of Transit stated that SFMTA has front line managers who have made similar comments. One Transit Safety Staff member at Green Division reviews rail videos monthly and looks for rules violations.

3. The DOT knows there is a master CAPs tracking spreadsheet which safety uses. He is informed of the statuses of CAPs on a quarterly basis. CAPs status are discussed in the monthly System Management Safety Committee (SMSC) meetings. At one point, SFMTA had a couple hundred or so open CAP's, however many were housekeeping issues. To date there are less than 100 open CAPs from ISAs.
4. The Director of Safety is a direct report to the DOT. The topic of safety is included in the quarterly Policy and Governance Committee meetings. Before each meeting, SFMTA gives the committee the safety related data. SFMTA's Executive Management provides updates and concerns on safety related issues monthly. At full board meetings that meets twice a month to discuss the safety issues of note. There are 10 direct reports in the monthly senior executive meetings. Safety is more like an ad-hoc agenda in those meetings and not so much the focus. SFMTA is on a 2-year budget cycle, so the safety division has opportunity to request resources they need it. Every two years, they evaluate their budget. Within the transit division, they have biweekly meetings for cable cars, bus, and rail. To keep safety in forefront by conducting safety briefing.
5. Safety responsibilities are included in job evaluations for Director of Operations, managers, supervisors, and employees.
6. The DOT has scheduled visits to the Operations Control Center, Maintenance Facility, and WP&S Facility on his calendar every week. He does try to get out there about once a week. He talks to a lot of employees and rides the system daily. He receives safety issues reported by employees, which is another channel of input to him. Unfiltered feedback from employees is another layer of communication for him.

<u>Findings:</u>
None

<u>Comments:</u>

None

Recommendations:
None

2018 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR SAN FRANCISCO MUNICIPAL TRANSPORTATION AGENCY (SFMTA)

Checklist No.	**2**	**Element**	**RSSPP Goals and Objectives**
Time	1:00 – 2:00 pm	**Location**	1 SVN 7th Floor DOT Conference Room #7023
Date of Audit	September 17, 2018	**Department(s)**	SFMTA Senior Management
Auditors/ Inspectors	Daren Gilbert Stephen Artus Steve Espinal Mike Borer Jason Dixon Jimmy Xia	**Persons Contacted**	Ed Reiskin (Director of Transportation) Melvyn Henry (Chief Safety Officer) John Haley (Director of Transit) Michael Kirchanski (System Safety Manager)

REFERENCE CRITERIA

1. CPUC General Order 164-D
2. CPUC General Order 164-E
3. SFMTA Rail System Safety Program Plan (RSSPP), Revision 6, dated 2/11/2015
4. SFMTA Rail System Safety Program Plan (RSSPP), Revision 7, dated 2/11/2016
5. SFMTA Rail System Safety Program Plan (RSSPP), Revision 8, dated 2/15/2017
6. SFMTA Rail System Safety Program Plan (RSSPP), Revision 9, dated 2/15/2018

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. What are the goals?
2. Obtain examples of how goals are being evaluated (metrics and measures) and review documentation used to track and measure SFMTA's activities to meet the goals and objectives.
3. Make a determination regarding the adequacy of the safety information provided to the Executive Management. Is the Executive Management receiving sufficient information to ensure SFMTA is meeting its safety goals and objectives? Are rule violations and other key safety metrics being tracked and reported to the Senior Management?
4. Determine whether the stated goals and objectives should be revised.
5. Determine whether management's responsibilities are adequately identified for the safety goals and objectives.

FINDINGS AND RECOMMENDATIONS

Activities:
Staff interviewed the Executive Management Team, reviewed SFMTA's Strategic Plan progress report and Transit Collisions Location Analysis sheet, and noted the following in summary:

1. SFMTA's goals are stated in their Strategic Plan. SFMTA is actively engaged in making continuous progress towards the ongoing goals and objectives identified in the SSPP. For example, some of their current initiatives to advance safety throughout the system include modifying streets and optimizing transit signals and switch alignments, etc.
2. SFMTA has key performance indicators in their Strategic Plan. Performance metrics is part of the Transdat meeting they have once a month.
3. SFMTA has many minor collisions both in rail and bus modes. SFMTA does conduct street redesigns to drive down number of collisions as appropriate. SFMTA reprogrammed two interlockings completely in an attempt to eliminate derailments.

   There has been a safety campaign focusing on work done by system safety personnel.

   SFMTA DOT stated that SFMTA has good data systems in place including databases for tracking rule violations and other key safety metrics, and he feels that he is receiving sufficient information to ensure SFMTA is meeting its safety goals and objectives.

4. Goals and objectives are high level, relevant, and appropriate.

5. SFMTA Management responsibilities are sufficient.

Findings:
None

Comments:
None

Recommendations:
None

2018 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR SAN FRANCISCO MUNICIPAL TRANSPORTATION AGENCY (SFMTA)

Checklist No.	**3**	**Element**	**Overview of Management Structure**
Time	2:00-3:00 pm	**Location**	1 SVN 7th Floor DOT Conference Room (#7023)
Date of Audit	September 17, 2018	**Department(s)**	Safety Division
Auditors/ Inspectors	Daren Gilbert Stephen Artus Steve Espinal Mike Borer Jason Dixon Jimmy Xia	**Persons Contacted**	Ed Reiskin (Director of Transportation) Melvyn Henry (Chief Safety Officer) Michael Kirchanski (System Safety Manager)

REFERENCE CRITERIA

1. CPUC General Order 164-D
2. CPUC General Order 164-E
3. SFMTA Rail System Safety Program Plan (RSSPP), Revision 6, dated 2/11/2015
4. SFMTA Rail System Safety Program Plan (RSSPP), Revision 7, dated 2/11/2016
5. SFMTA Rail System Safety Program Plan (RSSPP), Revision 8, dated 2/15/2017
6. SFMTA Rail System Safety Program Plan (RSSPP), Revision 9, dated 2/15/2018
7. Hazard Analysis, SY.PR.042
8. Senior Management Safety Committee, SY.PR.053
9. 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, maintenance, and ongoing other project activities. What is the level of cooperation between safety, maintenance and operations?
2. Solicit opinions regarding the effectiveness of the organization and request a few examples of how this 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.

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 5.4.3 (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 Executive Management Team, reviewed the agenda, minutes, and sign-in sheets of SFMTA's Senior Management Safety Committee Meetings from the past twelve months, and noted the following in summary:

1. CPUC has some concerns regarding free flow of information between safety, maintenance, and operations. Based on SFMTA's recent progress in closing their open CAPs, CPUC staff has heard that it has been improved. CPUC Inspector Supervisor stated that sometimes CPUC asks safety for material, which safety didn't have readily available, but only Transit had the information.

   The reenactment of the patron falling onto track that occurred on 7/11/2018 at Embarcadero Station Platform was undertaken by transit without the safety there. SFMTA policy requires that safety needs to be notified about reenactments conducted by other departments. This was concerning to CPUC.

   SFMTA staff conducting ISAs has difficulty getting information from Operations department. The Chief Safety Officer stated this problem has been reconciled and that this should not occur again.

   SFMTA also wants their TSS's to be empowered if they are not getting the requested information. CPUC staff asked SFMTA personnel to send all future ISA notifications to the CPUC Inspection group and Engineering Staff.

2. Examples of how SFMTA has worked to resolve identified safety issues including the following:
   a. Signal standardization
   b. Door issues on Breda LRVs, especially the problem of Breda LRVs' doors opening unintentionally while traveling in the subway.
      i. SFMTA finished rewiring of door panels on their entire fleet of Breda LRVs and they haven't had such problem since then.

c. Enlarging train coming signal heads
d. Measures to make automobile drivers impossible to make illegal left turns on 3rd St corridor.
e. Cesar Chavez and 3rd St Collision Mitigation
    i. Traffic engineers were discussing the existing problems.
    ii. Sustainable Streets proposed heavy duty signal arms. That is being done throughout 3rd St, but it takes time to get heavy duty hardware.

3. SFMTA's DOT doesn't think that personnel or resources limitation is an issue currently. SFMTA's CSO stated that they have adequate staffing and resources currently. New reporting criteria detailed in GO 164-E has increased the number of reportable accidents. Between rail and buses, they have a daily collision on Market St. Part of SFMTA's streets redesign is separating bikes from transit. Staff concurs that safety resources have not been an issue.

4. The Senior Management Safety Committee meetings were held as required by the SSPP.

5. The Safety Department has adequate personnel resources allocated to support interdepartmental coordination on safety issues and concerns. See #3, above.

6. There have been no cuts or major expansion of the SFMTA's safety department's personnel and resources over the last three years. The safety department is replacing a safety officer who retired in July 2018.

Findings:
None

Comments:
1. Based on staff's review of the SMSC meeting minutes from the past twelve months, the documentation for four monthly SMSC meetings from the one-year period were missing.
2. CPUC staff suggested that SFMTA should document and attach the topics of discussion during the SMSC meetings to the minutes.

Recommendations:
None

2018 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	3:00-4:00 pm	**Location**	1 SVN 7th Floor DOT Conference Room (7023)
Date of Audit	September 17, 2018	**Department(s)**	Safety Division
Auditors/ Inspectors	Daren Gilbert Stephen Artus Steve Espinal Mike Borer Jason Dixon Jimmy Xia	**Persons Contacted**	Ed Reiskin (Director of Transportation) Melvyn Henry (Chief Safety Officer) Michael Kirchanski (System Safety Manager)

REFERENCE CRITERIA

1. CPUC General Order 164-D
2. CPUC General Order 164-E
3. SFMTA Rail System Safety Program Plan (RSSPP), Revision 6, dated 2/11/2015
4. SFMTA Rail System Safety Program Plan (RSSPP), Revision 7, dated 2/11/2016
5. SFMTA Rail System Safety Program Plan (RSSPP), Revision 8, dated 2/15/2017
6. SFMTA Rail System Safety Program Plan (RSSPP), Revision 9, dated 2/15/2018
7. 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. Verify that the required annual SSPP review process is being implemented according to the approved process specified in the SSPP, Section 4. Review past correspondence and records for the last 3 years.
2. 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.
3. What can be done to improve communications and cooperation between Operations and Safety?

FINDINGS AND RECOMMENDATIONS

Activities:

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

- SFMTA System Safety's internal email correspondence for the 2017 SSPP, dated 2/15/2017
- SFMTA System Safety Deputy Chief Safety Officer's email detailing his correspondence with the Transit Division regarding changes they requested for the February 2018 SSPP, dated 2/13/2018
- Email correspondence between SFMTA's Safety and Transit divisions regarding the latest SSPP, dated 8/28/2018

1. SFMTA starts the required annual SSPP review process in November of each year according to the approved process specified in the SSPP, Section 4. When all necessary changes to the SSPP are identified, the Safety department drafts the revised SSPP and sends it out for comment to other SFMTA departments for final approval. When the safety department receives comments from other departments, the safety department incorporates the necessary changes to address the comments on the SSPP. SFMTA aims to finalize every annual SSPP revision as necessary by 1/31 of every year in order to comply with the due date of 2/15 of each year for submitting the annual SSPP revision to CPUC as required by GO 164-D/E. So far, SFMTA has encountered no problem with the process. The dates of SFMTA's submittal of their annual revision of their SSPPs to CPUC from the last 3 years are the following:
    a. 2016 SFMTA Rail SSPP, Rev. 7, submitted to CPUC on 2/16/2016
    b. 2017 SFMTA Rail SSPP, Rev. 8, submitted to CPUC on 3/9/2017
    c. 2018 SFMTA Rail SSPP, Rev. 9, submitted to CPUC on 2/22/2018
    d. Revised SFMTA Rail SSPP, Rev. 10, incorporating changes required by GO 164-E, submitted to CPUC on 9/5/2018
2. The documentation staff reviewed as mentioned above demonstrates that SSPP reviews and changes progress according to internal timeframes, are comprehensive in scope, and are signed-off by the designated staff as appropriate.
3. SFMTA can do the following to improve communications and cooperation between Operations and Safety:
    a. Safety needs to get the draft of the annual SSPP revision out sooner.
    b. Safety needs to get comments on the annual SSPP revision from Transit sooner. Safety needs to get the draft out sooner.
    c. Get Transit staff in line with what Safety is doing.

    Safety and Operations met late last year to discuss concerns about information flows between the two departments. Since the meeting, improvement in information flows has occurred.

Findings:

None

Comments:
None

Recommendations:
None

2018 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	3:00-4:00 pm	**Location**	1 SVN 7th Floor DOT Conference Room (7023)
Date of Audit	September 17, 2018	**Department(s)**	Safety Division
Auditors/ Inspectors	Daren Gilbert Stephen Artus Steve Espinal Mike Borer Jason Dixon Jimmy Xia	**Persons Contacted**	Ed Reiskin (Director of Transportation) Melvyn Henry (Chief Safety Officer) Michael Kirchanski (System Safety Manager)

REFERENCE CRITERIA

1. CPUC General Order 164-D
2. CPUC General Order 164-E
3. SFMTA Rail System Safety Program Plan (RSSPP), Revision 6, dated 2/11/2015
4. SFMTA Rail System Safety Program Plan (RSSPP), Revision 7, dated 2/11/2016
5. SFMTA Rail System Safety Program Plan (RSSPP), Revision 8, dated 2/15/2017
6. SFMTA Rail System Safety Program Plan (RSSPP), Revision 9, dated 2/15/2018

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 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.

FINDINGS AND RECOMMENDATIONS

Activities:

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

1. The SSPP defines the responsibilities and accountability of each department in relation to SSPP implementation, enforcement, and effectiveness.

2. Currently, no challenges were identified for each department in performing tasks relating to the SSPP or general safety.

3. Individual managers/supervisors are held accountable for the performance of safety-related activities. The performance of safety-related activities is part of the periodic performance evaluation of the management.

Findings:
None

Comments:
None

Recommendations:
None

2018 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR SAN FRANCISCO MUNICIPAL TRANSPORTATION AGENCY (SFMTA)

Checklist No.	**6**	**Element**	**Hazard Management Process**
Time	10 am - 12 pm	**Location**	1 SVN 6th floor, System Safety Conference Room
Date of Audit	October 5, 2018	**Department(s)**	Safety Division Industrial Safety (ISEC) Transit Management Transit Services
Auditors/ Inspectors	Arun Mehta Steve Espinal Patrick Donnelly Yan Solopov	**Persons Contacted**	Michael Kirchanski Aaron Lampkin Jeff Connelly Oliver Gajda Julie Kirschbaum

REFERENCE CRITERIA

1. CPUC General Order 164-D
2. CPUC General Order 164-E
3. SFMTA Rail System Safety Program Plan (RSSPP), Revision 6, dated 2/11/2015
4. SFMTA Rail System Safety Program Plan (RSSPP), Revision 7, dated 2/11/2016
5. SFMTA Rail System Safety Program Plan (RSSPP), Revision 8, dated 2/15/2017
6. SFMTA Rail System Safety Program Plan (RSSPP), Revision 9, dated 2/15/2018
7. Hazard Analysis, SY.PR.042
8. Muni Division Safety Committees, OS.PR.005
9. Accident Incident Investigation & Reporting SY.PR.044
10. 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 and SY.PR.042. 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 or Equipment 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/or their subordinates are reviewing ongoing 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 and SY.PR.042.

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 UHCs 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 operations representatives and reviewed relevant documentation and noted the following:

1. Staff found that SFMTA discovers hazards through accident investigation, video review, efficiency testing, and on-site inspections. According to the CPUC database, SFMTA reported 47 hazardous conditions including: 33 sign violations, 9 hazardous door openings (while train in motion or on wrong side of the platform), one roll back, one sink hole, one runaway train, one BART fire smoke into MUNI platform (Civic Center), and one wayside worker close call. Of the 47 reported hazardous conditions, 28 corrective actions have been closed. Hazardous condition corrections include discipline/training and re-engineering in order to address hazardous conditions. SFMTA submitted said corrections to the CPUC staff in a timely manner, as is required per General Order 164-D/E.

2. SFMTA currently stores information about Incidents and Hazardous Conditions into a database entitled 'TransitSafe', but is transitioning towards a more modern one called 'Intelex.'

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3. SFMTA performs tests such as 'signal-dimming' in order to identify operators and/or locations involved in signal violations. This helps identify unsafe operators who do not respond to the dim signals safely/properly.

   SFMTA's Safety Manager leads Change Control Board meetings, where managers from different departments meet in order to discuss potential safety issues. Attendance at these meetings has improved, and the staff relevant to addressing particular issues regularly attend.

   SFMTA has enacted several projects addressing safety in critical areas with hazardous conditions – for example, the Third Street Safety Initiative. Further, SFMTA has also completed a signal standardization project.

4. SFMTA utilizes procedure Hazard Analysis, SY.PR.042, which addresses the requirements.

5. Documentation indicated that hazards are being evaluate in accordance with he established procedures.

6.-7. SFMTA tracks Hazardous Conditions and the resulting Corrective Action Plans (CAPs) through a spreadsheet originally developed by CPUC staff, and later adopted and expanded by SFMTA. SFMTA demonstrated the spreadsheet to CPUC staff

during the audit. SFMTA meets with CPUC staff bi-weekly to evaluate the CAP status, including hazard related CAPs

Findings:
None

Comments:
Staff believes that SFMTA is addressing Hazardous Conditions as is required per General Order 164-E.

Staff has requested that when SFMTA submits Hazardous Conditions reports, as well as incident reports involving signal violations, that the involved operator's ID number be provided, so that Staff can also track repeat-violators. SFMTA staff has agreed to this request.

Recommendations:
None

2018 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR SAN FRANCISCO MUNICIPAL TRANSPORTATION AGENCY (SFMTA)

Checklist No.	**7**	**Element**	**System Modification**
Time	1 – 4 pm	**Location**	1 SVN 6th floor, System Safety Conference Room
Date of Audit	October 10, 2018	**Department(s)**	Safety Division
Auditors/ Inspectors	Claudia Lam Jamie Lau Madeline Ocampo	**Persons Contacted**	Michael Kirchanski – System Safety Albert Lam – System Safety

REFERENCE CRITERIA

1. CPUC General Order 164-D
2. CPUC General Order 164-E
3. SFMTA Rail System Safety Program Plan (RSSPP), Revision 6, dated 2/11/2015
4. SFMTA Rail System Safety Program Plan (RSSPP), Revision 7, dated 2/11/2016
5. SFMTA Rail System Safety Program Plan (RSSPP), Revision 8, dated 2/15/2017
6. SFMTA Rail System Safety Program Plan (RSSPP), Revision 9, dated 2/15/2018
7. SFMTA SOP Development & Approval, A.PR.002
8. SFMTA Rail Change Control Board, A.PR.015
9. Central Subway Safety and Security Certification Plan SY.PL.002
10. Procurement of New Light Rail Vehicles (LRV4) Contract No. SFMTA 2013-129, Safety and Security Certification Plan, LRV4.PL.06
11. LRV4 – Contract No. SFMTA 2013-19 Supplemental Safety and Security Certification Verification Report – Vehicle 2006 – Single Car Operation, LRV4.RP.020.2006
12. LRV4 – Contract No. SFMTA 2013-19 Supplemental Safety and Security Certification Verification Report – Fleet – Multi-Car Operation, LRV4.RP.020.S1

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

System Modification

Interview SFMTA representatives and review appropriate records for the last 3 years 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 are addressed in system modifications by identifying their specific activities in the process such as

documentation, participation in testing and inspections and observations performed at work sites.

3. 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 and reference material 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:

1. Change Control Board (CCB) has to approve any changes to the SSPP. Staff found RSSPP, Section 7, System Modification, covers the process for addressing safety issues and concerns in system modifications. Also, SOPs "A.PR.015 Rail Change Control Board" and "A.PR.002 Development & Approval" cover system modification in more details.

2. Each month, Rail Change Control Board meets to discuss system modification issues. Attendees include MOW, Operating Training, System Safety, and Capital Programs and Construction representatives. The attendee with the safety concern can submit the proposal, including the forms, and present them to the CCB. Before a request of change to be presented to the board, the Deputy Chief Safety Officer will review the requested change for any General Order violations. If there is, the request will not be presented. If there are no General Order violations, the SFMTA staff must conduct a hazard analysis and shall be presented to the board; the board members then will vote for or against the change. Examples requested include change request form for door openings issues and Twin Peak Tunnels modification project. In addition, System modifications may originate from accident investigations, hazardous incidents, or as a result of projects proposed by other City entities, such as SFDPW.

3. System Safety tracks the changes on an Excel spreadsheet. Staff reviewed the spreadsheet and found it documented the implementation methods including visual inspection on site. Staff reviewed three system modification projects done in the past three years:

2016-023 – ATCS Cutover for Muni Metro Subway;
2017-005 – New Signals on 19th Ave between Judah St. and Taraval St.;
2018-005 – Twin Peaks Tunnel Changes.

Staff verified the above projects had hazard analyses, verification of implementation, as-built records, and have followed the configuration management process by going through change control board. Except for 2016-023 ATCS Cutover project, there isn't a as-built drawing because the project is not yet completed.

Findings:
None

Comments:

1. In the Change Control tracking spreadsheet, add the name of person verifying the implementation for each item.
2. Change the "Severity Probability" to "Hazard Risk Index", and change "Resolution" to "Mitigated Hazard Risk Index" on the PHA worksheet template to match its SOP.

Recommendations:
None

2018 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR SAN FRANCISCO MUNICIPAL TRANSPORTATION AGENCY (SFMTA)

Checklist No.	**8**	**Element**	**Safety and Security Certification**
Time	Part 1: 9 am – 12 pm Part 2: 1:30 pm – 5 pm	**Location**	Part 1: Central Subway 530 Bush Street, 4th floor Part 2: MME LRV4 Conference Room
Date of Audit	October 9, 2018	**Department(s)**	Safety Division Capital Programs & Construction
Auditors/ Inspectors	Jamie Lau Rupa Shitole	**Persons Contacted**	Albert Hoe – CSP Beverly Ward – CSP Jane Wang – CSP Janet Gallegos – LRV4 Doug Lee – LRV4 Roy Lee – LRV4 Randall Wong – Safety Division Michael Kirchanski - Safety Division

REFERENCE CRITERIA

1. CPUC General Order 164-D
2. CPUC General Order 164-E
3. SFMTA Rail System Safety Program Plan (RSSPP), Revision 6, dated 2/11/2015
4. SFMTA Rail System Safety Program Plan (RSSPP), Revision 7, dated 2/11/2016
5. SFMTA Rail System Safety Program Plan (RSSPP), Revision 8, dated 2/15/2017
6. SFMTA Rail System Safety Program Plan (RSSPP), Revision 9, dated 2/15/2018
7. SFMTA Safety & Security Certification Plan - Central Subway Project
8. Procurement of New Light Rail Vehicles (LRV4) Contract No. SFMTA 2013-129, Safety and Security Certification Plan, LRV4.PL.06
9. LRV4 – Contract No. SFMTA 2013-19 Supplemental Safety and Security Certification Verification Report – Vehicle 2006 – Single Car Operation, LRV4.RP.020.2006
10. LRV4 – Contract No. SFMTA 2013-19 Supplemental Safety and Security Certification Verification Report – Fleet – Multi-Car Operation, LRV4.RP.020.S1

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

Safety and Security Certification

Interview the SFMTA representative(s) involved in the Safety and Security 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 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 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 and security certification management, including organizational authority and responsibilities.
    b. Identify the process used to verify and document conformance with safety and security requirements during the design, construction, testing, and operational readiness phases of projects.
    c. Are overseen and approved by FTA and its Project Management Oversight Consultants (PMOCs).
    d. Is the certification program being administered by the transit agency or a contractor?
    e. Has a certification committee been created?
    f. Has a certifiable items list been created?
    g. Have all designs been reviewed, stamped, and sealed by a licensed Professional Engineer?
    h. Are design changes and Non-Conformance Reports (NCRs) analyzed for safety impacts? Have these been thoroughly documented?
    i. Have training programs been updated as necessary and have all employees been trained?
    j. Has a testing program been developed and administered?
    k. Are Safety Division personnel involved in the certification of SFMTA New Starts and major projects? Review documentation to verify.
    l. 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 responsible for the following major projects and noted the following. The audit was split into two parts: Central Subway Project (CSP) in the morning and LRV4 Project in the afternoon.

1. Staff verified if a formal Safety Certification Plan (SCP) has been submitted by SFMTA for Central Subway and New LRV Procurement Projects and has been approved by the Commission:
   CSP: Yes. Revision 0 of SCP was submitted in October 2008 and was approved by CPUC through Commission Resolution ST-102; Revision 1 of SCP was submitted to CPUC in January 2012; CPUC Staff did not disagree with the SCP revision.
   LRV4: Revision 0 of SCP was submitted to the Commission in September 2016 and was approved through Commission Resolution ST-190. Revision 1 was submitted to CPUC in October 2017 due to organizational changes and update for single car operation and multi car operations; CPUC Staff did not disagree with the SCP revision.

2. Staff verified if each submitted SCP was consistent with General Order 164-D, the SSPP, and applicable reference documents:
   CSP: CPUC assigned Staff verified the SCP being consistent with GO 164 with a SCP Checklist "RTSS 9" dated in February 2009.
   LRV: CPUC assigned Staff verified the SCP being consistent with GO 164 with a SCP Checklist "RTSS 9" dated in September 2016.

3. Staff verified if there has been effective communication with CPUC staff throughout the lives of current and planned projects, including the Preliminary Engineering Design Phase:
   CSP: CPUC Staff has been involved with this project since 2007 during the preliminary engineering phase of the Central Subway Project. Staff verified CPUC's attendance and involvement from a meeting minutes dated on January 19, 2007.
   LRV4: There was a comment from previous Triennial Audit that the Project did not involve CPUC at the preliminary engineering design phase. Since then, the Project has involved CPUC assigned representatives with the first SCP development and ongoing project progress status. Staff reviewed a letter from the Project to CPUC dated January 8, 2016 for submitting the first draft of SCP for review. Since then, assigned CPUC representatives provided comments until final draft of SCP was issued in September 2016.

4. Staff verified if all design and construction changes were properly coordinated and addressed in the Safety Certification process:

CSP: The Project Management Plan Section 3.0, Management Control, documenting the process for design and construction changes. It indicates changes are to be discussed at regular project meetings. Staff reviewed a sample of the Configuration Management Board (CMB) Change form (CMB-627) dated in May 2018 showing the changes discussed and being agreeable by the project management board with signatures. CMB meetings are to occur every Wednesday.
LRV4: Design changes are done through Field Modification Instructions (FMIs). FMIs were discussed and approved during the Safety and Security Certification Review Committee (SSCRC) meetings. FMI process is covered in the Quality Assurance Program Plan, Section 6.1 Configuration Management. Staff sampled an FMI for Cab Handhold Assembly Update and verified that changes were documented in the instructions with engineering sign off. SFMTA ensures the changes were implemented for each car and is documented on a car history book. Staff sampled an FMI record for Roof Fire Penetration Update (FMI-4382), and found the FMI was implemented on car LRV 043 per its car history book.

5. Staff verified if identified hazards have been eliminated or controlled as required under the SCPs.
   CSP: The Preliminary Hazard Analysis (PHA) matrix from the PHA report (dated in 2009) did not indicate the status of the risk resolutions. To verify if a risk resolution was implemented, Staff sampled a risk resolution from the PHA report, TP-20, to mitigate a cable hazard through design. The resolution was shown being implemented in section 19.2, CCTV, of the Project's Design Criteria.
   LRV4: Staff sampled Hazard Log (SII-MTA-0814A) from pages 10 to 25 and did not find any open items. The hazard resolution process is covered in Section 10-D of SCP.

6. Staff verified if all certifiable elements for Safety Certified projects, if completed during the past three years, were identified for the Safety Certification Verification Report (SCVR) and submitted to CPUC as required by General Order 164-D.
   CSP: No SCVR has been submitted for this project at the time of audit.
   LRV4: All 19 elements were certified in the single-car operation design SCVR submitted to CPUC Staff on October 25, 2017; multi-car operation design SCVR was submitted on May 16, 2018.

7. Staff reviewed documentation for Central Subway and New LRV Procurement Projects to determine if a process is in place to identify and mitigate any safety hazards. Staff ensured that the following are being addressed:
   a. Address safety and security certification management, including organizational authority and responsibilities:
      CSP: Section 3.0 of the SCP addresses the project management organizational authority and responsibilities.
      LRV4: Section 7 of SCP addresses the project management organizational authority and responsibilities.

   b. Identify the process used to verify and document conformance with safety and security requirements during the design, construction, testing, and operational readiness phases of projects:
      CSP: Section 2.4 of SCP addresses the process.
      LRV4: Section 10 of SCP addresses the process.

   c. Are overseen and approved by FTA and its Project Management Oversight Consultants (PMOCs)?
      CSP: Yes. FTA's consultant (PMOC), Evans and Associates, produced a monthly report on the Project's progress. It was approved by FTA's FFGA funding in 2012. Staff sampled a PMOC Monthly Monitoring Report in July 2018 and verified that the Project is being overseen by FTA.
      LRV4: Yes, however, FTA did not assign a PMOC to this project. The project still provides quarterly reports to the FTA. Staff reviewed a sample of the quarterly reports dated July 2017 and verified that there is a quarterly report submitted to the FTA.

   d. Is the certification program being administered by the transit agency or a contractor?
      CSP: Yes. the certification program is being administered by the transit agency. Acting Program Director is an SFMTA employee and the Program Assistant is an employee of a joint venture consultant for the project.
      LRV4: Yes, the certification program is being administered by the transit agency. The Project Manager is an SFMTA employee.

   e. Has a certification committee been created?
      CSP: Yes, a Safety and Security Certification Review Committee (SSCRC) has been created for this Project. Staff attends the monthly meetings as needed.
      LRV4: Yes, a Safety and Security Certification Review Committee (SSCRC) has been created for this Project. Staff attends the weekly to monthly meetings as needed.

f. Has a certifiable item list been created?
CSP: Yes, Table 2 of the SCP has a certifiable item list.
LRV4: Yes, Table 1 of the SCP has a certifiable item list.

g. Have all designs been reviewed, stamped, and sealed by a licensed Professional Engineer?
CSP: Staff sampled a set of Union Square/Market Street Station design package, Volume 2 of 3., Revision 2. Staff sampled several pages of the Building Protection Instruction Plan and verified that pages were reviewed, stamped, and sealed by a licensed Professional Engineer.
LRV4: Staff sampled an engineering drawing A8152600 noted "Approved by Lawrence Mirecki at 9:57 am, Nov 15, 2016." Mr. Mirecki is not a registered engineer, but an experienced engineer for the industry hired by Siemens. A registered electrical engineer employed by SFMTA was the lead engineer of the project working with Siemens; he approved the design element of LRV4. Staff verified that the subject SFMTA electrical engineer is an active registered electrical engineer in State of California from a licensee lookup website.

h. Are design changes and Non-Conformance Reports (NCRs) analyzed for safety impacts? Have these been thoroughly documented?
CSP: The project is in construction phase. Contract changes are being logged in a non-conformance log. The changes will be discussed, and to be agreed by both the Project and the contractors. If changes are not agreeable by the contractor, contractor will still have to implement the changes but may put a claim against the Project. The contract changes do not change the design of the project. Staff reviewed the Contractor Non-Conformance Report (CNCR) and verified that the Project has a way to keep track of non-conformance contracts. The CNCR is managed by the Quality Assurance Manager of SFMTA.
LRV4: For each car, there is a General Problem Report documenting all the problems before shipment during manufacturing. The problems are either signed off if resolved or remain open and documented on an open punch list. Before each car approval, the punch list is being reviewed by SSCRC to determine that they are not safety-related. Staff sampled the General Problem Report for car LRV 2030 and its punch list. Staff verified the sampled remaining open items on the General Problem Report are logged on the punch list.

i. Have training programs been updated as necessary and have all employees been trained?

CSP: Currently the project is in construction phase and training programs have not started yet. According to Acting Program Director, training programs are estimated to be implemented in summer of 2019.
LRV4: According to a Project staff, the Project is still training operators for the new vehicles. SFMTA trained about 2/3 of the operators as of today. Maintenance training is on-going; still pending on some of the maintenance manuals for overhaul. The training programs were developed and filed in SCVR in October 2017 and no changes were made since then.

j. Has a testing program been developed and administered?
CSP: According to Acting Program Director, a testing program is not developed yet; estimated to be started developing early next year. A test program manager is going to be hired soon. However, Rail Activation Plan, which is part of the PMP, has the rough plan of a testing program, was sent to FTA for comments in April 2018. FTA came back for more details on the Rail Activation Plan, which SFMTA is working to address.
LRV4: Testing Program is filed with SCVR under Appendix C. The test results are being reviewed during the audit subcommittee of the Project. Siemens developed the test program; Siemens administered the tests; SFMTA ensures the tests are passed through the audit subcommittee. Staff sampled car LRV 2043 Audit Report, verified that the subcommittee has approved the passing of tests for Element B.

k. Are Safety Division personnel involved in the certification of SFMTA New Starts and major projects? Review documentation to verify.
SFMTA System Safety Manager is the chair of SSCRC for both CSP and LRV4 Projects. He is involved in the certification of the SFMTA New Starts and major projects such as Central Subway Project and LRV4 Project. He attends regular SSCRC meetings for both projects and is one of the sign-offs on the safety certification conformance.

l. 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.
Staff interviewed SFMTA System Safety Manager. For both projects, safety concerns were addressed through SSCRC meetings. SSCRC meetings were regularly attended by Project Directors and Safety Division, while observed by CPUC. For LRV4 project, Transportation Safety Specialist (TSS) from Safety Division witnessed testing for the pilot vehicle and reported issues to System Safety Manager as required. SFMTA provided various emails proving SFMTA TSS witnessed testing and with findings.

Staff reviewed CSP's "CN1300" construction specification conformance records to verify if the Project followed its SCP. According to CSP's SCP, Revision 1, Section 2.4, Safety/Security Certification Steps,
"Once all the conformance checklists for a particular Certifiable Element and Factors are executed, validated and reviewed, the responsible party completes and signs the associated Certificate of Conformance, and submits it to the SSCRC for review and acceptance."
During CSPs construction specification conformance phase, certifiable elements are broken down into many conformance checklist items for engineering approval and then SSCRC approval; the checklist items will then turn over to CPUC for audit and followed by Program Director and Safety Chief for final approval after all CPUC comments are addressed. From Staff's past observations, conformance checklist items were approved by Program Director and Safety Chief without questions if they were approved by SSCRC and after all CPUC's comments being addressed.

According to Staff's past review of CN1300 conformance checklist items, Staff found 30 of them having questionable conformance to their safety requirements. Staff mostly found submittals do not contain evidence that safety requirements are being met. Staff posted questions to SSCRC. At the closing of this audit, the Project admitted three of the 30 sub-parts are still pending on follow-up actions to complete. Staff still has not yet received a response on other questions.

Staff requested a separate meeting with the CSP's project management to explain why some of the conformance checklist items were approved by SSCRC while not yet meeting their safety requirements.

On October 18, 2018, CSP's Program Manager met with Staff to discuss the issue. The Program Manager explained to Staff that some of the conformance checklist items indeed did not meet requirements and indicated project management knows that these checklists will be eventually fulfilled, but may take a long time. For example, some of the facilities may require other authorities to approve, but other authorities have not yet responded to the Project. To avoid delaying the safety certification process and to provide the documents for CPUC's review early on, some checklists were approved by SSCRC without fully meeting their safety requirements. The Program Manager noted that all incomplete checklists are being tracked by project management. However, neither CPUC and Program Director were aware that the seemingly "completed" conformance checklists were actually not completed.

Findings:

1. Staff found SSCRC approved conformance checklist items while some of them did not meet safety requirements. Although the subject checklists are being tracked by CSP

project management, the items are still in fact being approved by SSCRC while not meeting safety requirements. Staff found CSP did not follow its SCP's safety certification steps in certifying the project.

Comments:

1. For LRV4 project drawings, there was no requirement for a licensed Professional Engineer (PE) to review, approve, and stamp the design drawings. Non-licensed Siemens Engineer was issuing the design drawings for the LRV4 project and SFMTA licensed PE was reviewing and approving them for this project. SFMTA licensed PE signed safety certification of the design but not on the actual drawings. SFMTA staff expressed that engineers working for individual car-making companies don't normally possess PE licenses; their many years of design experience within the industry assures product quality.
2. Staff found CSP's PHA matrix did not have a resolution status. Moving forward, SFMTA should require all safety certifiable projects' PHA matrices to show resolution status like LRV4's.

Recommendations:

1. SFMTA Central Subway Project should create a log that tracks checklist items that are still pending on follow-up actions or documents; the log should describe what are the remaining actions or documents in meeting safety requirements. SSCRC should continue to provide CPUC conformance checklist items' supportive documents for early review, although they may be incomplete. SSCRC should only approve conformance checklist items meeting all safety requirements.

2018 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 6th floor, System Safety Conference Room
Date of Audit	October 11, 2018	**Department(s)**	Safety Division Technology & Performance Transit Services Transit Management ISEC
Auditors/ Inspectors	Claudia Lam Matt Ames Madeline Ocampo	**Persons Contacted**	Gerald Williams Robin Courtney Aaron Lampkin Brent Jones Terrance Fahey Julie Kirschbaum Lee Summerlott Randy Catanach York Kwan Michael Kirchanski Aaron Lampkin Josh Sadorra

REFERENCE CRITERIA

1. CPUC General Order 164-D
2. CPUC General Order 164-E
3. SFMTA Rail System Safety Program Plan (RSSPP), Revision 6, dated 2/11/2015
4. SFMTA Rail System Safety Program Plan (RSSPP), Revision 7, dated 2/11/2016
5. SFMTA Rail System Safety Program Plan (RSSPP), Revision 8, dated 2/15/2017
6. SFMTA Rail System Safety Program Plan (RSSPP), Revision 9, dated 2/15/2018
7. Hazard Analysis, SY.PR.042
8. 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 representative(s) to explain how they receive safety-related information from other departments, including the operations and maintenance departments.
    b. Ask the Safety Division representative(s) to provide examples of how information received from the Transit and Maintenance departments was used to support safety data collection and analysis activities.
    c. Ask the SFMTA Safety Division representative(s) to explain how they collect information on derailments and rules violations on the SFMTA Rail System.
    d. Ask the SFMTA Safety Division how it ensures the quality and integrity of collected safety data.
    e. Ask the SFMTA Safety Division representative(s) 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 3.0 since 2005 to acquire and analyze safety data. SFMTA will be deploying a new software Intelex (company) to replace TransitSafe. Currently, SFMTA has implemented three modules (Hazard, Non-conformance, and CAP) to Intelexs. SFMTA's goal is to go paperless. Data migration from TransitSafe to Intelex is planned for the next few years.
   Other safety data such as employee performance failures, equipment failures, and procedural deficiencies are captured in other databases such as Central Control Log, Intelex's Module non-conformance captures employee performances. In

addition, SFMTA has Deficiency Testing which focuses on rules related to major incident like mal-function, speeding. SFMTA also has a program that takes a sample of video every month and reviews the rules violation and turn over to transportation for disciplinary action. It's been electronic since Dec 2017.

2. Staff randomly selects examples from TransitSafe for Unacceptable Incidents.
    - July 14, 2018 – unacceptable hazard: red signal violation occurred in the MMT at Signal Twin Peaks Tunnel. No Corrective Action Plan (CAP) is tracked in TransitSafe but electronic copy was submitted to CPUC. Hardcopy was provided to prove CAP#8093.
    - March 12, 2018 – Unacceptable hazard: GO 175 violation occurred on California Street near Powell Street. Spreadsheet is missing the incident.
    - March 21, 2018 - Unacceptable hazard: a signal violation occurred at 25th Street and Illinois Street. TransitSafe is missing records of the incident.

   Facilities maintenance, Transit Service, and Transit Management, Rail Vehicle and Cable Car Maintenance, and Facilities Maintenances keep their own records in own databases. Databases warehouses connect these databases and Transtat creates reports from the database warehouses.
3. Staff reviewed the randomly selected Transtat reports and examples from TransitSafe electronic files and verified that SFMTA has been collecting and analyzing safety data incorporated into SFMTA Hazard Identification and Resolution Process.
4. Data is used directly in compliance checks within the Efficiency Testing (ET). For example, signal violation or GO 172 violations, safety does the review of the video and a secret Rider Program includes Non-transportation safety staff to observe stop signal compliance, cell phone usage, and rule violations. Also, Database warehouses pulls data from TransitSafe and other databases to provide quarterly reports and flag the locations that are problematic. Data has been used for collision reduction or pavement marking. Staff reviewed the October 5, 2018 Report – Right and Left Sideswipe report.
5. Staff reviewed minutes for Senior Management Safety Committee Meeting, Strategic Plan (Policy and Governance Group = PGG). Information provided to Senior Management for divisional data accountability and metric compliance.
6. The data sources identified in SSPP are entered in different databases. The database warehouses gather all databases and all other department can access the data. Staff also reviewed several minutes and agendas for the monthly Division Safety Committee (DSC) and verified that the data are being evaluated and analyzed and distribution is being implemented as required.
7.

a. When TO observes any signal violation or maintenance issues, TO will notify Central Control Log and Central Control will notify Maintenance and Safety. In addition, on call TSS has a whole list of incidents that need to notify Central Control and Safety.
b. SFMTA provided doors incident as an example. Safety does the study and research and present it to the Change Control Board (CCB) for rewiring of the cars. Senior management committee, central control, transit operators, and rail vehicle maintenance were all involved. Another example was Twin Peaks tunnel; safety learned it from notification from another capital project. And then they discussed that contractors have install used ballast, and CPUC inspectors brought up the composite RR ties issues. So, safety presented all these supporting documents to CCB for approval.
c. Derailments are handled by Central Control log and incidents are logged in TransitSafe. Rules violations are communicated through the Secret Rider Program, compliance checks, Central Control Log, employee/supervisor reports, and TSS Compliance checks.
d. SFMTA Safety Division does self-audits. The on-call TSS conducts a daily verification of the safety incident log vs. Central Control Log and verifies the logs of all the calls from Central Control Logs and ensures all are reportable to CPUC or NTD. Safety (Mike) goes through the reported information consistently.
e. NTD reporting changed from multiple staff reporting to a single person. Reports are tracked via spreadsheet. Reports between multiple agencies are exact copies of each other.

Findings:

1. SFMTA SOP SY.PR.037 Safety Data Acquisition & Analysis Section 4.0 Procedure should include a description of all hazard data acquisition processes.
2. Examples from TransitSafe files for Unacceptable Incidents are not properly tracked. Staff found an example of unacceptable hazard record was entered in Incident Module and another Unacceptable Hazard has no CAP created in TransitSafe.

Comments:

Currently, TransitSafe doesn't have Withdrawn feature. Staff suggested that Intelex should include the withdrawn features to ensure that the withdrawn data can be excluded for analysis when the data is exported for analysis.

Recommendations:

1. SFMTA should include a description of all hazard data acquisition processes under its SOP SY.PR.037.
2. SFMTA should clean up its TransitSafe Hazard and Incident Module to ensure safety data are tracked properly.

2018 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR SAN FRANCISCO MUNICIPAL TRANSPORTATION AGENCY (SFMTA)

Checklist No.	**10**	**Element**	**Accident/Incident Investigations**
Time	9:00 AM to 12:00 PM	**Location**	1 SVN, 6th floor System Safety Conference Room
Date of Audit	October 5, 2018		Transit Division System Safety Division
Auditors/ Inspectors	Steve Espinal Arun Mehta Patrick Donnelly Yan Solopov	**Persons Contacted**	Michael Kirchanski Jeff Conley Aaron Lampkin Oliver Gajda Julie Kirschbaum

REFERENCE CRITERIA

1. Code of Federal Regulations, Title 49 Part 659.33 – Accident Notification, 659.35 – Investigations, Part 659.37 – Corrective Action Plans
2. Code of Federal Regulations, Title 49 Part 674.33 – Notification of Accidents, 674.35 – Investigations, Part 674.37 – Corrective Action Plans
3. CPUC General Order 164 Series
4. CPUC General Order 172
5. SFMTA System Safety Program Plan (SSPP), Revision 6, dated 2/11/2015
6. SFMTA Rail System Safety Program Plan (RSSPP), Revision 7, dated 2/11/2016
7. SFMTA Rail System Safety Program Plan (RSSPP), Revision 8, dated 2/15/2017
8. SFMTA Rail System Safety Program Plan (RSSPP), Revision 9, dated 2/15/2018
   SFMTA Accident/Incident Investigation & Reporting, SY.PR.044\10 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 two CPUC-reportable accidents and/or incidents for each year in the past three years involving (1) use of 60-Day EZ Form and (2) major accident reporting 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/E.

2. All accidents and incidents were reported within two hours of occurrence, as required by General Order 164-D/E, 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/E, Section 7.3.

4. All accidents and incidents were investigated in compliance with the requirements of General Order 164-D/E, Section 8, and SY.PR.044.

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/E.

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 has submitted reports of all incidents/accidents for years 2015-2018 to the CPUC according to the requirements in General Order 164-D/E.

2. Initial Notice Reports are largely submitted within two hours of incident occurrences, and Final Reports are typically submitted within 60 days or less - or are otherwise granted time extensions per SFMTA's request. Any exceptions were accompanied/followed up by proper cause for delay.

3. No exceptions were noted regarding the reported information at the time of accident notification.

4. Reports are complete in terms of the required information specified in General Order 164-D/E. The accident investigation reports are very thorough and complete with few exceptions. When the reviewing CPUC staff require additional information to make a determination about the cause of an incident or to verify that SFMTA staff's conclusions are correct, such as in-cab video recordings, SFMTA staff provides all the requested information without hesitation. Regarding accident investigations, SFMTA safety department has proven to be a transparent organization regarding CPUC oversight.

5. SFMTA staff regularly performs random video reviews for footage from both forward-facing and in-cab cameras, as is required per General Order 172. SFMTA staff monitor for rules violations including signal-violations by Operators.

6. SFMTA notifies other organizations such as NTD and NTSB as appropriate when accidents take place. There is no FRA joint corridor; hence FRA does NOT need notifications.

   Following are the notifications to NTSB through the National Response Center that SFMTA has made since 2015:

CPUC#	Accident Location	Description
2015050006	Lakeview and San Jose	Fatality
2017010020	Subway east of Castro Station	Fatality
2017030011	Mason and Filbert	Fatality
2017080008	MME Yard	>$25 K coupling incident
2018080011	Twin Peaks Tunnel	Fatality

7. In tandem with the submittal of incident/accident reports, SFMTA staff works towards addressing resulting Corrective Action Plans (CAPs). Incident/accident-related CAPs are tracked via a spreadsheet originally developed by CPUC staff and expanded by SFMTA. Additionally, SFMTA utilizes the 'TransitSafe' database to store information related to

accidents/incidents and the resulting CAPs and are transitioning towards the more modern 'Intelex' database.

SFMTA and CPUC staff meet bi-weekly to discuss CAP status and closures.

Simple CAPs such as operator re-training is usually completed by the time a final report is submitted within 60 days. Re-training is handled by SFMTA training staff. Re-training is typically done swiftly one-on-one or few-on-one, rather than in a larger classroom setting. Training is specific to an operator's violation, such as Collision Avoidance Training. SFMTA's Safety Department reports good cooperation and no significant pushback from other departments in handling accident investigations and CAPs related to incidents/accidents.

8.-9. Staff involved in this audit have actively reviewed tens of accidents and SFMTA accident files and train videos recently spanning last three years. All accident reports are verified to contain all evidence, causal and contributory factors, and CAPs.

Findings:
None

Comments:
SFMTA safety department has proven to be a very effective organization regarding accident investigation, mitigation of hazards, and safety certification (LRV4 and Central Subway) and working transparently with the CPUC staff. Serious injury accidents have been dropping in the past three years and staff attributes this in no small way to the efforts of SFMTA safety.

Recommendations:
None

2018 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR SAN FRANCISCO MUNICIPAL TRANSPORTATION AGENCY (SFMTA)

Checklist No.	**11**	**Element**	**Emergency Management Program**
Time	9:30 am – 1:30 pm	**Location**	1455 Market 7th Floor TMC Conference Room
Date of Audit	October 17, 2018	**Department(s)**	Security, Enforcement, and Investigations Safety Division Rail Operator Training Transit Services Operations Control Center
Auditors/ Inspectors	Rupa Shitole Joey Bigornia Mike Warren	**Persons Contacted**	Christopher Grabarkiewctz, SFMTA Chief Security Officer Scarlett Lam, Terrorist Liaison Officer/Coordinator and Senior Manager Michael Kirchanski – SFMTA System Safety Charles Haletly – SFMTA Training Julie Kirschbaum – SFMTA Transit Barry Chown – SFMTA Rail Training Manager Randy Wong – SFMTA System Safety Kaitlyn Carmady – SFMTA Transit Operations

REFERENCE CRITERIA

1. CPUC General Order 164 Series
2. SFMTA System Safety Program Plan (SSPP), Revision 6, dated 2/11/2015
3. SFMTA Rail System Safety Program Plan (RSSPP), Revision 7, dated 2/11/2016
4. SFMTA Rail System Safety Program Plan (RSSPP), Revision 8, dated 2/15/2017
5. SFMTA Rail System Safety Program Plan (RSSPP), Revision 9, dated 2/15/2018
6. SFMTA System Security Plan SC.PL.008 (SSI)
7. Emergency Operations and Recovery Plan

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. Solicit an overview of the process for SFMTA's emergency planning, training, and drill/exercise program and specific examples of coordination with emergency response agencies on emergency planning and drill/exercises
2. 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?
3. Verify that all recommendations from the Emergency Drills for SFMTA are tracked unto completion.
4. Verify the process through which emergency responders and other outside agencies are involved in the SFMTA emergency planning.
5. Verify that drill outcomes and evaluations were incorporated into response plans and procedures as appropriate.
6. Determine whether SFMTA has held periodic Fire Life Safety meetings
7. 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 five (5) 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

FINDINGS AND RECOMMENDATIONS

Activities:

Staff met with SFMTA representatives responsible for the Emergency Management Program and determined the following:

1. SFMTA has a comprehensive training program appropriate to job functions. It is multi-layer, progressive, and is at several levels. There is SOP training, new employees, and monthly training (which started October 2017) for new promotions agency wide. Handy references to emergency reference guide was provided. Emergency Operations Center (EOC) & Department Operations Center (DOC) training is specialized and domain specific expertise are conducted for evaluators such as CPUC, Caltrain, SCVTA, or others

are invited as well. According to System Security Plan Chapter 10 (Emergency Preparedness and Response Training) and Chapter 11 (Training & Exercises), training is provided to transit operators, transit supervisors, and station agents. Full scale (multi agency) exercises may be attended by San Francisco Police Department (SFPD), San Francisco Fire Department (SFFD), Emergency Management Services, Department of Emergency Management, CPUC, CalOES, TSA, FBI, etc. ICS training is in accordance with NIMS requirements.

Staff reviewed the Emergency Response Guide dated 2014-2015 and the Human Resources training record log dated 10-16-2018. SFMTA has various departments that attend the Emergency Response Plan training, but not all employees attend. Operators for all modes of transportation do not receive annual training specific to emergency response. LRV4 Project conducted an Emergency Tabletop Training Exercise attended by SFPD, SFFD, and others and a sign-in sheet dated 9/26/2017 was reviewed by Staff. If a corrective action was necessary, then revisions are made accordingly. SFMTA reports no recommendations were necessary for previous three years of LRV-4 tabletops exercises. All the drills have post meetings and after-action meetings to discuss lessons learned, issues encountered, etc. SFMTA also provided the Emergency Response Guide – dated 2014-2015 for Staff review. No exceptions were noted.

2. SFMTA presented a spreadsheet identifying all drills performed. Staff reviewed the following drills:
   - November 6, 2016 - SFMTA Subway Tunnel Fire/Smoke Full Scale Exercise (Embarcadero Station). Sign-in-sheet reviewed (Players, Actors/Passengers, Evaluators, Observers, OCC, Transit employees, etc.) and Staff found the sign-in-sheet did not have all participant signatures due to attendees coming in from different locations. Initial Planning Conference (September 27, 2016) and Final Planning Conference Meeting (November 1, 2016) was attended by Bay Area Rapid Transit (BART) Police Department and OCC and were also a part of this exercise. A BART fire liaison participates in this exercise. SFPD, SFFD, TSA, City College, VTA, EMS, and Reserve also attended. Approximately 120 individuals from 7 agencies attended the exercise. The After Action/Improvement Plan Conference meeting occurred on November 9, 2016 and an After-Action Report Summary dated November 16, 2016 identified actions. Two items required immediate attention, a meeting scheduled on 12/16/2016 with SFFD, etc. to discuss the issues, and the two items were completed. SFMTA updated their Subway Ventilation Fans Procedure R.OC.PR.017 revision #12 effective date 7/19/17 was a result of concerns raised after the full-scale exercise related to the subway. Evaluator notes were documented. Staff reviewed the observation notes log that was provided and noted that some of the items were only comments and no corrective action or follow-up was required.

- November 12, 2017 – Subway Tunnel Fire (FSE) file which contained conferences for the initial planning (August 30, 2017 & September 16, 2017), mid-term planning (October 20, 2017), and final planning (late-October to early November 1, 2017) phases. Sign-in sheets documented each conference and the file also contained the Evaluator Forms and comments/internal emails (11-13-2017, 11-15-2017) received from the After Action/Improvement Plan Conference (dated 11-13-2017). The information is entered and maintained in a Subway Fire Exercise Evaluation Notes database by Terrorist Liaison Officer/Coordinator and Senior Manager. The database list recommendations, corrective action status, notes, SFMTA lead, Target date for completion, Date Completed, Deviation, Count and Input. Staff found five records (#417) interoperability, (#435) which is an exercise design, (#446) interoperability for new radio system, (#450) which is an ICS recommendation for Standard Operating Procedure (SOP), and (#453) interoperability are in-progress remain open.

- August 10, 2018 – MUNI Bus Hijack exercise was performed as part of the MUNI bus EA/Hijack Exploratory Study to evaluate the effectiveness of Emergency Alarm (EA) response by Transit Management Center (TMC). This was a MUNI only exercise and there was no outside agencies participation. Planning meetings were held for operational preparedness. An after-action report was generated and there is one open CAP dealing with radio clarity to be addressed with the MUNI Bus Procurement of new radios.

3. See above (2) for database list.
4. See (2) above for pre-drill planning conferences invitations.
5. No changes were made to SOP except for one from 2016 which has been incorporated.
6. SFMTA does not have Fire Life Safety Committee meetings since it's not required by their SSPP.
7. a. Initial training occurs for LRV4 vehicle project in the tunnel/surface street operations. SOPs exist for the train operators (T/O's) for one-time training. Staff reviewed the T/O training syllabus documents, however the street running LRV's do not have a specific emergency training program. The subway running LRV's have specific training, OCC Rail Controllers training is conducted biannually.
   Staff reviewed the following Transit Supervisors (Class 9139) Test for Emergency Procedures:
   - ID 428 dated 1/12/18
   - ID 438 dated 3/19/18
   - ID 435 dated 3/19/18
   - ID 910 dated 3/19/18
   - ID 437 dated 3/19/18

   Staff reviewed the following Train Operators tests for emergency procedures:
   - ID 31447 recertification dated 7/24/16 and 9/12/18

- ID 173150 first certification dated 10/6/17
- ID 45916 first certification dated 5/26/17 and return to duty recertification 5/11/18

No exceptions were noted.

b. Please see (1) above.
c. Please see Safety Checklist 16-A.

Findings:
None

Comments:
None

Recommendations:
None

2018 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR SAN FRANCISCO MUNICIPAL TRANSPORTATION AGENCY (SFMTA)

Checklist No.	**12**	**Element**	**Internal Safety Audits/Reviews**
Time	9:30 am	**Location**	1 SVN, 6th floor System Safety Conference Room
Date of Audit	September 26, 2018	**Department(s)**	Safety Division
Auditors/ Inspectors	Steve Espinal Yan Solopov Patrick Donnelly	**Persons Contacted**	Fred Orantes, Transportation Safety Specialist - Lead Michael Kirchanski, Deputy Chief Safety Officer Randy Wong, Transportation Safety Specialist

REFERENCE CRITERIA

1. CPUC General Order 164 Series
2. SFMTA System Safety Program Plan (SSPP), Revision 6, dated 2/11/2015
3. SFMTA Rail System Safety Program Plan (RSSPP), Revision 7, dated 2/11/2016
4. SFMTA Rail System Safety Program Plan (RSSPP), Revision 8, dated 2/15/2017
5. SFMTA Rail System Safety Program Plan (RSSPP), Revision 9, dated 2/15/2018
6. SFMTA Internal Safety Audit Program, SY.PR.036
7. SFMTA's Audit Schedule 2016-2018

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/E.
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 involved SFMTA departments, the safety-related activities addressed, the reference criteria for the audit, and notes to support findings and recommendations.

5. Determine whether the ISAs adequately address interdepartmental and interagency communication issues, and whether or not SFMTA has a process for addressing and overcoming departments' non-responsiveness and failures to implement audit recommendations.
6. Determine how expertise for auditing specific functions is evaluated, and how personnel are assigned per the SSPP to ensure ISA quality. An example of a function is signal inspection.
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:

Staff interviewed SFMTA representatives involved in the Internal Safety Audits (ISA) Program, reviewed supporting documents, and determined the following:

1. Every year on or before February 15th, SFMTA submits the three-year ISA schedule along with the annual report to the CPUC as required per GO 164. If there are any changes to the ISA schedule, then CPUC representative gets a revised schedule via email from SFMTA. The SFMTA ISA program procedure was recently revised to update the process regarding future auditing of different departments such as Wayside (Signals, Track, Overhead Catenary, Substation, Facilities, etc.), Vehicles, Training, and tracking Corrective Action Plans (CAPs) from current Transit Safe database to Intelex.
2. SFMTA provided Staff with ISA schedule for CYs 2015, 2016, and 2017. SFMTA are conducting ISAs for all 21 SSPP elements within the three-year cycle and trying to distribute the areas and elements evenly related to Maintenance, Inspection, and training audits for various departments. There was limited access for SFMTA personal to conduct the scheduled audits as per the three-year schedule since a lot of CAPs were outstanding last year. Some audits from 2017 were not conducted and are due to be conducted through October-December 2018 timeframe. CPUC designated representative was notified of this change per SFMTA.
3. SFMTA provided emails showing 30 days in advance notices were sent to CPUC representative as required:
    - ISA checklist related to Metro Rail Operations dated November 7, 2016.
    - ISA checklist related to Training Operations dated January 24, 2017.
    - ISA checklists related to Accident Investigation and Internal Safety Review Program dated February 21, 2018.

- ISA checklists related to Configuration Management and Safety Data Collection and Analysis dated February 16, 2018.

4. Staff reviewed following completed checklists to verify compliance:
    - SFMTA shared the recent ISA related to Safety Certification program via Intelex (Record #22). The audit was attended by CPUC as well. The checklist covered questions pertaining to GO 164 requirements.
    - Safety Data Collection and Analysis audit conducted on March 5, 2018. There were two Corrective Actions issued (Nos. 42 & 43).
    - Internal Safety Audit Program audit conducted on Mach 29, 2018. There was one corrective action issued (No. 44).
    - Track and Signal maintenance audits was conducted on July 18, 2016. There were multiple findings and corrective actions were issued.
5. The ISAs are conducted independently for each department including System Safety. System Safety department addresses and follows up with other departments on all open corrective action items. During our interview, it was noted that there were many items on the corrective actions log that should have been closed in CY 2016 and 2017, but these items are still OPEN. On further questioning them, Staff was notified that some other departments like Transit Operations would not communicate in a timely manner, thus causing delays in closing the corrective actions.
6. Specific expertise for auditing track or signal is done by reviewing the procedures, reference criteria's, and preparing for the audits in advance. SFMTA may get help from CPUC or other outside party to conduct the audit if needed. The auditors have adequate background in maintenance and inspections related to rail.
7. Staff reviewed the following to verify compliance:
    - SFMTA Director of Transportation compliance letter refencing SSPP and ISA dated February 15, 2018. CPUC letter dated August 30, 2018 using checklist to review and approve ISA report for CY 2017.
    - SFMTA Director of Transportation compliance letter refencing SSPP and ISA dated February 15, 2017. CPUC letter dated April 7, 2017 using checklist to review and approve ISA report for CY 2016.
    - SFMTA Director of Transportation compliance letter refencing SSPP and ISA dated February 16, 2016. CPUC letter dated May 19, 2016 using checklist to review and approve ISA report for CY 2015.
8. SFMTA shared a Corrective Action Plan (CAP) log with Staff showing current overall ISA CAP status. SFMTA tracks these CAPs to closure. SFMTA currently has approximately 82 CAPs open from CY 2016-2018. Example: TransitSafe CAP System ID 6813 has been open since April 2017. SFMTA responsible departments for providing supporting documents for individual CAPs are not providing them to System Safety for review and approval in a timely manner.

<u>Findings:</u>

1. SY.PR.036 revised procedure section 4.9.1 CAPs and Senior Management Safety Committee (SMSC) Referral has not yet been implemented. SFMTA has failed to conduct Senior Management Safety Committee meetings as required to review old CAPs from 2016-2018 and resolve them in a timely manner.
2. SFMTA needs to close out CAPs in a timely manner by providing supporting documentation for each individual CAP to SFMTA System Safety department. Refer SY.PR.036 revised procedure section 4.9.2 CAP Resolution.

Comments:

1. SFMTA System Safety auditors are experiencing some delays in communications directly with Transit Operations department trying to conduct the audits. All SFMTA departments need to cooperate with the audit team and provide support during the audit and all follow-up on corrective action plan closeout meetings in a timely manner.

Recommendations:

1. SFMTA should adhere to its procedure SY.PR.036 sections 4.9.1 and 4.9.2.

2018 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR SAN FRANCISCO MUNICIPAL TRANSPORTATION AGENCY (SFMTA)

Checklist No.	**13-A**	**Element**	**Rules Compliance: Observation and Enforcement**
Time	9:00 am to 5:00 p.m.	**Location**	•Meeting will begin at 1455 Market Street, 7th floor Main Conference Room 1SVN • OCC for records review • Green Metro Training records review • 700 Pennsylvania MOW records review
Date of Audit	September 26, 2018	**Department(s)**	Safety Division Transit Services Transit Management OCC Transit Management Rail Vehicle Maintenance Cable Car Maintenance
Auditors/ Inspectors	Michael Rose Debbie Dziadzio Richard Fernandez	**Persons Contacted**	Julie Kirschbaum Chief Transportation Officer Ron Forrest Senior Operations Manager Jeff Conley Safety Division Chris Ramirez Operations Manager Lanair Haynes Operations Manager Eric Wu Maintenance Training Berry Chown Rail Training Manager Oliver Gajda Transit Planner

REFERENCE CRITERIA

1. CPUC General Order 164 Series
2. CPUC General Order 172
3. SFMTA System Safety Program Plan (SSPP), Revision 6, dated 2/11/2015
4. SFMTA Rail System Safety Program Plan (RSSPP), Revision 7, dated 2/11/2016
5. SFMTA Rail System Safety Program Plan (RSSPP), Revision 8, dated 2/15/2017
6. SFMTA Rail System Safety Program Plan (RSSPP), Revision 9, dated 2/15/2018
7. SFMTA Rail Rule Book, Revised: September 2015 and Updated June 2017
8. Rail Vehicle Transit Operator Compliance Program, TN.MO.PR.019
9. OCC Compliance Check Program R.OC.PR.028
10. SFMTA Efficiency Testing Plan
11. 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:

1. CPUC Staff reviewed TMC Compliance Check Program (R.OC.PR.028 eff date 7/19/17) and learned that all OCC Controllers receive an Annual Compliance check. OCC Controllers are also subject to daily compliance checks during the course of their duties. CPUC Staff reviewed SFMTA Efficiency Testing Plan including:

    OCC Controllers reviewed:
    #173150
    #45916
    #31447

    LRV Operators reviewed:
    #3671 #1628
    #3893 #1164
    #3896 #3489
    #1928 #3559
    All compliance and evaluations were performed in the mandated timeline.

2. Of the samples selected no employees were found in violation of rules or policies, however the procedures identify process for when that occurs.

3. CPUC Staff viewed efficiency testing conducted by SFMTA System Safety under the 'SFMTA Efficiency Testing Plan'. The Efficiency Testing Plan calls for testing to be conducted on a monthly basis at random periods and should be conducted on weekends, holidays, and throughout a 24-hr period. CPUC Staff viewed efficiency records from Oct. 2017, July 2016, and April 2015. CPUC Staff learned that System Safety conducts tests on a major safety subjects such as, speed though a known switch that Operators historically traverse at excessive speed. System Safety found 10 such violations at one location, on one day, and within a 2-hr period. CPUC Staff found all compliance checks follow the same criteria as just described with multiple infractions and a large task to re-test all employees who violated the rule under the same criteria. System Safety has not completed any re-testing as outlined in the Efficiency Testing Plan to any failures CPUC Staff viewed.

Findings:

1. CPUC Staff reviewed Rail Vehicle Transit Operator Compliance Program (TN.MO.PR.019 eff date 7/1/18). Section 6 relates to Records and their retention and advises to maintain all hard and/or electronic files for compliance checks for at least two (2) years. CPUC General Order 143-B, Section 14.03, that mandates record retention for 4 years.

2. System Safety is not following the Efficiency Testing Plan with monthly tests and are not conducting re-testing on failures as per the Efficiency Testing Plan outline.

3. SFMTA Efficiency Testing Plan is lacking a document control or revision number.

Comments:

None

Recommendations:

1. Ensure all efficiency and compliance test records, both hard and soft copies, are maintained for a minimum of 4 years.

2. Ensure SFMTA System Safety complies with the Efficiency Testing Plan and ensure efficiency tests are conducted as outlined in a monthly basis with proper follow up re-testing.

3. Ensure SFMTA Efficiency Testing Plan go through the process as outlined in SFMTA SOP Development and Approval A.PR.002 to receive an official documentation number.

2018 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR SAN FRANCISCO MUNICIPAL TRANSPORTATION AGENCY (SFMTA)

Checklist No.	**13-B**	**Element**	**Rules Compliance: Operations Safety Compliance**
Time	CPUC will randomly audit this section during the two weeks	**Location**	MME, Green, Cameron Beach, 700 Pennsylvania, OHL, random field locations include observations of vehicles in check
Date of Audit	CPUC will randomly audit this section during the two weeks	**Department(s)**	Safety Division, Rail Vehicle Operations & Maintenance, Cable Car Operations & Maintenance, OCC, Maintenance of Way (Track, OHL, Signals)
Auditors/ Inspectors	Michael Rose Debbie Dziadzio Richard Fernandez	**Persons Contacted**	Michael Kirchanski - System Safety Randall Wong – Transportation Safety Specialist

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 System Safety Program Plan (RSSPP), Revision 7, dated 2/11/2016
5. SFMTA Rail System Safety Program Plan (RSSPP), Revision 8, dated 2/15/2017
6. SFMTA Rail System Safety Program Plan (RSSPP), Revision 9, dated 2/15/2018
7. SFMTA Rail Rule Book, Revised: September 2015 and Updated June 2017
8. Rail Vehicle Transit Operator Compliance Program, TN.MO.PR.019
9. OCC Compliance Check Program, R.OC.PR.028
10. 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 accidents/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 during the same.

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 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 personnel 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, 10 Rail Vehicle maintenance personnel, 10 Cable car maintenance personnel, and 10 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:
CPUC Staff conducted field observations from 09/24/2018 to 10/04/2018 throughout the SFMTA System. CPUC Staff rode multiple rail lines and rail vehicle types that included LRV's on the K, L, M, N, and T Lines, Historical Cars on the E and F Lines, and the Powell/Hyde Cable Cars. CPUC Staff interviewed 60+ Operators, Gripmen, and Conductors throughout the System to ascertain their knowledge of SFMTA rules and procedures. CPUC Staff visited the Operations Control Center (OCC) and interviewed Train Controllers and Transit Operations Specialists.

Findings:
1. While conducting field observations, CPUC Staff observed SFMTA Operators on the K, L, M, N, and T Lines not sounding the gong/bell in accordance to SFMTA Rail Rule Book, Rule 5.2.1. When CPUC Staff interviewed the Operator, it was determined that SFMTA personnel had the Rule of the Week that specifically addressed Rule 5.2.1 in their possession. Train ID and Operator information was recorded then given to SFMTA Operations Supervisor for further assessment.
2. While conducting field observations at the Turntable located at Hyde St and Beach St, CPUC Staff observed two Conductors using their Personal Electronic Device (PED) in violation of CPUC General Order 172. SFMTA System Safety was notified, and information was turned over to SFMTA Transportation Supervisor on sight.
3. While conducting field observations on the SFMTA F Line at the Jones St and Beach St (#135184) and the SFMTA Embarcadero Station (#16692), CPUC Staff observed Operators leaving their Historical Cars and PCC's unsecured in violation of SFMTA Rail Rule Book, Rule 4.24.6.
4. CPUC Staff observed multiple SFMTA Conductors sitting in the Cable-Car passenger compartment while the Gripmen operated the Cable-Cars down the Hyde St and Beach St decline and then onto the turntable. Per SFMTA Rail Rule Book, Rule 10.30.1
5. At Embarcadero Station, CPUC Staff and SFMTA System Safety observed three infractions of SFMTA Rules 4.24.5 and 4.24.6., unattended rail vehicles. In each occurrence, SFMTA Operators exited the LRV and leaving all doors open without proper relief. This could allow the public to walk from the platform, onto the LRV, and into the unattended cab with no obstruction.

Comments:
1. CPUC Staff visited MME yard on multiple days and found lead switches lined into blue flags where men were working on equipment. Blue flags do not protect men or equipment; they are a warning. The lead switch lined away from the rail men or equipment are working is proper protection.
2. CPUC Staff observed a number of CPUC General Orders and SFMTA Rule violations throughout the SFMTA System. CPUC Staff requested SFMTA System Safety and SFMTA

Operations join the field observations so they could observe and verify the noncompliant operating findings.

3. CPUC Staff noted the SFMTA Operators were not open to coaching or discussing rules. While speaking with an SFMTA Operator to give him positive feedback for a job well done, the operator was defensive, agitated, and disrespectful. CPUC Staff found this to be the case with most of the Operators, Gripmen, and Conductors throughout the SFMTA System.

Recommendations:

1. SFMTA Transportation Supervisors should be conducting efficiency tests to ensure Operators are familiar with and following SFMTA Rules as outlined in the SFMTA Rail Rule Book. Efficiency Tests should be forwarded to SFMTA System Safety so that and negative trends can be tracked. This would allow SFMTA System Safety to compile the data and suggest improvements in either Training or Operation Divisions.
2. SFMTA should enforce General Order 172 and SFMTA Rule 2.15.4 throughout the SFMTA System. PED violations are a systemic problem on SFMTA and the numerous violations should be addressed at the top levels of Management.
3. SFMTA should enforce SFMTA Rule 4.24.6 throughout the system concerning unsecured rail vehicles. Operators who were interviewed concerning SFMTA Rule 4.24.6 were either unaware of the rule or seemed insouciant to the reason the rule exists in the first place.
4. SFMTA Cable-Car Conductors should be attentive to their respective duties and SFMTA Management should enforce SFMTA Rule 10.30.1.
5. SFMTA Transportation Supervisors should ensure SFMTA Operators are not leaving their LRV unless properly relieved and enforce SFMTA Rules 4.24.5 and 4.24.6.

2018 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	10:00 a.m. to 5:00 p.m.	**Location**	Site visit MME, 700 Pennsylvania, and Scott
Date of Audit	September 27, 2018	**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	Michael Rose Debbie Dziadzio Richard Fernandez	**Persons Contacted**	Alvino Garcia Transportation Safety Specialist Miguel Contreras Acting Division Manager Julie Kirschblaum Chief Transportation Officer Leda Rozien Sr. Operations Manager Oliver Gajda Transit Planner

REFERENCE CRITERIA

1. CPUC General Order 164 Series
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 System Safety Program Plan (RSSPP), Revision 7, dated 2/11/2016
5. SFMTA Rail System Safety Program Plan (RSSPP), Revision 8, dated 2/15/2017
6. SFMTA Rail System Safety Program Plan (RSSPP), Revision 9, dated 2/15/2018
7. SFMTA Rail Rule Book, Revised: September 2015 and Updated June 2017
8. 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

Activities:

CPUC Staff viewed hours of service, time card and/or payroll records of SFMTA Controllers, Operators, Cable Car, and MRO's. SFMTA Personnel discussed in detail the Operators and Cable Car Employee's cycle of a shift, going on duty, relief, and final off duty time. When an Operator or Cable Car employee hits the 12-hr mark of his/her shift, they are to stop and wait for a relief employee to take over duties.

CPUC Staff reviewed the time period of October, November, and December of 2015, 2016, 2017 and June, July, August of 2018 to ensure compliance to CPUC General Order 143-B, Section 12.04, of each group below:

38 Operators
14 Cable-Car
2 Revenue Vehicle Maintenance (unrestricted) personnel:
9 MROs (Line Supervisors)
3 Track Maintenance
3 Signals Maintenance

Findings:

1. CPUC Staff found Central Control Operations Division Time Records are missing 'Approver Signature' on multiple documents. The 'Approver Signature' verifies the Controller time record for each week.

Comments:
None

Recommendations:
1. SFMTA should follow proper document instructions and fill out all required signature lines to verify legality of document control.

2018 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 am – 5:00 pm	**Location**	1 SVN 6th floor, System Safety Conference Room
Date of Audit	September 24, 2018	**Department(s)**	Transit Division Safety Division ISEC Capital Programs & Construction Maintenance Training Dept
Auditors/ Inspectors	Michael Rose Debbie Dziadzio Richard Fernandez	**Persons Contacted**	Siew-Chin CP&C Kaitlin Carmady Transit Planner Byan Ahmadzade Division Deputy CP&C Franklin B Johnson Safety Analyst Michael Kirchanski System Safety Manager Paul Lee Transportation Safety Specialist

REFERENCE CRITERIA

1. CPUC General Order 164 Series
2. CPUC General Order 143-B
3. SFMTA System Safety Program Plan (SSPP), Revision 6, dated 2/11/2015
4. SFMTA Rail System Safety Program Plan (RSSPP), Revision 7, dated 2/11/2016
5. SFMTA Rail System Safety Program Plan (RSSPP), Revision 8, dated 2/15/2017
6. SFMTA Rail System Safety Program Plan (RSSPP), Revision 9, dated 2/15/2018
7. Roadway Worker Protection Plan (RWP) SY.PL.003
8. Contractor Safety Program SY.PR.034
9. SFMTA Rail Rule Book, Revised: September 2015 and Updated June 2017

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. Verify that contractor training requirements are specified in contract documents.
3. 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.
4. SFMTA procedures require regular internal audits and inspections of construction sites to monitor compliance with its safety requirements.
5. 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.
6. The Safety Division, Industrial Safety and Environmental Compliance, and 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.
7. SFMTA's monitoring and enforcement activities are properly recorded, distributed, and filed.
8.

FINDINGS AND RECOMMENDATIONS

Activities:

1. CPUC Staff interviewed SFMTA Director of CP&C Division and reviewed three contracts to ensure that the SFMTA control documents clearly establish responsibilities and requirements for the contractor safety program.
2. Training and certification for contractor employees included in contract verbiage. Contracts include all SFMTA, State, and Federal rules and regulations, including procedures applicable to contractors and their employees.
3. #2, above satisfies the requirement that SFMTA is ultimately in charge of its system including contractors and their employees who must comply with all established safety rules and procedures. CPUC Staff also reviewed SFMTA Contractor Safety Program (SY.PR.034 effective date 7/14/14).

Contracts reviewed were:
#1307 Divide Feeder Circuit Carl 11 (5/18)
#1294 M-Ocean View Track Replacement Program 19th Avenue & Rossmoor Dr (12/16)
#1282R1 Twin Peaks Tunnel Trackway Improvement Project (2/18)

4.-7. CPUC Staff reviewed several job briefing sign-in sheets for the above listed contracts/jobs and inspection reports for M-Ocean View Track Replacement, Twin Peaks Tunnel Trackway Improvement Project, and Divide Feeder Circuit Carl 11. The inspection reports were generated by SFMTA System Safety (inspections and work site inspection compliance reports) and Capital Projects Daily Reports. Also included in the review were RWP UHC reports generated by SFMTA System Safety.

Findings:

1. SFMTA Industrial Safety is not conducting required visits to work zones per SFMTA Contractor Safety Program SFMTA SY.PR.034 Section 4.3 and 6.2. The Safety Analyst shall visit the work zone regularly during the project and determine if the contractor and his/her employees are complying with Cal OSHA regulations.

Comments:

The documents SFMTA System Safety sent via email to CPUC Staff after the meeting for Checklist 13-D contained (Samples of Safety Managers Inspection Reports 7/20/18, and Weekly Safety Meeting Record Sample 7/17/18). These samples have no document control showing if they originated from SFMTA or the Contractor. Furthermore, these documents have only abbreviations of the Individual's Title. The abbreviation of the Individual's Title shows no ownership of the document whether it is from SFMTA or the Contractor.

Recommendations:

1. SFMTA Industrial Safety must follow SFMTA Contractor Safety Program SY.PR.034 to ensure any contractor safety violations are mitigated.

2018 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	8:00 am – 5:00 pm	**Location**	1 South Van Ness, 3rd floor Civic Center Conference Room
Date of Audit	October 1, 2018	**Department(s)**	Transit Division Transit Management Transit Services Cable Car Division Safety Division
Auditors/ Inspectors	Michael Rose Debbie Dziadzio Richard Fernandez	**Persons Contacted**	Oliver Gajda – Transit Planner Michael Kirchanski – System Safety Manager Julie Kirschbaum – Chief Transportation Travis Richards – Transit Panner

REFERENCE CRITERIA

1. CPUC General Order 164 Series
2. CPUC General Order 143-B
3. SFMTA System Safety Program Plan (SSPP), Revision 6, dated 2/11/2015
4. SFMTA Rail System Safety Program Plan (RSSPP), Revision 7, dated 2/11/2016
5. SFMTA Rail System Safety Program Plan (RSSPP), Revision 8, dated 2/15/2017
6. SFMTA Rail System Safety Program Plan (RSSPP), Revision 9, dated 2/15/2018
7. SFMTA Rail Rule Book, Revised: September 2015 and Updated June 2017
8. Rail Vehicle Transit Operator Compliance Program, TN.MO.PR.019
9. Bulletins, Orders and Notices A.PR.003
10. SOP Development and Approval A. PR.002
11. 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, Rule Book, 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 were approved by the Chief Operating Officer with the concurrence of affected departments.
4. Operating Bulletins were 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. Do Safety Division representatives support any rules compliance activities?
12. Do 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

Activities:

1.-9. Staff met with SFMTA System Safety and SFMTA Operations to discuss the implementation process and deletion of operations rules and procedures, maintenance procedures, and bulletins. SFMTA Personnel presented CPUC Staff with SOP A.PR.002 and A.PR.003 along with the life cycle of SOP SY.PR.002. The document SOP SY.PR.002 was created for Cable Car Track Inspection and Maintenance, because of the string of derailments on the Cable Car lines. SFMTA Documentation showed the

review of rules and procedures of the working group, Rail Change Control Board Sign in Sheet, and Meeting Agenda along with emails to amend corrections and additions as needed before submission to SFMTA upper Management.

10.-13. CPUC Staff and SFMTA System Safety discussed their role in rule changes and the Hazard Management Process. SFMTA System Safety is included in the initial process of SFMTA General Notices, Division Bulletins and Rules. After implementation, SFMTA Operations and Maintenance send no further information to System Safety to track trends in safety and complete the Hazard Management Process.

Findings:

1. CPUC Staff visited SFMTA OCC at 355 Lenox Way and found that SFMTA General Notice Bulletins posted are not up to date and expired. The oldest General Notice posted is dated back to 2014.
2. CPUC Staff learned SFMTA System Safety is not notified from Operations or Maintenance Departments regarding the performance of rules checks, assessments, and testing that is done in the field.

Comments:

None

Recommendations:

1. SFMTA Supervision should follow SOP A.PR.003 and insure all General Notices, Division Bulletins, and Order Bulletins are up to date and ensure expired documents are removed.
2. SFMTA Operations and Maintenance should include System Safety in all performance of rules checks, assessments, and testing that is enforced in the field. This will allow SFMTA System Safety to properly track trends and conduct thorough Hazard Analysis.

2018 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	September 24, 2018	**Department(s)**	Safety Division Transit Services OCC
Auditors/ Inspectors	Michael Rose Debbie Dziadzio Richard Fernandez	**Persons Contacted**	Ron Forrest Senior Operations Manager Julie Kirschbaum Chief Transportation Officer Nancy Dock Transportation Safety Specialist Oliver Gajda Transit Planner Randall Wong Transportation Safety Specialist Berry Chown Rail Training Manager Velda Carr ATCS Instructor Chris Ramirez Operations Manager Greg Dorais Electronic Maintenance Tech

REFERENCE CRITERIA

1. CPUC General Order 164 Series
2. CPUC General Order 143-B
3. SFMTA Rail System Safety Program Plan (RSSPP), Revision 7, dated 2/11/2016
4. SFMTA Rail System Safety Program Plan (RSSPP), Revision 8, dated 2/15/2017
5. SFMTA Rail System Safety Program Plan (RSSPP), Revision 9, dated 2/15/2018
6. SFMTA Rail Rule Book, Revised: September 2015 and Updated June 2017
7. Rail Vehicle Transit Operator Compliance Program, TN.MO.PR.019
8. OCC Compliance Check Program R.OC.PR.028
9. OCC General Duties and Responsibilities R.OC.PR.001
10. 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 Control Center procedures and training 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 these are 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:

1. CPUC Staff interviewed SFMTA Personnel and was advised that the OCC Manual is reviewed and revised as necessary on an as needed basis. CPUC Staff then reviewed SFMTA SOP Development & Approval (A.PR.002 eff date 10/11/17), which describes the procedures for SOP initiation (any manager at any level may initiate development of an SOP) through Document Configuration Control (DCC) Manager, Rules and Procedures Working Group (RPWG), posting to On-Line SOP Library, Signed Document-Distribution, and removal of obsolete and/or expired SOPs.

2. CPUC Staff received minutes from the RPWG dated July 19, 2017 regarding revisions to 27 Transit Division SOPs, to confirm that the SOP Development & Approval guidelines were followed.

   CPUC Staff reviewed TMC General Duties and Responsibilities (R.OC.PR.001 eff date 7/19/17), OCC Activity Guidelines and Standards (R.OC.PR.002 eff date 5/12/11), and OCC Compliance Check Program (R.OC.PR.028 – will be referenced on Checklist 13-A).

3. CPUC Staff reviewed Daily Logs for January, February, and March 1st of 2016, 2017, and 2018. The Daily Logs are maintained electronically by SFMTA Controllers (in place of the referenced 'Unusual Occurrence Report' Logs).

4. SFMTA Personnel discussed the preventative and corrective maintenance practices recommended by SCADA Vender, General Electric. If a software update is required, General Electric sends a software update that must be manually downloaded since SCADA is a stand-alone system and not integrated into any online network. SFMTA Maintenance Tech conducts performance checks that occur twice a day to verify normal operations. GE maintains current back up hard drives in case of failure.

5. Staff reviewed documentation regarding the SCADA system and identified no concerns.

Findings:
None

Comments:
None

Recommendations:
None

2018 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. - 4 p.m.	**Location**	700 Pennsylvania, Main Conference Room
Date of Audit	October 9, 2018	**Department(s)**	Maintenance of Way, Motive Power, Facilities Maintenance, Overhead Lines, and Signals Maintenance
Auditors/ Inspectors	Adam Freeman James Matus Matt Ames	**Persons Contacted**	Melvyn Henry Michael Kirchanski Terrance Fahey

REFERENCE CRITERIA

1. CPUC General Order 164 Series
2. CPUC General Order 143-B
3. SFMTA System Safety Program Plan (SSPP), Revision 6, dated 2/11/2015
4. SFMTA Rail System Safety Program Plan (RSSPP), Revision 7, dated 2/11/2016
5. SFMTA Rail System Safety Program Plan (RSSPP), Revision 8, dated 2/15/2017
6. SFMTA Rail System Safety Program Plan (RSSPP), Revision 9, dated 2/15/2018
7. SFMTA Fire Protection System Inspection and Maintenance, W.BG.PR.014
8. Subway Emergency Telephone Preventive Maintenance, R.SM.PR.010
9. Subway Emergency Egress Door Inspection and Maintenance, W.BG.PR.008
10. Subway Emergency Ventilation Fan System Inspection & Maintenance, W.BG.PR.006
11. Subway Station Emergency Egress Lighting Inspection and Maintenance, W.BG.PR.008
12. Facilities Emergency Response, R.OC.PR.010
13. 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 sampling 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 and noted discrepancies were corrected in a timely manner.

FINDINGS AND RECOMMENDATIONS

Activities:

CPUC staff interviewed SFMTA representatives and reviewed a random sampling of facility and equipment records for the past 3 years to determine whether the required inspections were performed as per supporting reference criteria and inspections were properly documented and noted, discrepancies were corrected in a timely manner, potential hazards found during inspections were tracked, from recommendation, to corrective action plans, to completion.

Reviewed hard copies of SFMTA's newest SOPs which are still in draft form (which require signatures.) The SOP for e-ventilation had different review dates on two different pages. SFMTA assumed the January 2018 date referred to the date the draft was started. It looks like it's been in draft form for about a year.

Reviewed facilities 2017 and 2018 Fire protection equipment/systems monthly, quarterly, annual inspections; Fire Alarm 2018 binder, the months of April, May, and June hard copies were missing; 5-year inspection was completed in 2015.

Activity interview notes:

1) EAMS (Enterprise Asset Management System) PM completion goal is 80% each month. SOP's require 100% but unable to fill open positions to be able to complete 100% of PMs. Reviewed work order status months - March - December 2017.
2) Completed inspections (PMs) were properly documented in EAMS. Incomplete inspections remain as Open Work Orders in EAMS.

   If a finding/deficiency/hazard is identified during a PM, a 'No' checkbox will be indicated, resulting in the generation of a corrective/follow-up work order. For example: An Annual PM was conducted of a water boiler on 12/4/17 at 425 Geneva Ave, a 'No' checkbox was filled, and a corrective work order was created (WO # 212732). This work order was completed on 12/29/17. Most items found during a PM are corrected within the PM time frame; these items are noted in the 'Comment' section of the work order within EAMS.

Open PM's are reviewed weekly within EAMS. 1st Quarter 2017 Facility Maintenance Work Control (FMWC) transitioned from MP2 software to EAMS software. EAMS is used to track PMs through the work order process. Maintenance information migrated to EAMs (Enterprise Asset Management) a year and a half ago (March 2017). EAMs tracks the PM (preventive maintenance), which is based off SFMTA SOPs, which is based off their RSSPP.

3) Potential Hazards are tracked in EAMS. Items found during PM that are not covered by the PM checklist will create work order request, which the FMWC will address – i.e.: forced entry, vandalism. Work order requests typically originate from a Security Agent, Metro Control, 311 Hotline, the Engineering department, or the public. Work orders are assigned priority codes – numerical scale where 1=emergency, 2=urgent, 3=routine, 4=low, 5=unknown. There is no timeframe assigned to priority codes, therefore no expected completion metric to track.
4) Hazards found during PMs were tracked until completion or are being tracked with EAMS. Safety is not aware of hazards or involved in the process of mitigating identified hazards. Safety might become aware of hazards during the Internal Safety Audit process or during Safety department daily activities. If an identified hazard requires the configuration control process to address, Safety is involved then.
5) No CAPs have been created in the past three years. An example of an item that required a CAP was the LRV PM Fall Protection facility improvements.

Findings:

1. Facility and equipment inspections were not performed as per supporting reference criteria.

No records were available to ensure the monthly and quarterly fire protection inspections are being completed as required by SFMTA Fire Protection System Inspection and Maintenance procedure # W.BG.PR.014.

2. SOP's were found to be in draft form for an extended period, or beyond next specified review dates.

Comments:

To make a priority code timeframe, define prioritization levels (so no one rates something urgent that is actually minor), and implement a tracking mechanism that's in compliance with MUNI's own rating procedure. Evaluate if any of the PM's are excessive.

EAMS 'Priority Codes' should have a timeframe expectation; this timeframe expectation should be utilized for tracking of open Corrective/Follow-up Work Orders.

CPUC observed in EAMs that hundreds of work orders were awaiting supervisor review. MUNI explained that work orders remain open also because they are waiting on vendors.

Recommendations:
1. SFMTA should perform Preventative Maintenance (PM) inspections per supporting reference material (SOPs). PM inspections should be completed in the time frame specified by the SOP or manufacturers' recommendations.

2. SFMTA should review, update, and approve SOP's within accordance with SFMTA policy and procedures.

2018 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	9-12-18	**Department(s)**	Maintenance of Way, Motive Power, Facilities Maintenance, Overhead Lines and Signals Department
Auditors/ Inspectors	Shane Roberson Salvador Herrera	**Persons Contacted**	Melvyn Henry Michael Kirchanski Terrance Fahey Charles Drane Leo Martinez Michael Johnson Nancy Dock

REFERENCE CRITERIA

1. CPUC General Order 164 Series
2. CPUC General Order 143-B
3. SFMTA System Safety Program Plan (SSPP), Revision 6, dated 2/11/2015
4. SFMTA Rail System Safety Program Plan (RSSPP), Revision 7, dated 2/11/2016
5. SFMTA Rail System Safety Program Plan (RSSPP), Revision 8, dated 2/15/2017
6. SFMTA Rail System Safety Program Plan (RSSPP), Revision 9, dated 2/15/2018
7. SFMTA Fire Protection System Inspection and Maintenance, W.BG.PR.014
8. Subway Emergency Telephone Preventive Maintenance, R.SM.PR.010
9. Subway Emergency Egress Door Inspection and Maintenance, W.BG.PR.008
10. Subway Emergency Ventilation Fan System Inspection & Maintenance, W.BG.PR.006
11. Subway Station Emergency Egress Lighting Inspection and Maintenance, W.BG.PR.008
12. Facilities Incident Response, R.OC.PR.010
13. 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 for the last 3 years 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:

CPUC reviewed records for:

W.BG.PR.014 fire protection system inspection and maintenance.

R.SM.PR.010 subway emergency telephone preventive maintenance.

W.BG.PR.008 subway emergency egress door inspection and maintenance.

W.BG.PR.06 emergency ventilation fan system inspection and maintenance.

R.OC.PR.010 facilities incident response.

R.SM.PR.021 battery backup power subway signaling system.

R.SM.PR.010 subway emergency telephone preventive maintenance.

11. No defects noted

W.BG.PR.06 emergency ventilation fan system inspection and maintenance.

12. No defects noted

R.OC.PR.010 facilities incident response.

13. No defects noted.

Findings:

1. W.BG.PR.008 subway emergency egress door inspection and maintenance.
   14. CPUC noted at Montgomery Station 2, multiple inspection outside of the 4-week intervals prescribed in SOP. Dates are 5-4-18 to 7-9-18 and 7-10-18 to 8-21-18 for egress door inspections.
   15. CPUC noted at Powell, Montgomery, and Castro with multiple PM's beyond the 4-week intervals within the previous 3 years. Example: Montgomery 7-8-17 to 9-6-17, Powell 5-21-18 to 7-27-18.
2. R.SM.PR.021 battery backup power subway signaling system.

16. CPUC noted at Van Ness bank #2 on 11-5-17 was noted by SFMTA inspectors was bad and in need of replacement.

Comments:
None

Recommendations:
1. W.BG.PR.008 subway emergency egress door inspection and maintenance.
    17. SFMTA shall perform PMs within 4-week schedule.
2. R.SM.PR.021 battery backup power subway signaling system.
    18. SFMTA shall streamline procurement process so vital equipment is replaced without undue delay.

2018 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 12:00 PM	**Location**	700 Pennsylvania, San Francisco
Date of Audit	September 18, 2018	**Department(s)**	Capital Programs and Project (CP&C) Safety Division Maintenance of Way (MOW)
Auditors/ Inspectors	Jamie Lau Matthew Ames	**Persons Contacted**	Fred Orantes – System Safety Randall Wong – System Safety Kaitlin Carmady – Transit Operation (observer) Terrance Fahey –MOW Manager Siew-Chin Yeong – CP&C Director Matthew Fong – CP&C Civil Engineer

REFERENCE CRITERIA

1. CPUC General Order 164 Series
2. CPUC General Order 143-B
3. SFMTA System Safety Program Plan (SSPP), Revision 6, dated 2/11/2015
4. SFMTA Rail System Safety Program Plan (RSSPP), Revision 7, dated 2/11/2016
5. SFMTA Rail System Safety Program Plan (RSSPP), Revision 8, dated 2/15/2017
6. SFMTA Rail System Safety Program Plan (RSSPP), Revision 9, dated 2/15/2018
7. 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.
8. Records for Twin Peaks Tunnel, Sunset Tunnel, Muni Market Street Tunnel, 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 structure 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.

4. The System Safety Department is aware of all safety hazards pertaining to civil structures.

FINDINGS AND RECOMMENDATIONS

Activities:

Staff inquired CP&C and MOW personnel on their structural inventory. SFMTA owns and maintains Twin Peaks Tunnel, Sunset Tunnel, and Metro Tunnel. SFMTA traverses over 4th Street Bridge, Islais Creek Bridge, Third Street/ US 101 Overpass, San Jose/I280 Overpass, Highland Bridge and Richland Bridge. The bridges and overpasses are owned and maintained by either San Francisco Public Works Department (SFPWD) or Caltrans.

1. Staff inquired CP&C and MOW personnel about the inspection activities done by RTA. SFMTA recently conducted a tunnel inspection of the tunnels in 2017, and produced an inspection report dated January 2018; the previous inspection w conducted in 2011. The inspection reports include structure deficiency findings and recommended repairs; however, they did not have scheduled completion dates for each repair.

   SFMTA did not participate in inspections of bridges owned by SFPWD and Caltrans. MOW personnel indicated SFPWD and Caltrans do not inform SFMTA of their inspections and findings, therefore is not aware of the frequency and findings of those inspections.

   Staff noted SFMTA does not have a structural inspections and maintenance standard operating procedure (SOP) being referenced on its RSSPP. Hence, Staff did not have a reference to verify if the structure inspections were performed accordingly by CalTrans/BART/SFMTA.

2. Staff reviewed the 2018 inspection report. The reports have itemized findings and rating. The executive summary highlights the "Type I" deficiencies needing prioritized attention. According to a follow-up phone call between Staff and Mr. Matthew Fong on September 24, 2018, the Type I deficiencies identified in the 2018 report currently have the following status:
   - Twin Peak Tunnel: all four hazards corrected.
   - Sunset Tunnel: one hazard was not yet corrected or have assigned a contract.
   - Metro Tunnel: the extent of crack and source of water intrusion needs to be investigated. No contract assigned yet.

Staff noted the repair status of Type I deficiencies found in the 2018 report were not being tracked on a working document (such as an Excel matrix). Staff only learned about the status of the aforementioned deficiencies based on a phone dialogue with Mr. Matthew Fong on September 24, 2018.

SFMTA does not have inspection records on bridge and aerial structures owned by SFPWD/Caltrans. Staff was not able to review records pertaining to those structures. MOW agreed that there is a lack of communication between SFMTA and SFPWD/Caltrans regarding bridge and aerial structures inspections and maintenance.

Staff was not able to verify if structure deficiencies were corrected in a timely manner, as SFMTA does not have a structure maintenance SOP prescribing a repair timeframe for different types of deficiencies or has assigned a scheduled completion date for each identified deficiency.

3. Staff reviewed CP&C's tracking matrix for repair of structure deficiencies found in the 2011 and earlier tunnel inspections. The matrices show repair status but not all items have assigned responsible party for repairing the deficiencies. Staff found the matrices have numerous open items dated as early as 2002. All open items are Type II or less deficiencies (Type I being most severe). However, the matrices do not contain new deficiencies found in the 2018 report.

4. Staff inquired to System Safety personnel whether they are aware of the safety hazards found from the 2018 tunnel inspection. System Safety and CP&C personnel indicated there is not a regular communication between the two departments regarding tunnel inspections and repairs; therefore, they are unaware of the safety hazards pertaining to all civil structure safety hazards.

<u>Findings:</u>

1. According to American Public Transportation Association (APTA) Standard of Rail Transit Fixed Structures Inspection and Maintenance (RT-FS-S-001-02), tunnels should be inspected at an interval of 24 months. Staff noted the interval between the last two tunnel inspection was about 6 years. SFMTA did not follow industry standard on inspecting its tunnels.

   For bridge and aerial structures under SFPWD/Caltrans jurisdiction, SFMTA was not knowledgeable of their inspection cycles and findings, as SFMTA does not have inspection records from the authorities.

2. SFMTA documented findings on the tunnel inspection reports, however, no scheduled completion dates were assigned. Therefore, staff was not able to verify if discrepancies were corrected in a timely manner.

   Since SFMTA does not have inspection records of bridge and aerial structures from SFDPW/Caltrans, Staff is not able to verify if the bridge and aerial structural discrepancies were corrected in a timely manner.

3. For the repairs that fall under CP&C, Mr. Matthew Fong uses a matrix tracking the repair status of identified structure deficiencies, but they are not assigned a scheduled completion date. Also, the matrix does not have the deficiencies findings from the latest 2018 report. Mr. Fong indicated all structural deficiencies repairs should be tracked by MOW; Mr. Terrance Fahey of MOW indicated he does not have a tracking mechanism. However, Staff learned Mr. Fong somehow tracks all repair items, but he does not always receive notifications when work is being done by MOW. The matrices are also not being shared outside of CP&C.

   Staff found SFMTA did not have a proper tracking mechanism that tracks all structure deficiencies found during an inspection until resolution.

4. Staff noted System Safety Department is not aware of safety hazards found from the 2018 tunnel inspection.

Comments:
None.

Recommendations:

1. Using but not limited to AREMA, FRA 49 CFR 237, APTA RT-FS-S-001-02 Rev 1 and FHWA National Highway and Rail Transit Tunnel Inspection Manual (2005 Edition) as standard industry guidelines, create a structures inspection and maintenance SOP, and reference the SOP in Section 15 of RSSPP. The SOP should include but not limited to the following:
   a) A process to obtain outside agency inspection dates, results of the inspection, and action plan for correcting noted conditions found during inspections;
   b) A process to communicate with outside agencies regarding structures during emergencies and SFMTA asset issues related to these structures;
   c) A process to ensure that SFMTA owned structure inspections occur in the specified time frame;
   d) A process to communicate potential hazards and noted conditions to the Safety Department;

e) A process to track noted conditions found during inspections until corrected;
f) A process to ensure that noted conditions found during inspections are corrected within the timeframe specified by the responsible Engineer.

2. Create a structural inspection and maintenance database per APTA RT-FS-S-001-02 Rev 1, Section 3.2.1 and 4.4. Assign designated personnel to maintain this database.
3. Complete all Type I deficiencies from tunnel inspections with open status repair as soon as possible. Provide CPUC a work plan with estimated completion dates for such repairs.

2018 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	September 12, 2018	**Department(s)**	Maintenance of Way, Motive Power, Overhead Lines and Signals Maintenance
Auditors/ Inspectors	Shane Roberson Salvador Herrera	**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 Series
3. CPUC General Order 143-B
4. SFMTA System Safety Program Plan (SSPP), Revision 6, dated 2/11/2015
5. SFMTA Rail System Safety Program Plan (RSSPP), Revision 7, dated 2/11/2016
6. SFMTA Rail System Safety Program Plan (RSSPP), Revision 8, dated 2/15/2017
7. SFMTA Rail System Safety Program Plan (RSSPP), Revision 9, dated 2/15/2018
8. Overhead Lines and Traction Power R.OC.PR.019
9. Overhead Lines Inspection W.OL.PR.008
10. 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, interview SFMTA representatives, 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:
CPUC verified SFMTA maintenance inspection standards all follow GO 95.

CPUC inspected and found SFMTA is current with inspections during the past 3 years.

CPUC noted SFMTA is documenting and noting defects during inspections.

SFMTA is identifying potential hazards through its inspections and are documented into a work order, then entered into a defect database, which is then prioritized, and a work order is sent out for repair.

Priorities are as follows:

- 1 = 24-48 hours
- 2 = 0-3 Months
- 3 = 4-6 Months
- 4 = 7-12 Months

Findings:
None

Comments: CPUC found an excessive amount of past due defective items of which 100+ have to do with the light rail division. CPUC did field inspections to determine the severity of defects that are past due of the priority time limits. CPUC found that although the items are relatively minor, SFMTA should conduct a campaign to close all existing past due open items within a timely manner.

Recommendations:
None

2018 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	9-11-18	**Department(s)**	Maintenance of Way, Track, and Signals Maintenance
Auditors/ Inspectors	Shane Roberson Sal Herrera	**Persons Contacted**	Terrance Fahey Young Laolago David Harbin Leo Martinez Nancy Dock

REFERENCE CRITERIA

1. CPUC General Order 164 Series
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. SFMTA Rail System Safety Program Plan (RSSPP), Revision 7, dated 2/11/2016
6. SFMTA Rail System Safety Program Plan (RSSPP), Revision 8, dated 2/15/2017
7. SFMTA Rail System Safety Program Plan (RSSPP), Revision 9, dated 2/15/2018
8. Battery Back-Up Power Subway Signaling System PM, R.SM.PR.021
9. Track Inspection and Maintenance R.TR.PR.001
10. Track Switch Inspection and Maintenance R.TR.PR.002
11. Highway – Railroad Grade Crossings and Light Rail-to-Freight Rail Crossing Interlockings Inspection and Maintenance R.SM.PR.027
12. Model 55 E Electric Switch Machine Preventative Maintenance R.SM.PR.032
13. Model 5F Electric Switch Machine Preventive Maintenance R.SM.PR.033
14. Model T-3 (Girder Rail) Electric Operated Switch Machine Preventive Maintenance R.SM.PR.023
15. Vital Rely Testing R.SM.PR.019
16. 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, to 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 this.
3. Review underground insulation testing records for the past three years.

FINDINGS AND RECOMMENDATIONS

Activities:

CPUC reviewed records for the following to determine if items 1 – 3 above are met :

- Highway – Railroad Grade Crossings and Light Rail-to-Freight Rail Crossing Interlockings Inspection and Maintenance R.SM.PR.027
- Model 55 E Electric Switch Machine Preventative Maintenance R.SM.PR.032
- Model 5F Electric Switch Machine Preventive Maintenance R.SM.PR.033
- Model T-3 (Girder Rail) Electric Operated Switch Machine Preventive Maintenance R.SM.PR.023
- Vital Rely Testing R.SM.PR.019
- Rail Transit Track Switch Control and Signal Interlocking (Surface Streets) R.SM.PR.017

Findings:
None

Comments:
None

Recommendations:
None

2018 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	Part 1: 8:00 a.m. to 4:30 p.m. Part 2: 9:00 a.m. to 12:00 p.m.	**Location**	700 Pennsylvania, Main Conference Room
Date of Audit	Part 1: September 11, 2018 Part 2: October 1, 2018	**Department(s)**	Fleet Engineering, Maintenance of Way, Motive Power, Overhead Lines and Signals Maintenance
Auditors/ Inspectors	Shane Roberson Sal Herrera Adam Freeman James Matus	**Persons Contacted**	Charles Drane Michael Johnson Lou Maffei Elson Hao Terry Fahey Josh Sadorra

REFERENCE CRITERIA

1. CPUC General Order 164 Series
2. CPUC General Order 143-B
3. SFMTA System Safety Program Plan (SSPP), Revision 6, dated 2/11/2015
4. SFMTA Rail System Safety Program Plan (RSSPP), Revision 7, dated 2/11/2016
5. SFMTA Rail System Safety Program Plan (RSSPP), Revision 8, dated 2/15/2017
6. SFMTA Rail System Safety Program Plan (RSSPP), Revision 9, dated 2/15/2018
7. 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:

1. CPUC signal inspector viewed meter calibration matrix, field verified meters are properly tagged and visited the calibrations shop.

2. CPUC staff interviewed SFMTA representatives from each department and reviewed test records and procedures related to the calibration of Measurement & Testing Instrumentation.
   CPUC staff inspected no fewer than eight measuring or testing instruments, which included torque wrenches, brake control unit test machine, digital multimeters, vacuum gauges and scales.
   CPUC signal inspector viewed meter calibration matrix, field verified meters are properly tagged, and visited the calibrations shop.

2. No specific calibration procedures exist for the rail maintenance department.

Findings:

1. CPUC staff found that the rail vehicle maintenance department is not properly calibrating its measurement and testing instrumentation. There is no calibration program for the light rail vehicle maintenance. The only calibration program available for review was Signal & Communications maintenance (R.SM.PR.013).
2. Rail vehicle maintenance does not have a master tool list available and personnel responsible to oversee and ensure all tools are properly calibrated within the prescribed scheduled intervals, each tool should have a tool identification number and a standard calibration date decal. CPUC staff observed tools with a number of different calibration date decals, some hand-written (hard to read) and some computer printed.
3. CPUC staff found the following randomly selected tools to be out of calibration: (torque wrench #0035 11/22/2017), (torque wrench #DJ4374 06/12/2018), (torque wrench #0037 08/02/2017), (torque wrench #DD6489 06/08/2018), (torque wrench #dd8437 08/02/2017), (HVAC vacuum gauge), (HVAC scales), (brake control unit gauges 06-12-18). Staff could not locate 2017 calibration certificates.
4. CPUC staff found that the records showed signal meters were up to date. CPUC noted while in the field with the signal crew, there was no calibration verification stickers on grounds meter and fluke meters. SFMTA R.SM.PR.013.4.1F

Comments:

CPUC staff found digital multimeters being used that were owned by employees of SFMTA (personal tools), CPUC staff expressed concerns related to the tracking of personal tools that may be taken home and then returned to use on rail vehicles.

Recommendations:

1. SFMTA rail vehicle maintenance should develop a procedure/program that ensures all tools that are used for measurement and testing of rail vehicles is being properly calibrated at the prescribed intervals, the tools are being properly inventoried and being tracked by an assigned employee. This program should include a standard calibration status identification sticker that is affixed to each tool, identifying the last calibration date, tool identification number, and the next calibration date due. The method used to label each tool so that the next scheduled testing/calibration due date can be observed on each tool. The program should also identify procedures related to tools that are found to be defective or tools found to be out of calibration by rail vehicle maintenance personnel. The procedure should address the inspection of each tool before use, up to date calibration date, as well as the record retention related to each tool calibration certificate.
   The program should include any rail vehicle personnel training on the program requirements.
2. SFMTA Signal department must ensure each DMM and EETI in the Calibration Program have an up-to-date calibration "due-date" sticker permanently affixed.

2018 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**	Tunnel Inspections
Date of Audit	9-14-18	**Department(s)**	Transit Division Maintenance of Way, Track Maintenance, Signal Maintenance
Auditors/ Inspectors	Shane Roberson Sal Herrera	**Persons Contacted**	Young Laolagi David Harbin Jeff Conley Terrance Fahey

REFERENCE CRITERIA

1. General Order 164 Series
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. SFMTA Rail System Safety Program Plan (RSSPP), Revision 7, dated 2/11/2016
7. SFMTA Rail System Safety Program Plan (RSSPP), Revision 8, dated 2/15/2017
8. SFMTA Rail System Safety Program Plan (RSSPP), Revision 9, dated 2/15/2018
9. Track Inspection and Maintenance R.TR.PR.001
10. 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)
11. SFMTA Vital Relays Testing, R.SM.PR.019
12. Rail Transit Vehicle Tagging System (VETAG) Preventative Maintenance, R.SM.PR.029
13. Track Switch Inspection & Maintenance R.TR.PR.002
14. 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 mostly 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:
CPUC inspected switches at MME, MMT, Eureka, West Portal, and inspected crossings/interlocking's at 3rd and Carrol/Cargo, and inspected MMT relay room.

Findings:
Staff noted:

- Outbound walkway at Ferry Portal outbound entrance, rusted diamond plated walk way rusted to a point that rust has crated holes in it. GO 143-B, 9.05
- CPUC noted within the portal and interlocking areas, signal vital relay cabinets are not properly secured. GO 127, 3.12
- Switch #7, liquid tight is broken with conductors exposed. CFR 234.211, GO 127, 3.12
- Switch #13B missing permanent labels. CFR 236.76.
- Walkway T534+00 is loose and unstable. GO 143-B, 9.05
- Reflective missing striping on back of x bucks at 3rd and Carrol crossing. MUTCD 8B.03
- Flashers are out of alignment at 3rd and Carrol crossing. CFR 234.253
- Bell on West side not working at 3rd and Carrol.
- Flashers out of alignment at 3rd and Cargo.
- W-10 missing at 3rd and Cargo.

Comments:
N/A

Recommendations:

1. Walkways shall be maintained. Per GO 143-B, 9.05
2. SFMTA shall secure all equipment. Per GO 127, 3.12
3. SFMTA shall ensure all conductors are properly labeled. Per CFR 236.76
4. SFMTA shall install striping on back side of all x bucks. Per MUTCD 8B.03
5. SFMTA shall align flashers. Per CFR 234.253

2018 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	9-noon and 1-5 pm	**Location**	700 Pennsylvania, Main Conference Room
Date of Audit	9-12-18	**Department(s)**	Transit Division Transit Services OCC Maintenance of Way Track Maintenance Signal Maintenance
Auditors/ Inspectors	Shane Roberson Sal Herrera John Madriaga	**Persons Contacted**	Melvyn Henry Michael Kirchanski Jim Kelly Terrance Fahey Young Laolagi David Harbin Kartik Shah

REFERENCE CRITERIA

1. General Order 164 Series
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. SFMTA Rail System Safety Program Plan (RSSPP), Revision 7, dated 2/11/2016
6. SFMTA Rail System Safety Program Plan (RSSPP), Revision 8, dated 2/15/2017
7. SFMTA Rail System Safety Program Plan (RSSPP), Revision 9, dated 2/15/2018
8. Automatic Train Control System (ATCS) Wayside Equipment Preventive Maintenance, R.SM.PR.026
9. Subway Wayside Signal Head Preventive Maintenance, R.SM.PR.030
10. ATCS Station Controller Subsystem Preventive Maintenance, R.SM.PR.007
11. ATCS Inductive Loop Cable Preventive Maintenance, R.SM.PR.038

12. ATCS Wayside Platform Emergency Stop Buttons Preventative Maintenance, R.SM.PR.003
13. ATCS Wayside Portal Intrusion Detection System Preventive Maintenance, R.SM.PR.004
14. Automatic Train Control System (ATCS) Wayside Equipment Maintenance, R.SM.PR.026
15. ATCS Wayside Uninterruptible Power Supply (UPS) PM, R.SM.PR.002
16. 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.
    c. Inspect the ATCS induction loop cable in the Market Street/Twin Peaks Tunnel during non-revenue hours to evaluate the integrity of the loop cable
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 12 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 12 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 reviewed records for:

R.SM.PR.002 ATCS Wayside Uninterruptible Power Supply
R.SM.PR.003 ATCS platform emergency stop button, PM
R.SM.PR.004 ATCS portal intrusion detector, PM
R.SM.PR.006 ATCS axle counter wayside equipment, PM
R.SM.PR.007 ATCS station controller subsystem, PM
R.SM.PR.026 Automatic Train Control System
R.SM.PR.030 subway wayside signal head, PM
R.SM.PR.038 ATCS inductive loop cable, PM

R.SM.PR.004 ATCS portal intrusion detector, PM

19. No exception noted

R.SM.PR.006 ATCS axle counter wayside equipment, PM

20. No exceptions noted.

R.SM.PR.007 ATCS station controller subsystem, PM

21. No exceptions noted

R.SM.PR.015 switch machine model 55E, PM

22. No exceptions noted

R.SM.PR.019 vital relays

23. No exceptions noted

Findings:

R.SM.PR.002 ATCS wayside uninterruptible power supply

24. CPUC noted PM form not correctly filled out for Montgomery, Civic Center, Castro, Powell, and MMT. Missing signatures and dates.

R.SM.PR.003 ATCS platform emergency stop button, PM

25. CPUC noted SFMTA is in the process of removing this PM stating that the emergency platform buttons are locked due to continuous false alarms from patrons.

R.SM.PR.030 subway wayside signal head, PM

26. CPUC noted signal head as of the date of this inspection were all past due ranging 2 weeks to 5 weeks. It was noted when SFMTA switched over to EAM system the dates were improperly entered.

R.SM.PR.038 ATCS inductive loop cable, PM

27. CPUC noted SFMTA has stopped conducting the 52-week inspection. SFMTA has stated that the manufacturer's recommendation is too taxing and did not think it was necessary to continue such a regimented inspection interval based on verbal recommendations from the manufacturer.

Comments:

N/A

Recommendations:

1. R.SM.PR.002 ATCS wayside uninterruptible power supply
   28. SFMTA should insure all forms are properly completed.
2. R.SM.PR.030 subway wayside signal head, PM
   29. SFMTA should conduct PM's immediately.
3. R.SM.PR.038 ATCS inductive loop cable, PM
   30. SFMTA should continue its 52-week inspections until manufacturer recommendations have been submitted in writing.

2018 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	September 10, 2018	**Department(s)**	Transit Division Maintenance of Way Track Maintenance Cable Car
Auditors/ Inspectors	Sal Herrera John Madriaga	**Persons Contacted**	Melvyn Henry Terrance Fahey Young Laolagi Ed Cobean Rigo Hernandez

REFERENCE CRITERIA

1. General Order 164 Series
2. General Order 143-B
3. SFMTA System Safety Program Plan (SSPP), Revision 6, dated 2/11/2015
4. SFMTA Rail System Safety Program Plan (RSSPP), Revision 7, dated 2/11/2016
5. SFMTA Rail System Safety Program Plan (RSSPP), Revision 8, dated 2/15/2017
6. SFMTA Rail System Safety Program Plan (RSSPP), Revision 9, dated 2/15/2018
7. Code of Federal Regulations CFR 49, Part 213, Track Safety Standards
8. SFMTA Track Maintenance and Inspection SOP, R.TR.PR.001
9. SFMTA Cable Car Roadway Track Inspection & Maintenance, C.PR.002
10. Track Switch Inspection & Maintenance, R.TR.PR.002
11. 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: :
CPUC staff inspected SFMTA Track Maintenance and Inspections, SFMTA Cable Car Roadway Track Inspection & Maintenance, and Track Switch Inspection & Maintenance to determine compliance with items 1 – 3, above.

Findings:

9. Switch 13 missing cotter pin on detector rod. (CFR 213.133 0133A7)
10. Switch 15-B right hand point chipped. (CFR 213.135 0135H1)
11. Switch 13-A Left hand point chipped and worn. (CFR 213.135 0135H1)
12. Switch 11-B improper fastening on heal block. (Used double washers on heal block bolt.) (CFR 213.121)
13. Frog tread portion showing wheel wear. (CFR 213.137)
14. Switch 5-B right hand point chipped and worn. (CFR 213.135 0135H1)
15. Switch 5-A chipped point, frog worn and chipped, walk platform unsecured/unstable is a falling/tripping hazard. (CFR 213.135 0135H1)
16. Switch T-7 frog heal joint welded across the top (CFR 213.233 D)

Comments:
Maintenance items should be duly noted during inspections on inspection forms and tracked for repairs.

Recommendations:

1. SFMTA should ensure all switch maintenance and defective items are noted and proper remedial action taken in a timely manner. SFMTA shall make proper repairs; utilize current track maintenance standards, including manufacturer's recommended material and follow General Orders and CFR's. SFMTA R.TR.PR.002 part 6.0, R.TR.PR.009 rev1

2018 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	8:00 am- 4:00 pm	**Location**	700 Pennsylvania for LRV/HSC track records Cable Car Barn for Cable Car track records
Date of Audit	September 11, 2018	**Department(s)**	Transit Division Maintenance of Way Track Maintenance Cable Car Division
Auditors/ Inspectors	Sal Herrera John Madriaga	**Persons Contacted**	Melvyn Henry Ed Cobean Terrance Fahey Young Laolagi Rigo Hernandez Josh Sadorra

REFERENCE CRITERIA

1. General Order 164 Series
2. General Order 143-B
3. SFMTA System Safety Program Plan (SSPP), Revision 6, dated 2/11/2015
4. SFMTA Rail System Safety Program Plan (RSSPP), Revision 7, dated 2/11/2016
5. SFMTA Rail System Safety Program Plan (RSSPP), Revision 8, dated 2/15/2017
6. SFMTA Rail System Safety Program Plan (RSSPP), Revision 9, dated 2/15/2018
7. Track Inspection and Maintenance, R.TR.PR.001
8. Cable Car Roadway Track Inspection and Maintenance, C.PR.002
9. Cable Splicing & Maintenance, C.PR.015
10. 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:
CPUC reviewed metro track and cable car maintenance program, procedures, records, and standards to determine compliance of items 1 – 7 above.

Findings:
None

Comments:
None

Recommendations:
None

2018 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 – High Rail Equipment Inspection by CPUC Equipment Inspector**
Time	9:00 AM – 4:00 PM	**Location**	Cable Car Barn Cameron Beach
Date of Audit	October 2, 2018	**Department(s)**	Transit Division Rail Vehicle Maintenance Cable Car Maintenance
Auditors/ Inspectors	Adam Freeman James Matus Sal Herrera	**Persons Contacted**	Brent Jones Randy Catanach Michael Kirchanski Josh Sadorra

REFERENCE CRITERIA

1. General Order 164 Series
2. General Order 143-B
3. SFMTA System Safety Program Plan (SSPP), Revision 6, dated 2/11/2015
4. SFMTA Rail System Safety Program Plan (RSSPP), Revision 7, dated 2/11/2016
5. SFMTA Rail System Safety Program Plan (RSSPP), Revision 8, dated 2/15/2017
6. SFMTA Rail System Safety Program Plan (RSSPP), Revision 9, dated 2/15/2018
7. SFMTA Rail Vehicle Preventive Maintenance & Inspection Scheduling, L.PR.017
8. SFMTA Cable Car Preventative Maintenance Inspection and Scheduling, C.PR.001
9. SFMTA Cable Car Defect Card, C.PR.004
10. LRV Maintenance Meet & Greet "01" Defect Card Process, 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 6 LRV2/3 cars, 3 LRV4 cars, 4 Historic Streetcars, 3 Cable Cars, and 2 hi-rail vehicles from the available vehicles in the maintenance shop and perform detailed inspections to determine if SFMTA is properly and adequately maintaining (Apply whatever criteria is applicable):
   a. Traction motors

b. Propulsion controller assemblies and components
c. Axle-mounted gearbox
d. Truck, axle, and wheel assemblies
e. Brake systems
f. Lighting
g. Coupler and drawbar assemblies
h. Passenger doors and step assemblies
i. Passenger component and safety appliances
j. Operator cab and appurtenances
k. Pantograph assemblies and related traction power components for LRV
l. Public address and intercom systems
m. Trolley pole assemblies and related traction power components for historic streetcar
n. For cable cars inspect from 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.
o. The rail components of the hi-rail trucks including wheels, pins, tie rod ends, latches, hydraulic hoses, backup alarms, and grease fittings

2. Determine whether the cars are in compliance with all applicable references based on inspections.

FINDINGS AND RECOMMENDATIONS

Activities:
CPUC staff performed detailed vehicle field inspections at Cameron Beach, Cable Car, MME & Green Metro Yard to determine if SFMTA is properly and adequately maintaining the revenue and non-revenue rail vehicles.

Field inspections were conducted on the following randomly selected vehicles:

- LRV2/3 vehicles: 1401 A & B end air hose damaged, B-end truck air hose worn, 1408, 1411, 1424 B-end hose bracket lose, defective sanding hose bracket, 1425, 1427 center truck ground lug broken, 1428 defective sanding hose bracket, 1434, 1455 danger high voltage decal worn rooftop, Amphenol plug disconnected A-end 1458 A & B end gear box leaking needs oil, 1465, 1526, 1537 B-end side window seal defective, 1545

- LRV4 vehicles: 2024 & 2012.

- Historic vehicles: PCC street car #1056, Milan #1856 gear cases leaking, Milan #1815 B-end truck journal bearing bolt missing & gear cases leaking, PCC Street car #1072

- Cable cars: Powell/Hyde Cars #5, 15, 13 & 17

- Hi-rail vehicles inspected at MME, Truck #73500325 – missing fire extinguisher & first aid stickers, New hi-rail freightliner 6 pack "not assigned a number yet", Ford truck #188-- no date on fire extinguisher, Truck # 735-092

Findings:
CPUC staff found that the hub odometers used on the Historic PCC cars and LRV 2/3's are not accurately and effectively providing a means for ensuring Running Repair 2.5k & Major PMI 10k inspections are being completed at the required intervals. Hub odometers are inspected and found to be defective frequently between inspection intervals. Hub odometers on the Historic PCC cars and LRV 2/3's that are being used by SFMTA have been known to be unreliable for years and continue to be used as a way of tracking mileage between inspection intervals.

CPUC staff found the historic PCC cars have axle mounted gear cases leaking.

Comments:
None

Recommendations:
1. SFMTA performs Preventive Maintenance Inspections (PMI) at mileage-based intervals and for this reason, SFMTA should source a more reliable means to track mileage of Historic PCC cars and LRV 2/3's to ensure preventive maintenance inspections are being completed at the required scheduling intervals.

2018 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	Day 1: 9 am – 4 pm Day 2: 9 am – 5 pm	**Location**	MME and Cable Car Barn
Date of Audit	Day 1: 10/2/18 Day 2: 10/3/18	**Department(s)**	Transit Division
Auditors/ Inspectors	Adam Freeman James Matus Sal Herrera	**Persons Contacted**	Scott Middleton Randy Catanach Brent Jones Gino Potter Josh Sadorra

REFERENCE CRITERIA

1. General Order 164 Series
2. General Order 143-B
3. SFMTA System Safety Program Plan (SSPP), Revision 6, dated 2/11/2015
4. SFMTA Rail System Safety Program Plan (RSSPP), Revision 7, dated 2/11/2016
5. SFMTA Rail System Safety Program Plan (RSSPP), Revision 8, dated 2/15/2017
6. SFMTA Rail System Safety Program Plan (RSSPP), Revision 9, dated 2/15/2018
7. Rail Vehicle Preventive Maintenance & Inspection Scheduling, L.PR.017
8. 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 10% of LRV2/3s
b. At least 10% of LRV4s
c. At least 10% of Milan cars, PCC cars, and other historic cars
d. At least 10% of California Street cable cars and Powell Street cable cars
e. At least 10% of 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:

CPUC staff reviewed Preventive Maintenance Inspections records at Cameron Beach, Cable Car, MME, Green Metro Yard & Harrison St. shop to determine if the required inspections and other maintenance activities were performed at the specified frequencies and that all defects and non-compliance issues are being identified and tracked through work order repairs. Records that were reviewed:

- Reviewed 2.5k, 10, 20, 30 & 40k Preventive Maintenance Inspections records related to the following randomly selected 14 vehicles, LRV2/3 vehicles: 1405, 1412,1420, 1442, 1451, 1461, 1477, 1482, 1495, 1499, 1515, 1539, 1543, 1548.

- Reviewed Preventive Maintenance Inspections records year 2018 for the following LRV4 vehicles: 2005.

- Reviewed A, B, C, D & E Preventive Maintenance Inspections records related to the following randomly selected 4 historic vehicles: Milan car #1815 & 1818, PCC street cars 1011 & 1074.

- Reviewed A & B Preventive Maintenance Inspections records related to Powell/Hyde cable cars #9, 15, & 19 & California cable car #54

- Reviewed Quality Assurance random post inspection records related to the viability and completeness of LRV PMI inspections, inspection records are sent to the Superintendents and CMO immediately after completion.

- Reviewed 2018, BIT inspection records, completed work orders & daily pre-trip inspection records related to the following Hi-rail vehicles: Unit #735969 Swingmaster 181, unit #735859 Freightliner.

Findings:
CPUC staff found repeated vehicle mileage log audits between inspection intervals that identified defective Hub Odometers. The mileage tracking system used on the Historic PCC cars and LRV 2/3's very difficult to determine if inspections are being completed at the required intervals.

CPUC staff observed Historic PCC streetcar mileage tracking is not accurate for Preventative Maintenance tracking. 2.5k inspections need to be tracked with current mileage to ensure 2.5k inspections are completed at the required intervals.

Comments:
CPUC staff found that completed PMI records related to LRV2/3's is not being reviewed and closed out for up to 30 days after the inspection has been completed.

No wheel measurements records for historic cars, only visual inspection to wheels.

O1 defect cards found to be incomplete, missing information and occasionally not turned in at all.

Recommendations:
1. Non-revenue hi-rail vehicle procedure #D.04.00.002 should be reviewed and updated, last revision 03/02/1998. 90-day BIT inspections should include detailed repair reports to identify defects found and corrective action taken for each defect.

2018 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR SAN FRANCISCO MUNICIPAL TRANSPORTATION AGENCY (SFMTA)

Checklist No.	**15 - G**	**Element**	**Maintenance Audits and Inspections – Traction Power System**
Time	9 am – 1 pm	**Location**	2502 Alameda Street
Date of Audit	September 13, 2018	**Department(s)**	Transit Division Maintenance of Way Overhead Lines
Auditors/ Inspectors	Sal Herrera Shane Roberson	**Persons Contacted**	Melvyn Henry Terrance Fahey Michael Johnson Fred Orantes

REFERENCE CRITERIA

1. General Order 164 Series
2. SFMTA System Safety Program Plan (SSPP), Revision 6, dated 2/11/2015
3. SFMTA Rail System Safety Program Plan (RSSPP), Revision 7, dated 2/11/2016
4. SFMTA Rail System Safety Program Plan (RSSPP), Revision 8, dated 2/15/2017
5. SFMTA Rail System Safety Program Plan (RSSPP), Revision 9, dated 2/15/2018
6. CPUC General Order 95
7. CPUC Resolution E-1492 Authorizing Deviation from Rule 37 of General Order 95
8. SFMTA Overhead Lines Inspection, W.OL.PR.008
9. Non-Scheduled Work on Overheard Line Wires (4-Digit Lockout Code), W.MP.PR.158
10. Need to add more SOPs

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

Maintenance Audits and Inspections – Traction Power System

Interview SFMTA representatives and select at least one section of rail traction power system at random from each of the following areas: J, K, L, M, N, and T LRV Lines

For each section, review the appropriate documentation to determine whether:

1. The rail traction power system is inspected and maintained in compliance with applicable standards.
2. Substations are inspected and maintained in compliance with applicable standards.

Perform a visual inspection of one substation for each of the above areas to determine whether they are in compliance with SFMTA standards and are in a state of good repair. Perform a detailed inspection of substation components.

3. 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.
4. Review SFMTA's stray current program to determine whether:
   - SFMTA is active in mitigating the effects of stray current on its own and surrounding structures.
   - SFMTA has procedures in place to identify and correct hazards caused by stray current.
   - Any hazards identified have been addressed and tracked through Corrective Action Plans to completion.

Activities:

1. CPUC inspected maintenance records for SFMTA Traction Power, OCS, and Substations.

2. CPUC performed visual inspections of Substation's Bryant, Illinois, Michigan, and Substation E.

3. Conducted Visual inspections of OCS on all SFMTA lines and tunnels.

   CPUC inspected records of defective conditions and a field inspection of randomly selected defects from the records inspection.

   Hazards are addressed and entered into a Defect Database, which is then set out to crews to repair as needed and assigned a time based Priority. Priority 1 is 24-48 hr., Priority 2 is 0-3 months, Priority 3 is 4-6 months, and Priority 4 is 7-12 months repair.

4. SFMTA does not have any stray current program as they have never had any stray current issues historically.

Findings.
CPUC found that SFMTA has 100+ defective items past their respective priority time limits.

Comments:
N/A

Recommendations.

1. SFMTA should close all existing past due open items within a timely manner. SFMTA should comply with their SOP's and ensure all open items are taken care of within their respective time frames.

2018 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	8:00 a.m. – 5:00 p.m.	**Location**	**Beginning at MME… then to other locations from there.** **Green Metro Division** **• Operations Control Center** **• MME**
Date of Audit	September 25, 2018	**Department(s)**	**Green Metro Rail Training** **Operations Control Center** **Maintenance Training Department**
Auditors/ Inspectors	Michael Rose Debbie Dziadzio Richard Fernandez	**Persons Contacted**	Julie Kirschbaum-Chief Transportation Officer Ron Forrest-Senior Operations Manager Barry Chown-Rail Training Manager York Kwan-Superintendent Transit Services Brent Jones-Cable-Car Division Oliver Gajda-Transit Planner Jeff Conley-Safety Division Nancy Dock-Transportation Safety Specialist

REFERENCE CRITERIA

1. CPUC General Order 164 Series
2. CPUC General Order 143-B
3. SFMTA System Safety Program Plan (SSPP), Revision 6, dated 2/11/2015
4. SFMTA Rail System Safety Program Plan (RSSPP), Revision 7, dated 2/11/2016
5. SFMTA Rail System Safety Program Plan (RSSPP), Revision 8, dated 2/15/2017
6. SFMTA Rail System Safety Program Plan (RSSPP), Revision 9, dated 2/15/2018
7. Metro Rail Operations Training Program Plan I.PL.001
8. 2015 LRV Operator's Training Manual
9. Rail Car Operations Training Program Plan, TN.MO.PL.025
10. LRV Maintenance Operator Training Program Plan, TN.MT.PL.018
11. On-Track Equipment Operator Training Program Plan, TN.MT.PL.013
12. Rail Car Maintenance Train the Trainer Training Program Plan, TN.MT.PL.014
13. Cable Car Guide Book, TN.CC.MN.004
14. LRV Maintainer Training Program Plan, L.PL.021
15. OCC Training Program Plan, R.OC.PL.026

16. Roadway Worker Protection Plan
17. Track Maintenance Unit Training Program Plan, R.TR.PL.012
18. Signal & Communications Maintenance Unit Training Program Plan, R.SM.PL.001
19. Motive Power Unit Training Program Plan, W.MP.PR.157
20. 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
   - Cable-Car
2. Review training, certification, and recertification records of the selected employees related to RWP, PED, and other specific job required training to determine whether:
   a. All personnel successfully completed initial training programs, and any discrepancies were addressed and resolved.
   b. All personnel have been retrained and recertified at the correct frequency and are currently certified to perform their duties according to the procedures.
   c. Verify that a process for maintaining and accessing employee training records is in place.
   d. Verify that categories of safety-related work requiring training and certification have been identified.
   e. Verify that employee and contractor job classifications requiring initial and refresher training and certification have been identified.
   f. Verify that SFMTA has a process in place to assess compliance with its training and certification requirements.
   g. Verify that corrective actions taken to discipline employees and contractors for failure to follow established procedures once trained and certified are established and consistent.
   h. Verify that contractor training requirements are specified in contract documents.

FINDINGS AND RECOMMENDATIONS

Activities:

1. CPUC Staff reviewed TMC Training Program Plan (R.OC.PL.026 eff date 9/15/17), Roadway Worker Protection Plan (eff date 2/7/14), and TMC Compliance Check Program Plan R.OC.PR.028 Rev 7 (eff date 07/19/17). CPUC Staff then reviewed Job Postings for the following SFMTA positions to ensure minimum qualifications were met: Transit Supervisor (#9139), Transportation Controller (#9153), Transit Operator (#9163), and reviewed General Notice 2017-064 (eff date 6/16/19) regarding General Sign-up.

2. CPUC Staff reviewed the training, certification, and recertification records of the following SFMTA Train Controllers:

   # 173150
   # 45916
   # 31447

   All Controllers were trained and recertified in the mandated two (2) year frequency. Examinations included: Rulebook knowledge, Call Tag Exercise, ATCS Knowledge and Diagram Exercise, VCC Reboot and Handover Exercise, TMC Manual, Safety Knowledge, Clearance and Permits, Emergency Procedures, CCO Dispatcher.

   CPUC Staff performed an inspection of training records for LRV4 Operators, LRV4 Line Trainers, "Expert Operators", LRV4 Mechanical Technician Trainers (unrestricted), SFMTA Certified Transit Instructors and reviewed LRV4 Train the Trainer requirements. CPUC Staff randomly selected 9 LRV4 qualified Operators, 6 LRV4 Line Trainers, 6 MRO's, 2 Rail Maintenance (unrestricted) Trainers.

   LRV4 Operator requirements include experienced SFMTA LRV Operators who are trained by "Expert LRV Operators", who are current in their recertification, have had no rules violations in the past year and have a minimum of 5 years LRV operations.

   Training for LRV4 operations consist of 4 days, 10-hour/day training. The first two days is with a Certified Transit Instructor on the simulator, in the yard, and on the main line during non-revenue hours. The second 2 day, 10-hour training session consists of operations on SFMTA Main Line accompanied by the "Expert Operators".

   Operators reviewed:

#3321	#1306	#3345	#3617
#2108	#2058	#3371	#2892
#3572	#2178	#3418	#1731
#1675	#4354	#3396	#2303

   Cable Car reviewed:

#3976 #3784 #1983
#3799 #1475
#3924 #2798
#3962 #976

LRV4 Line Trainers "Expert Operators" reviewed:
#0876 #1717
#1974 #3262
#2478 #3269

MROs Train the Trainer records reviewed:
#9139 #30924
#44485 #906
#843 #921
#55997 #19799
#47635 #57805
#48845

Rail Maintenance (unrestricted) instructors:
#019036 #046051

Findings:
1. LRV4 Line Trainers "Expert Operators":
#1974 was 9 days late in required 12-18 month compliance ride (10/18/16, 4/27/18)
#3262 was training LRV4 Operators while RWP certification was expired one month (8/5/16, 9/5/18)

2. CPUC Staff reviewed LRV Operators for efficiency test records during checklist 13-A and noted inconsistencies from SFMTA Employee files on CPUC 143-B, Section 13.03, which requires training every two years on SFMTA's operating rules. CPUC regulated training requirement on SFMTA Operating Rules is deficient within their training and recertification tests relate to equipment and route (i.e. PCC, Milan, F Line, E Line) are not in the SFMTA Operating Rule Book.

3. While reviewing MRO training files, CPUC Staff found several document control discrepancies. The Module Waiver Form states 'This form is invalid without the signature of the Senior Operations Manager of Transit Services below'. The Module Waiver Form is not signed on a consistent basis by the Senior Operations Manager, making those without signatures invalid.

Along with the Module Waiver Form, CPUC Staff viewed multiple MRO Rail Training Evaluations without Employee and/or MRO signatures required for validation of training.

4. CPUC Staff found SFMTA Train Operator, Train Controller, and Light Rail Supervisor training files deficient in General Order 172 Section 5.3. SFMTA has not properly trained employees on PED Zero-Tolerance nor has SFMTA provided a refresher course as outlined in General Order 172 Section 5.3.

Comments:

1. Controller records are well maintained and comments for employee reviews are properly filled out with detailed notes.
2. CPUC Staff spoke with a LRV Operator in training who has taken the SFMTA PED Training and 11 question test. CPUC Staff found the Operator knowledgeable and with a clear understanding of General Order 172 and his responsibilities regarding PED.

Recommendations:

1. Ensure all required training, including compliance rides occur in the mandated timeline.

2. Ensure all LRV Operators are trained, at a minimum, every two years on SFMTA Operating Rules.

3. SFMTA MRO Personnel are to verify document control to properly document training of employees and ensure that the form is completely filled out including signatures.

2018 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. - 5 p.m.	**Location**	**1 South Van Ness**
Date of Audit	9-20-18	**Department(s)**	**Maintenance Training Department, Green Metro Rail Training, Maintenance of Way, Track Maintenance, Signal Maintenance, Rail Vehicle Maintenance**
Auditors/ Inspectors	Shane Roberson Sal Herrera	**Persons Contacted**	David Chan Lee Summerlott Terrance Fahey

REFERENCE CRITERIA

1. CPUC General Order 164 Series
2. CPUC General Order 143-B
3. SFMTA System Safety Program Plan (SSPP), Revision 6, dated 2/11/2015
4. SFMTA Rail System Safety Program Plan (RSSPP), Revision 7, dated 2/11/2016
5. SFMTA Rail System Safety Program Plan (RSSPP), Revision 8, dated 2/15/2017
6. SFMTA Rail System Safety Program Plan (RSSPP), Revision 9, dated 2/15/2018
7. W.OL.PL.017 Overhead Line Unit Training Program Plan
8. W.MP.PL.157 Motive Power Training Program Plan
9. L.PL.021 LRV Maintainer Training Program Plan
10. TN.CC.PL.015 Cable Car Inspector Training Program Plan
11. R.TR.PL.012 Track Maintenance Unit Training Program Plan
12. TN.MT.PL.013 On-Track Equipment Operations Training Program Plan
13. TN.MT.PL.014 Rail Car Maintenance Worker Train-the-Trainer Training Program Plan
14. TN.MT.PL.018 LRV Maintenance Operator Training Program Plan
15. R.SM.PL.001 Signal & Communications Maintenance Unit Training Program Plan
16. SY.PL.003 Roadway Worker Protection Plan
17. Internal Audit Annual Reports 2015-2017

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 classifications:
    - Vehicle Mechanics
    - Track Maintenance Personnel
    - Overhead Lines Personnel
    - Substation Maintainers
    - Maintenance Contractor
4. Review the selected employees' training and certification records for the last three years to determine whether or not:
    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 non-compliance and are consistent among similar infractions.

FINDINGS AND RECOMMENDATIONS

Activities:

CPUC reviewed training records for:

- Vehicle Mechanics
- Track Maintenance Personnel
- Overhead Lines Personnel
- Substation Maintainers
- Maintenance Contractor

Findings:
None

Comments:
None

Recommendations:
None

2018 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, 6th Floor
Date of Audit	October 11, 2018	**Department(s)**	System Safety Department
Auditors/ Inspectors	Michael Warren Rupa Shitole	**Persons Contacted**	Michael Kirchanski

REFERENCE CRITERIA

1. CPUC General Order 164 Series
2. CPUC General Order 143-B
3. SFMTA System Safety Program Plan (SSPP), Revision 6, dated 2/11/2015
4. SFMTA Rail System Safety Program Plan (RSSPP), Revision 7, dated 2/11/2016
5. SFMTA Rail System Safety Program Plan (RSSPP), Revision 8, dated 2/15/2017
6. SFMTA Rail System Safety Program Plan (RSSPP), Revision 9, dated 2/15/2018
7. SFMTA SOP Development and Approval, A.PR.002
8. SFMTA Rail Change Control Board, A.PR.015

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

Configuration Management and Control

1. Randomly select three 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 CPUC if required;
   c. Configuration Change Request Forms were used;
   d. Potential Hazard Checklist was used
   e. The System Safety Department performed the design review, analysis, and approval of the Modification and Change Request Forms for the project;
   f. The modification or change was reviewed and approved by SFMTA Rail Change Control Board (RCCB) and authorized by executive management.
   g. The modification or change was circulated to the proper departments prior to implementation;
   h. All necessary parties or contract employees within or outside the agency were properly notified of the modification or change.
   i. As-Built or In-Service Drawings are updated accordingly and filed properly

FINDINGS AND RECOMMENDATIONS

Activities:

Staff interviewed SFMTA representatives for Configuration Management and Control process and noted the following:

1. Staff reviewed the Digital Signal Processor (DSP) dated April 2016 upgrade project.
    a. Thales, SFMTA Automatic Train Control System (ATCS) vendor conducted their own safety certification documents and SFMTA Signal department was also involved in the review. The DSP card was a replacement part, tested and certified by the Automatic Train Control System (ATCS) vendor, Thales.
    b. No CPUC review was required for this upgrade project as per System Safety Manager.
    c. Rail Change Control Board (CCB) Change Request Form #2016-002 approved on 4/20/16 was reviewed.
    d. Preliminary Hazard Analysis (PHA) was performed by Safety department. Reviewed the PHA report on file.
    e. Safety Department chairs the Rail Change Control Board and therefore is involved from the beginning to the end of any change.
    f. Rail Change Control Board Change Request Form #2016-002 approved on 4/20/16 had all the required signatures on the Form. Some of the signatures were as follows: Director of Transportation, Chief of Safety, Director of Transit, Maintenance of Way (MOW), Materials Management, Security & Enforcement, Training, etc.
    g. The modification related to the DSP upgrade project was circulated to all departments through the Rail Change Control Board meeting. MOW Signal department was closely involved with this project.
    h. The Program Manager or requestor for this DSP project is the person in charge to notify all necessary parties of this change or modification.
    i. This project is currently on hold since December 2017 as Thales, the SFMTA vendor and MOW is looking for a replacement due to compatibility issues. The Signal Maintenance Superintendent notified the CCB about the project being on hold.
2. Fall Protection & Disconnect Switch Project - Presidio Yard dated 7/14/2016
    a. SFMTA Capital Programs and Construction Division's engineering performed the design work for this project and submitted designs for department review at the 35%, 65%, and 95% design stages.
    b. No CPUC review was required for this upgrade project as per System Safety Manager.
    c. Rail Change Control Board (CCB) Change Request Form #2016-008 approved on 7/14/16 was reviewed.

d. Preliminary Hazard Analysis (PHA) was performed by Safety department. Reviewed the PHA report on file.
e. Safety Department chairs the Rail Change Control Board and therefore is involved from the beginning to the end of any change.
f. Rail Change Control Board Change Request Form #2016-008 approved on 7/14/16 had all the required signatures on the Form. Some of the signatures were as follows: Director of Transportation, Chief of Safety, Director of Transit, Vehicle Maintenance, etc.
g. The modification related to the Fall Protection project was circulated to all departments through the Rail Change Control Board meeting. Vehicle Maintenance department was closely involved with this project.
h. Affected departments are notified and trained on usage upon sub-project completion. As an area receives its fall protection upgrade, it is being immediately utilized; the entire project is not yet complete.
i. This project is not yet complete and as such, the contractor has yet to deliver completed as-builts. Staff was informed that as-builts are a part of project deliverables upon completion.

3. Modification of Breda LRV Door Cut-Out Switch dated 4/5/18
    a. SFMTA Fleet Engineering reviewed the modification and was a voting party at the CCRB meeting for project approval.
    b. SFMTA notified and worked with CPUC to develop this resolution.
    c. Rail Change Control Board (CCB) Change Request Form #2018-001 approved on 4/5/18 was reviewed.
    d. Operational Hazard Analysis (OHA) was performed by Safety department because the Breda cars were already in service. Reviewed the OHA report on file.
    e. Safety Department chairs the Rail Change Control Board and therefore is involved from the beginning to the end of any change.
    f. Rail Change Control Board Change Request Form #2018-001 approved on 4/5/18 had all the required signatures on the Form. Some of the signatures were as follows: Fleet Engineering, Operator Training, System Safety, Rail Vehicle Maintenance, etc.
    g. The modification related to the Breda LRV door cut-out switch was circulated to all departments through the Rail Change Control Board meeting. Fleet Engineering and Vehicle Maintenance departments were closely involved with this project.
    h. Affected departments were notified of the modification.
    i. As-builts have been properly updated.

Findings:
None.

Comments:
None.

Recommendations:
None.

2018 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 8th floor 8203
Date of Audit	October 10, 2018	**Department(s)**	Industrial Safety & Environmental Compliance (ISEC)
Auditors/ Inspectors	Arun Mehta Steve Espinal	**Persons Contacted**	Franklin Johnson Gerald Williams

REFERENCE CRITERIA

1. CPUC General Order 164 Series
2. CPUC General Order 143-B
3. SFMTA System Safety Program Plan (SSPP), Revision 6, dated 2/11/2015
4. SFMTA Rail System Safety Program Plan (RSSPP), Revision 7, dated 2/11/2016
5. SFMTA Rail System Safety Program Plan (RSSPP), Revision 8, dated 2/15/2017
6. SFMTA Rail System Safety Program Plan (RSSPP), Revision 9, dated 2/15/2018
7. Injury and Illness Prevention Program IIPP, IS.13.00.001
8. Hazard Communication Program – Chemical Product Approval, Use & Training, OS.PR.100
9. 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 to determine whether:

1. SFMTA regularly holds Joint Senior Management Safety Committee (SMSC) Meetings. Randomly review SMSC Meetings Minutes.
2. The Senior Management Safety Committee appropriately responds to employees' complaints regarding safety problems.
3. Does SFMTA have an established process to review and update its Injury and Illness Prevention Program (IIPP) on a regular basis?
4. An appropriate procedure is being implemented, and an appropriate form is developed and distributed to all employees to effectively report safety hazards in the work place.
5. Employees are aware of the Employee Safety Program and comfortable utilizing it. Explain how often training is provided.

6. Appropriate corrective actions regarding employee safety have either been satisfactorily completed or are being actively tracked and documented.
7. 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.
8. Verify construction projects have specific procedures in place to ensure worker protection and public safety on the job site. Verify that SFMTA operating and maintenance safety rules and procedures are included in construction contracts to bind contractors and their employees to fulfilling their roles and responsibilities safely. Verify that implementation of these procedures is the responsibility of both the contractor and SFMTA.
9. Verify that appropriate forms of disciplinary action are taken consistently to correct employees and contractors who have not followed established safety rules and procedures.
10. Verify that OCC works effectively with ISEC (Industrial Safety & Environmental Compliance) in reporting employee accidents and safety hazards.

FINDINGS AND RECOMMENDATIONS

Activities:

Staff interviewed the Manager, and Safety Analyst, of Industrial Safety & Environmental Compliance (ISEC) group at SFMTA headquarters. The ISEC group is responsible for Local, State, and Federal Requirements compliance and its Employee Safety Program.

1. SFMTA Senior Management Safety Committee (SMSC) meets on a monthly basis. Minutes of the meeting and topics discussed are documented. Staff reviewed several of these documents from August 2017 through August 2018 and confirmed that Management follows the protocol.
2. According to ISEC, employee safety concerns are addressed. However, employees do go to CALOSHA directly with complaints. SFMTA ISEC receives what are referred to as D letters with workers complaints from CALOSHA. SFMTA receives about five to ten D letters a year.
3. ISEC does review and update their IIPP periodically when deemed necessary.
4. Examples of hazard mitigation include pigeon abatement. ISEC staff documented work done to safely reduce the pigeon presence and associated hazards on SFMTA property. Other examples included mitigation of heat exposure during heat waves. ISEC made sure water bottles were passed out to the Operators and encouraged the Operators to stay hydrated. Also, ISEC worked closely with Union 258 to encourage employees to work in safe manner.

5. Employees do approach ISEC to air their concerns. Suggestion boxes maintaining the privacy of the employees according ISEC staff are rarely used and are no longer checked.
6. Staff reviewed two accident reports including SFMTA employee contacting the overhead catenary and an untrained employee using a truck lift to move ties resulting in the truck turning on its side. ISEC staff generated a report on both incidents and documented both corrective actions. Corrective Actions are usually implemented immediately so tracking corrective actions is usually not necessary.
7. According to ISEC staff, they have adequate resource to address CALOSHA requirements, local EPA, Bay Area AQMD, and Department of Public Health regulations and concerns.
8. SFMTA operating procedures include contractor safety program and rules adherence. However, the SOP is written to mainly oversee projects on the right of way. Rules that are stressed included General Order 175 right of way workers. Nothing is said of projects separated from the right of way. For instance, the ISEC staff played no role in the Twin Peaks tunnel project, which took approximately two months to complete and resulted in a fatality. ISEC has a greater role in the Central Subway Project, which they inspect. According to ISEC, they inspect the Central Subway Tunnel project on a biannual basis.
9. ISEC has no disciplinary authority.
10. Operations Control Center (OCC) and SFMTA Safety Department are both working adequately with ISEC on all work-related topics as a result of CPUC Recommendation during the 2015 CPUC Triennial Audit.
    Current ISEC programs include:
    - Pest Management
    - Employee Assault Prevention Program
    - Violence prevention through de-escalation training

<u>Findings:</u>

1. SFMTA General Manager requires mandatory Supervisor training involving Employee Safety, but it is not being implemented in its entirety. ISEC has experienced push back from transit management department.

2. Based on Contractor Safety Program SOP SY.PR.034 and SSPP, the ISEC unit should be in the System Safety Division reporting to the Chief Safety Officer.

   Furthermore, the Safety Department is in charge of changes to SOP's which the ISEC unit is in charge of supporting and enforcing Contractor Safety Program SY.PR.034 SOP 3.1, indicating the Chief Safety Officer is responsible for review and updating the SOP.

Comments:
None.

Recommendations:
1) The ISEC should have the full cooperation from the whole of SFMTA.
2) The Industrial Safety and Environmental Compliance, based on procedures, should be a part of the safety department.

2018 CPUC SYSTEM SAFETY REVIEW CHECKLIST FOR SAN FRANCISCO MUNICIPAL TRANSPORTATION AGENCY (SFMTA)

Checklist No.	**19**	**Element**	**Hazardous Materials Program**
Time	1:30 AM to 4:30 PM	**Location**	1 SVN 8th floor Western Addition Conference Room 8104
Date of Audit	October 10, 2018	**Department(s)**	Industrial Safety
Auditors/ Inspectors	Yan Solopov Patrick Donnelly	**Persons Contacted**	Gerald Williams Franklin Johnson

AREFERENCE CRITERIA

1. CPUC General Order 164 Series
2. CPUC General Order 143-B
3. SFMTA System Safety Program Plan (SSPP), Revision 6, dated 2/11/2015
4. SFMTA Rail System Safety Program Plan (RSSPP), Revision 7, dated 2/11/2016
5. SFMTA Rail System Safety Program Plan (RSSPP), Revision 8, dated 2/15/2017
6. SFMTA Rail System Safety Program Plan (RSSPP), Revision 9, dated 2/15/2018
7. 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 if SFMTA has a hazardous materials (HazMat) program or plan in place including an OSHA or state equivalent compliant HazMat program (if applicable).

4. Verify that the Employee Safety Program includes a process to familiarize the employees with the hazards presented by materials used in the work place.

5. 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.

6. 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.

7. Verify that all MSDSs are available to all personnel who handle or work with hazardous materials.

8. 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 new 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.
    d. How often are random inspections performed on site?

FINDINGS AND RECOMMENDATIONS

Activities:
Staff interviewed SFMTA representatives in charge of the Hazardous Materials Program from SFMTA's Industrial Safety division and reviewed relevant documentation. Staff found the following:

1. SFMTA employs two programs dealing with hazardous materials:

    'HAZKOM' is a program training all SFMTA maintenance staff in addressing spills and in the handling of the materials they work with.

    'HAZWOPER' is a program training 40 specific staff members to serve as 'incident commanders' and handle hazardous waste, as well as react to spill incidents. Ideally, at least one HAZWOPER-authorized staff member is present at a work site, or is within close range of one.

    SFMTA representatives provided completion certificates for forty-one staff trained in HAZWOPER. These are entitled 'Industrial Emergency Council Certificate of Completion.'

2. SFMTA did not have any reportable hazardous materials discharges or spills within the last three years of operation, so were not required to file any spill reports.

3. The previously mentioned HAZWOPER program is based upon OSHA standards and is designed for use in the SFMTA system.

4. SFMTA utilized Safety Data Sheets (SDS) binders to educate staff about how to handle potentially hazardous materials. Each material is granted a leaflet within the SDS binders. The previously mentioned HAZKOM program is meant to familiarize maintenance employees with hazards posed by the materials they utilize.

5. Maintenance supervisors determine the need for new materials. A Maintenance supervisor must issue a documented request for a new material to Industrial Safety, along with an unfilled Chemical Control Form.

   Industrial Safety representatives then decide whether to approve the material. If they decide to approve it, they must enter data into the Chemical Control Form, and create a new SDS which instructs staff on handling this particular material. Both forms are then submitted to the Purchasing department. The new SDS is added to SDS books throughout SMTA's system as soon as possible.

6. Industrial Safety representatives stated that most materials utilized by maintenance are used in much the same way, and that significant follow-up duties are not required for each new material. If any unexpected harm occurs, SFMTA will prepare a 5020 form and the Industrial Safety Environmental Compliance team would investigate the situation.

   SFMTA annually renews a Memorandum of Understanding with the Department of Public Health, which removes and disposes of all hazardous waste from SFMTA's property.

7. MSDS, currently referred to as SDS or Safety Data Sheets are stored in large binders which are available to staff throughout SFMTA's facilities. They are also available to staff online.

8. The procurement process was previously described in Item 5. In summary, Maintenance supervisors determine the need for new materials and issue requests to Industrial Safety. Industrial Safety approve requests and submit Chemical Control Forms and SDS forms to Purchasing, who handle procurement.

SDS forms are kept via a physical filing system, so are only on-file with Industrial Safety and not System Safety. However, Industrial Safety is considering switching to an electronic system.

Industrial Safety Staff perform unofficial surprise inspections regularly throughout field visits. Field visits can include training assignments, corrective action verification, and others. These occur at least once per week, or more.

Findings:
None

Comments:
Staff support the idea of switching to an electronic filing system for SDS tracking. This would better allow Industrial Safety to share this data with other departments.

Recommendations:
None

2018 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, 6113, Reggie Smith's Office
Date of Audit	October 10, 2018	**Department(s)**	Drug and Alcohol Program
Auditors/ Inspectors	Yan Solopov Patrick Donnelly Madeline Ocampo	**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 Series
3. CPUC General Order 143-B
4. SFMTA System Safety Program Plan (SSPP), Revision 6, dated 2/11/2015
5. SFMTA Rail System Safety Program Plan (RSSPP), Revision 7, dated 2/11/2016
6. SFMTA Rail System Safety Program Plan (RSSPP), Revision 8, dated 2/15/2017
7. SFMTA Rail System Safety Program Plan (RSSPP), Revision 9, dated 2/15/2018
8. 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 SFMTA has a policy for managing the use of over-the-counter drugs. Booklet – Policy and Procedures Handbook. FTA-Required Opioid update, August 21, 2018. Additional memos regarding marijuana since it became recreational.

2. Select at random at least two safety-sensitive employees who tested non-negative for drugs or alcohol in the past 3 years and 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.
d. Employees who retested positive are disciplined.

3. Determine if 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?

4. Review training program curriculums to verify SFMTA is training all employees regarding its drug and alcohol policy.

5. 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:
Staff interviewed SFMTA representatives in charge of the Drug and Alcohol Program and reviewed relevant documentation. Staff found the following:

1. SFMTA maintains a 'Substance Abuse: Policy and Procedures' handbook which instructs staff about their rules for over-the-counter drug use. This booklet is available to all staff. The latest version was issued on August 21, 2018, and included an FTA-required update regarding opioid use. SFMTA has issued additional memos regarding the use of marijuana, since it has become legalized for recreational use.

    SFMTA's policy includes both specific and randomly applied drug and alcohol testing. Random testing is assigned via a computer to 40% of SFMTA's safety-sensitive staff on an annual basis, as per Section 9.3.4 of the above handbook.

2. SFMTA utilizes several types of mandatory drug tests, including a 'pre-employment test' applied prior to a return to service following a 90-day absence. Another test, called a 'return-to-duty,' is applied when an employee is removed from service for drug use, counseled, and allowed to return.

    Staff reviewed the files for two randomly chosen SFMTA employees, with employee ID numbers Cap#4428 and Cap#4167. Staff identified that both had tested positive in

pre-employment tests and had been evaluated by SAP . Both had eventually tested negative on return-to-duty tests and had returned to duty with no further documented issues.

3. SFMTA's Drug and Alcohol Program was last audited by the FTA in 2013. The FTA issued findings stating that SFMTA was enacting an insufficient degree of post-accident drug and alcohol testing. FTA recommended that SFMTA retrain supervisors of all safety-sensitive employees to enact these duties. Additionally, the FTA had several minor findings regarding language utilized in SFMTA's policy and pre-employment form.

   SFMTA addressed the findings of the 2013 FTA audit and received a letter verifying compliance. SFMTA has not been audited by the FTA since that point.

4. SFMTA utilizes two types of training related to drug and alcohol use.

   All new safety-sensitive employees must complete SFMTA's Substance Abuse Policy Training, which briefs them on SFMTA's rules regarding drug use. This training is two hours long.

   Supervisors of safety-sensitive employees must complete Post-Accident and Reasonable Suspicion Training, which trains supervisors in identifying and addressing observed impairment in their staff. This training is two hours long.

   Both trainings are only required to be completed one time. However, SFMTA has recently offered re-training in the latter supervisor training and is considering doing so on an ongoing basis.

   SFMTA utilizes the 'Assistant' database to track training for the two above courses.

5. Staff verified that SFMTA annually submits an MIS Data Collection Form to the FTA documenting their drug and alcohol testing data. Staff received copies of the 2015, 2016, and 2017 submissions.

Findings:
None

Comments:
Staff supports SFMTA's idea of offering re-training in Post-Accident and Reasonable Suspicion for supervisors.

Recommendations:
None

2018 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 3rd floor, 3074
Date of Audit	October 10, 2018	**Department(s)**	Materials Management Section Office of Contract Administration
Auditors/ Inspectors	Rupa Shitole Mike Warren	**Persons Contacted**	Ashish Patel, Contract & Procurement Manager Geoffrey Diggs, Supply Chain Manager Michael Kirchanski, System Safety Manager

REFERENCE CRITERIA

1. CPUC General Order 164 Series
2. SFMTA System Safety Program Plan (SSPP), Revision 6, dated 2/11/2015
3. SFMTA Rail System Safety Program Plan (RSSPP), Revision 7, dated 2/11/2016
4. SFMTA Rail System Safety Program Plan (RSSPP), Revision 8, dated 2/15/2017
5. SFMTA Rail System Safety Program Plan (RSSPP), Revision 9, dated 2/15/2018
6. Purchasing Materials and Supplies M.PR.001
7. Change Control Board A.PR.015

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

Procurement Process

1. Interview SFMTA representatives and review appropriate documentation for the past 3 years to:
    a. Verify SFMTA personnel are following applicable Procurement Policy and Procedures and ensure safety issues and concerns are addressed in the procurement process. 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. Determine that adequate procedures are in place to mitigate or replace defective or deficient equipment if such equipment is introduced into the SFMTA System.

3. 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?

FINDINGS AND RECOMMENDATIONS

Activities:
Staff interviewed SFMTA representatives who are responsible for Procurement Process and noted the following:

1. a) Enterprise Asset Management System (EAMS) replaces the old system (SHOPS) that SFMTA had been using in the previous years. The Purchasing Materials and Supplies procedure (M.PR.001.A version 4 dated 2015) is the current procedure the department complies to for the last three years. The Approved Equal Parts for Railcars procedure (ME.PR.005) covers the Change Control Board (CCB) reviews and approval of any new procurement that are not in the rail fleet system from before (Original Equipment Manufacturer parts for example). The Safety Department chairs the CCB meetings conducted biweekly and all other departments are also involved. If a new part is ordered it is tested and then the affected departments are involved in the review and approval process. The Engineering department is responsible to do all the testing and results are provided to the CCB for further analysis and approval. The procurement process includes Safety Department to perform their Preliminary Hazard Analysis for any new procurement. Staff reviewed the following document:
   Purchase Request Form for "Visitor" Residential Parking Short Term Permit (PO #: 234793).

   b) Staff interviewed Safety Department related to this question. There has not been any new parts procurement for the last three years. The Twin Peaks Tunnel was a capital funded project and was handled separately from the internal procurement process. The track ties purchased during this project didn't meet the specifications of NFPA 130 and were bought separately through the procurement process for this project with different people involved. All SFMTA involved parties have reviewed and concluded the ties as non-hazardous material in Twin Peaks Tunnel. The Fleet Engineering department reviews, tests, and approves any new material or equipment changes to the current fleet. Then after successful testing by Engineering Fleet, the CCB reviews and approves any new changes. The Safety Department does the Preliminary Hazard Analysis (PHA) on new parts or equipment if required and discusses PHA at the CCB. As an example, the Digital Signal Processor (DSP) dated April 2016 upgrade project

was reviewed. A PHA and Thales (SFMTA Contractor) supporting documents for this upgrade was reviewed and approved through CCB and Safety Department was involved throughout the approval process along with other departments.

c) Any new hazardous materials procurement is reviewed and approved by the CCB and Safety department is a part of the overall review and approval process. The materials data sheet is also provided to all employees who handle hazardous materials on the job. The system is updated as required by appropriate rules and regulations. Staff reviewed Purchasing Request Form (PRF) dated 7/11/2018 for contract number 1000003225 (PO #232657). Staff reviewed approved Chemical Control Material Form (CCMF) for August 21, 2018 for SFMTA MOW Track Department. Staff reviewed CCMF for October 12, 2017 for Cable Car Woods & Mason. All the Safety Data Sheet (SDS) were also attached to the CCMF and Safety Department controls the originals on file.

2. Any new procurement for parts or equipment related to Maintenance of Way (MOW) is reviewed, tested, and approved by the Engineering department assigned. The Engineering department procedure for Approved Equal Parts for MOW was requested but there is no such procedure in existence. The Fleet Engineering department reviews, tests, and approves any new material or equipment changes to the current fleet per Approved Equal Parts for Railcars (Document number ME.PR.005 dated 10/1/18). A part can be tracked back to the system and its original shipment. The serial numbers are provided for bigger parts and the smaller parts like nuts and bolts does not have serial numbers. Therefore, the bigger parts are traceable if defective. SFMTA usually investigates defective parts if there is a trending pattern, Safety assigns a Transportation Safety Specialist (TSS) for investigation. Staff after further interviewing SFMTA representatives and based on the email dated 11/1/18 from System Safety Manager it confirms that SFMTA does not have adequate procedure(s) documented to reflect their current practices.

3. a) As per System Safety Manager, there has been no new parts procured for existing rail vehicles were purchased. As discussed above all new parts or equipment must be approved through the Rail Change Control Board, 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 effects 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. Were a set of

parts to be deemed defective, they can be located through Work Orders to their location on the system and promptly removed.

Findings:

1. Based on interview and the email dated 11/1/18 from System Safety Manager, it confirms that SFMTA does not have adequate procedure(s) documented to reflect their current practices. There is no procedure documenting how Engineering department gets involved in Approved Equal Parts for MOW. Engineering department safety assurance for any part procurement related to SFMTA System was lacking evidence.
2. There are no adequate procedures in place to mitigate or replace defective or deficient material/equipment if such material/equipment is introduced into the SFMTA System.

Comments:

None.

Recommendations:

1. SFMTA Engineering department should provide safety assurance for approved equal parts related to MOW as well as Railcars.
2. SFMTA should document in its procedures how to mitigate or replace defective or deficient material/equipment if such material/equipment is introduced into the SFMTA System.

2018 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	1 pm – 5 pm	**Location**	MME
Date of Audit	October 4, 2018	**Department(s)**	Rail Vehicle Maintenance Security, Investigation & Enforcement Video Recovery
Auditors/ Inspectors	Michael Rose Debbie Dziadzio Richard Fernandez	**Persons Contacted**	Brent Jones – Director Cable-Car Jeff Conley – System Safety Robin Courtney – System Safety Admin Shahin Shaikh – Chief Clerk Chieng Nim- Electronic Tech Hugh Reynolds – Video Electronic Tech Julie Kirschblaum – Chief Transportation Lanair Haynes – Transit Operations Manager

REFERENCE CRITERIA

1. CPUC General Order 172
2. SFMTA System Safety Program Plan (SSPP), Revision 6, dated 2/11/2015
3. SFMTA Rail System Safety Program Plan (RSSPP), Revision 7, dated 2/11/2016
4. SFMTA Rail System Safety Program Plan (RSSPP), Revision 8, dated 2/15/2017
5. SFMTA Rail System Safety Program Plan (RSSPP), Revision 9, dated 2/15/2018
6. SFMTA Zero Tolerance Policy
7. SFMTA SOP SC.PR.005

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

General Order (GO) 172 Personal Electronic Device Prohibitions/In-cab Cameras Compliance

Interview SFMTA representatives and review appropriate documentation to determine the following:

Part 1: In-Cab Cameras

1. Verify in-cab cameras are installed on all light rail vehicles.
   a) Which types vehicles have cameras, and if there are any exemptions for vehicles without cameras.
   b) What inspection program exists for in-cab camera systems?

c) Are the cameras capable of continuous recordings for at least eight (8) continuous operational days?

2. Verify if in-cab camera recordings are being reviewed following reportable accidents and incidents and what is in the criteria?
3. Determine if a recording footage retention policy exists and how long footage is available for potential rule violations.

Part 2: Zero-Tolerance Policy

1. Verify if a zero-tolerance policy for personal electronic device usage is implemented and employees who violate this policy are being disciplined
2. Verify the Zero Tolerance Policy identifies disciplinary actions, steps up to and including discharge, and an appeals process for violators.
3. Determine if SFMTA has records of GO-172 violations on-file for the past 3 years.
4. Determine if SFMTA has a training class requirement for employees to complete on PED usage.
   a) Review employee records to determine if initial and refresher training is conducted for all required employees at least once every 2 years.
   b) Verify SFMTA's PED training policy is administered to Train Operators, Controllers, and Wayside employees.
   c) Review at-least 3 employee records from Train Operators, Controllers, and Wayside workers to verify the RTA to provide roll-call sign-in sheet for all PED policy courses occurring in the past 3 years. Select several required staff, preferably from differing job categories, and verify that training/retraining was completed.
5. Perform a field check to verify the PED Reminder Decal or Prohibition Sign is installed on light rail vehicles.

Part 3: Monitoring and Enforcement

1. Verify SFMTA conducts periodic random monitoring (e.g. video footage, etc.) inspections for GO 172 violations and records are documented.
2. Verify SFMTA performs periodic operations evaluations and inspections and records are on file for at least 3 years.

FINDINGS AND RECOMMENDATIONS

Activities:
PART 1-
CPUC Staff interviewed SFMTA personnel and discussed the In-Cab Cameras on all light rail vehicles. CPUC Staff was informed that Digital Technologies Inc. are the manufacturer of the cameras in all light rail vehicles. The cameras can be accessed remotely, and a demonstration was given to CPUC Staff.

CPUC Staff learned LRV and PCC cameras are tested via the integrated software for connectivity, and overall functionality at the shop nightly. The Cable-Car camera system is a single fisheye camera that is checked once a month. There is no way for an operator or technician to tell if the in-cab or forward-facing camera is working or not (red light). CPUC Staff discovered that if an In-Cab or forward-facing camera is not working and cannot be repaired, it will still be put into revenue service as a leader in the consist. Cable-Car policy is to inspect the camera system once a month leaving a potential for a malfunction not to be discovered for up to a month. SFMTA Personnel showed CPUC Staff the continuous recording for over 8 hrs on a live feed from LRV 1486 and LRV 1516. CPUC Staff also viewed samples from SFMTA Share Point where in-cab and forward-facing camera recordings from reportable accidents and incidents are stored. All video footage for potential rule violations are saved for a minimum of 3 years.

PART 2 –
Per the SFMTA General Notice 2018-GN-047 that supersedes SFMTA General Notice 2018-28, SFMTA no longer has current document that outlines discipline for PED violations. This violates the PED Zero Tolerance Policy as outlined in CPUC General Order 172, Section 2.11. CPUC Staff reviewed 18 PED violations from 2015 through 2018 and followed the disciplinary actions taken by SFMTA.

Part 2 Section 4 was reviewed under Checklist 16-A, Finding #4.

PART 3 –
CPUC Staff viewed video footage of a PED violation from a random monitoring inspection found in a random video observation. SFMTA conducts approximately 10, 15-20 min random video observations for General Order 172 PED compliance. The SFMTA Operator Conduct Spreadsheet is an outline that shows various violations, from PED to sleeping. This spreadsheet is filled out and included in all random video observations.

Findings:
1. The SFMTA General Notice 2018-028 Zero Tolerance Policy was broken into 2 separate disciplinary matrixes. The first Matrix covers the use of a PED while operating and the Second Matrix covers employee PED ON and in his/her possession while operating.

2. SFMTA General Notice 2018-GN-047 supersedes General Notice 2018-28, which SFMTA no longer has a written policy for discipline as outlined in General Order 172 Section 2.11.

Comments:
SFMTA Cable-Car should mirror the daily inspections conducted on LRV cameras. Increasing Cable-Car camera inspections from once a month to daily to ensure proper working condition. This is also outlined in Video Surveillance SOP SC.PR.005 Revision 3.

Recommendations:
1. SFMTA should write a General Notice that is clearly defined under one matrix to avoid confusion and follows General Order 172 Zero Tolerance Policy.

2. SFMTA must follow General Order 172 Section 2.11 and define SFMTA consequences to a staff member who does not comply with the PED use prohibitions of this General Order.

2018 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	9-20-18	**Department(s)**	Transit Division – Maintenance of Way Safety Division Capital Programs and Construction
Auditors/ Inspectors	Shane Roberson Mike Rose	**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 Rail System Safety Program Plan (RSSPP), Revision 7, dated 2/11/2016
4. SFMTA Rail System Safety Program Plan (RSSPP), Revision 8, dated 2/15/2017
5. SFMTA Rail System Safety Program Plan (RSSPP), Revision 9, dated 2/15/2018
6. SFMTA Roadway Worker Protection Plan

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

General Order (GO) 175 Rules and Regulations Governing Roadway Worker Protection Provided by Rail Transit Agencies and Fixed Guideway Systems

Interview SFMTA representatives and review appropriate documentation to determine the following:

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 identifying 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 watchperson 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 Worker 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 at 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

Review SFMTA's RWP program and verify:

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 for:
    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

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

Activities:
CPUC Staff Interviewed SFMTA System Safety and RWP Training Personnel for CPUC General Order 175-A and SFMTA RWP compliance for items in PARTs 1 – 4, above. SFMTA Personnel presented CPUC Staff with SFMTA RWP training records and the SFMTA RWP outline of classroom instruction. The RWP slideshow is very detailed, but SFMTA RWP is missing the Near Miss Reporting Program as required in CPUC General Order 175A Section 10.

Findings:
1. CPUC Staff determined SFMTA does not conduct RWP field exercises as outlined and required in CPUC General Order 175A Section 9.5(b).
2. CPUC Staff discovered SFMTA does not have a Near Miss Reporting Program as required and fully outlined in CPUC General Order 175A Section 10.

Comments:
SFMTA RWP classroom, should have sufficient capacity for all students and be reasonably close to where the field exercise portion of the training will take place.
SFMTA should consider having only one RWP Training program for all SFMTA Employees and Contractors to ensure everyone is trained properly and uniformly.

Recommendations:
1. SFMTA shall include CPUC General Order 175A Section 9.5(b) in its RWP Program Instruction and ensure each class has training experience in a representative field setting. All training shall be conducted by a Trainer who has experience and knowledge of effective training techniques as outlined in CPUC General Order 175A Section 9.6(a).

2. SFMTA shall create and institute a Near Miss Reporting Program, ensure it conforms to CPUC General Order 175A Section 10, and include it in the SFMTA RWP Program.